



**UCAM**  
UNIVERSIDAD CATÓLICA  
SAN ANTONIO

FACULTAD DE CIENCIAS JURÍDICAS Y DE LA  
EMPRESA

DEPARTAMENTO DE CIENCIAS SOCIALES,  
JURÍDICAS Y DE LA EMPRESA

“The contribution of the New Institutional Economics  
in order to avoid opportunistic behaviour in the  
Packaging Supply Chain. A business process oriented  
analysis of the forthcoming German Ink Ordinance to  
avoid food safety scares”

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**AUTHORIZATION OF THE DIRECTORs OF THE THESIS  
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Sign, to comply with the Royal Decrees 99/2011, 1393/2007, 56/2005 y 778/98, in Murcia, (01.09.2015).

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### III

#### **Abstract**

**Purpose** – The thesis aims to explain how the theory of New Institutional Economics can be applied to inspire and develop our understanding of the dynamics surrounding the German paper based packaging supply chain (PPSC) behaviours and relationships in view of the future German Ink as well as Mineral Oil Ordinance and its expected European spill over.

**Design/Methodology** – A meticulous survey of the literature is applied. The study underlying this thesis conducted a research design embedding the selection of participants and inducting them into the research processes by pre-tasking, drafting and executing expert interviews as well as obtaining feedback for respondent validation. The interviewees were representatives of the most central actors in the decision-making process. Seventeen senior managing directors or chairperson of industrial packaging associations on national and European level. The research involved five focus groups: systemic industrial associations (n=5), ancillary suppliers of fibre based packaging (n=2), independent or corporate packaging supplier (n=5), food packers or manufactures on international level (n=2) and industry-oriented consultants (n=3).

**Findings** –The author posits that NIE theory provides valuable insights for relationship engineering within supply chains where social, legal and behavioural dynamics dominate. The findings and conclusions of this research foster valuable information and concrete recommendations for PPSC in Germany. The findings have significance for those who administrate as managers and contribute to the rare body of literature relating the law bill of the expected German Ink and Mineral Oil Ordinances in a business process context.

**Practical Implications** – It is a serious and critical job and duty for managers to conclude and mitigate issues in time to come. The set of NIE theories purvey this demand by providing them with useful tools to respond. The recommendations are related to all decision makers and stakeholders to ensure the success of their business processes within the PPSC.

**Keywords:** German Ink and Mineral Oil Ordinance, New Institutional Economics, supply chain management, business processes, expert interviews, and computer assisted qualitative data analysis



## Acknowledgements

This thesis is dedicated to my wife Silke as well as my family; they have been patient for the last couple of years. My wife put her demands aside, despite the burden of her job at management level; I could not have done it without her. I also thank my daughters Kim Karolin and Bonnie Marie for their patience.

Let us not forget either my father Peter and my mother Luise(†): They have done their best to assure me to fight hard for what I believe. Finally yet importantly to all my friends, who stayed patient with me when I had to cancel appointments or simply disregarded them because I had to write my dissertation.<sup>1</sup>

I thank my supervisors, Professor Dr. Fernando E. Torrejón Flores (UCAM, Murcia) and Professor Dr. Thomas Heupel (FOM, Essen) for their guidance and encouragement along the way.

I am grateful to all participants who took part and support this research: their honesty, openness and willingness to cooperate in interviewing and expert discussions.

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<sup>1</sup> Maybe this is not to everybody's taste, but I also want to acknowledge my dogs Cindy(†), Audrey(†), Emma and Rabia. They were always around me during my PhD journey. All listened patiently when I practice for lectures, conferences or milestone-seminars.



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## List of Acronyms and Abbreviations

<b>ADI</b>	Acceptable daily intake
<b>B2B</b>	Business to Business
<b>B2C</b>	Business to Customer
<b>BasisVO</b>	Basic Regulation
<b>BfR</b>	German Federal Institute for Risk Assessment
<b>BGB</b>	German Civil Code
<b>BLL</b>	German Federation for Food Law and Food Science
<b>BMELV</b>	Federal Ministry of Food, Agriculture and Consumer Protection
<b>BRC</b>	British Retailer Consortium
<b>CAQDAS</b>	Computer assisted qualitative data analysis
<b>CCP</b>	Critical Control Points
<b>CEO</b>	Chief Executive Officer
<b>CFB</b>	Code Frequency Browser
<b>CLM</b>	Council of Logistic Management
<b>CMB</b>	Code Matrix Browser
<b>CMR</b>	Carcinogenic, mutagenic or toxic to reproduction
<b>CoE</b>	Council of Europe
<b>COO</b>	Chief Operation Officer
<b>CPM</b>	Critical path method
<b>CRB</b>	Code Relations Browser
<b>CSCMP</b>	Council of Supply Chain Management Professionals
<b>CSO</b>	Chief Sales Officer
<b>DFTA</b>	German subject section for Flexo printing
<b>DG SANCO</b>	Directorate General for Health and Consumer
<b>DGHM</b>	German Society for Hygiene and Microbiology
<b>DIT</b>	Daily Intake Tolerance
<b>DoC</b>	Document of Compliance
<b>EC</b>	European Community
<b>ECMA</b>	European Carton Makers Association
<b>EFSA</b>	European Food Safety Authority
<b>EFSA</b>	European Food Safety Inspection Service

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<b>EU</b>	European Union
<b>EuPIA</b>	European Printing Ink Association
<b>EUR</b>	Euro (currency)
<b>EVOH</b>	Ethylene vinyl alcohol copolymer
<b>FDHA</b>	Federal Department of Home Affairs (Switzerland)
<b>FEFCO</b>	European Federation of Corrugated Board Manufacturers
<b>FMCG</b>	Fast Moving Consumer Goods
<b>FRF</b>	Fat Reduction Factor
<b>FSA</b>	Food Standards Agency
<b>FVO</b>	Food and Veterinary Office
<b>GAP</b>	Good Practice in Agribusiness
<b>GC/FID</b>	Gas chromatographer with flame ionization detector
<b>GC/MS</b>	chromatogram/mass spectrometer
<b>GDP</b>	Gross domestic product
<b>GE</b>	General expectation
<b>GHP</b>	Good Hygienic Practice
<b>GML</b>	General Migration Limit
<b>GMP</b>	Good Manufacturing Practices
<b>GNP</b>	Gross national product
<b>GSCF</b>	Global Supply Chain Forum
<b>GT</b>	Game Theory
<b>GTP</b>	Good Trade Practice
<b>HA</b>	Hazard Analysis
<b>HACCP</b>	Hazard Analysis of Critical Control Points
<b>HGB</b>	commercial code (Germany)
<b>HOE</b>	Homo Economicus
<b>HPC</b>	Household and Personal Care Standard
<b>ibid</b>	Latin, meaning "in the same place"
<b>ICT</b>	Incomplete Contract Theory
<b>IFS</b>	International Food Standard
<b>IoP</b>	Institute of Packaging
<b>ITX</b>	Isopropylthioxanthone
<b>JECFA</b>	Joint FAO/WHO Expert Committee on Food Additives

<b>kg</b>	Kilogram
<b>kt</b>	Kilotons
<b>LFGB</b>	German foodstuffs and consumer products act
<b>LMQ</b>	Low Migration Quality
<b>LMRStV</b>	Food Law (Germany)
<b>mg</b>	Milligram
<b>MOAH</b>	Mineral oil aromatic hydrocarbons
<b>MOSH</b>	Mineral oil saturated hydrocarbons
<b>NGO</b>	Non-governmental organization
<b>NIAS</b>	Non-intentionally added substances
<b>NIE</b>	New Institutional Economics
<b>NOEL</b>	No-Effect-Level
<b>NOSH</b>	Natural oligomeric saturated hydrocarbons
<b>NT</b>	Network Theory
<b>OCC</b>	Old corrugated container
<b>OML</b>	Overall migration limit
<b>P/A</b>	Principal and Agent
<b>PA</b>	Polyamid
<b>PA</b>	Principal Agent
<b>PAA</b>	Principal-Agent-Approach
<b>PAH</b>	Polycyclic aromatic compounds of hydrocarbons
<b>PAT</b>	Principal Agent Theory
<b>PE</b>	Polyethylene
<b>PET</b>	Polyethylene terephthalate
<b>PERT</b>	Program evaluation and review technique
<b>PIM</b>	Plastics Implementation Measure
<b>POA</b>	Poly alpha olefins
<b>POSH</b>	polyolefin oligomeric saturated hydrocarbons
<b>PP</b>	Polypropylene
<b>ppb</b>	Parts per billion
<b>ppm</b>	Parts per million
<b>PPSC</b>	Paper based packaging supply chain
<b>PR</b>	Property Rights Theory

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<b>PR</b>	Property Rights Theory
<b>ProdHaftG</b>	Product liability law
<b>QDA</b>	Qualitative Data Analysis
<b>QM</b>	Quality Management
<b>QMS</b>	Quality Management System
<b>QSM</b>	Quality System Management
<b>R&amp;D</b>	Research and Development
<b>RASFF</b>	Rapid Alert System for Food and Feed
<b>RBV</b>	Resource Based View
<b>REACH</b>	Registration, evaluation and authorization of chemicals
<b>ROI</b>	Return on Investment
<b>RTF</b>	Rich Text Format (*.rtf)
<b>SC</b>	Supply Chain
<b>SCF</b>	Scientific Committee on Food
<b>SCM</b>	Supply Chain Management
<b>SCN</b>	Supply Chain Network
<b>SME</b>	Small and Medium-sized Enterprises
<b>SML</b>	Specific migration limit
<b>SRQ</b>	Sub Research Questions
<b>ST</b>	System Theory
<b>TAC</b>	Transaction Costs
<b>TCE</b>	Transaction Cost Economics
<b>TDI</b>	Tolerable daily intake
<b>TPE</b>	Third Party Enforcement
<b>TQM</b>	Total Quality Management
<b>UBA</b>	Federal Environment Agency (Germany)
<b>VDP</b>	German Pulp and Paper Association
<b>VDW</b>	Federation of Corrugated Board Manufacturers Association



**Supplementary Units**

**mg** milligrams

**mg/dm<sup>2</sup>** milligrams per square decimetre

**nm** Nanometre

**ppb** parts per billion or 1 in 1.000.000.000

**ppm** parts per million or 1 in 1.000.000

**µg/kg** micrograms per kilogram

**EU Cube:** The standard for 1kg food is a cube. The edge length is of 10 cm. The cube has six side-surfaces of 10dm<sup>2</sup>. The threshold of 10ppb per dm<sup>2</sup> migration test is evaluated to 60mg/kg with regard to a contact zone of 6 times 10dm<sup>2</sup> of the whole cube, containing 1kg food.

1 µg/kg of food equates to 1 ppb

1mg/kg food equates to 1 ppm



The introductory chapter highlights the scientific and methodological orientation of the study and provides a substance to establish the research problem within its context. The guiding research questions; remarkableness of the research as well as the research objectives will be presented. The qualitative, explorative as well as deductive approach to the methodology is discussed. To explicate the study's approach, it is necessary to explain the research method that was chosen. In this regard conceptual analysis, qualitative content analysis, categorising and coding as well as the difference between qualitative and quantitative research are also discussed.

## 1. INTRODUCTION

Nowadays, grocers as well as food retailers present consumers a wide-open choice of packed food. Packaging in general, is the major means of communication as well as differentiator for products from their competitors. Rappold et al. (2005, p.4) denote that packaging [*"... offers brand owners the opportunity to provide product differentiation and a quality image using packaging that has distinct merchandising advantages and display appeal when compared with competing types of packaging"*]. Packaging grants hygiene, serves as protection for transporting as well as storage; it prohibits spoilage from supplier to the end customer. In addition, it sets the brand's reputation as well as polishes the image of the brand or private label. It is a host for information; it provides sales promotion and advertising factors.

Industrial mass production of packaged food plays a key role in the evolution of packaging. The economies of scale as well as speed<sup>1</sup> are entailed; effectiveness in distribution, processing and warehousing in the intense supply chain competitions have made many products and articles more reasonably priced (Chandler 1999, p.235-236; Carson, 2014, p.1).

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<sup>1</sup> Following Janvier-James (2012, p.196) speed is second to none in a food supply chain, the [*"spoilable, subject to rapid extinction, needed on short notice, valuable in connection to its mass, very expensive to manage."*]

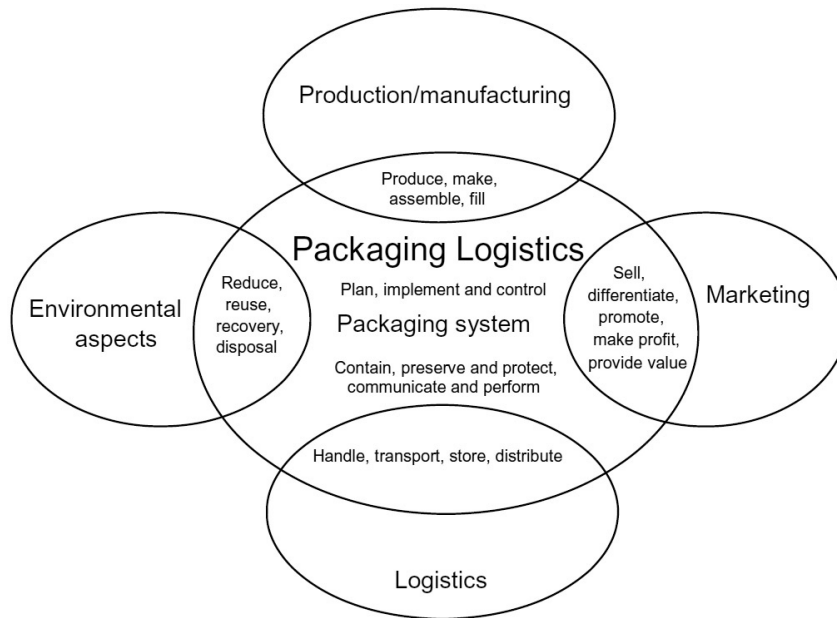
Due to ecological as well as economical needs, fibre-based packaging substrates are massively produced with recycled paper fibres (Wenzel, 2012, p.42). Studies from Switzerland have evaluated cardboard packaging made under use of recycled fibres can contain serious portions of mineral oil traces (Biedermann & Grob, 2010, p.785). The mineral oil impurities stem from graphical printing inks, which are needed for newspapers printing. Frequent intake of these contaminates in our packed food can lead to excess in the toxicological statutory limit values. Even 30 years ago, animal feeding studies in the 1980<sup>th</sup> have proven that mineral oil mixtures are stored in the body. The deposit in tissues led to inflammations, injuries in liver, lymph nodes as well as heart valves by the test species (Hellwig et al., 2010, p.18). Currently, in recent times, there are no studies or results on the impact and effects of mineral oil impurities on humans, but it cannot be lined out that this matter composition contains carcinogenic compounds and potentials. The expansion of foodpackaging migration alerts as well as is in recent times<sup>2</sup> has been spotlighted by consumer protection organisations, NGOs and the public media. The headline driven German legislature respond with the imminent German Ink- and Mineral Oil Ordinance, expected to be in force in 2017/2018.

During recent years some scientific articles and economic reviews focused on the problematic use of recycled paper-fibres or migration of mineral oil traces, while others concentrate on documentation and compliance. This thesis seeks to interpret the big picture as well as to describe the impact and consequences.

Humankind lives in a world full of uncertainty and must face various risks day by day. Information as well as signalling can reduce uncertainty and risks, thus ensuring trust. Aimed at the examination of behavioural uncertainty in hierarchical relationships, recent literature emphasises to imply the interpretations of the New Institutional Economics (NIE). The NIE attempts to analyse institutional arrangements and is thus suitable to provide impulses to clarifications for present problems. This thesis investigates behaviour within the paper based packaging supply chain in Germany employing these theoretical considerations. The decision makers can be modelled as agents within a supply chain (SC).

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<sup>2</sup> See food safety scares: ITX (2006), Benzophenone (2009) and mineral oil traces (2010, 2012, 2013, 2014, 2015).



**Figure 1:** Packaging Logistics by Saghir (2004)

The agents act and decide on individual deal level, but also influenced by relationbonds within the SC. Due to this complex system of dependence it is reasonable to address and determine an agent-principal based approach. The other facets of the NIE are about to adjust the governance structure, to admin and arrange the dealing with contracts and costs of transactions, in addition to give shape to an institutional environment focusing on formal rules and a coping framework of property rights.

The study underlying this thesis conducted a research design including the selection of participants and inducting them into the research processes and introducing the participants to the interviews by pre-tasking, drafting and executing the interview to obtain feedback on the interviewees for respondent validation. To recruit participants exponential discriminative snowball sampling was the method of choice. All respondents were representatives of the most central actors in the decision-making process: senior managers at decision-making levels as well as chairmen or head of industrial associations. The overall goal of this thesis is to investigate agents and principals behaviours in a future risky market

due to the coming ordinance, particularly in the incident of food scares, by means of media effective complaints and product recall. The thesis evaluates the validity of solutions to problems that are provided by the NIE in a tailor-made manner for the paper based packaging supply chain (PPSC). The thesis closes with recommendations for future adapted behaviour.

### 1.1 THE SIGNIFICANCE OF THE STUDY

Existing literature rarely provides knowledge about effects of the structural alterations stated before. However, until now no study has been undertaken to collate a single conceptual framework. This study and research is the first comprehensive view to the PPSC, which is faced with the upcoming German Ink and Mineral Oil Ordinance. The thesis dares to have concrete and theoretical implications, it broaches knowledge and deeper understanding of how the fibre based packaging sector may demonstrate adaptive and suitable future behaviour. The thesis also aims to be well on target to serve executives to outline strategies to cope with legal effects. This research will provide new data and assumptions; the research findings are grounded on worldwide literature, studies, and official documentary studies of authoritarian bodies as well as real-time expert interview results.

The study fenced in five focus groups: industrial associations (n=5), suppliers of raw materials for fibre based packaging (n=3), packaging supplier (n=5), food manufactures on European level (n=2) and consultants (n=3). The expert interviews were semi-structured in that they aimed at answering a similar core set of open questions for each case. They were applied to fill breaches in the literature review and document trail and to ask for enlightenment of facts to complex matters. The face-to-face interviews (n=14) and via telephone (n=3) have lasted about 30 minutes and have been conducted in German (n=15) or English (n=2).

The interviews were accomplished from February to end of April in 2015. The individual duration was about 32 minutes on an average; the total transcript took almost 47.000 words. The qualitative analyse of opinions and attitudes were done with QDA-Software MAXQDA Version 11 (Windows).

## 1.2 RESEARCH AIMS AND OBJECTIVES

In order to achieve the goal of the study, the next objectives need to be applied:

(1) To give shape to a conceptual description and explanation of the NIE theoretical framework, approaches, as well as phenomena that influence it.

(2) To provide a specific level of understanding of the NIE conceptual framework and phenomena regarding the research problem of the PPSC.

(3) To contribute to methodology, data collection / evaluation and to factual analysis and valuation of data, conclusions and findings of the study to answer the research questions.

(4) To give a concrete atmosphere to future risk provoked by the coming regulations.

(5) To provide recommendations for adjusted behaviour to meet these future actions.

## 1.3 RESEARCH QUESTIONS

The following overarching research questions encapsulate the situation in the field of the PPSC and address:

(1) What is the contribution of the NIE to prevent opportunistic behaviour within the paper-based packaging supply chain?

(2) What are the challenges for companies to cope the demand of the ordinance?

(3) Which instruments are used for future compliance?

(4) How can the field of paper-based packaging be improved to face the impending ordinance?

The basis for all these analyses is the review of literature to determine all of the important factors that relate towards the theoretical foundations of NIE and supply chain management. All reviews are directed towards the particular nature of the dissertation's central object of study, the German PPSC. The following sub research questions (SRQ) attempt to provide answers to the above rationale,

problem statements and guiding research questions. The study will attempt to answer these questions by implementing primary and secondary sources:

- SRQ1\_1: Witch theory has the biggest influence?
- SRQ1\_2: What is the glue between these partial NIE theories?
- SRQ1\_3: How do frequency long term relationships provide benefits?
- SRQ2\_1: What kind of market entry barriers must be faced?
- SRQ3\_1: How validation will be performed by authorities or NGOs?
- SRQ3\_2: How do echelons within the PPSC fulfil their tasks?
- SRQ3\_3: What is the meaning of Certification Systems?
- SRQ3\_4: How is trust encapsulated within the PPSC?
- SRQ3\_5: What kinds of trust building instruments are used?
- SRQ4\_1: What are future success factors within the PPSC?
- SRQ4\_2: How asset specificity is concerned?
- SRQ4\_3: Will an oligopoly rise?
- SRQ4\_4: Will there be an EU spill over in legislation?
- SRQ4\_5: Will paper based fibres be substituted by plastics?

#### 1.4 LIMITATIONS OF THE STUDY

The introduced study has limitations. In the first place the research focuses on the German PPSC, focusing on a small number (n=17) of experts. Access to these representatives was gained via exponential discriminative snowball sampling, contacting one participant via the other; the findings of the study may therefore have some limitations. Supplementary limitations: (1) all findings and conclusions are settled on the information, data and expert-discussions provided by the respondents, due to this they are subjected to the potential stakeholder-bias of the involved people. (2) The scope of the study is limited and restricted towards the German PPSC (n=15) only two respondents of sample represent the European view. As such, the findings may vary if the study may be applied to a foreign PPSC or economy. (3) This study focuses exclusively on the issues of corrugated board and folding boxes, all other paper based, different types of packaging like bags e.g.



are excluded. (4) The State of knowledge for investigative research while writing this thesis is 15<sup>th</sup> of April 2015, the day of the last conducted expert interview.

## 1.5 SELECTION OF THEORETICAL FOUNDATION

A theory can be characterised as a scientifically acceptable body of principles offered to explain a phenomenon. While a model has a descriptive underpinning, a theory is much more complex in that it is a [*"comprehensive, systematic, and reliable explanation and prediction of relationships among variables"*] (Cloete, et al. 2011, p.32). A majority of theories have explored supply chains and supply chain management. Nevertheless, as a matter of fact, the multi-faceted natures of the phenomenon under study, here the paper based packaging supply chain (PPSC) and the impact of the coming directives have not been explored. What are the right theoretical principles for supply chains that are considered to be composed of the actors in networks that work jointly to add value to end customers? A supply chain can be characterised as a supply network, in which the inter-organisational relationships are mutual between the upstream and downstream partners. Perspectives of different complementary theoretical approaches will be introduced and presented below in alphabetical order.

### 1.5.1 Game Theory

Game Theory (GT) endeavours to point out the intercourse and/or synergy between individual actors or groups of players whose opportunities and goals are conflicting or even competing. It is a mathematical theory of decision making in conflicting or cooperating constellations. The goal is to provide normative guidelines for rational behaviour of individual actors, which are confronted with strategic decision making or involved in economic interaction. The theory is concerned and adapted towards optimal strategic behaviour, equilibrium situations, stable outcomes, bargaining and formation of coalitions. GT can be divided into two different positions. Noncooperative GT uses the notion of equilibrium to determine rational outcomes of a game; it deals with rational actors interacting or coping with one another to achieve their own individual goals. The purpose is to make predictions on the outcome.

When supply chain cooperation is considered, this may be formalized in repeated games like repeated orders within a SC. Game theoretical approaches are employed in SCM to model problems. Both manifestations of economic activity, noncooperative and cooperative conditions, are disputed in single- and multiperiod settings.

The term and wording “game” is used here as a comprehensive metaphor for interactions among the actors and decision architects in a SC. Inventory management is often subjected to game theoretical consideration. Kreps (1990, p.771) gave shape and outlined critics, he complained that GT took institutions, known as the rules of the game, as given exogenously, no need to explain where the institutions come from or how they went into existence. Important pieces of transaction depend on the legal or social framework in which the transaction is embedded, laws and customs in particular.

In simple words, GT is a kind of study of rational decision-makings in situations where two or more players have choices to make; the related outcome depends on the choices under uncertainty made by each individual player. In a nutshell, GT looks at the conflicting or cooperative behaviours of two intelligent and rational decision makers for different scenarios like win-win, win-lose, lose-win and lose-lose situations.<sup>3</sup>

### 1.5.2 Grounded Theory

The approach of the Grounded Theory contributes to the findings of Glaser & Strauss in 1967. Their book “The Discovery of Grounded Theory” provided a feasible approach for conducting qualitative research projects. They postulated a radical new approach for developing and building an empirical theory. In their time theory, development was done before collecting and analysing data. In contrast, they crafted as well as executed an alternative approach, that theory building is connected to the data collection and the flow during the analysis process, an early kind of flexible data mining. Grounded Theory’s major intent is to [*“systematically seek the full range of variation of the phenomena under scrutiny”*] (Strauss &

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<sup>3</sup> For further reading see Chinchuluun et al. (2008)

Corbin, 1990, p.423). The common approaches used in Grounded Theory for systematic data collections are:

(1) Participant Observation: the researchers examine people in their own usual sceneries or naturally occurring situations. This embroils the researcher in the daily taken actions, lives and practices of those being considered, colloquially this is called fieldwork.

(2) Interviewing: the researchers will study a culture or faction by talking with representatives or members of them. Talking with respondents or informants is called interviewing. Like interplay, interviewing implicates asking questions and receiving related answers. They can be categorised in unstructured interviews, semi-structure ones or structured proceedings.<sup>4</sup>

(3) Collection of items: researchers may also study a phenomenon by collecting texts and items produced by members of the sample like written protocols, charts, flowsheets, emails, texts or media messages used by a culture or social setting in their daily lives (Strauss & Corbin, 1990, p.419).

This engages the researcher to shift in and out of the data collection and analysis process, like iteration. This generative question, introduces the initial iteration of theoretical sampling, to identifying a sample of respondents to observe or interview. After collecting some data, the researcher analyses them. This is called [*“theoretical sampling”*] (see Strauss & Corbin, 1990, p.421). The comparative process maintains until the researcher gets the point, where no further new ideas, perspectives and meanings are being identified within the database (like a saturated salt solution in chemistry).

The reason why Grounded Theory is introduced here is related to the research instrument, that this study will employ later. The study will use open coding - where the researcher begins to segment the interviews (data) into groupings of preliminary categories of findings due to the aspects that being examined, after doing so, the study will organize and integrate the categories and

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<sup>4</sup> For further reading see also Cohen & Crabtree: "Qualitative Research Guidelines Project." July 2006. <http://www.qualres.org/HomeAnal-3596.html>, last access 20.05.2015

themes in a way that articulates a coherent understanding of the phenomenon of study.

### 1.5.3 Network Theory

In the Network Theory (NT), the establishment of networks and various kinds of cooperation are not only based on economic motivations and economic benefit; in contrast, power as well as trust are key concepts in this approach. Networks create trust and increase forbearance (Uzzi, 1997). Following Nooteboom (1996) involved actors believe to act and decide on basis of their functional role with goal orientation, interests, rules and power relations. The term and wording “network” covers all arrangements, contractual relationships among individual, autonomous actors and coping institutions. NT points out those companies as actors and players in the market rely and trust not only on single relationship with direct business partners but within the whole network of relationships.

This competitive leverage can only be achieved within supply chains by developing long-term, trust-based relationships between all concerned echelons within a supply chain (Pala, 2014).<sup>5</sup>

### 1.5.4 Principle-Agent Theory

The Principal/Agent Theory (PAT) is affected and concerned with the governance as well as control mechanism arrangement of firms and individuals. The theory aims to mitigate opportunism, to shorten conflicting interests and balance the ruling information asymmetry among the principle and the agent. Consequently, contracts are used as instruments. In addition, incentives are provided for matching the expected outcome of the principle. PAT is of particular relevance for the situations and settings where one party (the principal) delegates control, certain services or tasks to an extra party (the agent) by limited influence and minor monitoring. The agency theory is eminently grounded on two main columns of determination: principal-agent normative research and the positivist agency theory. The principal-agent “normative” research focus on economists who

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<sup>5</sup> See also Pala (2014, n.p.) at <http://cscm-research.blogspot.de/2013/09/supply-chain-management-theories.html>, last access 16.05.2015.

have investigated egoism, bounded rationality and agents' risk aversion as the core determinants for computer added simulations of relationship modelling (Eisenhardt, 1989, p.58). Mathematical model making is applied to create and shape the design of contract-based incentives to align the interests of all players. However, the computed and non-empirical direction of the principal-agent research lacks a real world application. The positivist, descriptive agency theory has contributed to understanding real world behaviours and issues in terms of agency logic (Mitnick, 2011, p4). PAT aims and seeks to analyse intermediate relationships in business and government cases and provides recommendations for action how they might be managed and accomplished. Essentially, positivist agency theory provides an instrument that might be employed to explain how actors within the SC counter to transaction cost quandaries (e.g. product failure) where rational and non-rational behaviour will come into existence. The findings of PAT also support decision makers to understand SC behaviour: (1) the elaboration of inter- and intra-organisational dependences; (2) the preservation of perplexing relationships between suppliers and buyers; (3) the dynamics of risk sharing and conflict between actors; and (4) identifying the costs and improvements of supply chain solidarity; (5) in case of substantial goal conflict between echelons (e.g. suppliers and buyers) and (6) to trigger the risk under the influence of uncertainty (Sajad et al. 2012, p.556-570).

### **1.5.5 Property Rights Theory**

The Property Rights Theory (PRT) postulates that a firm can be esteemed as an institutional pattern where the governance structure is employed to decrease transaction costs by contracts, as well as to secure the economic distributing due to property rights (Kledal, 2003, p.14). PRT is focused on the systemically relevant question of who should hold and control assets in settings, frameworks or networks where two or more technologically divisible activities are vertically linked together, it focuses on system-wide impacts of different, alternative asset ownership like the "make-or-by decision". PRT does not focus primary on incentives. Consequently, it is not costless to design, protecting and to impose property rights. The related costs, which went into existence, are known as

transaction costs, they give shape as well as determining the governance structure of the echelons.

One way to economize on these questions is the make-or-buy decision, the costs of contracting within a hierarchy or using the market with its price mechanism. By choosing LMQ-processing as a production method and framework for packaging, the packaging company gets access to a critical resource: the opportunity to specialize its human capital. The related specific, residual rights of control generate a rise of power. In correspondence to power the property rights approach is in general focused on preferences, concerned in settlements of price, quality as well as efficiency.

#### **1.5.6 Resource Based View**

Resource Based View (RBV) believes that a firm's resources and capabilities are its most substantial assets. The primary courtesy of RBS is about obtaining access to another firm's core competencies to achieve competitive improvements, so it is targeted on acquisition on ownership and substantial use of intangible assets like knowledge, peerless skills and brand image.

The RBV discusses the position that reasonable competitive advantage can be derived by firms harnessing resources and capabilities that are valuable, rare, imperfectly imitable, and non-substitutable (Barney, 1991) and may be combined into core competences (Prahalad & Hamel, 1990). Collaboration is important in the context of the resource-based view; since by definition, it involves firms mutually leveraging each other's resource base and capabilities due to acquire competitive advantage. A key issue of the RBV is the finding that a SC can be characterised as a unique agglomerate of resources that can give its echelons sustainable and clear competitive edge (see also King, 2002).

#### **1.5.7 System Theory**

System Theory (ST) points out that models, principles, as well as laws exist that can be applied to generalized systems or their substructure, irrespective of their particular kind. The general systems theory tries to find and define common acceptable laws in physical, biological and social systems based on the methodical

holism; it is not a single research discipline but more an interdisciplinary discourse. Models as well as principles, which are found in one system, should also be applicable in other systems like equilibrium, signalling and response or self-organisation (Bertalanffy, 1973, p.30-31)<sup>6</sup>. In light of SCM context ST brings together different components like the workforce (humans), knowledge, materials and financial resources to form a subsystem, which is consequently, part of a larger system as supply chains or network (see also Pala, 2014, n.p.). The theory argues that for a holistic perspective ST must be applied to acquire the internal and external factors that shape an organisation's supply chain performance.

### **1.5.8 Transaction Cost Economics**

The main question that Transaction Cost Economics (TCE) tries to answer is why firms exist. TCE's basic idea is to align transactions in a transaction cost economizing way (Pala, 2014, n.p.). In addition, governance structures will be established to mitigating hold-up problems linked to contractual risks such as asset specificity. Central to the theory's argument is the idea that firms and arms-length contracts through markets are two opposite poles connected by a continuum of hybrid governance structures, like joint ventures, strategic alliances or other forms of cooperation. Transaction costs arise in addition to the costs of production through the creation, assignment, transfer as well as implementation of property rights (Wigand et al., 1997,p.35) and include information and communication expenses, time as well as efforts employed in managing the desired exchanges (Sajad et al., 2012). In view of SCM, TCE aims to shorten the costs when deciding whether to use own production resources or to buy on the market (Pala, 2014). Hereby, the theory points out that various control and governance mechanisms should be applied to reduce the potethe risk of opportunistic behaviontial risk of opportunistic behaviour within supply chains when outsourcing. TCE indicates that in act of any economic commerce, the cost of products, articles or services should also include all costs, which may be out of sight (Sajad et al., 2012). Alternatively, relationships within a SC are often intangible trade-offs within a

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<sup>6</sup> For applications for social systems see Luhmann (2008) and Parsons (1976), not employed in this thesis, but recommended for further reading.

make or buy decision and TCE does not provide a sufficient explanation of social, political, legal and behavioural dynamics.

### 1.5.9 Incomplete Contract Theory

The theory of incomplete contracts of the firm (ICT) embedded issues of PRs, insights of TCE regarding the significance of bounded rationality in conjunction with contracting costs with the stringency of agency theory (Brynjolfsson, 1994). The ICT focuses on different organizational structures assigned to PR to resolve the issues that rouse when agreements are incomplete and contain loopholes, which may induce opportunistic responses. Finally the theory provides a principle for defining divergent organizational structures by ownership and control of key assets (Grossman & Hart, 1986, p.692), following preliminary considerations from Williamson (1975, 1979). As a matter of fact, contracts by their own nature are fundamentally incomplete due to the bounded rationality of the contracting parties (Kherallah & Kirsten, 2001, p.15). They conclude that firms will become permanence when people write and enter into incomplete contracts and instead proposed that the allocation of governance and control subsequently becomes necessary. Following Grossman & Hart (1986, p.699) it is thus agreed that contracts are ceaselessly renegotiate, redesigned to obtain more efficacy despite the renegotiation cost. These notions of contractual incompleteness can be used to understand economic institutions and arrangements (Grossman & Hart, 1986, p.699). According to Saussier (2000) four aspects are particularly relevant when considering incomplete contracts: (1) ownership and the boundaries of firms, which refer to PR and (2) securities and power distribution. Ownership provides power and the right to decide about asset (outside of a given contract) when contracts are incomplete with loopholes.<sup>7</sup> Grossman & Hart's (1986) theory of incomplete contracts should be understood as a facet or a selective expansion with regard to central considerations of NIE.

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<sup>7</sup> For further reading see Saussier (2000a)



### 1.5.10 Theoretical Foundation

The above mentioned and short outlined theories are not the only complete theories in SCM literature, a bundle of many more theories are related to SCM (see also Pala, 2014, n.p.). The challenging problem with diversity of theories is to define a sole point of view. Nevertheless, each of the previous stated theories have a different aim in the management and structure of supply chains so that each will consequently give a unique perspective of the PPSC phenomenon being studied. A measure used to prevent unilateral experiences and points of view is to employ several theories, which complement each other and fit into a multifunctional framework, to attack the research problem from different viewpoints as a multi-disciplinary analysis. PAT can be applied to make known contractual counteractions to the desired outcome or behaviour uncertainty inside of the SC relationships (Sajad et al., 2012).

PAT provides a holistic view of divergent behaviour of agents within the SC relationships. Information and material flow, upstream from raw materials and downstream to the end customer, give the connective link within a principal / agent-relationship. In addition, principal-agent relationships within a SC are influenced by third party regulation and enforcement (ibid, 2012).

PAT support decision-making, by providing measures around incentives, information sharing, goal congruence, and specifically with respect to supplier and customer relationships to mitigate behavioural uncertainty across transactions (ibid, 2012). Supposed shortcomings of TCE and PR may be widely balanced by the application of agency theory. The normative entity of PAT will not be employed in this study.

As stated before TCE theory provides control and determine governance structures to shorten the uncertainty of opportunistic behaviour within supply chain firms when outsourcing to contracting business partners. TCE supports the basic concept that all cost of the product or service should also include all hidden costs. "First of all to be cheap" became a mantra, a familiar expression among the PPSC, TCE will help to align transactions in an economizing way. Property rights cover the framework of political as well as legal ground rules that founds the basis for production, exchange, distribution and the rights of a contract (Kledal, 2003, p.11)

Resume: NIE seems more than other theories to fit as well as to close the gap between real life phenomena and its theoretical validation within the PPSC. For the purpose of this study and with regards to its multifaceted nature, the New Institutional Economics will be the theoretical foundation, the method of choice; wholly in the spirit of Masten (1996, p. 24): [*“No single theory is likely ever to explain fully all of the reasons why people organize as they do”*]. All facets of non-market institutions are excluded in this research study.<sup>8</sup> This thesis will not explore institutions of the political and legal sphere but only ones of economic nature.

## 1.6 DEFINITIONS

The following wordings are commonly used terms within this study’s field of research. To shorten the range of possible misunderstanding and to share the same meaning of terms, the main key words employed in this thesis will be explained and used with this meaning through the whole study. The description is briefly to give a concrete shape to the wording before entering the fundamentals and the main sections of the study.

German Ink- and Mineral Oil Ordinance: it is expected that a change in legislation may occur, concerning the German LFGB, as the 21<sup>th</sup> legal amendment the “Inks Ordinance” for packaging inks and the 22<sup>th</sup> legal amendments the “Mineral Oil Ordinance” with general validity for consumer goods and not only for food packaging. In 2010 when the first weak signals reached the PPSC, both legal amendments were used in a single term, the colloquial phrase “Ink Ordinance”. Mineral oils and its derivate are widely formulated as solvent and binder for offset printing inks (Lorenzini, 2012). Due the state of knowledge, the lawmaker had taken an isolated view, exclusive to inks. Due to supplemental research and recent scientific findings, the diffusion of mineral oil into the loop of recycled fibres has been categorised as a ubiquitous one.

To cope with the emerging problem and to close the case in time, the lawmaker split the law bill into two independent, separate legislative proposals. In

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<sup>8</sup> e.g. Information and political economics, economics of law and constitution.

the course of this study, the terms ordinance and law bill are synonymous and discusses both amendments due to their shared origin and the problem of overlapping. The German Federal Ministry of Food and Agriculture has presented the revised fifth legal proposal for the Ink Ordinance at 15<sup>th</sup> February 2015. The Mineral Oil Ordinance is still under construction; the third legal proposal has been tendered. The most striking issue is to find common grounds for assertion. No procedure of analysis is currently available and used within the toolset of official control for foodstuffs. Unequivocally verified evidence, based on analytical findings, is not available at present. The lawmaker gladly publicised an end-of-pipe solution: barrier coatings.

Corrugated Board: the rolls of containerboard are forwarded to converting plants, where they are converted into corrugated board products. The corrugated medium is in contact with heat and steam treatment before receiving its distinctive fluted shape by a pair of mating corrugated rollers. Starch is brought in contact to the tops of the paper flutes and they are wedged with the inner linerboard. Further processing can add additional liners (layers) for building up double- or triple-walled corrugated board. The so coupled corrugated board is dried after this and slit lengthwise and cut into sheets, ready for casemakers or diecutters. The final stages of processing are carried out and the finished boxes are stacked and shipped.

Paperboard: Paperboard, also known as solid board or folding box board, is characterized by thicker layers than paper. Paperboard is broadly used for fibre based food packaging, due to its low cost, lightness, good resilience, good printability and recyclability. The most prominent features and appeal to customers is its natural look compared to plastic materials.

Closed loop: the End-of-Life phase is an important part because it can have a significant influence on the overall profile of cardboard or corrugated board. The closed-loop approach considers that the recovered paper fibres are handled in the same life-cycle of the product. This demands that all recycled fibre input is collected and that no old corrugated container (OCC) does not leave the system

nor does additional corrugated product enter the system. This prevents corrugated material from going to landfill operations or incineration, and therefore no environmental effect is related to this material. Depending on the condition of recovered OCCs the amount of recycled fibres is between 85% and 95% of the recovered liners and papres can be used again to produce recycled containerboards (Gaudreault, 2014).

**Crisis:** According to the Oxford Dictionary (2015), a crisis is a time when a difficult or important decision must be made. A crisis is a critical event or point of decision, which if not managed in an appropriate, timely way or even ignored; it might turn into a tragedy as well as disaster.

**Food scare:** In recent times, awareness of food safety crises primarily came from the media. The media can inform but also scare, terrify the public opinion with headlines. This opinion building influences buyer behaviour. In the 90<sup>th</sup> of the last century, Wildavsky & Dake (1990) have shown that behaviour associated to food scares are grounded on consumers risk perceptions and on risk attitudes. Risk perception reflects a consumer's interpretation of the likelihood they will be exposed to the illness or disease. The crisis related responses of the final customer within the PPSC are cutting consumption or the turn to substitute products, which may be integral part of a competitive SC. In both incidents, market clearing is interrupted and negative externalities will come into existence for stakeholders, e.g. brand owner, retailer, and private label.

**Migration from recycled fibres:** food contact materials used for packaging can contain various substances able to migrate, which may pose a risk for public health. Recent European legislation is particularly focused on plastic materials; materials like cardboard and corrugated board are much less regulated. Paper based packaging materials and especially recycled contact layers can contain a variety of contaminants. Some are highly volatile and easily pass from the board to the food as mineral oil. The very volatile of these hydrocarbons can easily migrate to paperboard food content through the gas phase, due the evaporation-condensation mechanism (steam pressure). This applies particularly to foods

which are subjected towards a high surface to weight ratio, with a long shelf life and in direct contact with the packaging paper in the absence of a plastic or aluminium protective barrier. The presence or existence of a functional barrier layer between paperboard and food or feed is not always able to avoid contamination, because it depends on the barrier's chemical nature, homogenous structure and thickness (Lorenzini, 2012).

Set-off migration can be a fast process, but mostly migration is influenced by time, temperature and pressure. In general contaminants are represented by substances like mineral oils, phthalates, plasticizers, and photo initiators (ibid, 2012).

Mineral Oil: It is one of the many products extracted from petroleum. It is a compound, an agglomerate of thousands of hydrocarbons.<sup>9</sup> It is widely used as solvent for printing inks applied on paper based products such as newspapers, books and packaging (included food packaging). This is the reason why in paperboard packaging obtained from recycled materials, amounts up to thousands of mg kg<sup>-1</sup> of mineral oil hydrocarbons can be found: they derive both from the recycled material and from the paperboard package printing itself.

Mineral oil is commonly used as a solvent and binder for offset printing inks, and therefore present in old newspapers to be recycled (ibid, 2012). As stated before the toxicity of the accumulation of mineral oil in tissue is not fully evaluated, but a temporary acceptable daily intake (ADI) of 0.6mg/kg has been constituted for MOSH. MOAH are probably more toxic, both are suspected to be a potential carcinogen (Harling et al., 2012).

Functional Barriers: many food and beverages require barrier applications. Barrier efficacy is usually defined against oxygen and moisture. Polyolefins (PE

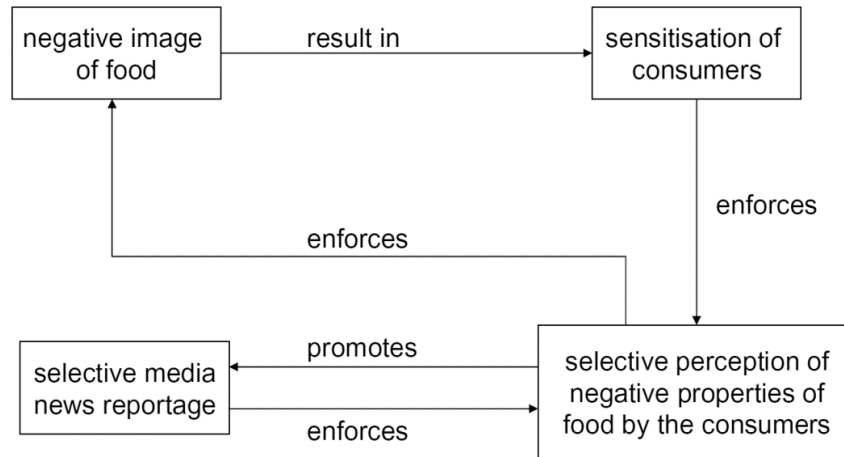
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<sup>9</sup> Owing to this fact the appearance of a mineral oil in a GC chromatogram is not given by some clear peaks but it is instead as a hump of unresolved isomers.

and PP) are poor barrier against mineral oil. Mineral oil will be much more efficiently stopped by polymers bearing polar groups (PA, PET, EVOH, etc.). Absolute barriers are glass and metal or metallized surfaces without pin holes.

**Analytics:** in addition to the lack of legislative references, food contamination with mineral oil also poses problems in analytics. Huge complicated molecules form the contaminants. An effective analytical method must be capable to extract, separate them and quantify the amount to provide a legally, resilient framework in case of liability. Food compositions are declared and labelled by law, but the formulation of raw materials for packaging composition is very often the company's best kept secret. Consequently, when analysing a packaging sample with chromatographic techniques, the analyst finds the [*“Forest of Peaks”*], mostly unexpected and unknown (Harling et al., 2012).

**Media:** The media is a key player in forming opinions. The role of the media is important in the formation of the public opinion; especially the mass media has an influential effect, a crucial and huge role in the communication process. The frequency of negative news will not only be determined by the actual scandal frequency but also from the demand for scandal information. This coherence is called the [*“vicious circle of selective perception”*] (Alvensleben1998, p.9).

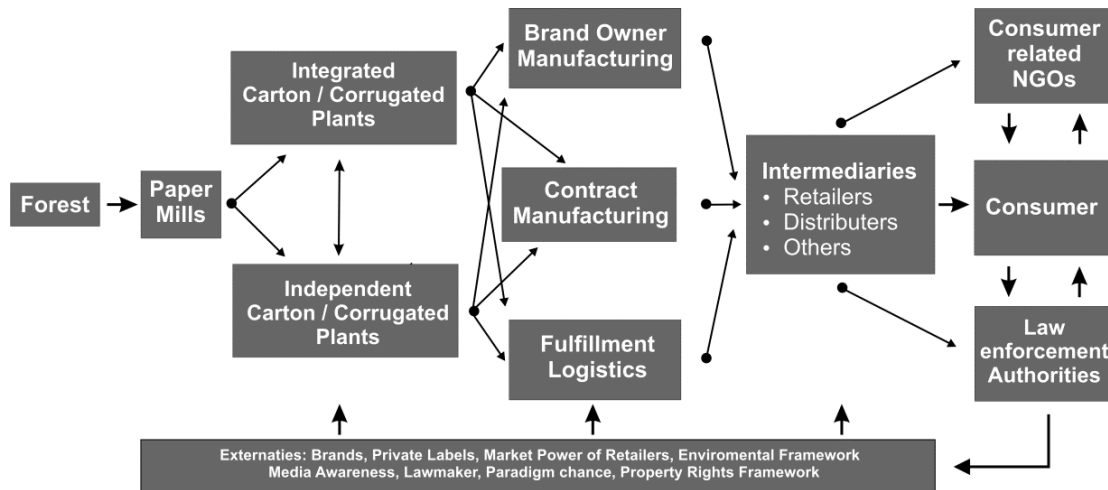


**Figure 2:** Vicious circle of selective perception (Source: Alvensleben1998, p.9)

Communication: Communication is one central aspect in daily life. Communication means the exchange of ideas and is closely related to interaction (Saggau, 2005, p.58). A well-established description of communication is the “sender-receiver-model” which means that communication only happens if there are at least two participants taking part in the communication whereas both act reciprocal as sender and receiver (Lasswell, 2009). The direction and the way of communication are important factors for the success of the communication intention. There is (1) direct communication, immediate contact between sender and receiver; (2) indirect communication, communication via media; (3) unidirectional communication, one communicator and a silent receiver; (4) bilateral communication, a dialog between the communicator and the related receiver (Bruhn 1997, p.173).

Paper based Packaging Supply Chain (PPSC): these are integrated or independent converters of solid or corrugated board, but also suppliers that print and process food- and non-food packaging. Businesses here is operated and covered by a complex set of regulations: enforced and inspected by government agencies and voluntary commitments of industry associations (Juterzenka & Heupel, 2015). Packaging is an entity of various components and must ensure its ability to transport and store materials as well as to transmit information. As far as packaging is involved with foodstuff is most of all directed to protect the content

by maintaining its properties. This study looks at the paper based packaging supply chain from upstream paper mills and raw material suppliers to the downstream-located retailer or grocer.



**Figure 3:** The PPSC and its driving forces, authors own graph, published before in Juterzenka & Heupel (2014b)

Low Migration Quality (LMQ): a focal point in raw materials is low migration quality (LMQ). It identifies and describes manufacturing packaging for foodstuffs in such a state of technique that no harmful substances are formulated or unfortunate added (NIAS). Generally these substances exhibit very little odour or, off-flavour as migration levels are kept low for food, pharmaceutical as well as tobacco applications.

### 1.7 THE STRUCTURE OF THE THESIS

The thesis is divided into eight chapters. The following section offers an overview of the rationale and professional scope that have guided the direction and purpose of this thesis.



Chapter I: Introduction and Methodology. This chapter introduces and discusses the aims of this study. It elaborates the research questions. The chapter illustrates the purpose and reasons and the scope and significance of the thesis. The second part introduces the research methodology. It describes the research design and approaches. In addition, it also addresses the research methods applied in this study, and describes the process of qualitative content analysis. The aspects of reliability and ethical considerateness in view of the participant group for expert interviews are also addressed in this first chapter. The scope of the first chapter takes from subsection 1.0 to 2.12.

Chapter II: Packaging, Supply Chain and Certification Systems. This chapter provides an overview of the paper based packaging supply chain employed in this thesis. It introduces fibre-based packaging in brief details and provides a general description of SC and certification systems (private standards). The scope of the second chapter is from subsection 3.0 to 3.9.6. This chapter encompasses segments that have been presented in international conferences or published in scientific journals before (see Juterzenka & Heupel, 2014, 2015)

Chapter III: Literature Review and Regulations. This third chapter is divided into two parts. Part A is concerned with the theoretical background, literature review and regulations to food and feed. Part B presents to 360° view to the future ordinance. The scientific assessment points out the complex mechanisms of migration and the pollution of substances. The chapter aims to outline the dilemma between environmental sustainability (the need for circle economy) and preventative measures for public health. The scope of the third chapter is from subsection 4.0 to 7.9.

Chapter IV: Scenario Analysis. The fourth Chapter analyses the liability risk within the packaging chain. It starts with a description of the relevant details of a media-effective recall, a summary of contractual agreements and lawful interactions of any kind of all business operators within the packaging chain and also examines material defect liability. This chapter encompasses results that have been presented in international conferences or published in scientific journals (with

full peer review) yet or already accepted for publication (see Juterzenka & Heupel, 2014, 2015). The scope of the fourth chapter is from subsection 8.0 to 8.2.3.

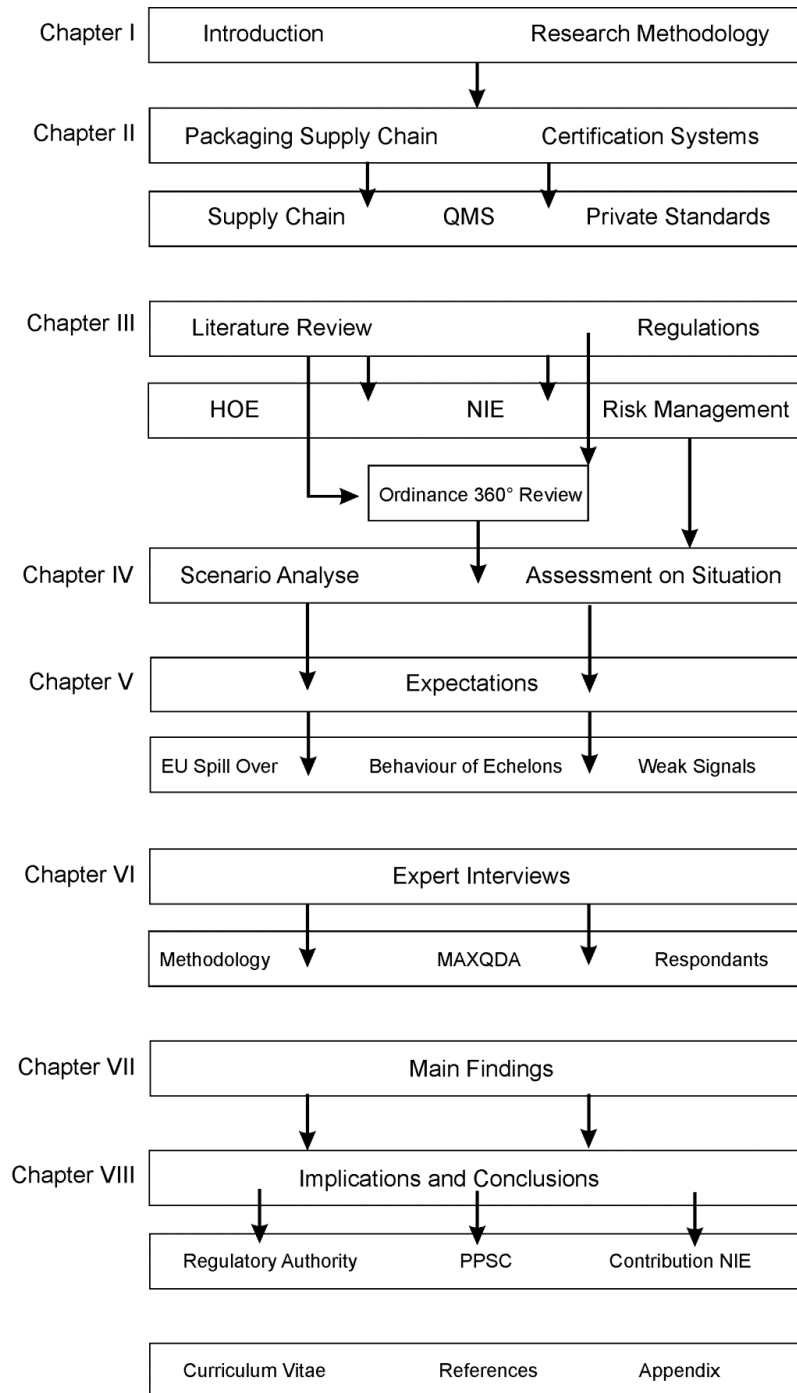
Chapter V: Expectations. The fifth chapter deals with the expectations due to the analyses stated before. The expectations set down in this chapter have been already presented at various international conferences, lectures or published in scientific journals (with full peer review). The scope of the fifth chapter is from subsection 9.0 to 9.9.

Chapter VI: Expert Interviews. The sixth chapter provides knowledge expert interviews and introduces the participants. The technique of computer assisted qualitative data analysis (CAQDAS) will be presented and the program of choice: MAXQDA. The scope of the sixth chapter is from subsection 10.0 to 10.7.

Chapter VII: Main Findings. This seventh chapter presents the overall results and findings of this study, along with a discussion of the qualitative data collected all through this study. The chapter aims to analyse institutional arrangements and provides solutions for the present problems and research questions. In addition, it gives shape the economic role of trust. The scope of the seventh chapter is from subsection 11.0 to 11.5.

Chapter VIII: Recommendations and Conclusions. The last chapter provides a compendium of the entire study and offers recommendations based on the primary data, as well as the secondary data gathered throughout the study. It offers recommendations arising from the findings. Limitations of this study are identified and it indicates areas for future research and offers decisive conclusions. The scope takes from subsection 12.0 to 12.6.

## 1. INTRODUCTION



**Figure 4:** Structure of the thesis



## 2. RESEARCH METHODOLOGY

The research methodology of the thesis and guidelines to its study are discussed in this chapter. The same applies for the selection and profile of the respondents and access to industry associations. The code of ethics, confidential assurances provided to the respondents during induction are also given shape in this chapter. The approaches towards data-collection, -interpretation and -analysis, as well as measures of trustworthiness employed, are emphasised here.

According to Yin (2011) the picking and choosing of a research strategy is bound on three conditions: (1) the character of the research question, (2) the scope of control that the researcher has got (3) and the degree of focus on contemporary. Following Glesne & Peshkin (1992), the researcher is the main instrument for research, as he observes, asks questions, and interacts with research participants or despondence. Therefore, following Nicholson (2007, p.64) [*“... the researcher is obligated to provide a thumbnail sketch of his or her background and experience”*]. Due to this, the reader is in a better position to judge the comments and conclusions of a study (Spradley, 1980).<sup>10</sup>

Various scientific methods can be used to analyse empirical evidence in the field in an attempt to confirm or disprove a hypothesis or to conclude findings on a research question. In distinguishing the research methodologies, the qualitative and the quantitative approach can be differentiated, but subjected by the way, in which data will have been gathered. Qualitative research strives for in-depth description. In contrast, the quantitative approach is characterised in that information or data are compiled and interpreted by applying statistics. In simple words, quantitative research aims to be objective; the qualitative one is subjective. The research decision of whether to select a quantitative approach or a qualitative research model is a philosophical one. It depends on: (1) the nature of the project, (2) the type of information required, (3) the placement of the study and (4) the availability of recourses. Elements of both research approaches can be employed together in mixed-methods studies.

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<sup>10</sup> See CV of the author

As Collins & Hussey (1997, p.78) note, that the use of different research designs and techniques within the same study can [*"... overcome the potential bias of a single method approach."*]. Both disciplines, qualitative and quantitative approaches are empirical methods, because they engage the collection, analysis, and interpretation of (field) observations or data.

## 2.1 QUALITATIVE RESEARCH

Qualitative research is exploratory research. It is used to gain and broaden an understanding of underlying reasons shaped by opinions, motivations and reasons. Qualitative research obtains to collect, analyse and interpreting data. The field of research is what humans in real life do and say. Experts in their specific area or field of knowledge are directly asked about their perception with regard to certain issues by means of interviews, offering their expertise and views to provide the opportunity for in-depth exploration of issues (Maurer, 2004, p.1). Wyse (2011, n.p.) called attention to the point that qualitative research employed in addition to uncover future trends and behaviours. Qualitative data discovering methods employ unstructured or semi-structured techniques.

This may take place in discussions with focus groups, unique interview and expert interviews or observations in the field. The difficulty about supporting all the statements mentioned above is the dependence between findings and personal skills of the interviewer; because it may be asserted that, the quality and any derivative use of the findings from qualitative research depend directly from the skills, experience of the interviewer and the drift or spin of the interview.

Beside all critics of "subjective findings", the primary objective of this kind of approach is to generate rich, detailed as well as valid (process) data that assists to a deep understanding of the context (Anfara & Mertz, 2006, p.135). Denzin & Lincoln (2005, p.xv) summarise that [*"... qualitative research is an interdisciplinary, trans-disciplinary, and sometimes counter-disciplinary field; it crosscuts the humanities, social sciences and physical sciences and is many things simultaneously"*].

## 2.2 QUANTITATIVE RESEARCH

In opposition to qualitative researchers' approach, quantitative researchers focus on the fact that data can solely be interpreted substantially when they are subjected to a close relationship with the object of study. Quantitative research quantifies a problem or a subject matter of an investigation by generating numerical data or data that can be transformed<sup>11</sup> into accessible statistics. Quantitative measurement must be objective, quantitative and statistically valid.

It is used to compute behaviours, attitudes, opinions, and other defined variables to generalize results and findings from a larger sample. To collect quantitative data is much more structured than gathering qualitative data; they include different forms and kinds of surveys, face-to-face interviews, interviews by phone, chats, online polls, and systematic observations (Wyse, 2011, n.p.) Collin & Hussey (1997, p.12) state that the quantitative research approach provides results that are open-minded and unbiased; they are not influenced by the researcher. Quantitative research generates reliable population based and generalizable data and correlations, and is well applicative for establishing cause-and-effect relationships, such as changes when time will go by.

## 2.3 PARADIGMS

Following Ponterotto (2005, p.127-128) a paradigm is a philosophy. It comprises a belief system, worldview or framework, which guides research and experience in field research within real life. The paradigm is the planning, coping framework for the research process; it may include research guidelines and issues, assumptions and principles for the researcher to follow.<sup>12</sup> Bogdan & Biklen (1988, p.22) shape the term paradigm as [*"a loose collection of logically related assumptions, concepts, or propositions that orient thinking and research"*]. The paradigms used in this research are interpretive. The interpretive paradigm discovers meanings and interpretations by studying cases in natural settings and employing the resulting

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<sup>11</sup> Like employing proxies, when the variable is not directly concrete accessible.

<sup>12</sup> There are three established research paradigms which will not be mentioned here in detail: Positivism, Critical-Ideological and Constructivism-Interpretivism. For further reading see Ponterotto (2005, p.129-130).

data for analytic deduction. The interpretive paradigm adopts an ontological status which adopts that reality is composed, and comes forth out of social interaction, in derivation the interpretive paradigm leads to qualitative research (Ponterotto, 2005, p.130-131, Denzin & Lincoln 2003, p.29). This thesis cope a qualitative research paradigm, because qualitative research provides insights and findings that are deduced from the empirical research in a natural situation, and claims to gain an in-depth understanding of a situation. The researcher in the field and his sample, the respondents, jointly creates findings and conclusions by interacting in dialogues (Ponterotto, 2005, p.129). Qualitative research methods are employed more often within the constructivist / interpretive paradigm as they are presumed to fit and be better suited to investigate the truth (Christie & Fleischer, 2008, p.25).

#### 2.4 RESEARCH DESIGN

It may be asserted that qualitative business researchers focus on practical issues. It should incorporate or rely on some theoretical ideas and concepts, or try to develop these further in the research process by theory building (Eriksson & Kovalainen, 2008, p.41). Planning, preparations and execution of a research project are the frame- and patchwork of a research design. The design process covers all proceedings from literature review, methodology, empirical data gathering, analysis and the writing processes of the thesis. Eriksson & Kovalainen (2008, p.35) gave concrete shape to the research processes they describe is as a [*... circular process which involves revising and revisiting the original ideas and thoughts, revising plans, reading lists and rewriting the chapters*"]. Maxwell (2013, p.2) supports these statements, he postulates that a research design involves and copes all framing [*activities of collecting and analysing data, developing and modifying theory, elaborating or refocusing the research questions, and identifying and addressing validity threats*"].

The research questions to be explored are the nucleus of the research design and linked to all other components. Owing to this fact Maxwell (2013, p.76) points out that qualitative researchers often do not develop and improve their final research questions until they have sufficient, significant amount of data collection as well as analysis. The thesis followed these guidelines; the researcher began with certain goals and a substantial base of professional experience and theoretical literature based knowledge, in deduction these determined certain problems or



issues and generated questions about these. The researcher starts with working assumptions, the final research questions were determined after closing the fundamental part of this thesis.

Qualitative studies often employ small and manageable numbers of samples and of uncertain representativeness. This limitation usually means that the study can provide only suggestive answers to any research question framed in general terms (Maxwell, 2013, p.79).

Purposive sampling, even with a small number of respondents, can give a representative and accurate picture of future development and generate adjusted behaviour. This modus operandi demands to enhance understanding of the selected samples (people or groups) as they are picked out for a specific purpose, supporting task or expertise in the field of research. Due to this very fact Devers & Frankel (2000, p.264-265) postulate that the researcher must be able to give reasons for employing purposive sampling and to demonstrate validity for the research findings and conclusions.

In subject-specific literature, purposive sampling is also called judgemental sampling. Judgement sampling is a non-probability sampling device, here the researcher believes in his own judgement when choosing members of population or respondent to participate in the study.

More specific instead is the recent goal orientated description of Maxwell (2013, p.98-99) in which he points out the following five goals for purposive selections: (1) receiving reliable representation; (2) receiving data from the most relevant population for the study; (3) deliberately examining theories that have started with or which have developed during the study process; and (4) establishing comparisons from different participants to further enlighten the research findings or identifying unexpected phenomena and generating new theories and to (5) develop causal explanations.

In this study, the research design includes: (1) the selection of participants; (2) the introduction of the participants by pre-tasking, drafting and executing the

interview, (3) obtaining feedback from the despondences for validity (member checking), and (4) data collection in a recorded form.<sup>13</sup>

Member checking is a procedure whereby collected data and interpretations are tested as they are derived from members and groups from which data are inquired. The process of member checking is the almost important action inquirers or researchers can take, for its focus on sound credibility criterion. Member checks are testing the overall report of the interview or case study with the related source groups before casting it into final form for analytics. These checks are carried out after completion of the study. (Guba, 1981, p.85-86).

## 2.5 VERIFICATION THROUGH A PILOT STUDY FOR INTERVIEWS

In supporting the findings of Zikmund (2003, p.117) a pilot study is defined as [*“... collective data for a small-scale exploratory research project that uses sampling but doesn't apply rigorous standards”*]. As a pre-test, a pilot study help to improve aspects and issues for a future final study yet to come. It checks procedures in the field of research, the kind of data collection and related instruments, and finally the analysis as well as evaluation plan (Yin 2011, p. 37).

A pilot study was managed whilst the calendar weeks 04-06 in 2015. Its purpose was to detect weaknesses in implementation and to provide data for sections of a probability sample. It was also confirmed that the questions had been formulated in a neutral way.

The participants understood all questions, and the interviews were closed timely. The pre test applied purposive sampling to determine respondents. The participants of the pilot study knew that they are participating in a pilot study and wished to stay anonymous. The probability samples were a quality manager of a medium-sized packaging company, a managing director (CEO) of a commercial printer for labels and packaging and a sales representative, an application engineer

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<sup>13</sup> The hardware used for audio-digital recording was an Apple Ipad4 with the application “Voice Record Pro” from Dayana Networks Ltd., Version 27.01.2015. The application was chosen due to control of playback speed for transcription, volume and setting bookmarks.

of an international ink supplier. The pilot study provides opportunity to practice, to test the equipment and to reformulate questions for the later interviews.

As a result of the pilot study, the ranges of interview-questions were shortened, despite questioning were detected by the respondents and have been answered with similar, repeated wording. Some questions facing the respondents were scientifically too complex, featuring specific migration limits (SML) and different techniques for measuring. These questions were eliminated. The different recommendations were integrated into the content of the interview, esp. the correctness of the asking questions.

## 2.6 ACCESS TO INSTITUTIONS AND INDIVIDUALS

When the researcher approaches interviewees within institutions or organisations, he must convince them to participate. In this regard, Eriksson & Kovalainen (2008, p.54-55) provide guidelines, to introduce the research project; to meet the right person and admit permission. To use personal communication is necessary, then use sales skills and let the company or institution representative know in simple words the direct benefits to the company/institution including confidentiality undertakings and that a code of ethics will be employed in the study.<sup>14</sup>

In the phase prior to all interviews, the researcher must seek permission from the respondents at the designated institutions to craft and execute the research and obtain confirmed mutual consent to do so. Ehigie & Ehigie (2005, p.622-623) point out in addition that research is perceived as disturbing and a disruption in daily business life and lacks of any foreseeable, without measurable and countable benefits in the short or long-term for the institution or company that is being studied. It is critical for the researcher to develop mutual trust in order to create a working relationship and atmosphere with the company/institution (Flick 2002, p.56-57).

Cooper & Schindler (2008, p.37) point out that the permission to conduct research by an informed consent forms a strategy which demands written consent.

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<sup>14</sup> See Appendix sub section 15.11

Here to obtain reliable, helpful information the researcher has to accepted only interview-partners who have given a written declaration of consent. Some research respondents have reservations, restrictions of time or fear of probing questions, so the researcher must overcome these barriers with multilateral confidence building measures to form a relationship. This type of exercise was supported by the interview-participants signing the research introduction letter from the researcher himself, which also contained assurances of confidential treatment as well as the use of audio-digital voice recording to ensure accurate representation of the participant's answers.

## 2.7 ETHICAL CONSIDERATIONS

As Goddard & Melville (2005, p.49) remarked, to gather knowledge or data from people, ethical concerns must be considered, [*... apart from instrumentation and procedural concerns*"]. These include respecting their privacy, treating them as individual persons as well as do not subject them to unnecessary questions, all coped by an appropriate respect. This implies in addition that the respondents shall not be recognizable while reading the study, when they demand to stay anonymous. [*People have a right to privacy, and the researcher must keep collected data confidential...*] (*ibid*, 2005, p.49) and store them in his own sphere of influence. Ethical considerations are demanded in research in to avoid misconduct in science: ethical guidance and codes of honour that must be conform (Eriksson & Kovalainen 2008, p.68-69). The principle of ethics in empirical field studies and research is to ensure that no one is harmed or negatively affected by researcher's activities. Nevertheless, the researcher in the field must explain as well as demonstrate the value of the research project to give shape to a win-win situation between the researcher and the respondents. He has to grant how their rights will be safeguarded. Consequently, the researcher will obtain permission in written or oral reassurances from the respondents ahead of conducting the research project (Cooper & Schindler 2008, p.37).

One last comment on the authors own behalf: Beside all respect to gender policies this thesis is written in the gender of the author. It was easier for him to write in one's own gender and not a disregard to female researchers.

## 2.8 DATA COLLECTION BY INTERVIEWS

An interview is a method of data collection and typically seen as the gold standard, the best solution in qualitative research method. Berg (2004, p.75) defines interviewing as a ["... *conversation with purpose*"]. Weiss (1994, p.29) defines interviewing as ["... *a construction sill of knowledge*"].

A selected group of participants (the sample) were asked questions to find out what they think and why they behave in their own manner. Interviews make it plain and simple to compare answers. Following Hussey & Hussey (1997, p.156) interviews are being conducted face-to-face (personal), voice-to-voice (phone) or screen-to-screen (chat); executed with individuals or a group. An interview involves a face-to-face verbal collaboration between the researcher and his respondents and should have a plan.

Data collection for this thesis was mainly through in-depth interviews with the selected respondents. In collecting data by employing interviews, the researcher must not have an impact on the respondent's answers (Goddard & Melville 2005, p.49). Cooper & Schindler (2008, p.162ff.) postulated that the achievements of the qualitative interview depends on how much the researcher anticipates all respondents for the interview, this kind of quality assurance process is called ["*pre-tasking*"].

During the interviews, the author wrote down the key statements. When the session was closed, the researcher drafted a detailed report from memory (field notes) because after the microphone has been switched off, additional information was offered from all participants. Some lively discussions and intensive interaction followed.

Afterwards, the recorded materials (files) are transcribed from digital audio format (mp4) into written text format. The original recordings are stored and held as a reference database that can be looked up, to verify the correctness of the transcriptions.

### 2.8.1 Transcriptions

Transcription is the modus operandi of transferring oral speeches to written texts. Kvale & Brinkmann (2009, p.178) point out that oral speech that need a translation from one form to another. The text analysis can only refer to the transcripts, but it is limited by its nature. Transcripts are never complete representations of the raw material from which they originated.

For this study, a smooth verbatim transcript - or clean read - is the method of choice. The transcription has been done word by word without utterances as a coherent text, simple to understand, representing the original wording. Grammatical structure has been improved.

### 2.8.2 Data analysis

Following Mayring (2014, p.41) qualitative content analysis cannot be seen as a statically, sound outlined and sharpened approach or instrument; it must be more seen as a sequence in which independent stages of analysis enduringly have to be added. In more qualitative research is emphasized again and again that theoretical arguments must be applied. Technical blur is to be recompensed by theoretical guidelines or a sound theoretical framework (ibid, p.41). As a rule of thumb, content analysis necessitates a written or transcribed text as a source (ibit, p.57). The hand outgoing data, word files from the original database are the foundation of the analysis, spoken colloquial language must be transcribed, and rules on how must be defined exactly prior to writing (ibid, p. 57).

### 2.8.3 Content analytical units

A key principle of content-analytical procedures is the rule that the written down text is not recognized and analysed as a whole, but classified into fragments of text to which the categories are assigned later (Mayring 2014, p.51). Two features characterize content analysis, according to the definition of this study: [*“rule-bound procedure {...} and the theoretical orientation of the interpretation of the findings”*] (ibid, p.59). According to Mayring (2014, p.59) theory here is to be understood as a set of general criterions on the subject or sample to be examined and analysed to achieve new knowledge. The specific methodological approach for the evaluation of this

study is a step by step plan, an algorithm (see appendix) similar to Mayring (2014, p.95; 2010, p.93):

(1) The research process starts with the selection and definition of the categories, which will be the central, core element of analysis. The category definitions encompass the significant material from the base texts; consequently, they have to be determined prior and can be modified while running a pre-test.

(2) Anchor samples will be identified and marked in the context of the textfile. Significant text passages will be related towards discrete categories to be cited as characteristic examples, they serve to illustrate the badge of those categories (ibid, 2014, p.95).

(3) Coding rules must be at hand if problems of description between compete categories arise, guidelines must be framed before text-segments are associated with a unique category (ibid, 2014 p.95).

(4) To perform a trial run: corresponding to the ultimate examination of the textfiles, facts of interest can be labelled by mentioning the category number as well as high-lighted by diverse coloured underscorings in the base text itself (ibid, 2014 p.95). In this study the marking options of MAXQDATA<sup>15</sup> are used.

(5) The segments from the initial text are marked with anchors. After matching them they are treated in accordance with the structured guidelines defined before (ibid, 2014 p.95).

(6) Final coding: The whole material has to be worked through keeping within the guidelines of the same rules, category definition and grade of abstraction (ibid, p.96-98).

(7) Main categories: At the end of this process a list of categories will come into existence, may be grouped to build main categories, useful to answer the research questions.

(8) The result is at first the list of main and subcategories. If categories will have been established in more than a few text segments while numerous evidences are thinkable, the category occurrences will be subjected to a frequency analysis.

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<sup>15</sup> MAXQDA is a professional QDA-Software for qualitative data analysis.

The category system and derived data (the frequencies) have to be evaluated and discussed in the light of the guiding research question (ibit, 2014 p.83, 86, 98).

(9) Analysis: The result is the frequency distributions of categories. The frequencies of allocated categories completed over all text-units or the comparing of frequencies in dissimilar groups of text-units may be considered statistically (ibit, 2014 p.22, p.98). The Code Frequency Browser (CFB) of MAXQDATA is used for this. In case of several category systems assigned to the same units, a simple correlation analysis is possible with the CRB of MAXQDATA.

## 2.9 VALIDITY AND RELIABILITY

Maxwell (2013, p.106) recaps that truthfulness of research entails validity and credibility of information provided to an enquirer or researcher. Trustworthiness consists of four elements (Guba, 1981, p.80):

(1) Credibility refers to whether those findings bear any relationship or affinity towards former data to the data from which one drew the findings: [*“The testing of credibility is often referred to as doing “member checks,” that is, testing the data with members of the relevant human data source groups “”*] (ibid. p.80).

(2) Transferability is about whether the findings can justifiably transferred to any other research context.

(3) Reliability is about how well the researcher can assure readers of his findings and the way he arrived at them from the raw context or model (ibid, p.82).

(4) Conformability refers to whether or not one can convince readers that, as a researcher, one is not influenced by personal biases, prior knowledge or theoretical background (Lee & Lings, 2008, p.210).

Donaldson et al. (2009, p.52-53) gives shape to credibility as a quality that emerges on evaluation of information or research work by experts. They adjudged research as credible when it acknowledges the views of those who are considered. The value proposition for this research was stated at the introduction stage to the selected participants who represented well-known players in the PPSC. The fact that they are senior professionals and decision-makers in the field of supply-chain management gives credibility to the study.



## 2.10 TRIANGULATION

This section focuses on the triangulation process in research data collection methods and subsequently, the collection of information. The use of various information sources enables triangulation, which in turn helps ensure validity. Following Bryman (2006, p.105) triangulation means [*“convergence, corroboration, correspondence of results from different methods. In coding triangulation, the emphasis was placed on seeking corroboration between quantitative and qualitative data”*]. Jick (1979, p.608-609) points out that triangulation offer researchers several considerable preferences:

(1) Triangulation entitles researchers to make sure of their results. This is the entire soundness of the multi method research design.

(2) Triangulation can play other practicable roles too; it can provoke the generation of skilful methods, new ways of approaching a problem to balance against conventional data-collection techniques (ibid, p.608).

(3) Divergent or opposite results from multifaceted methods can lead to worthwhile explanation of the evaluated research problem (ibid, p.609).

(4) The usage of multi methods can also induce a formation or integration of theories (ibid, p.609).

(5) Triangulation may also contribute as the critical test, to decide between rivalling theories. (ibid, p.609)

Concisely triangulation gives rise to use more sources of knowledge. As related to multiple sources, it provides more insight into the phenomena (Cooper & Schindler 2008, p.185). Triangulation limits and mitigates biases and limitations and allows the researcher to obtain broader perspectives (Willis et al. 2007, p.219). It enhances validity (Lee & Lings 2008, p.239) and the researcher can entrust on both primary and / or secondary data sources, videlicet literature study and field interviews.

Resume: The range of triangulation in this study is limited, only secured by employing senior-executives for the interviews, but cross-referenced from recent literature and conference papers and participants' member checking and debriefing after the interview. A third, linearly independent source of data collection like questionnaires was not performed in the study.

## 2.11 VERIFICATION

Creswell (2007, p.207-208) gave shape [*“validation strategies”*] (ibid, p.207), procedures or measures of verification. He proposed that at least two of all must be embedded in one given study:

(1) Lengthy engagement as well as tenacious observations in the field, to include building trust with the sample as well as with the respondents, to get familiar with the culture, and checking for half-truths related to distortions hosted by the researcher himself or informants in the field of research (ibid, p.207).

(2) In use of triangulation the researchers apply multiple and linearly independent sources and theories to shed light on a field of research or perspective. The overall goal [*“... is to provide corroborating evidence”*] (ibid, p.208).

(3) Peer review and/or debriefing after fieldwork assists as an external verification of the research, in a corresponding perspective as reliability in quantitative research is used (ibid, p.208).

(4) During the study period, the researcher rearranges initial hypotheses until all cases fit the framework and eliminating all exceptions (ibid, p.208).

(5) Describing the researcher bias right from the start of the research project is considerable, the reader must understand the researcher's point of view and any corresponding biases, his definitions and working assumptions could be a burden (ibid, p.208).

(6) In member checks or validations by the respondents, the researcher solicits or canvasses participants' views of the trustworthiness of the interviews. This is considered [*“... to be the most critical technique to establish credibility”*] (ibid, p.208), it involves escorting data, analyses, and corresponding conclusions in return to the respondents, so that the study participants (the sample) can judge the credibility and veracity.

(7) Deep and rich depiction guides the reader to conclude his own decisions, regarding towards transferability. By employing a comprehensive description, the researcher permits readers to assign or address information to other settings (ibid, p.209).

(8) External audits as well as publications allow an exterior consultant or member of the scientific community to examine the procedures and the findings to

assess their accuracy (ibid, p.209). A peer-reviewer analyses if the findings, interpretations, evaluations and conclusions are confirmed by the data, theory or other fact-findings.<sup>16</sup>

Resume: In the scope of this study, the author incorporated: (1) Member checking; (2) deep and elaborate description and (3) external audits with presentations at conferences, lectures and peer-reviewed articles to receive feedback (see subchapter 13). Only after the literature is reviewed, analysed, and after the respective specific graphics have been presented and peer reviewed is it used for pre-tasking the interviewees (see Juterzenka & Heupel (2014a,b, 2015).

## 2.12 CONCLUSION OF CHAPTER 1

The first chapter provided an introduction into the field of research and the reasoning for choosing the NIE. A brief clarification of the thesis's buzz and key words was given. The qualitative research paradigm used in the study was discussed and the research fields of exploratory, deductive, and qualitative research have been introduced.

Purposive sampling was elaborated and demonstrated. The ethical considerations for the study, selection of participants, and access to institutions and individuals were covered. The data collection methods used, which include interviews and field notes, the recording process and transcription of the data were described. The content analysis method was stated, validity and reliability were expressed.

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<sup>16</sup> For further reading see Crosswell (2007), Denzin & Lincoln (2000) and Guba (1991), Lincoln & Guba (1985)



### 3. THE PAPER BASED PACKAGING SUPPLY CHAIN

Anecdotally it is said that paper based packaging is a hidden champion. This industrial branch works in silence but its output is omnipresent. Paper, carton board and corrugated board are the most desired kind of packaging all over Europe.<sup>17</sup>

The European Federation of Corrugated Board Manufacturers (FEFCO) is an umbrella-organisation. The organisation represents the interests of the corrugated industry all over Europe. Latest figures of them point out that the corrugated board industry production is almost 42 billion m<sup>2</sup> per anno.

In sum 420 companies, and 686 plants in total are in the field in Europe and around 78.800 people were employed. About 40% of corrugated packaging is designed and used to protect food products.<sup>18</sup> The entire European corrugated industry had a sales volume of 4.730.760 T€ and a turnover of 4.691.473t in corrugated board.

Besides corrugated packaging, the other hidden champions are folding boxes. The market is huge! A 2013 survey by the European umbrella organisation of European Carton Makers Association (ECMA) puts the market share for the German cardboard industries by 25% with a production value of 1.879 Mrd. EUR.<sup>19</sup>

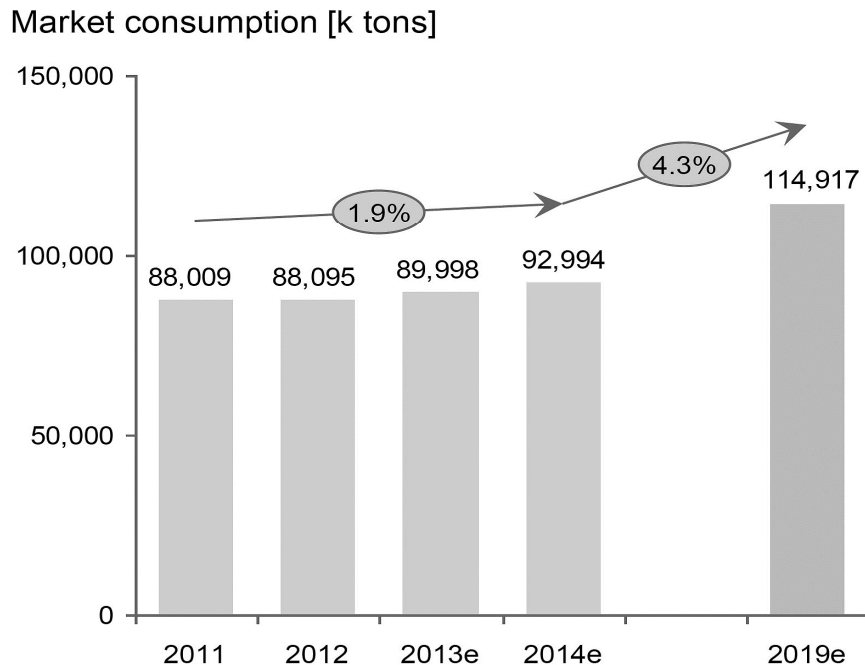
Strong competing suppliers and the procurement power of customers demarcate the industrial aria of corrugated paperboard and folding boxes.

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<sup>17</sup> FEFCO press release from 25<sup>th</sup> March 2015: The study took place in Belgium, Germany, Netherlands, Italy, Poland, France, and Spain. 1.114 consumers stated that the kind of packaging have an impact on their purchase decision, 93% said that they would prefer to buy products in paper-based containers than in plastic porches.

<sup>18</sup> <http://www.fefco.org/about-fefco/what-fefco>, last access 12<sup>th</sup> June 2015

<sup>19</sup> See <http://www.ecma.org>, last access 12<sup>th</sup> June 2015



**Figure 5:** Western European growth rates for corrugated board, source: pira report 2014 and BCG (Lorenz, 2014, p.10)

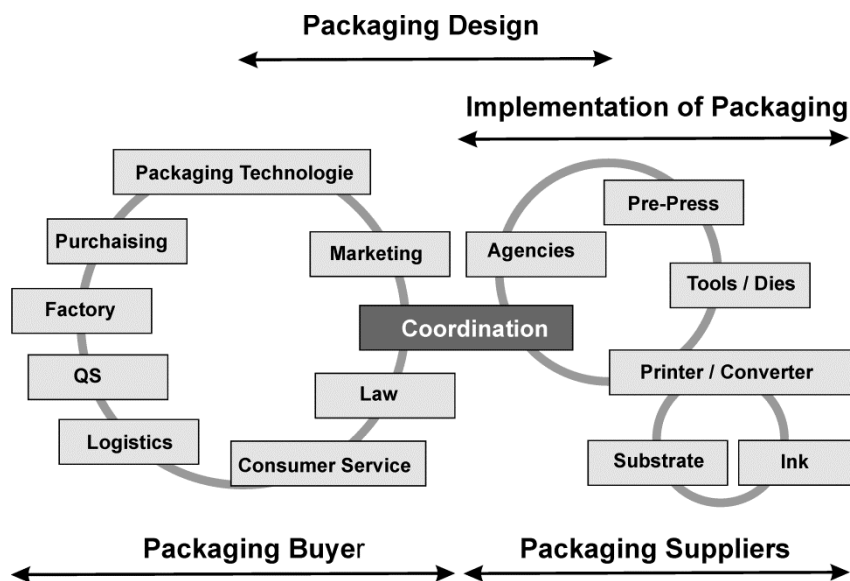
In a number of segment markets, where competition is particularly fierce due to overcapacity, a significant competitive pressure rules. The sector's standards for high quality on delivery were identical or directly comparable. In this process, the players must hold their own by means of quality and price to prevail over their competitive rivals.

Cost leadership or the need to differentiate, to find a niche is the framework of business. On the one hand, large corporations, in particular, benefit from vertical integration, including incorporated control of recycled fibres.

On the other hand, small, medium-sized enterprises (SME), which are independent plants, are investing in consultancy expertise or skills or technologies, which considerably raise their competitiveness against large corporations.

## 3.1 WHAT IS PACKAGING?

The idea of packaging has changed from a sole protective function, towards being a share of the logistics chain. The terms packaging and package are often mixed up both within literature and in daily business speech. It is to be expected that a literature survey of the definition of packaging will include a large number of definitions. Research recently carried out in the Institute of Packaging (IoP in Naperville, USA) by Paine (1981, p.3) defines three definitions of packaging. These definitions summarize packaging as: (1) a coordinated system for transport, distribution, storage, and retailing; (2) a method or technique of ensuring safeguarded delivery (3) or a function focused to minimise costs of forwarding and delivery by optimal sales promotion.



**Figure 6:** Packaging aspects, authors own graph, based on ESKO Media files at [www.esko.com](http://www.esko.com), webcenter (2015, N.N.)

Almost 20 years later Soroka (2010, p.3), likewise from the IoP, confirmed these definitions and showed again that packaging is best marked up as an adjusted system of preparing goods for distribution, storage as well as retailing. Prendergast (1995) states that packaging may be circumscribed as all products to

be used and designed for the containment, delivery as well as presentation of the inner packed goods. It starts from the raw materials to ready-made goods and articles, from the producer to the consumer. Packaging has many faces, in its more familiar and usual form it is simply a box made of corrugated board or cardboard on the grocer's shelf. It can be a wraparound for beverage. It can also be used as a shipper for goods or smaller boxes. Hanlon et al. (1998, p.1) states that packaging at the point of sale are art and science, they are materials and equipment, they provide improvement in protection and promotion, they comply with laws, logistics, manufacturing, and materials handling.

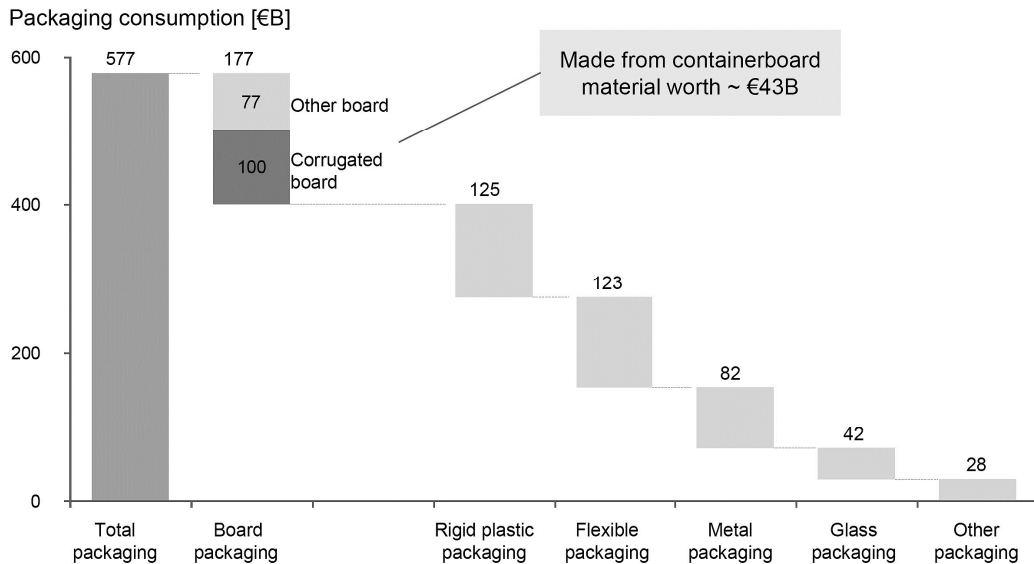
Referencing Piringer (1993, p.1-27, 38ff, 92ff, 203-263) boxes, trays or displays are a large advertising area and inspire consumers to purchase the product within. The legislator's definition of packaging is according to the EU-directives (94/62/EC)<sup>20</sup>. Here packaging is described as: all products composed of any kind of materials to be used for containment, protection, handling, as well as presentation of goods, from raw, starting materials to handled goods, from the manufacturer to the user or the consumer. Primary or sales packages are boxes or wraparounds, containers, bags or pouches which form a sales-unit for the end consumer. Secondary packaging or known as grouped packaging is a tray, box or container that contains a number of single sales units. Tertiary or transport, shipping packaging are containers, made in general of corrugated board, pallets or even shrink wrap foil that were used to aid handling and to prevent damage to products.

For sake of completeness, packaging covers or includes shipping containers common for all kinds of forwarding. It is crucial that each level is designed and developed to be functional. Due to the interaction between the levels the estimated performance of the packaging solution should include all the levels (Hellström & Saghir, 2007, p.216)

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<sup>20</sup> European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste.





**Figure 7:** Source: Pira Packaging report 2013; Pira Corrugated report 2014; BCG analysis, Lorenz (2014, p.9)

Lambert et al. (1998, p.332) argues that a good packaging design is mainly dependent on pricing and standardization, protective and hygienic level, handling and pack ability, reusability and / or recyclability. From the view of warehousing and materials management, the packaging is closely connected to productivity and cost-effectiveness: a correctly designed packaging decreases cost, increases service and improves handling in the stock and store.

Prendergast & Pit (1996) suggest that packaging can be divided into two aspects: logistics and marketing: to contain and safeguard the goods while delivery and distribution and also for its marketing function. Packaging is essentially used for the purpose of sales packaging, attracting final end consumer as well as strengthening the packed product's image.

Packaging is an entity of components with the duty to serve predictably and to cover a certain product. The function of food and animal feed packaging is primarily to protect the contents by maintaining its properties even in direct contact. Food and feed, pharmaceutical and tobacco packaging materials must be manufactured by good manufacturing practices (GMP) so that under typical, common or foreseeable conditions of use, they do not dispatch their constituent

elements to the product in quantities, which may possibly endanger human health or bring about an intolerable change in their composition. Packaging must make sure its contents transportability and storability as well as transmitting information (labels, printings) to retailers and customers. The packaging materials or layers can be very different and can consist of various intermediate products.

Seen under the light of contamination one must note that all the layers of packaging are coupled via the gas-phase with each other. Due to their mettle, technical function or barrier properties they can also have a massive impact on the inner packed food. The fundamental principles of the Framework Regulation EC 1935/2004 apply to the packaging system in a whole.

As mentioned before packaging systems might have the potential risk to influence packaged food. It is to be expected (Huber, 2011, p.2) that for the very reason a huge difference has to be drawn between packing and food contact materials or layers for a risk assessment: packaging components are physically touching the food. Typical items are cardboard boxes, flexible films, tubs and aluminium membrane or caps. According to Huber (2009) there are four categories to classify food contact layers:

(1) Packaging component is in close air or gas-phase contact with the foodstuff. Examples are a box or pouch for twisted products, a non-sealed chocolate tray or a retail case for wrapped products. They all have got one thing in common; to share the same gas phase.

(2) Packaging component is in direct contact with food during consumption phase. For example, a box for sealed praline tray, container around bars, a lid of sealed boxes.

(3) Packaging components are in close contact with sealed low barrier films, for instance PE-coated paper, a bag for cereals, OPP-pouch or bags for biscuits.

(4) Packaging component is a sufficient, fundamental barrier made of PET-coatings or absolute barrier like glass, aluminium or metallization.

## 3.2 SUPPLY CHAIN

Recent research postulates that [*... the objective of a supply chain is customer satisfaction*] (Govil & Proth, 2002, p.7). From the 60s of the last century, the idea and concept of logistic has gone through a number of changes. Ballou (2004, p.4) defines logistics in its militaristic context as: [*The branch of military science having to do with procuring, maintaining and transporting material, personnel and facilities*]. This means the planning and handling of personnel and related materials and their implementation into strategically sound methods and procedures. Coming from the military need of tactics and strategies for the resupplying of armies, the issue of logistics moved to non-military management. Vogt et al. (2005, p.4) states that logistics means the application of reasoning and mathematical analysis and derivations to the complex issue of correspondent problems to match labor and supplies. The term [*supply chain*] is itself a novel phrase or wording in management, first went into existence in the early 1980s when writers nailed the term to describe a novel management discipline (Oliver & Weber, 1982, cited in Cristopher 1992, p.63-75), Cooper et al. 1997, p.1).<sup>21</sup> It was a redefinition of common accepted business activities covering transport and warehousing, manufacturing-based operations, the facets of procurement, order and inventory management, process planning up to customer service. The integration of warehousing and transportation came into existence followed by game-changing, re-engineering in all material respects of supply chain cost structures in the 1980s. In the late 1980s the focus of further development shifted to customers' needs and derivated services. Following the wording from by the Council of Logistic Management (CLM) Cooper et al. (1997, p.1) state precisely the term of logistics as [*... the process of planning, implementing and controlling the efficient, effective flow and storage of goods, services and related information from point-of-origin to point-of-consumption for the purpose of conforming to customer requirements*]. The concept of logistics was remastered again, when the formulation of a supply chain strategy came into existence. In other conceptions, SCM also combines coordination as well as collaboration with channel partners (echelons). In simple words: this could be upstream raw suppliers, downstream intermediaries / third party service providers, and finally end customers using the

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<sup>21</sup> For further reading see Sucky (2004, p.7-9)

finished goods. SCM also includes the informational interchanges in the logistical process reaching from acquisition of raw materials to delivery (downstream) of finished products to the end customer (upstream). Govil & Proth (2002, p.7) add the global point of view, they define supply chain as a [*“global network of organisations that cooperate”*] (ibid, p.7) to encourage the exchange of information and the flow of materials between suppliers and end customer by the lowest cost and the highest speed to be just in time. A supply chain needs a design: plants, stocks, transportation and the flow production processes to satisfy customers demands must be harmonized (Harrison et al., 2004, p.4). The entire infrastructure is wrought with a system that lays down the control and enforcement tools, the conditions for co-operation and co-ordinating all business processes and activities to deliver consumer value at minimum cost (Hugo et al., 2002, p.29). A review of the SCM literature shows that some kind of puzzlement exists in terms of the nature of SCM but some commonalities do exist:

(1) Between all SCMs' stakeholders is a bidirectional flow of communication, production materials, related services as well as operational activities. Customers are demanding goods consistently delivered faster, right on time, and with no damage. Each of these economic constraints necessitates trust and coordination.

(2) SCM contains interwoven plots and complex shifts of many independent organisations. The regulation and managing of these interactive relationships are of fundamental interest.

(3) SCM establishes a several stage processing sequence. In its general sense and implementation it ties up the entire chain from source suppliers' to the final end customer.

(4) Above all goals SCM tries to contribute to value added advantage and services to customers by a proper and effective use of resources to create advantages.

(5) Various authors outline SCM in operational terms to mention the flow of materials and/or goods, others name it a management philosophy or management process.<sup>22</sup>

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<sup>22</sup> For further reading see Mentzer et al. (2001).

Compared with business processes supply chain business processes become linked towards a network structure, a network across intra- and intercompany boundaries (Lambert et al., 2000, p.66). Christopher & Peck (2004, p.4) describe SCM as: [*“... a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer”*].

The awareness of networks is of primary relevance to this thesis, because the striking issue is that SCs are not purely linear chains or straight flows: they are complex networks (Christopher & Peck, 2004, p.4). The products and information flows within and between nodes in a variety of networks that link organisations and industries (ibid, p.4)

For the purpose of this thesis, following Mentzer et al. (2001 p.18), Supply Chain Management describes the [*“... systemic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole”*].

### 3.3 THE FOCAL COMPANY

In 1977 A. Dupont Chandler (jr.) postulated in “The Visible Hand” that the revolution in forewadding, transport and linked communications led to radically new production and distribution systems in many sectors and branches of the U.S. economy, even within the food sector. As new manufacturing and logistics systems were developed (Chandler, 1999, p.209ff, p.240ff), economies of scale came into existence (ibid, p.147, p.236). Professional food processing and related effective packaging, conservation technologies have been the foundation for the rise of national and international brands and food mass retailing chains (ibid, p.224).

Increased speed in handling orders, the progressing of massdistribution, the rise of massmarketers as actors in the market, represented an organizational revolution and made it possible to increase the speed and lower the cost of the distribution of goods (ibid, p.235-236). Elimination of smaller players from the market took place: massmarketers replaced merchants as distributors of goods because they internalized a high volume of market transactions within a single large modern enterprise. Massmarketers reduced the unit costs of distributing

goods and articles by making a game change, for a single set of workers using a single set of facilities to handle a much greater number of transactions within a given period.

In the meantime, high-volume stock-turnaround encourages a sound cash flow that permits the enterprises to purchase larger quantities in cash and reduce the cost of credit needs and finances for the distribution of goods. Chandler (1999, p.235ff, 244) gave concrete shape to these economies of scale and distribution, because they were not yon of size but due to speed, he named them [*“economies of speed”*] (see also Carson, 2014, p.1).<sup>23</sup>

In the past, many attempts have been made to optimize operational business processes within companies. The game changing goal was to apply useful tools to enhance the performance of thcompany and has no large effect on SCM. The necessary measures usually only led to partial improvement in the competitiveness of an individual company (Pfohl, 2000, p.3ff).

Following Sydow (2001, p.283) supply chains often have a certain structure; there exists a focal company, which exerts a great influence on the supply chain. Supply chain networks are delineated by the existence of a focal company, which coordinates the network in a hierarchic way in order to meet strategic objectives. Borchert (2001, p.1) argues that the focal company is a system head, therefore it can assume the management of all echelons , in order to integrate and combine the coordinating instruments, measures and units into a goal oriented productive entity. Known as a system head, a focal company is in general a powerful industrial and/or commercial institution that has a great impact on other companies. By definition, strategic networks are guided by focal companies, but not dominated by them (Sydow, 2005, p.270).

Focal firms are architects of business transactions in the market; they design as well as formulated, create and produce goods or services. Within a supply chain framework the focal firm is a ruling institution: the dominant decision making authority body, which provides the rules to shape how the business processes are formulated and set in force by coordinating upstream echelons. The focal firm is

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<sup>23</sup> Speed is crucial due to the facts that the products are spoilable, subjected to extinction, and limited choises on short delivery notice (Janvier-James, 2012, p.196).

acknowledged by consumers as responsible as well as liable for the product or article (Hanf & Dautzenberg, 2006, p.79f). In addition, market power is applied to align and synchronize the actions of the actors in the chain. This business managerial task can be characterised by two fields of operations: the duties of cooperation and coordination (ibid, p.80-81). Cooperation problems stem from conflicts of interest, because all network partners are agents by nature and this may cause motivation problems (Reiß, 2000, p.25). As a rule of thumb, agencies problems in cooperation arise due to self-interested individuals optimising their own business/private benefits ahead of striving for collectively-beneficial achievements. Coordination problems refer to messes due to misalignment of the actions of independent companies. Hanf & Dautzenberg (2006, p.80) outline this obstacle as a lack of allocated knowledge, concerning decision making rules as well as the unconsciousness of existing mutual interdependences.

The other network actors are extremely dependent upon on the focal company because of adopted contracts, which may involve long-term relationships. Woven around the focal company many mutual dependencies exist and the supplying organisations recover some power from the focal company in return because the focal company itself depends on critical inputs or rare resources from its suppliers (Medcof, 2001, p. 999f).

With retail branded products or private labels the retailer is the focal company. This highlights a kind of appalling state of affairs towards grocers and food trade chains. Their business now has a new dimension, because former they chose their suppliers related to the price, they must now take the responsibility and manages the supply chain to grant for quality, packaging and credence attributes to the consumers. (Hanf & Hanf, 2007, p.497).

### 3.4 CHAIN NETWORKS

Nowadays, business decisions are dominated by buzzwords like globalization of markets, lean management as well as increased competition among firms. At a time of globalisation and rapid technological progress, it is necessary to generate and offer an inter-company coordination of activities.

Harland et al. (2003, p.51) states that these current business trends are resulting in complex, forceful supply networks.

The main attributes of such networks or chains are that the echelons within the chain are sovereign, independent actors or marketers who try to optimize their individual objectives. Every decision taken by a firm can also affect the performance of the other actors in the supply chain (as a trade-off). These interactions between firms' management allow for alignment and coordination of actions (Meca & Timmer, 2008, p.1). In nowadays business environment, it is a common accepted fact that competition no longer takes place between individual companies but among whole supply chain organisations (Christopher, 1998, p.28).

Hanf & Dautzenberg (2006, p.90) identify a supply chain network as a joint and cooperative behaviour and actions of companies and business actors who are related by vertical product and information flows to provide a product or service to the final end customer. A recent definition is given by Janvier-James (2012, p.195), he characterises the role of a SC as adding value to a articles and goods by forewaddinging it from one place to another location, throughout the process the goods can be converted and value added through the flow of processing.

All above given definitions focus on the key issues of a competent SC: it starts with resources (raw materials), combined with a number of value adding activities or processes and finally finishing with the transfer of a finished goods to consumers.

Stevens (1989, p.3-4) characterises a supply chain as a system whose integral parts include material suppliers, production sides, distribution services as well as customers, linked together via the downstream flow of materials and the feed-back flow of bidirectional information. Harland (1999) tried to integrate the network and supply chain approach. She gave shape to a concept of a supply chain network with regards to individual firm as a concatenation; each with its own particular network of chain-bound echelons and partners. SC networks are mostly created by firms that are arcane, embedded within a perplexing network of horizontal (joint-ventures or alliances) and vertical dependences (buyer - supplier) (Lazzarini et al., 2001; p.8-9). Lambert & Cooper (2000, p.70) gave shape to the outlined by stating [*" ... the supply chain looks less like a pipeline or chain than an uprooted tree"*].



Efficient contract management, specific bilateral agreements and extensive regulations on the control of business processes are necessary to be able to control, and thus to decrease the possibility of opportunistic behaviour. The strategic success factors are cost, quality, time, flexibility, service and product diversity (Kaluza et al., 2003, p.1). It is the intrinsic objective of SCM to optimize the effectiveness and efficiency of its services in the supply chain. One of the significands of increasing complexity in service and production is the finding that separat firms cannot be remarkable in every business (Harland et al., 2003, p.52-53), this means that lean thinking is necessary risk assessment, to avoid any waste of resources, and high customer orientation is to be acquired. Following the concept of Porter's value chain<sup>24</sup> a supply chain is separated into discrete parts and steadily optimized. The primary value-adding activities are to be provided by the parties due to their core competencies. Finally, directly upstream suppliers and the suppliers of the suppliers are included in the supply chain, even the customers and their customers are taken into account.

Today in the fibre based packaging business the rivalry is not among single companies but rather amongst vertically cooperating networks. Companies have to cooperate to guarantee the conformity and increased efficiency especially by means of bidirectional communication. SCNs in the foodstuff industry are labelled as strictly coordinated systems. They consist of a system head, which is responsible for coordination and other rule given elements. The related packaging supply chain is an integral part of this coordinated system too.

### 3.5 SUPPLY CHAIN MEMBERS

The members, the so called [*echelons*] (see Kordic ,2008; Ballou ,2006; Lai et al. ,2005; Iyengar ,2005; Chen & Paulraj ,2004; Omta et al. ,2001) of a supply chain include all companies or organizations with whom a focal company interacts

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<sup>24</sup> Porter's model of the value chain outline the benefits and added values that firms acquire in restraining the production process into single, discrete fragments. This kind of fragment evaluation supports them to recognise inventive organizational and managerial practices to improve their productivity and profit (Porter, 2008; 1995).

within its linked business processes. The length of the supply chain is equivalent to the number of bonds among the echelons. Any echelon can represent an industry, i.e., starting with raw materials, manufacturing industry, transportation and logistics, co-packaging, wholesale and retailers. Their suppliers or customers directly or indirectly rout the effective commerce and synergy between all echelons. The scope of processing covers the point of origin (upstream) to point of consumption (downstream) or the final end customer.

To make such a very complex network chain more manageable, Lambert & Cooper (2000, p.70) distinguish between primary and supporting echelons.<sup>25</sup> Lambert et al. (2000, p.70) entitle primary members of a supply chain as [*“... all those autonomous companies or strategic business units who carry out value-adding activities (operational and / or managerial) in the business processes designed to produce a specific output for a particular customer or market”*]. In difference to this definition, supporting members are [*“... companies that simply provide resources, knowledge, utilities, or assets for the primary members of the supply chain”*] (ibid, p.70). Supporting companies may be seen in business partners, which offer financial services to the manufacturer, the proprietor of the building that provides warehousing, or companies that supply production equipment like spareparts. These echelons support the primary members and will continue to do so in the near futures if there were not replaced by others. Supporting companies are subjected to a high degree of interchangeability in the range of their products or services, if they are not covered with certain specificity.<sup>26</sup>

An important aspect of Lambert et al. (2000, p.71) is the distinction between primary and supporting members making it possible to define the point of origin and the point of consumption within a supply chain. The point of origin of the

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<sup>25</sup> Lambert & Coopers (2000) definitions are settled on their interviews, discussions with the stakeholders of the GSCF. The wordings were applied by business process by Davenport (1993).

<sup>26</sup> Lambert et al. suggestion for deducing between kinds of members is to some range matching Porter's categorises between primary or support activities in his framework named [*“value chain”*]. Porter describes the enterprise as a chain of production represented by the primary business stages of inbound forewadding and outbound logistics, operations, marketing, sales and service. He faced not the whole production process from starting material to a tradeable product for the ultimate customer. For further reading see Porter (2008, p.33f)

supply chain becomes manifest where no previous primary suppliers exist. The moment of consumption is nailed where no additional value is added,<sup>27</sup> and the good, product or service are consumed by the final customer (ibid, p.71).

### 3.6 THE STRUCTURAL DIMENSIONS

Mentzer et al. (2001, p.4) characterises a supply chain as [*“... a set of three or more entities (organizations or individuals) involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer”*]. Seen from this point of view, a supply chain can be diverse in its core structure as well as varying in scale and scope of complexity.

A number of key issues arise from the constructional design of the supply chain network. As Lambert et al. (2000, p.71) remarked, that these dimensions are:

(1) Horizontal structure, which relates to the number of echelons or tiers across the length of supply chain, with numerous tiers, or short, with few tiers.

(2) Vertical structure, which refers to the number of echelons or purchasers desinged within each tier, strictly coordinated via vertical linkages. In the food and related packaging business, this is necessary to grant attributes to consumers: (a) to gain cost advantages and (b) to reduce and share risks. Jarillo (1988, cited in Hanf & Dautzenberg, 2006, p.79) argues that extended vertical networks can also be characterised as pyramidal hierarchic collaborations, with a focal company that coordinates the network in a hierarchical character, like the [*“uprooted tree”*] by Lambert & Cooper (2000, p.70).

(3) Horizontal settlement of the focal firm between the end points of the SC. The system head can be in place near at the foremost source of supply, be next to the end customer, or somewhere among these boundary stones of the supply chain. (Hanf & Dautzenberg, 2006, p.83)

Such networks contain a focal company that is expected to manage and safeguard the system in order to realise the strategic objectives. The focal company

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<sup>27</sup> Added value within the meaning of the difference between the costs of production and the revenues realized by sales in the market place. Not in view of packaging and printing for value added printing like coatings to give products additional refinement and a more esthetical appeal.

is in general that branded or labelled firm that is recognized by the final end-consumers as being responsible and in charge for the specific food commodity: the manufacturer in the case of a branded label, the retailer for a private label. If the focal company is widely regarded as being responsible and liable for the safety of the food then the focal company should establish a ruling management system to all echelons that essentially prevents further recurrence of food scares: overall procedures in cross-intersection quality management.

### 3.7 QUALITY MANAGEMENT OF CHAIN NETWORKS

It is a common accepted fact that [*“... poor quality leads to high costs, low productivity, and lost of market share”*] (Dramm, 2000, p.1). From all this it follows that all efforts in a supply chain related to a focal company are centred on redeeming the highest possible value throughout the manufacturing process at the lowest cost (ibid, p.1). With regard to quality and productivity, numerous methods and game plans for achieving high business performance have come into existence and gone. Even though some companies are doing well in cultivating quality, productivity, as well as business performance, too often quality control programs and concepts have failed (ibid, p.1).

Schaffer & Thomson (1992, p.80ff) states that prosperous change management begins with countable results and the core element of practical, successful implementation of quality and productivity improvement is to focus on producing measurable results.

Common based definitions start from the opposite premise that quality simply lies in the eyes of the beholder. Following Garvin (1984, p.1-4) it can be stated that individual consumers are aware to have different wants and needs, he suggested that definitions of quality could be organized into such categories: peerless or unique, product-based, manufacturing-based or value-based product.<sup>28</sup> The approach of Reeves & Bednar (1994, p. 420-435) provides a tighter definition of quality aspects such as excellence, value, conformance, and meeting the buyer's expectations. In the further course of this study, the nature of quality and quality

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<sup>28</sup> For further reading see Garvin (1984, p.1-20), Reeves & Bednar (1994, p.419-445)

perception will not be further discussed. The term will be used as the goal of matching consumer's requirements and needs.

Quality is not as an accompaniment to food and packaging a bonus for the customer; it is expected and important for the acceptance of a product. Following Dramm (2000, p.1) poor quality is also related towards additional costs, low productivity due to rework as well as loss of market shares. Quesada et al. (2012, p.38) draws attention to obtain better quality, productivity and efficiency to foster better performance in the field of business operations.

The recent literature propounds that competitive advantage by companies or incorporated chains could be acquired by implementing and settling core elements e.g. manufacturing quality, customer focused service, a well-structured organisation structure as well as a framework that goes right circle for continuous improvements. Old school quality control focuses solely on product-oriented detection of second-rate quality or defects in methods of final inspection after completion of the production process. In order to ensure and improve quality in the food and related packaging sector, quality systems in the past have had to undergo a paradigmatic change: from simple end-of-the-pipe monitoring towards ruling management oriented quality regimes (Enneking et al., 2007, p.343). Recent norms of retailer organisations, chain adjusted private standards or quality programmes, the expected ordinance of the German government concerning low migration quality (LMQ) of packaging and the urgent need for implementation of self-effective control techniques in terms of QM systems of the packaging industry has given rise to process orientated quality management.

Quality assurance systems have been designed in former times to safeguard agreed-upon characteristics and production procedures are being complied with. This helps to avoid information asymmetries of non-visible product attributes, in meaning of trust in such matters as food safety, organic production, denomination of origin (Holleran et al., 199, p.669-670); and at present a desirable and certainly possible low migration paper based packaging. Upstream quality management in agribusiness is increasingly targeting on three pillars: quality standards, third-party reviews and external audit certifications. These cornerstones of monitoring were distributed to upstream and downstream echelons within a supply chain network.

Increasing consumer concerns concerning food safety scares during the last years and uprising knowledge about food-borne illnesses and impurities forced both the food and packaging industry to improve quality and safety assurance systems (Bredahl et al., 2001, p.90).

Quality assurance systems set up classifications of technical requirements and guidelines for producing, processing or conveying, packaging, warehousing and transporting to food and feed. These private standards may include demands of environmental, sustainable and management practices. The systems also delineate an inspection system (customer audit, third party audit or an exploration by local authorities) to verify that members (echelons) comply with these requirements. Quality labels and hallmarks of such programs offer an indicator of unobservable product attribute and characteristics. The quality assurance approach focuses mainly on process and flow control to achieve defect prevention. Continuous control of work and manufacturing flows in consolidation with suitable documentation and testing of samples of transactions for traceability purposes, accompanied by process improvements enhance product quality.

The next level of development towards a higher quality regime level is called quality management. Quality as a whole is hereby seen as a management task, top down. All actors and stakeholders involved must use all quality-assurance measures for each process in order to conduct all facets that may have an impact on product quality (Erling, 1999, p.2). Material or processing defects in final products thus occur less frequently, because they are avoided from the start. Total Quality Management currently occupies the highest position in the quality-system hierarchy. The definition of Total Quality Management, DIN EN ISO 8402, is as follows: [*“A management approach of an organisation, centred on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction, and benefits to all members of the organisation and to society”*] (Pfitzinger, 2002, p.5). The three basic cornerstones of TQM are thus strict customer, employee and process orientation.

Quality management systems must achieve as ultimate goals two main objectives, which go far beyond companies' boundaries. On the one hand, the QM-system has to fulfil the legally demanded task of providing transparency, traceability and documentation. It has to imply compliance according to stringent

regulatory requirements for products and value adding services or all requirements for multi-firm manufacturing.

### 3.8 STAKEHOLDERS IN THE PACKAGING SUPPLY CHAIN

The subchapter deals with the flow of production within the PPSC, parts of this subchapter have already been published before, see Juterzenka & Heupel (2014a, b, 2015).

The definitions and reasonings in the coming sections refer to all potential stakeholders in the packaging supply chain, down to the suppliers of starting products like ink, lacquer, paper and board, glue etc. and up to the food packer, grocer and final end user. The downstream partners of the packaging supply chain seen from the packaging company point of view are the raw material suppliers. These stakeholders are merrily bound to their recipes, food law status and declaration of non-disclosure (Stähle, 2009, p.8). Representative for all suppliers of specific raw materials and consumables will be in this case the ink manufacturer as a supplier of crucial base material. His supply and contractual bound situation is comparable with other echelons within the whole chain and flow of production of paper based packaging, but particular attention is funded to the very fact that the ink manufacturer is faced with rigorous observation by the legislature (Baumann, 2010, p.8) due to the migration potential. The manufacturer of process materials enters into a contract over manufacturing and delivery of auxiliary supplies with the manufacturer of packaging. The ink manufacturer for example knows that his product is designated to be applied to the outside of packaging. To keep the secret of the composition and recipes of his inks, he does not announce or reveal to the packaging manufacturer, which substances were used to compose the inks.

The upstream echelon (contract partner yet to come) for the packaging company in the PPSC is the food packer. Here the filling or co-packaging the box is done, trays or shippers with food or animal feed, sealed in a pouch or unpacked, if the food will be washed or peeled before use. In this legally substantial moment, the simple box changes into food packaging, a transfer of risk takes place. All packaging specifications like construction and design of packaging, technical parameters, packaging and closing technology, the final sealing, logistic

requirements, packing and storage conditions, and the entire packaging system must now function smoothly.

The grocery producers allocate their products to the point of sales, and the merchants offer the packaged food products to the consumers or end customers. It might be supposed that at this stage of flow of goods no DoC is issued. Following Drescher & Hanf (1994, p.423-430) it may be helpful to note that there is shared trust in excellence in major retail chains with private labels or a high level of expectation towards brand owners. This issue will be discussed later in sub chapter 12, where recommendations of action are expressed.

The next echelon or commercial chain-trading partner in the upstream flow of packaging is the merchant and at last the final customer. The merchant markets or offers the intention to sell foodstuff. By promotion, the merchant addresses an invitation for other actors in the market to submit offers to him. In case that a customer agreed to the merchant's invitation by reasonable as well as coherent behaviour by paying at the cash registers, the merchant as well as the customer are bound by a contract. Nevertheless, it must be well thought out, that each party of the mutual contract must obtain somewhat of value: the merchant the cash, the end consumer the goods. If the consumer buys foodstuffs for his personal need and consumption, which means with a clear-cut intention, then there is an implied term between both, that the goods must be fit for that. They have to correspond to this intention and to grand for that certain purpose and reason, if not; the end consumer may perform legal claims against the grocer, retailer or brand owner. The enforcement of liability for packaging defects towards the trader or brand owner will be passed through to the packaging company and further downward to the raw material suppliers (Juterzenka & Heupel, 2015).

### 3.9 CERTIFICATION SYSTEMS

The food as well as the feed sector and the corresponding packaging supply chain are coped by different kinds of quality management and related certification systems. The models are concerned with the starting materials, the production process, the product itself, and the ruling management system associateing a regular audit of the structural and operational organization as a whole. Consequently, this requirement must be applicable to all echelons in a SCN.



The difficulty about supporting this statement is that it may be seen as opportunity for many companies to select the best-fit solution according to their needs, but buyer demands or the requirements of the focal company can create problems of contrasts between the certification protocols and guidelines. Some of the more recent standards for QM are strongly promoted by retail chains or buyer associations. These principals have an interest in establishing high-level quality assurance, but also transfer the processing of review, audits and inspection operations and the burden of quality control towards the bounded suppliers within the SCN. Due to the market power these focal companies have, they are able to insist on many additional, individual requirements to the QM-standards or to adopt chain-specific, tailored solutions for their own proprietary QM-system standards that are more suited to satisfy retailer chains (principals) needs (Canavari et al., 2007, p.399).

A further complication is the design and development of appropriate information and communication systems among each echelon. Krieger & Schiefer (2007, p.303) point out that a recent trend in private standards is to be seen in the development and adaption of manifold quality systems and norms which enable them to stay unique in validity but they can also coexist and recognise each other. The overall goal may be achieved that general quality systems may be harmonised. The core demands are interchangeable: the formulation of production processes and suitable documentation is an overruling dimension of these different, not harmonised and often competing quality systems. The outcome of this progress is that those raw material suppliers, converting and value adding companies have to implemented different quality systems and have to comply with various requirements for their certification and re-certification; without an integrated execution, a lot of double work would be done. This burden of administrative, regulatory and excessive bureaucracy, thereby open the floodgates for opportunistic behaviour (Hinrichs, 2007, p.413); Hanf & Hanf, 2007, p.491; Theuvsen & Spiller, 2007,p.16; Hirschauer & Mußhoff, 2007, p.436).<sup>29</sup> The linkage of suitable technological procedures and quality management systems is not enough

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<sup>29</sup> To prevent food safety scandals and related packaging defects, which are caused by opportunistic behaviour, an improved principal / agent approach is recommended.

to raise and to guarantee compliance. Documents themselves may often be subject to fraud by opportunistic economic agents. It is reasonable to assume that it is essential to design incentive-compatible contracts, which induce and enforce compliance with process standards as well as with quality assurance systems.

Foodstuffs, animal feed, and the related packaging legislation have changed during the past decades. Key elements of acts and ordinances have been enriched so that the producers and actors in the market must fulfil due diligence in their quality assurance efforts. Concisely, echelons must implement all appropriate steps to safeguard the safety of the products. These changes in legislations are also reasons for the development of better quality standards in the past.

### **3.9.1 Good Practice**

At the early 1960s, the FAO and WHO promoted the joint Codex Alimentarius regulation, the so-called book of food, as a consequence of the expansion of the global food trade with related trends like electronic procurement and just-in-time production. The codex is a collection of internationally recognized standards, codes of standards and practices, guidelines and recommendations for food production and safety. (Codex Secretariat FAO, 2006, p.1-12). In the 1980s the development of systems with regard to process management like “Good Practice” started:

- (1) Good practice in agribusiness (GAP), a guideline for the reduction of biological, chemical and environmental endangerments;
- (2) Good hygienic practice (GHP), is obligatory for hygienic adjustments;
- (3) Good manufacturing practice (GMP) is a basis for ensuring that products are consistently produced and controlled according to quality standards;
- (4) Good practice in trade (GTP), as the underlying guidelines for proper transport of living animals, starting materials and food.

The Good Practice guidelines support the demanded framework in manufacturing and processing, testing, and quality assurance in order to ensure

lack of risks for human consumption. It is designed to minimize the risks. Good Manufacturing Practice (GMP) for instance is a term that is recognized on global level for mastering control and management of manufacturing and quality control testing of foods, packaging, pharmaceutical products and medical devices. The compliance of GMP-regulations is constantly examined by authorities and certification auditors.<sup>30</sup>

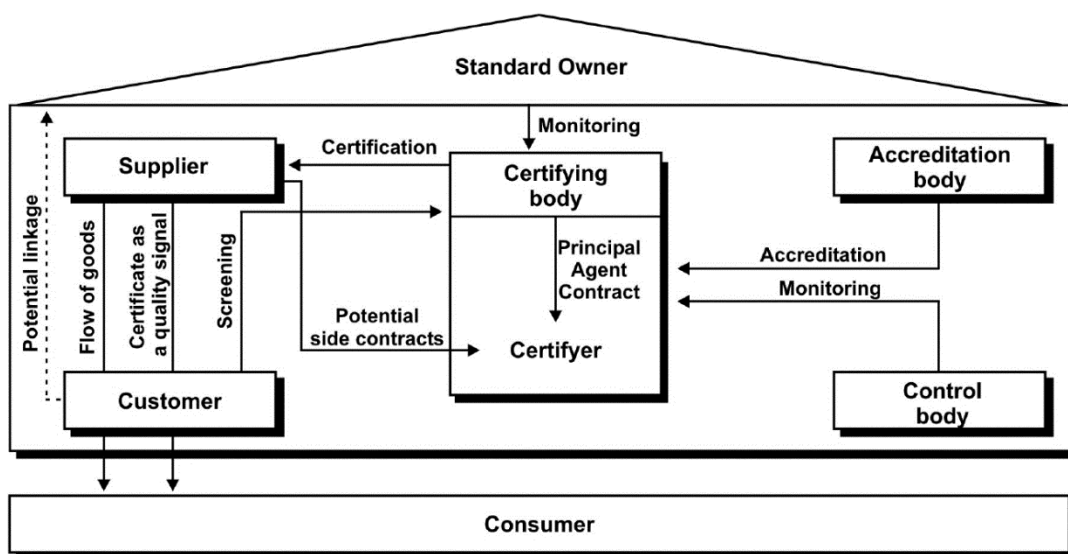


Figure 8: Basic NIE Structure of Certification process, source by Jahn et al. (2005)

### 3.9.2 ISO 9000

In the last span of the gone century in the 1990s, the international norm ISO 9000 has come into existence. The norms created and designed by the International Organisation for Standardisation (ISO) are worldwide accepted international standards to reach sole uniformity for industrial production processes and to prevent technical barriers of trade. It is a sector independent standard that's fits to every branch, because it formulates the framework for quality management and must be adapted individually. The following DIN EN ISO 9000:2000 norm includes

<sup>30</sup> For further reading see <http://www.gmp-publishing.com/en/good-manufacturing-practices.html>, last access 23.08.2014.

basic demands and guidelines of quality management and safeguarding rules for compliance and improvement.<sup>31</sup> The ISO 9000 was not just another tool for QSM; it was the first external certification system that went into existence.

This was considered to be the origin of a differentiation process of more specific certification systems, which industrial buyers could insist on prior to a business transaction. They could “call for papers” within the meaning of certificates or quality labels before the deal is done.

The other side of the coin, however, is that these benefits have been controversially discussed by managers as being bureaucratic nonsense. The dissemination of certificates is associated with quality management systems rather than the optimisation of business processes.

Additionally, quality and assurance systems have been foreseen as technical barriers to trade (Lazo et al., 2007, p.369).<sup>32</sup> Due to every critics of ISO 9000’s paper-driven bureaucracy, compared to the earlier audit approaches, the certification approach by third party audits is characterised by inspections carried out by neutral institutions on an accredited basis and is methodologically correct and traceable.

### 3.9.3 HACCP

Since the middle of the 1990s, more and more systems with reference to the Hazard Analysis of Critical Control Points (HACCP) system are implemented in the agribusiness sector. The core element and nucleus of the HACCP idea is the identification and clear assignment of health hazards all through production and processing.

The methodological approach of the HACCP-Framework was developed by the Pillsbury Company while producing packed foods for the National Aeronautics and Space Administration (NASA) for use in space missions in early

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<sup>31</sup> For further reading see Pfeifer (2001).

<sup>32</sup> For further reading towards ISO as a paper-driven process see Curkovic & Pagell (1999), and Luning *et al.* (2002).

1959.<sup>33</sup> The idea of HACCP went into public existence in the 1971 at the National Conference on Food Protection (Burson, 2005).

HACCP is a *modus operandi* that identifies potential contamination or impurities. In addition, it rigorously monitors hazard points so that the whole process is under control. HACCP is intended to maintain consistent quality rather than catch potential hazards.

The framework of HACCP shifts the burden and liability of compliance right upstream to the food-producer or -manufacturer to confirm that the product is harmless and safety to consume (Krieger & Schiefer, 2007, p.305).

The regularity can be employed to control and monitor all stages in the food system within its related packaging supply chain and is made to provide enough feedback to allow timely, direct corrective activities. HACCP regulations required to be mutual recognised across international boundaries of trade, in addition it is internationally necessary for the market entry (Unnevehr & Jensen, 1999, p.10-12).<sup>34</sup>

#### 3.9.4 BRC

As stated above the ISO 9000 framework for QMS and the integration in a firm is very flexible and adaptive. Due to this flexibility, the implementation of the ISO 9000 does not guarantee product quality. Common in the market are QMSs like the British Retailer Consortium (BRC), European Food Safety Inspection Service (EFSA) and the International Food Standard (IFS). These quality systems are often important to overcome market entry barriers. Retailers ask for these systems also to direct liability towards upstream suppliers.<sup>35</sup>

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<sup>33</sup> NASA had concerns of food, crumbs in detail due to zero gravity and food free of toxins (Burson, 2005).

<sup>34</sup> Due to increasing different national certification standards for HACCP and selective standards the international norm DIN EN ISO 22000 is directed for the standardisation of different systems. The systems focus is the control of hazards with specific measures.

<sup>35</sup> Arfini & Mancini (2003, p.4) state that the BRC members currently represent 90% of the total turnover of the British distribution market, and 50% of the total turnover in the British retail brand market.

Betwixt other legal consequences and complains,<sup>36</sup> British retailer chains have forced the upstream suppliers (echelons) to bear an increasing number of inspections to check and safeguard compliance based on mutual contractual requirements. For that matter the largest distribution and retailing chains in the UK market established an all-covering standard that give shape to hygiene and safety requirements and for quality assurance too. The development of such a generally agreed standard was initially determined by the need and demand to meet statutory requirements of the 1990s Food Safety Act; but in addition it was quickly understood as [“... *having significant benefits to the suppliers of products*”] to the UK retailer chains and there has been substantial interest internationally as this benchmark has been implemented and put into effect (Arfini & Mancini, 2003, p.1). Another driving force was the rise of private labels by British retailers. Food processors supply supermarkets with private label<sup>37</sup> food products. The brand owner sold mass production via a secondary trade name, a private label or a pseudonym or in behalf of the retailer. Under this light, the focal company has moved towards the customer, from the brand owner to the retailer. In the customers eyes the retailer is now responsible for quality assurance and public food welfare (Voerste, 2009, p.262-263). Following Arfini & Mancini (2003, p.1) the overall goal of the BRC food technical standard is to classify and categorise food safety and quality criteria demanded to be implemented for food processors to deliver to retailers. The guidelines and content of the benchmark are designed to grant an assessment or an audit to plants, processing installations, conveying methods and flow of goods by a competent third party. Therefore it is suitable to extend this thinking even to food and feed related packaging. The BRC standard is considered stringent, but accepted, even by German producers who supply UK retailers (Hinrichs, 2004, p.119). The key elements of the BRC food technical standard are: (1) to exercise a hygiene and safety control system founded on the HACCP principles; (2) a documented quality management system (3) the control of

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<sup>36</sup> See the Food Safety Act 1990 from 29<sup>th</sup> June 1990. <http://www.legislation.gov.uk/ukpga/1990/16/enacted>, last access 23.08.14.

<sup>37</sup> According to Arfini & Mancini (2003, p.3) the idea of a [“*private label*”] is not a very recent invention. The retailer brand, known as a private label was born in the United States in the 1920s. The growth of the private label started in the early 1950s, with large distribution chains that were able to establish own, company related sales policies based on the usage of their own brand name.

factory and plant environments, the products and factoring processes through a defined and documented organisational structure that give shape to the functions, responsibilities and hierarchical staff relations; (4) staff management.

### 3.9.5 IFS

The globalization of the commodity flows and FMCG's, increasing consumer watchfulness and a stressed risk of damage claims and claims for compensation, necessitated the development of a uniform, transboundary standard. Under the burden and tension of necessities for quality management, 40 trade chains from North America, Europe and even Australia got together in January 2000 to found and establish the Global Food Safety Initiative (GFSI). The entire goal of this approach was the formulation and mutual recognition of international safety standards for food producers (Gaugler, 2005, p.1). The standards correlate to product safety, legality and quality management systems. They are developed and designed to help organisations to ensure that they meet the needs of customers and stakeholders. Following Manvel (2011, p.2) the IFS benefits are: (1) shared standards have been realized with comparable, similar evaluation systems; (2) cost compensations for suppliers, traders and retailers, because audits are undertaken by qualified, certified auditors working for accredited, neutral certification bodies; (3) comparability as well as transparency all over supply chains (ibid, p.2).

The developed audit scheme is known as International Food Standard (IFS). Certification to the IFS is not in the interest of food-producing, packaging companies, but of the retailers as business partners. They referred to and demanded it. IFS is supposed to encourage a superior food safety level and defines very exact requirements for the introduction and maintenance of a HACCP system, for the processing plant's neighbouring's as well as for a all-embracing quality management system grounded on the DIN EN ISO 9001 standard. Starting in the middle of 2003 all major retailers in Germany asked the producers of their private brands or private label producers for a certification according to the German IFS

(Binner & Jansen, 2007, p.177; Mau & Mau, 2007, p.337).<sup>38</sup> For failure to comply with the IFS Standards these suppliers threatened, as at BRC, the delisting of the respective merchants. IFS recognize BRC certifications, to prevent extra work or additional tests for producers.

The IFS - currently named International Featured Standard Food - is addressed to all companies inside the food sector, which assemble or manufacture their own branded food (private labels) products or FMCG. The IFS has continuously grown into an internationally recognized umbrella brand standard (Manvel, 2011, p.2).<sup>39</sup>

The ISF Food Standard is a quality and food safety standard applying to all ex post farm gate stages of downstream food processing. The standard is for auditing retailer or wholesaler for branded food product suppliers and only belong to food processing, value adding companies or companies that handle packaging for loose food products. The IFS Food Standard can only be employed when a product is processed or when there is a foreseeable, predictable hazard for product contamination during the primary packing (ibid, 2001, p.2).

The IFS Logistics Standard is applicable to all types of transport within a food supply chain: temperature controlled or ambient, both food and non-food products. The guidelines include all logistics activities and handling where companies have a physical impact on previously primary packed products by means of transport, packaging of pre-packed food products, storage and distribution, transport and storage of pallets or bags in boxes (Poignee & Schiefer, 2007, p.165-167). When a food processing company has its own transport department or logistic activities like storage, distribution or co-packaging, it is included in the IFS Food Standard, in view of transport or storage. If these business activities are outsourced, the IFS Logistic Standard applies to them.

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<sup>38</sup> According to Manvell (2011) with almost 800 registered retailers the IFS Standard is today one of the largest, widely applied food safety standards. European, American largest food retailer chains and many other retailers at global level use IFS.

<sup>39</sup> For further reading see <http://www.ifs-certification.com>, last access 24.08.2014



### 3.9.6 Resume

A quality management system and certificates to demonstrate compliance are important assets for ensuring that companies' business remains productive and effective. Quality programs or better-said certification systems are well-defined structures; they try to establish company profiles to differ from the mass market. Following Poignee & Schiefer (2007, p.165) the dynamic of vertical-coordinated cooperation assists the existence of certification systems to deliver assurances to a higher extent in comparison, such a branch-wide lead can be understood in the EU concept [*"From Farm to Fork"*]<sup>40</sup>, but also in the light of the coming Ink and Mineral Oil Ordinance, from the recycling loop to the shelf. Due to their sector-wide claim, standards are affected and subjected towards coordination and control of problems concerning the compliance with the required guarantees and product characteristics. As far as that is concerned standards [*"... normally lack explicit signals, for example risk assessment and risk acceptance criteria"*] (Schiefer, (2003), cited in Poignee & Schiefer (2007, p.165). For that matter, realised improvements, hygiene, and food safety cannot be transmitted or demonstrated to consumers, so it may need a new label or hallmark for signalling.

A flourishing implementation of a food-packaging related hygienic, LMQ certification regularity not only charges the full appreciation of the workforce but also of the final customers. Due to this, it is important to "sell" a quality assurance system to demonstrate that products are superior to competitors and that for this kind of business consumer protection is necessary (Fischer, 2003, p.163).

An essential role of quality supply chain management is to create and to distribute confidence in the food supplied, and in particular as to such almost invisible credence attributes like the absence of contaminants or migration from packaging. That presupposes that the packaging supply chain partners can and have to rely on each another.

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<sup>40</sup> The booklet of the EU concept is to be found online at [www.europa.eu.int/comm/publications](http://www.europa.eu.int/comm/publications), last access 16.03.2014

Consequently, the QMS has to be integrated into a governance structure. The modern established QMSs like Good Practice, IFS and BRC are all went into existence by the current situation which claims an pre-eminence on risk.

Following Voerste (2009, p.146-153) customers point of view states, that risk perception is an equivalent dependant on the reputation or sound image of a focal company. The vertical systems like ISO along with the horizontal like BRC, IFS mainly rely and draw upon standardisation systems, in meaning of reliable customer service, for punctual distribution and faithful product quality on the highest standard.

This statements merits closer examination: what does it mean for your area of business to be part of a standardised supply chain network? The affiliation to such a standardised supply chain network brings either none or at the most only minor competitive advantage, as the standards are already too widely used on single firm level. Only if the costs are adopted or offset by corresponding gains, can the collaborative relationships be perpetuated over the period of time where the consumers highly value safety attributes (ibid, 2007, p.496). Due to this, no competitive payoff is to be expected from the affiliation with such a standardisation system.

#### 4. LITERATURE REVIEW

When one takes a closer look at the history of mankind, the first institutions may be interpreted as the right of the mighty one or the power of the fittest prevails. With the emergence of mankind natural divine institution came into existence. Alternative approaches to the development of institutions have been the undeniable claim to power of the sovereign in older times or the traditional guilds (Goebel, 2002). According to recent literature the meaning of institutions are various. It is a common accepted fact that institutions are a part of our life like the state, the law, the school and marriage.

Institutions occur not only by themselves, they are even cascaded in multiple fields. Goebel (2002, p.1) shows that the institution "enterprise" is a part of the institution "market economic", the participation of local actors is based within the institutional "contract" to confirm the institution's "contractual obligations" which will be applied and enforced by the institution "justice" in case of need.

Entirely all institutions have facts in common; their individual entity is to promote and support an orderly coexistence or to grant a behavioural standard. In simple words, the power of institutions is to create order by adaptation of a system of rules. An institution can also be described as a construct or system of acting that is founded on a system of rules and regulations in order to regulate the human behaviour (Goebel, p.2).

The primary role of institutions in society is to cut down uncertainty by establishing a sound and robust structure to the interactions of people. Although rigid laws or rules in form and content may change in the course of time as the consequence of political or legal decisions, informal constraints fixed in customs and traditions, with rules and codes of behaviour are much more impervious to advice policies. These educational and cultural boundary conditions not only correlate the past with the present tense, they also offer us with an instrument to explain the pathway of historical change. (Mahoney, 2004, p.120, see also similar pre-print 2003, p.173).

The reference point is a case of selecting a narrowly defined area of concern for human interaction; a recurring process that needs standardisation (Goebel, p.2);

this standardisation claims and requires full preparations for the compulsion and practical diligence to the rules. Any deviant behaviour is forbidden and must be disciplined or punished; convention or behaviour that is in correspondence with rules, laws and regulations must be enthused and rewarded. The concept of institution should not be limited to a monitoring and enforcement-system (Richter et al., 2003, p.6f.), but looked at as a central idea with underlying rules; in conformity with North's (1994, p.1) definition [*"institutions are the rules of the game or the humanly devised constraints that provide the structure of human interactions"*]. Later in 1996 North (1996, p.3) gives concrete expression to this thought by writing that: [*"Institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. In consequence they structure incentives in human exchange, whether political, social, or economic"*].

Dahrendorf (2010, p.31) defines and recaps them similarly, as the [*"rules of the game"*] that must be complied or have been agreed upon between the market players. In the following course of the thesis the central idea of institution follows the definition of Goebel (2002, p.3): institutions are (1) systems of behaviour-guiding principles and rules or behaviour steered action systems, (2) that organise human interaction in joint problem areas by a lead concept. (3) The lead concept shall remain for a longer period respected by between the stakeholders involved. (4) In order to protect observance due to the provisions measures will be implemented.

The term "institution" should be separated from the term "organisation", because the every-day usage may be fuzzy. Both terms are often employed as synonyms, but they have slightly divergent meanings: while institutions characterise the general rules of a society, organizations incorporate all actors, which are included in setting these rules (North, 1996, p.4-5)

An organisation is a deliberately, dedicated agent system created by its designers. Hayek (1994, p.34) suggests that an order might be called an organisation, in case that its artificial existence is based on the results of deliberate planning. Organisations are not spontaneous and do not grow from themselves like traditions, organisations are the rationalised form of an institution (Goebel, 2002, p.4). An organisation embeds recommendations for action and their own sanctions to grant compliance (Richter et al., 2010, p.8f). As an entity, organizations

can be characterised as a bundle or structure of roles. A lot of institutions are at the same time organizations e.g. family circle and companies (Kherallah & Kirsten, 2001, p.5). Further kinds of institutions are not organizations like means of payment, money or the law. It is also recommended to differentiate institutions from organizations. In the following course of the thesis, the term organisation will be used in the original Anglo-Saxon meaning as “bureaucracy” or “hierarchy”.

While institutions surround us, the question arises why have they grown up and what are their final benefits? Recent research of Goebel (2002, p.6f) refers to fundamental functions related to the entity of an institution:

(1) Order-function: Institutions shall establish order to reduce high complexity, significant risks and uncertainties (ibid, p.6f.)

(2) Discharge-function: A given order shortens the scope of action. It does not require a great dispute to recognise and pursue alternate courses of action (ibid, p.6f.).

(3) Motivating-function: Institutions represent a considerable stimulus and are therefore an essential instrument to determine the behaviour of individuals. This also applies to establishment of state institutions like administrative or judicial authorities or private institutions like contractual agreements. This approach will focus in particular on the field of rebuking undesired behaviour: Institutions can also be allowed to embody an institutional role of control and supervision (ibid, p.6-7).

(4) Coordination-function: Actors are influenced by other actors. Embedded in local environs and mutual interaction with actors, institutions assure security and create sound boundary frameworks and conditions. Institutions define reliable predictions what is considered right and normal. They adopt a coordination function among a work-sharing or an area-driven process (ibid, p.7).

(5) Cohesion-function: Institutions create a feeling of corporate solidarity, a sense of togetherness or a relationship of trust. A common accepted compliance regarding customs, traditions and culture. The common view of all actors makes the coexistence and coordination easier. This issue will be reviewed afterwards in chapter 5.3.9 in the view of clan mechanism (ibid, p.7).

(6) Yardstick-function: Institutions encourage and offer a good ground to reflect and scale our own behaviour as well as the behaviour of fellow human

beings. The yardstick establishes a legitimate basis for criminal offences to the conviction and the punishment of perpetrators or reward for compliance (ibid, p.7).

(7) Special-functions: Institutions can even cover specific areas of lasting domestic political stabilization and consolidation, the safeguarding of authority. To obtain legitimisation for their absolute rule, institutions must ensure the rights of marital cohabitation, school, local authorities and the sovereignty of the state administration (ibid, p.7-8).

(8) Derived-functions: It's in the nature of some institutions to lay down common rules applicable to new organisational structures or to help to enforce their laws like police, the legal and judicial system (ibid, p.8).

As discussed before the fundamental principle of institutions is to facilitate an orderly coexistence or a behavioural standard, to create an order and adaptation by a framework of rules. Regulating and control systems can only develop an immense impact of act-regulatory functionality if the actors within obey the right to subject the principles and convictions to any compulsion whatever. Goebel (2002, p.10f) state that the reasons for this may be found in the very different framework settings in which the institutions manoeuvre:

(1) Fear of punishment: I am aware of law, and in conjunction with the ruling, I do behave in the legitimate way and I am aware that failure to comply with that statutory provision will and should be punished (ibid, p.10).

(2) Sake of conformism: I follow as good I can the principles, because everybody is doing it (ibid, p.10).

(3) Expectation of benefit: I recognize the rules which govern, because I will be rewarded (ibid, p.10).

(4) Emotional ties or affinity: I pay attention, I take care, I heed and I fully understand the view of the regulator (ibid, p.10).

(5) Rooted habits: I obey, because everybody is doing that (ibid, p.10).

(6) Recognition of the legitimacy: I am following the rules, because I realise and recognise the legitimate authority of the regulator (ibid, p.10).

(7) Common understanding of the validity: I subject myself to a rigorous discipline, because it is right and proper (ibid, p.10).

The adoption of institutions or the enforcement of measures necessary may also be further complicated, if the measures include the use of force and violence. If all respective obligations and all required behaviour to comply with instructions is based on the fear of punishment and retaliation, a situation of uncertainty is fostered. Limits and rules must remain consistent and must be continuously monitored. At any time one must be sure that there is no failure to abide by the rules. Subject to a deterrent sanction or design or maintain organisations that continuously monitor and rules out for personal punishments with a rod of iron.

#### 4.1 THE MODEL OF THE HOMO OECOMICUS

Economists do know analytically since Cournot (1838) that actors are influenced by other actors.<sup>41</sup> From an analytical recipient's point of view the question arises what are the general bounding conditions, the several derived functions and the event-horizon in direction of the actors in an economic environment?

The answer to this problem is to be seen in the field of the NIE, settled in an institutional framework in which social acting takes place, but this will be discussed later. Milgrom & Roberts (1992, p.42) have stated that [*“... a central premise of economic analysis is that people have well-defined interests, describable by individual utility functions, and they seek to maximize their utility”*]. The bounding condition and the constraints of the actors are individual rational choices of action, in a particular world where the available, scarce resources<sup>42</sup> are not sufficient to meet the actor's essentially unlimited wants. The economic model of rational patterns guided by self-interested choice and egoistic behaviour is entitled Homo Economicus (HOE).

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<sup>41</sup> Cournot, A. (1838), *Recherches sur les Principes Mathématiques de l Théorie des Richesses*, Paris: Rivière, published as *“Researches into the Mathematical Principles of the Theory of Wealth*, Nathaniel T. Bacon, 1929, New York, Macmillan.

<sup>42</sup> A resource is anything that may be thought of as a potential advantage to a firm (Barney, 1991, p.100).

#### 4.1.2 Homo Oeconomicus

The postulation that people act rationally and rendering logical principles is not wishful thinking of economist, it goes back to the Greek philosopher Aristotle, but with the limitation that Aristotle ascribed rationality solely to men (Schneider, 2010, p.3). Man is a rational being. This belief pervades Aristotle's practical philosophy as a common thread. In his view, in essence, man is only happy when he acts accordingly (Grandjean, 2009, p.19f).

The theories behind an operational model of the HOE are subjected to certain principles and central basic assumptions. The model shall be able to reflect and predict reality. These constraints shall be the ground for examination and analyses of human behaviour in real world situations where decisions needed to be taken (Goebel, 2002, p.23ff):

(1) Own interests principle: the HOE is an egoist who puts himself first. The individual acts only in self-interest. He pursues his objectives through a set of personal choices and typical utility functions. Problems that may occur are analysed, evaluated and corrected only in the context of given personal preferences (ibid, p.23).

(2) The problem-oriented approach: the problem-oriented approach deals primarily with problem analysis, the decision-making matrix is solely sorting through possibilities for problem-orientated relevance. The preference criteria for a problem-solving treatment will safeguard that the HOE can correctly and fully generate his preferences and needs to come up with feasible courses of actions (ibid, p.24). According to Schneider (2010, p.3) this does not implicate that HOE [*... regards his fellow men with resentment and envy; he tends to adopt a "neutral" attitude towards them*].

(3) Principle of separation between preferences and needs: the HOE is faced with his inner, given and unchanging preferences towards external, potential fields of action. The field of action restricts his choices (constrains). The result of interaction between his individual preferences (desire) and the external restrictions is his choice of optimal action. The HOE reacts uniformly to changes in constraints and/or his preferences. Due to the fact that it is not possible to observe peoples individual, inner given preferences, the model of the HOE assumes that these



preferences are stable (Schneider, 2010, p.5; Goebel, 2002, p.24). If individuals behave in compliance with their preferences, they boost their own total utility. The formation and evolution of preferences is not input variable into the model.

(4) The principle of rationality: rationality is perceived to imply to be economic calculated purpose or instrumental rationality (ibid, p.24). Actions are rational if they meet the economic principle: To achieve a set of with the minimum allocation of resources or to attain a maximum possible degree of target achievement with limited resources available (Woll, 1981, p.53). Both characteristics are described as substantial rationality. The principle is useful in terms of processing or manufacturing of goods in which an added monetary value can be addressed (Schneider, 2010, p.5). Clear peripheral conditions as input into the practicable model and constant, calculable factors as output. When investigating the individual rationality the ability to measure utility is monetary value. Here, one can only take formal rationality as his basis in the manner an individual sets decisions. Due to this definition, an individual acts rationally by choosing uniformly between the alternate courses of action that are available and known to him (Franz, 2004, p.5). For classification and verification of this species (HOE) it is sufficient to show that the individuals try to the finest of its capability to act rationally even if concrete alternative forms of action and the consequences are unknown (Williamson 2010, p.43f; Kirchgässner, 2000, p.31f). Herder-Dorneich & Groser (1977, p.27, cited in Franz, 2004, p.5) show the diametric dimension of rationality: [*“A monk who renounces all worldly goods and the most wanted criminal who grabs everything, from a purely formal point of view, be perceived as acting rationally according to their own personal code of behaviour and values.”*]

(5) Complete Information: In its utter form the model states that the HOE is fully informed. This assumption does not imply that the future is known, but in simple words, it indicates that the HOE is fully aware and informed of alternative courses of action. He can assess the impacts and consequences of his behaviour and related weighted actions (Schneider, 2010, p.6).

Resume: The HOE always acts rationally. He decides systematically from variant courses of action and decides for alternatives, which offers him the maximised utility with the least effort and input (Schneider, 2010, p.6). The HOE can also be seen as a trend toward actors pronounced attitudes. A major

prerequisite remains that rational behaviour must be dominant; if not economically, it may fail on explanation and forecast of developments and interrelations in real life (Goebel, 2002, p.24). Expected value or personal utility are the rules of the game. Williamson (1975, p.26) notes that humans tendencies toward strife or lying and cheating prevail. Granovetter (1985, p.483) states that man adapted to economics is [“undersocialised”]. Goebel (2002, p.27) resumes from a pure economic point of view: man wants to increase his wealth. He wants to shelter his production or his earnings, but every individual would aim to work little. He does not hesitate to work with fraud and deceit, smoke and mirrors when it maximises his benefits. Egoistic, focused to his personal well-being, he is following guidelines or obeying rules just for his fear of punishment and consequences or due to an appropriate cost-benefit analysis. He tries to maximise utility while remaining emotionally neutral and uninvolved. That, at least, is the reigning paradigm of HOE, the benchmark for monetary or financial models.<sup>43</sup>

#### 4.1.3 Natural habitat of the HOE

Critical habitat includes areas with high biodiversity; in economic wording, different actors and players meet in the market. Beside the actors, the market can also be characterised by models or be translated into a merely theoretical construct. The thesis of the economic equilibrium principles is a microeconomic model that represents an economy as a whole; it is an approach to explain the behaviour of exchange, production, supply, consumption and prices in a whole economy. According to Erlei et al. (2007, p.43f) the assumption aims to explain the behaviour of demand and supply, as well as the related prices in an economy with incorporated and interacting markets. It seeks to demonstrate that a set of prices are in existence that will lead to equilibrium in short runs or long terms. The price ensures that all resources flow to their most effective use. Supply and demand determine the price, to be competent to satisfy the demands as long as the market is cleared completely. Following Goebel (2002, p.28) the flow is determined and restricted by boundary conditions, various basic assumptions and premises.

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<sup>43</sup> Recent findings of Siebenhüner & Ossietzky (2013) point out, that critic is valid. In the field of behavioural economics they show that the behaviour of real persons differs significantly from the HOE in economic theory.

(1) Adjustments of Quantities: all buyers, sellers and traders of products and/or services in the market are proportionally subjected to the quantity available to all market participants. The market cannot be shaped and dictates the prices. In every market perfect competition rules and thus leads to maximum economic welfare and efficient supply (ibid, p.28).

(2) The Requirements on Homogeneity: the value of goods, products and services produced or sold is the same. From the consumers' perspective there is no matter of time and supply in product market terms. The only criterion for a decision is the price (ibid, p.28).

(3) Absolute Market-Transparency: all market operators - including seller, buyers, consumers and investors- are timely and fully informed. Without significant cost or efforts, players respond quickly to price differentials (ibid, p.28).

(4) Perfect Contracts: suppliers and buyers imply the integral acceptance of perfect contracts, sufficiently characterised without fraud and uncertainty. Both contractual parties are mutually obliged to be authorised to close the agreement in short terms (ibid, p.28).

(5) Exclusion of Transaction Costs: all flow of trade or service exchange is easy and free of charge. No rise of costs for contract awarding, formal monitoring and contract amendments or changes. All transactions are timeless, without time delay (ibid, p.29).

#### 4.2 CRITICAL REVIEW

A world without transaction costs is a world free of institutions. Everyone knows everything due to the transparent market conditions and responds solely to economic price signals, no opportunistic behaviour and by no means, no uncertainties. A world of costless information: Free of doubt, motivation and relevant problems of coordination (Picot et al., 1997, p.86; Goebel, 2002, p.29). Political, moral and legal institutions, governance mechanisms are unconcerned, just the necessary to ensure compliance with the proposition of the freedom of contract (Richter et al., 2003, p.13). There is much criticism due to the high grade of academic abstraction, faced with the real physical world. The model's basic postulate is a world free of transaction costs (TAC). Nevertheless, indeed such

marketing cost, the effort to use the market, is real and objective to a considerable extent (Terberger, 1998, p.19ff., Goebel, 2002, p.29ff., Richter, 2003, p.10.):

(1) Necessary information is not provided free of charge; if it is not available or the cost to develop it would be excessive. Prior to concluding a contract, an asymmetric information flow normally exists between the contract partners. The speed and capacity of human information processing methods is not unlimited, mankind is mortal and subjected to temporal death.

(2) The value of goods, products and services produced or fabricated is not similar to all market participants. They are subjected to availability and mobility, limited time and essential difference in favourites of the mutual negotiating partners. Goebel (2002, p.30) deduces that the products and services now became specific, due to this there is no option anymore for a timely and reasonably priced replacement in the market.

(3) Contract partners are faced in any case with the threat of behavioural uncertainties. Opportunistic freedoms of action arise from a lack of information and transparency and provide further room for self-interested manoeuvres: my counterpart as a partner, customer or client, may calculate to deceive, to lie, to obtain anything in his favour and to renegotiate. By closing a contract, it could not be prognosticated what future is about, due to this contracts are complex, incorrect or incomplete to cope with this uncertainty (Juterzenka, 2014,b). To remain competitive, actors, firms and institutions have to adapt constantly to stay in line with their changing environment. The division of labour enable goods, products and services to cover distances for trade. This scope of mobility generates much suffering and additional difficulties. Goebel (2002, p.30) refers to growing problems surrounding coordination and motivation problems:

(a) Coordination: The most striking issue is that players in the market must seek and find counterparts who want / need exactly the offered good or service, like workforce and compensation. Required service and demand must be coordinated and delivered so that the expectations of the market are satisfied. The search for a suitable provider is laborious and time consuming: Excessive market research fees and comparison offers from market rivals are employed to quantitatively equate services and costs, at least to estimate the excellence of work conferring to predefined criteria.

(b) Motivation: In the absence of certainty in the market that contract partners behave as desired, the exchanged goods or achievements must be subject to control and inspection. Issues arise related to measuring, detection limits and the test methodology. Specific and tailor-made solutions cannot be interchanged arbitrarily. Milgrom & Roberts (1992, p.25) state [*“... when people are specialized producers who need to trade, their decisions and actions need to be coordinated to achieve these gains of cooperation, and people must be motivated to carry out their parts of the cooperative activity.”*]

Resume: In such a constellation, relationships of uncertainty and transactions of varying degrees of complexity, actors need an appropriate control system: A set of rules. For that matter Goebel (2002, p.31) summarises again that institutions matter, as Williamson remarked before in 1996 (1996, p.3). Arising from the criticism applied to the neoclassical economic equilibrium theories it can be concluded that there is a need in real life for institutional economics.



## 5. NEW INSTITUTIONAL ECONOMICS

To consider the influence of institutional arrangements at play in contemporary society is still a recent matter of interest in the economic field of research. Ronald Coase's article "The Nature of the Firm," from 1937 designed the first substructure for a new theoretical economic approach, which was first titled with the "New Institutional Economics" by Oliver E. Williamson (1975). Nevertheless, scientific progress and evaluation in the field of institutions has not stopped. Recent research upriser the discussion whether the NIE should be determined as an enhancement or improvement of the neoclassical approach or as a completely novel paradigm (Richter et al., 2003, p.3). Apart from the recent academic dispute, the thesis will define NIE according to Blum et al. (2005, p.43). Blum (2005) determined that the NIE approach is a generic term, subsuming particular different related theories. The NIE is an interdisciplinary terrain of research that combines several scientific fields. It's creating new perceptions on common accepted scientific objects regarding economics, organization theory, law and rights, political and social knowledge to recognize the institutions of commercial and economic, social, political and private life (Becker et al., 1998, p.1ff; Klein, 1998, p.456, Staffebach, 2000, p.8; Klein, 1998, p.456). In this context institutions are of essential interest. As North (1996, p.3) remarked they [*"... reduce uncertainty by providing a structure to everyday life."*] In a nutshell, its goal is to explain in an economical language what institutions are, how they arise and come into existence.

The collective term "New Institutional Economics" (NIE) take up the economic analysis of institutional state of affairs and the institutional arrangements of economy. The NIE cornerstone, the basic assumption is that the determinations and using of institutions and organisations cause costs which have an influence and an influence on the ultimate economic results. From a business administrative perspective, the explanatory partial preparations of new institutional economics (property rights approach, transaction cost theory, principal agent theory) are predicated on three certain assumptions (Goebel, 2002, p.49): (1) strictly follow the

model of the HOE; (2) institutions can be explained by reasons such as optimum conditions of individual behaviour in economic contexts; (3) the use of simplified key premises that involved actors can be mapped onto a set of rules to use mathematical models (ibid, p.49).

The NIE is not only focused on economic institutions but also in addition on economic behaviour within and the economic organization of institutions. It is the exchange of goods and services, which enable mutual bonds that gratify the requirements of suppliers, traders and buyers in the market. It's the complex systems of bartering relations of private industries and operators, which stand in the foreground of the analysis (ibid, 2002, p.51). Through the course of history practice has shown that affluence increased when caused by the idea to share property and workforce. Future-oriented opportunities to upturn wealth can just be accomplished by the give-and-take of goods and services. Following Coase (1960, p.10f) goods can be understood as a common set of property rights. The decisive advantage of dealing with property rights is to be seen that it is not only conducted towards trading of goods against other goods in a bartering system but also by the trading the rights of individual ownership and exclusive usage (Terberger, 1998, p.51). The absolute right of ownership can be entrusted to an economic operator (agent) under assured conditions, in shift for debts. These debts are named relative property rights (Richter et al., 2003, p.88). In cases of common property rights, the latter case is known as publicly owned property in contrast to private ownership. According to Goebel (2002, p.53) the contract based division of labour (increased productivity) and the contractual share and exchange of property rights induce the optimal utilization of resources. In simple wording, the result is an improvement in prosperity.

If an economic scene or framework is salubrious to bring forward sustainable growth, which safeguards improvements, welfare of the population, the question come forth: what is the yardstick to measure? The standard evaluation criterion of relevance as a basis for assessing alternative institutions is the collective pareto-optimal state. (Erlei et al., p.18)<sup>44</sup>. An institution would be pareto-efficient, if a final condition is provided, that no actor is wealthier than the other one. Within the

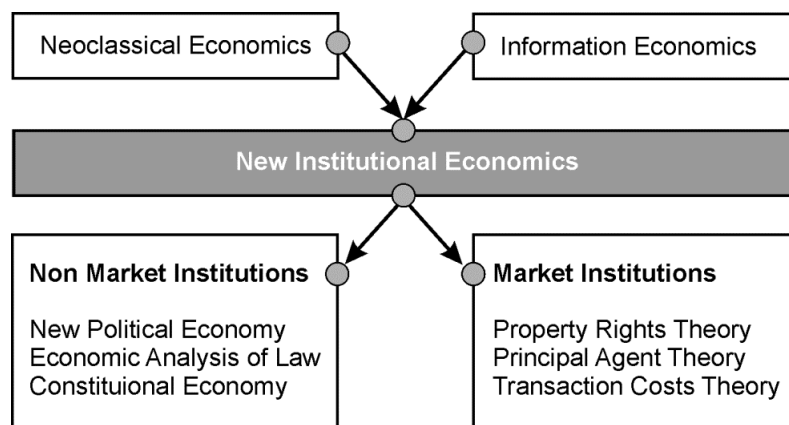
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<sup>44</sup> One brief comment: Not to be confused with Pareto Principle (the 80-20 rule).



circle of stakeholders of institutions, nobody suffers a loss of utility. The same state of affairs conduct from the matter that value maximizing, rational players close a contract in harmony with the goal of increasing their utility level (Goebel, 2002, p.46).

In addition to the standard evaluation criterion regarding pareto optimum two other arbitrary parameters and influencing variables make important inputs in the sphere of the NIE: The level of the transaction costs and level of agency cost. In variation of the previous pareto optimum in contracts the parameters transaction costs and level of agency cost are economic evaluations or ratings issued by a single, stand-alone contracting party. What might be the finest appropriate gadget along with measures of target achievement to realise the defined objectives, the optimal institutional regulation that one HOE can control or influence the other HOE in his own terms and favour (ibid, 2002, p.48). Again the question arises about the kind of yardstick. The yardstick must offer information about the accurate choice of economic advantageousness corresponded to solutions and recommendations for action. The TAC-approach favoured the best course of action that aimed to minimise the level of the transaction costs. The Principal-Agent-approach preferred minimum size of agency cost.



**Figure 9:** NIE outline plan, authors own graph

## 5.1 THE PROPERTY RIGHTS APPROACH

The straightforward approach focusing on the Property Rights Theory (PR) is the acknowledgement as well as the principle that for ownership is not only the possession relevant, but correspondingly all related rights involved in this manner (Alchian et al., 1973, p.16-19). The approach is settled on the assumption that physical resources as well as services do not drive the market; nevertheless, the market is reasonably defined by the exchange as well as transfer of bundled rights in the meaning of effective goods (Demsetz, 1967, p.347). The most elementary and lasting form of sole right of disposal or the sole property are titles to goods, land and resources. As a common accepted fact it can be seen, that in compliance with rules and laws, the owner of a thing may exclude others.<sup>45</sup> Richter et al. (2003, p.88) defined a title (to sth.) as an absolute, unconditional title that can be prosecuted before a judicial authority towards all parties. In general, they are of socially recognised importance due to major solid and immaterial values as well as contractor's duty of binding agreements (Richter et al., 2003, p.594). The nature of Property Rights can also be seen to limit the direct power of disposition as well as the mechanism of sanctions for actors which do not adjust to a general societal consensus (Furubotn et al., 1972, p.1139). Furubotn et al. (1974, p.3) outline PR as [*“sanctional behavioural relations among men that arise from the existence of goods and pertain to their use.”*]

Available options and suitable actions for the owner are restricted by the social norms so the value of a good depends crucially on its associated bundle of property rights. Williamson (2010, p.27) summed up property rights as: [*“The property rights literature emphasizes that ownership matters, where the rights of ownership of an asset take three parts: the right to use the asset, the right to appropriate returns from the asset, and the right to change the form and/or substance of an asset.”*]<sup>46</sup>

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<sup>45</sup> See German BGB §903, available in English language at [http://www.gesetze-im-internet.de/englisch\\_bgb/](http://www.gesetze-im-internet.de/englisch_bgb/); last access at 02.09.2013.

<sup>46</sup> An asset is assumed physical, such as plants, as well as human or intellectual assets (working power), such as working time (technical availability) or management knowledge (Lietke, 2005, p.3).

To give a structure to the central object of investigation literature discussed different meanings of property rights based on their properties and classes.<sup>47</sup> It is about the rights of individuals when using of resources, where the interactions between individuals are taken into account.

### 5.1.1 A Bundle of Rights

Property rights can be viewed or determined as an feature of an economic good. This aspect has four broad components. Commonly it is referred to as a [*bundle of rights*] (Klein & Robinson, 2011, p.194). It is common in recent literature to cluster the bundle into fractions (Tietzel, 1981, p.210, Goebel, 2002, p.66): (1) the intended use of the object (lat.: *usus*)<sup>48</sup>; (2) the claim of profit in total (lat.: *usus fructus*); (3) any rights of use, modification, exploitation and (lat.: *abusus*); (4) the privilege to assignment the aforementioned rights to third parties (lat. *ius abutendi*).

All four rights together are referred to as "Property Rights", whereas a single right of "Property Rights" is considered to be a part of the field. In a broader sense Goebel (2002, p.66) demonstrates the set of rights in view of a homeowner. The owner can inhabit his house, he may rent it to one other, or mortgage it for a loan, to sell it or have the intent to ward off unwelcome visitors. When the house is transferred to someone, all this rights will be assigned in addition to the buyer. In the perspective of the PR, the assets are not the material real estate, but absolute right to execute acts without the consensus of third parties. In the following course of the doctoral thesis the meaning of property rights will be defined according to Goebel (*ibid*, p.67): Property Rights are any kind of entitlement to be able to

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<sup>47</sup> See Furubotn et al., (1972, p.1140), Tietzel (1981, p.210), Ebers & Gotsch (2002, p.201), Goebel (2002, p.66).

<sup>48</sup> Early in Roman times four categories of property rights were known (Cezanne et al., 1998, p.1346). Latin expressions: "*usus*"= to use, "*usus fructus*"= enjoying the fruits of existing wealth, "*abusus*"= misuse, abuse, "*ius abutendi*"= the right to use up the subject.

dispose material and immaterial sources belonging to the latter in terms of law or socially based on the contractual relationship.<sup>49</sup>

According to common continental law, rights may only be used in respect to the areas and for the purposes for which they were granted and do not violate the rights of third parties. The scope and the enforcement of individual property rights are limited and must obey to all applicable laws and regulations.

The focus of the Property Rights approach corresponding declaration of the influence of socially recognized based on convention, tradition, or statute law on contracts action restrictions targeting on individual behaviour (Schüller, 1983, p.VII-XXI, Leipold, 1978, p.518). These limitations identified in that context are more important by the very nature for economic activity than the physical characteristics or the ownership of goods, which play a dominant role in the neo-classics paradigm (Tietzel, 1981, p.207ff).

In the focus on the individual with the desire for utility maximisation for personal benefit, the structure of the property rights is a system of motivation and incentives. The actors are applied to the attitude of reward the best and penalize the worst. (Furubotn et al. 1972, p.1138; Feldmann, 1995, p.47)

The representatives of the PRs approach assume that with its support it is probable to predict how people in certain institutional conditions will behave. As a basic assumption, Goebel (2002, p.70) formulates that the distribution and balance of responsibilities within the share of property rights affect the overall behaviour in a systematic and therefore predictable manner. At the same stage, the problem can be answered, how institutional arrangements must be designed to elicit an assured desired behaviour. The complete and unambiguous assignment of property rights is the ideal final state or objective. Only in this case all economic consequences (costs, efforts and benefits) can be assigned and addressed to the directly

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<sup>49</sup> Related to subjects who had been deliberately excluded, are the deductions of the PR towards forms of fixed intangible assets like reputation, social- and human capital. The point of origin of the Property Rights Approach was Roland H. Coase's (1960) essay "The Problem of the Social Cost" in which he has drawn attention to external effects, which will be discussed later. The systematic further development of the approach was continued by Alchian (1965; 1973) and Demsetz (1967; 1973, p.127-149). Further research of Furubotn (1972, 1974) and Pejovich (1971; 1972, 1974) broadened the view and extended the scope.

responsible actor: Reasonable costs and benefits are completely internalised (Döring, 1999, p.14)

Internalisation is to be understood as the allocation of social cost. The reason for internalisation of external costs is to avoid the misallocation of resources. In economical definition, externalities<sup>50</sup> or external effects are costs and efforts or positive benefits or added values that come from an transaction. Its existence affects an otherwise uninvolved actors who did not decide to incur that cost or receive its benefit. The objective of internalization is due to market failure (allocative market failures) to minimize the resulting inefficiencies and thus to achieve the welfare optimum (Feess, 2013). As a base line or a common principle, every HOE will only take into account costs and benefits that will face him. External costs and benefits do not interest him as long as external costs are not internalised and clearly reflected to him as relevant costs and efforts incurred (Goebel 2002, p.71).

Richter et al. (2003, p.96-100) acknowledges that it will not always be possible to assign unlimited property rights of resources to actors. This non-internalisation of external costs due to externalities is a problem.

In political-economics, internalization means the assumption of costs, charges or expenses suffered by the polluter, which is responsible for a specific damage or additional expense (Schubert & Klein, 2011). Various instruments can achieve internalization of externalities: In a small number of parties, with a high level of mutual, transparent information and clearly defined property rights the stakeholder can negotiate solutions (Coase Theorem), by a rising number of stakeholders green taxes (Pigouvian Tax) or pollution certificates may be used (Chilistalla et al., 2010, p.4)

Chilistalla et al. (2010, p.4) states that a Pigouvian Tax is gathered on a market activity that causes negative externalities. It is intended to adjust the inefficient market outcome (proof of market failure) by transferring costs associated with pollution from the public or community-owned property to the polluter. Featured practical examples of application of Pigouvian tax burdens are so-called ["*sin taxes*"]

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<sup>50</sup> The approach of Property Rights for overcoming problems with externalities honoured Coase with the Nobel Prize of Economics in 1991.

as rates for tobacco and alcohol or Eco Taxation (green taxes) on fuel (Chlistalla, 2010, p.4)<sup>51</sup> according to the [*“Polluter Pays Principle”*] (Thommen et al., 1999, p.122, 872).

If the central function of cost allocation is not granted, that trade, supervision and enforcement of property rights is not costless or free of charge<sup>52</sup>, external effects come into existence. The tie between causality and externalities is that the impact of actors in making economic decisions does not only harm him but also others in positive or negative terms.

Apart from compensation of given transaction costs and fees, the assets of property rights can be limited by external effects as a case in point if political decisions regulate the market. Picot et al. (1999, p.55) and Tietzel (1981, p. 211) call this circumstance [*“attenuation of property rights”*].

As a dictum, the decrease of absolute property rights is mentioned negatively because the relation between a concrete action and its follow-up consequences will be limited. Thiele (1994, p.994) concludes from this assumption that this shortens the incentive effect, the premium of property rights.

### 5.1.2 The specific share of Property Rights

The problems are well-known, choosing the choice to attenuate property rights. Most problems are due to the initial core hypothesis of behaviour: every HOE will try to maximise his personal benefit due to the given bundle of property rights. By mutual sharing of property rights different interests between the actors collide, a clash of diverging interests and diverging perspectives, a problem of motivation as discussed before. Goebel (2002, p.78) shows that there is a certain risk of economic exploitation if the behaviour of the contractual parties are difficult to define and measure (measurement problem) or substitution products or services are not close at hand (specificity problem). The actor, as a market participant, who is better informed possesses a certain lead in terms of information, to move him in

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<sup>51</sup> Baumol & Oates (1971) claim that the enforcement of a Pigouvian tax has rarely been proven to be implemented and set in force in practice due to the insufficiency to measure.

<sup>52</sup> Nonetheless, there are transaction costs which will be discussed later.

a position of power to exploit for personal advantage. The same applies to the actor who has several choices to, a situation of power due to financial and operational freedom of action. In principle, property rights are shared or attenuated between actors by a settlement and closing of a contract. Common in literature are:

(1) Tenancy agreement and contract of lease: the pure rental agreement abandons and cedes a non-transferable, simple user right of the matter (*usus*). The property to generate sustainable profits by unauthorised sublease, or transfer to unauthorised persons (*usus fructus*) will not be transferred to the tenant. A contract of lease grants the retention of profits (*usus fructus*) in contrast (*ibid*, 2002, p.79).

(2) Loan contract: the one who gets cash, security loans or other fungible goods is obligated and bound by law to return the matter to the lender in the corresponding kind, manner, scope and quality.<sup>53</sup> In order to secure such reimbursement contracts are made. The recipient thus receives all property rights from the lender. The lender himself only reserves the right to reimbursements, he is entitled to a refund and ask to for interest (*ibid*, 2002, p.82).

(3) Contract for work and service: a contract for work and service grant that the manufacturing, modifications, a predetermined economic success or the output of a particular result will come into existence.<sup>54</sup> Seen in the light of property rights a transference is being made of human resources: The duty to work properly according to the specified parameters (*ibid*, 2002, p.82). The service provider obligates himself to share his abilities, to contribute skills and knowledge to the advantage of the buyer and to fulfil his needs. In return, he is entitled to claim appropriate remuneration or adequate fees. The purchaser is entitled to obtain the performance of service or work in accordance with the requirements, guarantees and compliance with all quality characteristics including the given requirements within the scope of the tolerance limits agreed to. The primary focus of the fundamental conflict between the mutual contract partners depends on the initial situation and the objectives. On the one hand the supplier wants to use his property rights to an optimum extent, low performance for substantial

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<sup>53</sup> See German BGB §607, similar to European continental law.

<sup>54</sup> See German BGB §631, the scheme is similar to European continental law.

compensation. In difference to this, the customer wants high performance by low compensation. Goebel (2002, p.83) carried out at the time of signing the work and service agreement and during the entire implementing period. There is no result and none of the partners can bank on success and compensation, there must be mutual confidence. A further key problem that affects the contracts are the issues that arise relating to measuring, detection limits and the test methodology of service and production. The possible high impact of specificity for the interaction may further impair the situation. Contract for work and service are particularly interesting for the NIE, because performance and consideration are under review at the same time and efforts cannot be effectively monitored (ibid, 2002, p.99).

(4) Contract of employment: the scheme or model of the design of a contract of employment is similar to a contract for work and service. One contractual partner (employee or worker) binds himself to carry out tasks or to perform acts of service. In return, the co-contractor commits to pay a fee or remuneration (ibid, 2002, p.84). The employment relationship is based on certain not replaceable persons; the personal assignment is much stronger than in a contract for work and service. Richter et al. (2003, p.158) points out that the incomplete nature of these contracts, due to their long-term orientation, frames the contract of employment as a characteristic, typical relational contract: the mutual contracting parties propose a long-term bond by openness in the purpose of the contractual provisions. The issue of specificity plays an important role here too: due to the long-term relationship the employee develops human capital. This is carried out automatically by adapting the workers human resources concerning the requirements of the employer. This external dependence is the specificity of human and social capital. Following this aspect the forces that work between the contractors is effected in reverse to the contract for work and service: an employer can more easily exploit workers rather than the other way around. Even when workers are thus in a position of dependency and vulnerability in a contract of employment, they have a potential for abuse and exploitation too. The Principal-Agent-Approach (PAA) of the institutional economics puts emphasis on this issue as a main interest: The worker as a HOE wants to perform poorly for substantial payment to make the best use of his human resource, based on the premise that suffering is associated with work (Goebel, 2002, p.85).



(5) Social Contract: common property or public goods are divided into equal quantities of property rights to many actors or stakeholders. All contractors of a social contract are equal partners to the divisions and possess a high degree of empowerment with no relations of domination among each other. The basic structure of a social contract is characterized by the nature of property, management authority and control bundled among shareholders. Problems may begin to develop due to the behaviour of an individual shareholder; this behaviour can have a significant impact on the whole result. The individual shareholder can decide to behave like a free rider, in the hope that the activity of all others will cope his shirking. As a HOE he has an expected gain in benefit, to avoid working burden. Conversely, the HOE has a loss of utility: due to the lower success prospects of all shareholders. Within the community of all shareholders the HOE is easy to control with measurement of his efficiency. It may be expected that the HOE in this case will not behave as a free rider.

(6) Contract of purchase: from the situation depicted directly above it could be assumed that property rights are shared or distributed among several actors. They jointly own rights like common homeownership (sharing of bundled property rights) or a worker makes his labor (human resource) available for a wage or salary, known as splitting of property rights (Goebel, 2002, p.87). Particular contractual duties in an agreement purchase are laid down in common continental law, like German BGB §433 that [*“... the seller of a thing is obliged to deliver the thing to the buyer and to procure ownership of the thing for the buyer. The seller must procure the thing for the buyer free from material and legal defects. The buyer is obliged to pay the seller the agreed purchase price and to accept delivery of the thing purchased ”*]. In simple words, a purchase agreement is an enforceable legal contractual obligation. This could be considered as typical sharing of property rights, a pro rata allocation by which contract, control and payment take place almost simultaneously, like concrete situations and conditions relating to daily life, e.g. shopping trips (Goebel, 2002, p.88).

Following Goebel (2002, p.88) contracts of purchase are profoundly important, by processing idle resources for manufacturing or improving the division of labour. Moreover, the contract of purchase enables the proper fulfilment of the contract in the first place, that property can be transferred to ensure efficiency in the use by that actor who can derive the maximum benefit,

expressed by the price. However, the disadvantages are quite obvious. The trader as a HOE wants to use his property rights in order to make optimum use of them: He seeks to sell his assets as dearly as possible.

The constellation of interest raised by the buyer is totally different; he is kept in a fragile position, if he cannot assess the essential characteristics of the products available for ordering. He has got measurement or benchmarking problems. Almost every purchase transaction is subjected to measurement problems. Kaas et al. (1996, p.243-252) regards attention to the modest fact that almost every matter of trade has internalized values, which have the characteristics of inspection, certain properties of experience and trust. Particular features of inspection are an easy measure to verify, they are evident. To preserve certain properties of experience one has just to make usage of the subject matter. These problems become apparent during the application. All promised properties that cannot be confirmed for accuracy and current validity are considered to be matters of trust.

Many economists believe that contracts are the most important factors to change and trade property rights. If this happen in free-market model (social market economies or free market economy) the designed structure of property rights provides ideal conditions for smooth transfer and flow of goods and strong rise in prosperity and welfare. (Goebel, 2002, p.96).

Contracts will automatically conduct to pareto-optimal solutions in a free market. Kirchgässner (2000, p.165) take a critical view of this issue, because it deliberately ignores the fact that:

(1) The initial asset or setup of individuals with resources is a result of natural causes, accidents of force majeure or power struggles and distributional conflicts and not of institutional obligations be translated into practice on the basis of voluntary treaties.

(2) A partial redistribution of property rights is not only possible by appropriate contracts, but for instance through theft, embezzlement, fraud, inheritance and marriage.

(3) Contracts may be concluded between parties of any kind, which are not being adjudged to be nearly the same with the stakeholders.

(4) The power imbalance and information asymmetry between actors prior to contract conclusion will lead to suboptimal outcomes.

In view of certain essential aspects of the difficulties arising by the share of property rights by the alteration of various kinds of contracts shown before, the related aspects are also examined to serve as the foundation for the PAA and the TAC.

Another field of application of the property rights approach is the examination of legal norms: statutory regulation, laws and regulations currently in force are interpreted as especially advantageous forms of motivation and incentive systems analysed in view of economic efficiency (Kirchgässner, 2000, p.126). Analyses of this type are known as "Economic Theory of Law".

### 5.1.3 Dimension of Dynamism

The property rights approach even adds a dimension of dynamism. North's (1994) attitude from the perception of economic history contributes to an economic theory of historical science. It is assumed, for instance that a structural change in structural conditions and competitive situations should only be implemented if the expected benefits returns it provides substantially outweigh the costs (Demsetz, 1967, p.350; Tietzel, 1981, p.214.).<sup>55</sup> Following Feldmann (1995, p.70) North's point of view contributes the understanding how causes of formation and change in property rights are engaged in economic development.<sup>56</sup> Feldmann (1995, p.69) refers to further fields of application: The property rights approach enables one to analyse the theory of the firm and the behaviour of actors inside, the stakeholders and the complex entanglement of relationships within.

## 5.2 THE PRINCIPAL-AGENT-APPROACH

The agency-relationship can be described in simple words: the term expresses the idea that actors have an impact on one another. PAT is based on the assumption of information asymmetries between the engaged actors or

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<sup>55</sup> Demsetz (1967, p.351ff) shows the classical example of the fur trade: The transition from hunting grounds of collective use towards an allocation of private ownership of land by North-American Indian tribes.

<sup>56</sup> For further readings about advantages and disadvantages see the "Tragedy of the Commons" by Hardin (1968).

stakeholders, which leads to opportunistic behaviour. Rules among the actors and conditions may even be reciprocal. The results of the monitoring of the actors have not been gifted to explain clearly, who the principal is or the agent, the answer depends heavily on the economic and political principles and on the sector that is being analysed. Goebel (2002, p.98) states that the mutual impact between actors in a work-diversified economy with the sharing and exchange of PR is very much alive and virulent.

All substantive contractual problems that have been discussed within the PRA can also be described as an agency-problem, because in all mentioned kinds of contracts and agreements one actor depends on another. Particularly interesting features of the PAA are the sharing of assets due to property rights and problems relating contractual obligations (ibid, p.98).

Two types of contracts are given priority: the contract for work and service and the contract of employment. Keeping sense of this focus Richter et al. (2003, p.163) circumscribed the term "principal" with purchaser and customer and "agent" with contractor. Jenson et al. (1976, p.308) define an agency-relationship [*"... as a contract under which one or more persons engage another person to perform some service on their behalf which involves delegating some decision making authority to the agent "*].

Ross (1973, p.134) paraphrased contractual relationships as [*"...one, designated as the agent, acts for, on behalf of, or as representative for the other, designated the principal, in a particular domain of decision problems "*]. In simple words, an actor is noted to be an agent when he is acting as representative and performs specific tasks by means of delegated decision-making authority.

To engage an agent is the common accepted result of a world characterized by a growing division of labour and specialization. Seen from an economic perspective specialisation can also be considered as positive, it creates efficiency, but the PAA stresses and paying attention to the specific, complex economical problem the division of labour (Goebel, 2002, p.99).

### **5.2.1 The complex issues of Agency-relations**

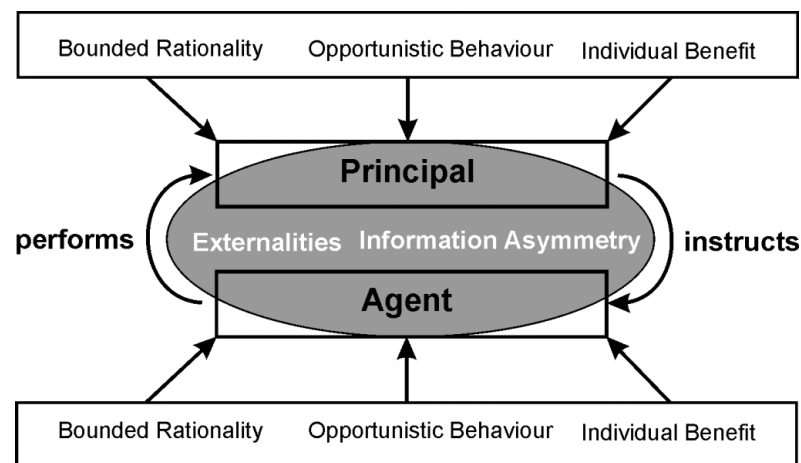
The objects of cognition of the agency theory are the relationships that match the legal concept of representation. According to Goebel (2002, p.100) and Richter (1990, p.581) the following premises apply to an agency-relationship:

(1) The agent nominates a number of acceptable actions that have an impact on the welfare of himself and the principal. Therefore, the agent can well have a positive or negative effect on the principal even forced by external effects.

(2) The underlying view of the world and the interaction with fellow human beings is characterised by the nature and preferences of the HOE. Both actors are rational benefit-maximizers.

(3) Principal and agent have mentioned different expectations due to their individual restrictions of rights of disposal over assets. See the working burden of the employee (agent), the efforts made to minimise his work efforts at a given level of salary versus the objective of the employer (principal) to maximise effort and commitment of each employee.

(4) Between a principal and an agent rules informational asymmetry. The agent possesses a certain lead in terms of information. The agent can donate his knowledge and talents, his intentions and motives are fine to him, but hidden to the principal. The principal himself is not in an advantageous position; he cannot monitor and evaluate the agent's actions and measures all the time. This enables the agent to enjoy too much latitude for action-taking and decision-making. Consequently, the principal cannot conclude from any work results to the unobserved and unsupervised actions of the agent.



**Figure 10:** Framework of P/A relationship, authors own graph

The agent is usually better informed than the principal is. In case that both counterparts have balanced and costless access to rights and unlimited access to information, economic dilemmas are excluded (Picot et al.,1999, p.85) In real life, the gathering of information is not costless, knowledge<sup>57</sup> is therefore incomplete and arranged unequally between both, principal and agent.

For the reasons stated above, there is a crucial risk for the principal that the agent claims and attempts to maximise his individual benefit. At the same time, the agent cannot act and behave in the best interests of the principal.

Recent literature classifies this field of problems into four categories of agency-problems related to information asymmetry that appear at different times and even can overlap (Arrow,1985, p.38ff; Spremann, 1987, p.9ff and Breid, 1995, p.824f): (1) hidden characteristics, (2) hidden action; (3) hidden information and (4) hidden intention.

### 5.2.2 Hidden characteristics

The principal attempts to find an agent who possesses the mandatory qualifications and skills, who is suited well to appropriate for implementing the principal's requirements. The agent's characteristics at the beginning of the cooperation are largely unknown. If a contract is being required, ex ante one should know any warranted skills or characteristics of the agent. Directly related to the problem of hidden Characteristics is adverse selection (negative selection). The agent's characteristics are often hidden so it creates a significant risk that the assortment of business associates is an adverse selection.<sup>58</sup>

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<sup>57</sup> Knowledge is used here interchangeably with the term information.

<sup>58</sup> Adverse Selection (ex ante): if one of two marketers is better informed prior to conclusion of contract and can hide this advantages of asymmetry of information (by hidden characteristics and hidden intention), the problem arises of pre-contractual negative selection (adverse selection): The individual economic actors do not possess any real information or different information about the offered product and the related economic characteristics and risks. Information on quality helps to differentiate products. The more information is at hand for product characteristics, less critical the price component, so the final price to market is no longer the outstanding criterion for customers purchasing decisions. (Diehl et al., 2003, p.57; Lynch et al., 2000, p.101).

According to the research of Akerlof (1970) poor quality displaces the good quality from the market<sup>59</sup>. Goods offered in the market with average or even inferior quality corresponds with withdrawal and overall decline in demand of providers with the best quality. The absence of product and quality information subsequently leads to a pure market solution with the risk or result of market failures. The optimal allocation (pareto efficient equilibrium) of resources does not take place.

The agent as a HOE attempts during the negotiation to have a substantial skin in the game, of individual or economic interest (Ebers et al., 2002, p.213). Beside the ruling informational asymmetry and divergent objectives between the principal and the agent there are other positions beyond the criteria mentioned before (Goebel, 2002, p.101): (1) the agent has a professional look and is extremely saleable.; (2) every agent emphasizes the quality of his services or products; (3) the agent is trying to portray himself in a good light by supporting the principal's issue; (4) the agent does everything in order to obscure inconsistencies and weaknesses; (5) the agency-problem of "hidden characteristics" cannot only be addressed to actors, but also to products.<sup>60</sup>

Hidden characteristics related to the agent are personal attributes or conditions which cannot be monitored and assessed by the principal to be used for or against a corresponding cooperation agreement. Typical unobserved (to the principal) characteristics are: (1) the qualifications, service capability and

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<sup>59</sup> This kind of market failure is known in literature as the [*Lemmon Problem*] created by Akerlof (1970), see Pindyck et al. (2005, p.803) too.

<sup>60</sup> If information asymmetry is related to products or suppliers of ground handling services to third parties of poor quality high quality products at fair prices they were stiffed out of the market.

preferences of the agents; (2) reservation utility of the agent<sup>61</sup>; (3) estimations of the agent towards forthcoming development of exogenous factors<sup>62</sup>.

### 5.2.3 Hidden action

The most important turning point of a principal agent relationship is the closing of the contract; after this point of no return is reached, hidden action will come into existence. The principal cannot monitor the operational activities of the agent, and as mentioned above his operational performance (the result) of the agent may not be an equivalent result of the agent's efforts or it is difficult or expensive to measure or the result is subjected to exogenous factors. Hidden action discusses the impracticality of observing the agent's management actions after stepping into the agreement (ex post). In such a case, the agent may use the arising informational asymmetry to try to apply the irregularity for his personal benefit. Under the prerequisite of the above expounded working burden of the agent, it is to be expected that the agent has had a good skive. The agent may have worked hard and slowly, he has hidden or concealed his productivity, in simple words he shirked. This cop-out is associated within agency-theory as [*shirking*] (Richter et al., 2003, p.82), a central problem in employment relationships and work organisation. Taylor (2011, reprint from 1913, p.13-19) already recognized this problem nearly 100 years ago. Shirking is closely regarded to voiding on the job, the resources and assets of the company are used for private purpose.

Due to the agent's, hidden action the principal cannot monitor precisely the agents effort after entering into a contract. Following Jost et al. (2001, p.25) the

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<sup>61</sup> Based on PAA on the analysis of the initial situation, considerable strength and bargaining power is reserved for the principal, the agent can only agree to the terms of contract or reject the treaty. Due to this boundary condition the principal must induce the agent to provide the right input quantity (Holmstrom, 1982, p.324) However, the agent will only accept an offer if his expected utility is at least as great in this respect, as his benefit he could achieve through an alternative contract. This welfare is often revealed as the reservation utility. (Picot, 1999, p.105 and Jost et al., 2001, p.19)

<sup>62</sup> In the framework of this thesis externalities are all positive or negative consequences an economic actor's optimisation behaviour, which are not remunerated via the market or could be determined as individual economic costs.



principal aims to eliminate uncertainty; he is involved in an amount of time and work, subjected with high costs.

The agent's activities that take place *ex post* are provided without the observability, controllability, expertise and assessment skills of the principal. (Holmström, 1979, p.74.) The desired result of the agent's work may not be related to the agent's efforts, it could also be related to outward influences and not the results of the agent's management performance. No conclusions can be settled on the agent's efforts, related burdens from the principal's limited point of view, no implication of performance. (Kaas, 1992, p.884-901)

Seen from the agent's position (as a HOE) the determined framework leaves an additional margin for manoeuvring with considerable self-interest. Both measurement problems and monitoring problems induce behavioural uncertainty. The issue of behavioural uncertainty leads to the problem of hidden action, which in turn causes a moral hazard risk; i.e. the agent might exploit any informational asymmetries for his own interests. The troublesomeness of hidden action or hidden information occurs, if the demanded and settled efforts of the agent are hardly observable or do not demonstrate contract compliance or to handle this at reasonable costs (Richter et al., 2003, p.163). For the principal, the risk of the contract is the moral hazard problem, the agent's level of activity, performance or achievements.

#### **5.2.4 Hidden information**

The designation of the term "hidden information" is not clearly and unambiguously defined in recent literature, because a heterogeneous distribution of information is given in all different varieties of asymmetric information. Alparslan (2006, p.20) and Weierhäuser (1996, cited in Saam, 2002, p.55) applied the characteristics of hidden information towards essential amenities of goods or services. Langerfeld (2003, p.57) designated quality uncertainty as hidden information in the meaning of uncertainty about quality and condition at the time of purchase. The most commonly used definition in the reviewed literature may be related to Arrow (1985, p.38): Hidden information contributes to the PAA, when the agent conceals information (knowledge) about his scope of action, his selection of suitable courses as to the related risks for the principal. The principal cannot rely

on maximisation of the benefits and the short cut costs. In the further course of the thesis Arrow's definition will be used in viewing the behaviour of the actors and Langerfeldt's definition in view of essential features of goods or services.

All problems that arise in view of a principal agent relationship are due to the fact that the principal does not have access to complete and costless information. The problem of conducting hidden information is post ante, after entering into a contract; the principal can observe the agent, nevertheless not evaluate the outcome of his efforts due to any lack of professional skills, expertise, competence to dispense the responsibilities concerned.

As an example all professional services (engineers, consultancy bureaux, lawyers, accountants, doctors, estate agents and other similar services) are subjected to the same conditions referred to in that provision. Hidden information for instance can also describe a situation in which the manager (agent) possesses better information about corporate earnings than external capital donators (principals) do. Goebel (2002, p.102) showed the example of automobile garage in particular: A customer can watch and see that the clutch has been replaced, but be unable to recognise whether it is required or not. These examples are of general application, in all cases where asymmetric information rules and the specificity of the agent is particularly strong, this issue comes up: The agent as a HOE can choose a self-interested choice which leads to his most added value. These self-interested choices are known as fringe benefits.

Alternatively, the agent may, within the context of the performance of the existing agreement, gather additional information useful for his own interest and benefit. The agent has the occasion to promote the usage of exogenous factors responsible for the outcomes of his efforts like failure.

The agent obfuscates and blames his failure on adverse exogenous factors, although it is in fact due to his poor labour input (burden of work). The principal lacks expertise and assessment skills, which correlate with the ability to analyse and reach conclusions. The risk of a hold up rises again, which must be mentioned ex ante by closing the contract.

### 5.2.5 Hidden Intention

According to Breid (1995, p.824) the principal are not recognising ex ante the agent's hidden intention. Hidden intention occurs ex post of contract conclusion. The possibilities, interests and intentions of the agent are not well-known. It generally remains unclear how the agent will behave due to potential conflicts of interest; will he behave in an accommodating manner or self-interested. Hidden intentions as well as hidden characteristics are elements of every negotiation and other pre-contractual situation. The principal is not aware about the agents (HOE) specific plan of action or basic intention that will affect him later in the further progress of the mutual business relationship. Sewing (1994, p.67) claims in that regard that that the principal can subsequently monitor the agent's behaviour, but during the trice of decision (ex ante) the principal is out of assured knowledge. If an agent post ante altered the assessment of the principal's cooperation in his opportunistic favour, hidden intention is clearly demonstrated. The agent can exploit the vagueness of certain terms or even the circumstance that the agreement is silent about certain matters (contractual omissions), in opposite to this the principal can be induced to undertake significant investments which could not be retreated again, so called sunk costs.<sup>63</sup>

In a nutshell, the principal is kept in a state of subjection. If the agent takes advantage in opportunistic manner due to the principals state of dependency the situation is classed to be a hold up. Picot et al. (1999, p.89) provides the concrete example of additional rebate demands by a large automotive corporate group put on an addicted supplier or subcontractor.<sup>64</sup>

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<sup>63</sup> The term sunk costs points to economic decisions established in the past, which expenditures have caused irrevocable costs from today's perspective. For further reading see Krahnert (1991) and Sutton (1991).

<sup>64</sup> For further reading about hidden intention see: Ebers et al.(2002, p.264), Picot (1999, p.89); Saam (2002, p.29) and Schröder (2004, p.241-242).

### 5.2.6 Uncertainty and Risk

These uncertainties or problems become apparent or come into existence when the agent adapts accordingly or behaves in the same manner. Blum et al. (2005, p.158) associate these behavioural characteristics with one's behaviour in crisis situations or facing situations of tension, when it is necessary to demonstrate dependability, i.e. fairness in business relationships, such as compliance with guidelines, duty to cooperate in good faith, duty of loyalty and acts of generosity or goodwill payments.

As stated before a significant risk may arise, after the contract has been signed. Ex-post hold up: agent versus principal. Hidden intention causes the problem of hold-up, which is also related to resource dependency or capital specific investment. If the agent has a range of asset specificity, he may hold up the principal to create or exploit a state of dependence. The idea of asset specificity is devoted to that of opportunism.

Williamson (1975, 2010) differentiates between four types of asset specificity: (1) Site specificity: fixed installations or localised facilities like railway trackside assets; (2) Physical asset specificity: special machine technology and special knowhow; (3) Human asset specificity: employee qualifications (assets in human capital); (4) Dedicated assets specificity: investments in systems engineering, optimized plant equipment with minimized operating costs.

Under the given constraints shown above the agent may dominate and exploit the principal (lock in), because the principal cannot shift to other sources of supply or service (sunk costs). This problem becomes clear when comparing the logical correlation between the PPA and the TAC. The specificity of an investment represents the risk-inducing moment: The principal danger in the opportunistic use of existing dependencies (Picot et al., 2003, p.49). The reason for the hold-up phenomenon is founded by the so called [*lock-in effect*]. A lock-in effect shapes that institutions relationship-specific investments have carried out are mutually dependent on each other. Williamson (2010, p.61) supposed this situation when a downstream supplier adjusted his production, processing methods and workflow of goods to tailor towards a certain manufacturer. For principal's benefit it is relevant how far the agent exploits his market power to maximize his individual utility. This issue will be reviewed later in chapter 5.3 concerning the TAC-

approach. The typical agency problem is to be seen in the very fact that prior to the closing of the agreement the principal is interested in knowing if there might be a future hold up *ex ante* and what the motivations of the agent are.

Following the reviewed literature, the arising problems of hidden action and hidden information are summarised under the heading “moral hazard” (Arrow, 1985, p.38). The term moral hazard may be expanded to known agency problems according to Goebel (2002, p.103): fraudulent representations, shirking, consumption on the job, free riding, fringe benefits or the hold up, in all actions the moral of the actors plays an significant role in the commercial partnership.

### 5.2.7 Acceptable solutions for the PA problem

It is to be expected (Picot et al., 1996, p.50) that the PAA is suitable to revive problems concerning mutual relationships and correspond with correct findings and design recommendations due to the asymmetrical sharing of knowledge and information among actors and the resulting risks. As stated before the principal is in no site to consider the exact amount of efficiency of the agent’s efforts or to evaluate in total the agent’s behaviour. Based on this premise it creates a divergence between taking the variances from a best case: The greatest possible harmoniousness between principal and agent. This variance causes and implies welfare losses and is reflected in the so called “agency costs” (Knorr, 2001, p.31). Agency costs are referred to the reduction of economic welfare, defined quantitatively in monetary units. They are based at the very fact that the principal as well as the agent withhold information, both enforce the issue of asymmetrically distributed information. The agency cost to achieve this are the sum of the enforcement and control costs of the business relationship (as a part of quality control costs) and opportunity cost calculation by symmetric distributed information. The smaller the deviation of the actual construction situation is from the ideal state, the lower the agency costs. Fama et al. (1983, p.327) showed that [*“... agency costs include the costs of structuring, monitoring, and bonding a set of contracts among agents with conflicting interests, plus the residual loss incurred because the cost of full enforcement of contracts exceeds the benefits.”*]

Discussing previously identified parameters and variables in view of the PAA like removing information asymmetries between principal and agent,

resolving conflicts of interest and the need to maximize the individual benefit, the actors may seek institutional solutions to these problems, which will be discussed in the following chapter.

### **5.2.8 Ex Ante - Reduction of information asymmetries**

Away from reality within the perfect market all players are subjected to the same conditions and transparencies, unknown are agency problems due to information asymmetry. Assuming perfect markets with unerring free, costless information, no opportunistic behaviour is possible covered by a riskless and timeless future. This scenario is named first best solution since it generates the optimal result for all parties. In reality information asymmetries rule. To achieve the optimum result, subjected to information asymmetries, the often poor, less productive or more cost intensive measures are referred to as "second-best solution". The distinction between the two scenarios is interpreted by the existence of agency costs (Spremann, 1988, p.617). According to Richter et al. (2003, p.173) and Meinhövel (1999, p.7) agency costs are subdivided into the three sectors:

(1) Monitoring and control costs: All efforts of the principal to control the agent's activities. Monitoring expenditures by the principal are anticipated cost of monitoring, incentive components and risk premiums.

(2) Bonding costs: The agents signalling and warranties to establish compliance with skills for work and accountable for the result, self-selection and to build his reputation. Bonding expenditures by the agent are covered by signalling before business, timely reporting, and the obligation to pay compensation and guarantee commitments for a smooth trade. Dietl (1993, p.136) and Kaluza et al. (2003, p.25) refer even to product related bonding cost like the introduction of a brand name or a report commissioned by the manufacturer.

(3) Residual loss: possible welfare losses associated with remaining difference between optimal result and actual earnings, while taking into account all relevant agency costs. The opportunistic performance of the agent, the existence of transaction costs and potential power relationships that do not materialize because of uncertainties will lead to the actual profit being always less than the potential one (Richter et al., 2003, p.166f.).

Agency costs occur in any form of cooperation between two or several people or institutions. The agency costs arising from the formulation, implementation and enforcement of agency agreements (Feldmann, 1999, p.135). During the pre-contractual level, the principal can screen the market for a suitable agent. Screening will reduce the risk of adverse selection; it encompasses all levels of planning and execution of principal's information activities for evaluation of the agent's performance and future behaviour.

Examples of day-to-day screening are the calling for tender, soliciting offers, presentations and previews, visits to reference sites or contractual negotiations. The principal tries to deliberately reduce information asymmetries (Martensen, 2000, p.120). The concept of "screening" dates back to Stiglitz in 1973, an active acquiring of information (published in 1975).<sup>65</sup> If the principal's screening behaviour is reflected towards the agent, and the agent provides credible evidence about his reliability and reputation, the concept is named signalling: the agent himself has an interest to reduce information asymmetries. Goebel (2002, p.111) points out to the detail that such signals are trustworthy only if it would simply be too costly to provide the risk of sending a misleading signal.

Signalling is known as the prior transfer of information in a pre-contractual business phase. Here the better informed agent provides to the worse informed principal information concerning otherwise hidden characteristics of his business or concealed intentions. The objective of this approach is to shorten uncertainty associated with the selection of new agents (adverse selection) and discretionary room for manoeuvre between the contractual parties (hold up). Signalling allows an agent with higher qualifications to differentiate him from those with fewer qualifications (Picot et al., 1999, p.78). The credibility of signalling claims is a form of establishing and building a reputation or a real share of the risks, because the agent commits and subjects himself to promises of guarantee; rely on excesses or

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<sup>65</sup> Stiglitz (1975) focused on the labelling of individuals, on resulting costs and benefits, institutions that provide it. He showed the determination of the equilibrium amount of screening subjected to various institutional adaptations.

performance-related remuneration (Cezanne et al., 1998, p.1352). The concept of “signalling” dates back to Spence in 1973.<sup>66</sup>

Another essential mechanism to shorten the principal’s substantial risks as well as uncertainties towards quality is self-selection in this context, in terms of self-assessment. The principal ex ante poses a decision-making state of affairs with various criteria, which manoeuvres the agent towards a decision. The agent’s self-selection might exhibit the inner characteristic of the agent as well as spotlighted future behaviour or assumed contractual loyalty. Owing to that kind of stipulation of the agreement yet to come, by now a principal-orientated selection process takes place (Neus, 2007, p.220). An example in a day-to-day self-selection situation is the choice of a certain personal and property insurance type. The agent (potential policyholder) provides personal information and certain behavioural characteristics to the principal (insurer) by having the choice of various types of contracts (Shapira et al., 1999, p.139ff.). To select a packaging issue, a supplier relationship may be subjected to an unlimited fulfilment guarantee. The agent must compensate the principal’s harm, if he considers the danger of non-delivery of contracted goods.

The less informed principal covers sufficient information based on the agent’s depending complex decision-making situation (Picot et al., 1997, p.50); Cabrales et al. (2011, p.138). This variant is similar to a fairly well informed principal who performs screening, but it belongs to the principal to introduce the sole criteria for selection. The agent is subjected to these criteria; he must fulfil them due to materialization of the contract (Stiglitz, 1975, p.293).

### **5.2.9. Reduction of information asymmetries - Ex Post**

The origin of moral hazard or incentive problems is an asymmetry of information among individuals. Individual actions cannot be observed and consequently contracted post ante. A profane remedial action to the dilemma is that the principal empowers resources, like time and money into monitoring of

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<sup>66</sup> Michael A. Spence essay is settled on his PhD Thesis “Market Signalling: “The Informational Structure of Job Markets and Related Phenomena”, Harvard University in 1972. Publication as an extract in “The Quarterly Journal of Economics” in 1975.



actions and apply this knowledge in the agent's contract. Nevertheless, both sides agree, full observation of actions is either impossible or disproportionately costly.

Moreover mandatory guidelines for all phases of production cannot be provided by the principal due to ruling asymmetry of information, therefore it is of extreme importance to provide incentives to ensure and provide controlling influence towards agent's respective behaviour (Hartmann-Wendels, 1992, p.73).

The monitoring in contractual relationships is an umbrella term covering all types of observation or supervision of service processes using technical resources or other formal inspection systems.<sup>67</sup>

With the implementation of control and information systems, the principal reduces his deficit of evidence regarding the outcome of the agent and the development of exogenous factors. It is to be expected that the agent takes into account the principal's interests the more precise information the principal has got about the agent (Saam, 2002, p.32). The general rule for monitoring is: the earlier and the more concrete the information, the better. With monitoring procedures however, inherent problems are associated: They require extra time, money, resources, and on the other hand, they support suspicion when the monitoring exceeds the level of normality. A familiar remedy to the issue is that the principal delegates the burden of monitoring to another agent. Goebel (2002, p.12-13) does not recommend this procedure, it poses just another agency-problem. Mühlbacher (2002, p.10) provides a possible approach to this problem:

(1) In the context of cooperative contract structures network partners may be included in the monitoring process. Here, the assumption is given that competitions among these cooperative actors provide optimal and constant quality certainty in order to increase manipulation safety and optimize faultfinding.

(2) Performance-related, success oriented compensation system. A contractually regulated profit sharing is a reconciliation of interest between

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<sup>67</sup> The terminology is not uniform in literature, Alparslan (2006, p.34) distinguishes between information systems and (2006, p.38) control systems. Picot (1999) debating solely the English meaning of monitoring as the essential idea. The thesis will use the wording of Saam (2002, p.32) as common terminology: monitoring recognized as control- and information systems.

principal and agent to reduce the problems of hold up and locked in, the agency problem is mitigated. Richter et al. (2003, p.164) provide the issue of share cropping, a contractual participation in harvesting, contractual harvester (hackneys) can increase their earnings through own efforts.<sup>68</sup>

The implementation may takes place via long-term sourcing agreements or as a rule of thumb<sup>69</sup> the agent may be vertically integrated into the principal's structure. Based on these considerations Picot et al. (1996, p.50) point out that their devotion to cooperate will prosper to demonstrate compliance and offer transparent information in addition. Reporting in the meaning of documentation is an instrument of the agent. The agent's documentation of all relevant business processes and results display transparency to the principal. In case of reproach due to poor performance from the principal, the agent can demonstrate that other external factors or influences have had an effect on the outcomes.

Continuous reporting by the agent to the principal on the current state of affairs can thus signal his willingness and his capacity to perform. Goebel (2002, p.113) states that the agent has to make a voluntary commitment to ensure transparency and otherwise prevent nagging mistrust in the principal's eye. Reporting in regular, short intervals cannot prevent protection from opportunistic behaviour among the actors, but reporting promotes timely identification and sanctioning. Reporting and monitoring combined with regular, precise and reliable information about business, the market, technology, product and services are important to allow an appropriate and effective risk management. Both have major importance in this context.

Additional measures to slow down and mitigate the conflict between principal and agent like trust, reputation, rule-based action or clan mechanism will be examined later in sub chapter 5.3.9.

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<sup>68</sup> In the following course of the thesis, the problems of designing incentive schemes will not be discussed.

<sup>69</sup> Rule of thumb here: If you can't beat them, by them.

## 5.3 THE TRANSACTION COSTS APPROACH

Economic transactions come into existence, whenever resources are transferred. This business process can occur within a firm, as an internal transaction or at the market, a so-called external transaction (Richter et al., 2003, p.55). Commons (1931, p.652) set into existence the concept of transaction and was second to none to specify that [*"... transactions are, not the exchange of commodities, but the alienation and acquisition, between individuals, of the rights of property and liberty created by society, which must therefore be negotiated between the parties concerned before labour can produce, or consumers can consume, or commodities be physically exchanged"*].

A common analysis unit of the Transaction Cost Theory (TAC) is a single transaction or arrangement, which is defined as the transfer of property rights.<sup>70</sup> Picot et al. (1996, p.41) claimed that all costs involved in information and communication for initiation, agreement, settlement, control and adaptation and perceived as a fair exchange of services and trade are referred to as transaction costs. The amount of transaction costs depends on specific properties of services to be provided and behavioural properties of the engaged economic actors plus the selected integration form and type of organization (Picot et al. 1996, p.41). Arrow (1969, p.48) has manifested transaction costs as the [*"... costs of running the economic system"*], in simple words the costs of accessing and using the market. The TAC assumes that any kind of action within a market-economy is linked with costs. Following Williamson's (1985, p.19) perspective they are ubiquitous and cannot be cleared out of existence, he concluded, [*"... that transaction costs are the economic equivalent of friction in physical systems"*]. Transaction cost economics postulate the problem of economic institutions as an issue of ubiquitous contracting, the allocation and transfer of property and use rights.<sup>71</sup>

Following Dietl's (2006, p.1) way to look at transaction cost theory, market facets like firms, cooperations and even government are alternative forms of organization. They are imbedded in an economical framework with a complex division of labour and unequally shared knowledge. The TAC aims to identify relevant characteristics and benefits of transactions for each type of transaction to

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<sup>70</sup> See Coase (1937); Williamson (1975, 1985) and Picot (1982).

<sup>71</sup> See Coase (1937); Williamson (1975, 1985) and Picot (1982).

determine the efficient coordination for operating and service processes. A transaction is revealed as the delivery or of a good, product or unique service. Transactions give rise to costs, these primarily include information, communication and coordination costs such as search costs, origination costs, costs agreement, settlement, adjustment and control costs (Coase (1960, p.15); Picot (1982, p.270); Windsperger (1983, p.896). Wallis et al. (1986, p.98) sums up transactions cost as [*... to the consumer seeking to purchase a good (or service), we define transaction costs as all costs borne by the consumer that are not transferred to the seller of the good.*"]. The same study of Wallis & North (1986, p.120) gives an idea as to the proportions of TAC by saying that [*... the transaction sector grows from roughly one-quarter of GNP in 1870 to over one-half of GNP in 1970*"], in simple words estimated over 50% of the total GDP accounts for transaction costs.<sup>72</sup>

The theory dates back to considerations of Roland Coase, in 1937 and was primarily developed further by Williamson.<sup>73</sup> Williamson placed TAC in relation to his estimation: ex-ante and ex-post. Ex-ante transaction costs are costs for searching and information, for drafting of contracts, for there negotiations, and as costs for the safeguarding of contracts and bargains among companies and service vendors (Williamson, 1985, p.20). As ex-post TAC Williamson points to costs for the adjusting of details as well as to costs for controlling, monitoring and enforcement of contracts. Uncertainties in the economic and possible opportunistic behaviour of the cooperation partners and the environmental factors (externalities) are additional alternate drivers of transaction costs, which are subjected to bounded rationality and the probability for opportunistic actions by the transaction partners (Zernott, 2004, p.51). Consequently, the TAC is based on three fundamental

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<sup>72</sup> For a general overview regarding categories of transaction costs see Albach (1998) and Picot et al. (1993). Most exemplary Ex ante: Information costs (search for information), origination costs (contact), agreement costs (drafting, negotiations, contract formulation, and safeguarding agreements between the actors to a transaction). Ex post: Settlement costs (brokerage fees, transportation costs), control costs (compliance deadline, quality, quantity, price and non-disclosure agreements, acceptance of delivery), change in costs or adjustment of costs (deadline, quality, quantity and price changes) and ex post reasons (maladaptation, haggling, establishment, operational and bonding cost) (Hasenpusch, 2009, p.76)

<sup>73</sup> See Williamson (1975; 1985 and 1996).

behavioural assumptions: bounded rationality<sup>74</sup>, possible potential opportunism and the neutral risk inclination of the participants. Transactions are as stated above not free of charge. Additionally to the cost of production<sup>75</sup> known from neoclassical economics, transaction costs are nested in the mutual coordination of transactions. This passage serves to illustrate that the market use causes costs. Following a commercial perspective the market provides the context for transactions, they will come into existence while transferring a good, service or the related property right. Williamson (1985) has given further concrete form to transaction; he claimed that transactions are a complete process.

### 5.3.1 Dimensions of transactions

The transaction cost methodology centres on the hypothesis that the amount of the costs incurred for the settlement and organization of a transaction are covered by certain attributes, which will distress the whole transaction process. Williamson (1985, p.52) presents three attributes that can be used to match the relative height of economic transaction costs: (1) extent of particular investments; (2) uncertainty (ambiguity) and (3) the frequencies of transaction.

The most important dimension of the transaction is the specificity. Williamson (1991, p.282) states that [*"... it has played a central role in the conceptual and empirical work in transaction-cost economics"*]. Specificity means uniqueness and lack of interchangeability for goods or services. The asset specificity of production factors arises when one or more specific investments are the precondition of an exchange transaction. Williamson (1996, p.59-60) distinguishes between four kinds of asset specificity; he introduces that his idea of asset specificity refers to [*"... the degree to which an asset can be redeployed to alternative uses and by alternative users without sacrifice of productive value"*]: (1) site specificity : fixed installations or localised facilities like

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<sup>74</sup> Bounded rationality: The participants tend to act rationally in the result, but they succeed only impaired. This is also illustrated in the behaviour of informed consumers, they do act rationally when purchasing decision are made at the point of sale.

<sup>75</sup> The manufacturing costs are the value of the cost that a company in general must expend for production factors in order to create a product or service. These costs represent a key factor in order to make decisions about production and pricing.

railway trackside assets; (2) physical asset specificity: special machine technology and special knowhow; (3) human asset specificity: employee qualifications (assets in human capital) following (4) dedicated assets specificity: investments in systems engineering, optimized plant equipment by minimized operating costs.<sup>76,77</sup>

The asset specificity is higher the higher the opportunity costs are in an alternative use of the production factors. The more unique the specificity of an investment is given, the closer upstream supplier (agent) and downstream customer (principal) are locked in. Due to this dependency, they are more probable to create a long-term business relationship and thus reduce the risk of termination of a business relationship (Picot et al., 1999, p.70).

Following Perry (1989, p.213) such asset specificities will spread quasi-rents which are the differential amount among the value of an asset in this unique use and the value in its next (second best) best use.<sup>78</sup> A unified quantification of specificity does not yet exist in literature. The degree of specificity is expressed in literature by a lot of authors in combination with the worth of the quasi-rent.<sup>79</sup>

### 5.3.2 Uncertainty

In transactions, a considerable uncertainty exists regarding the forthcoming economic settings and their consequences on the transaction object itself. Uncertainty occurs when the behaviour of the transaction is subjected to bounded rationality, opportunism as well as complexity (Williamson, 1990, p.65). He conferred how post-contractual obstacles can arrive within the setting of relationship-specific transactions, which are dominated by environmental uncertainty and demand ex post particular investments. The source of environmental uncertainty may be seen in technical, political, legal, social and

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<sup>76</sup> For the asset brand name capital see Williamson (1989, p.136-181) cited in Schmalensee et al. (1989). Brand name capital: all investments to develop and maintain a brand name. This investment is specific, as customer and supplier are brought into such a situation, those goods and services are being linked with the company name or logo.

<sup>77</sup> See Masten et al. (1991, p.9). for the asset temporal specificity. Temporal specificity: where timely performance is critical factor, delay can turn to a potentially effective strategy for exacting price pragmatic concessions.

<sup>78</sup> For further reading see Alchian, Crawford and Klein.

<sup>79</sup> For further reading see Picot, Dietl and Windsperger.

nature-related changes. Environmental uncertainty also called external or parametric uncertainty may arise from random natural events or unexpected deviations in the market conditions, eg. consumer behaviour. The associated behavioural uncertainty is due to lack of communication, deficits and opportunism.

Uncertainty related to non-strategic behaviour can be caused by the lack of data for current and strategic behaviour. This issue arises due to insufficient communication between the transactions partners (Williamson 1990, p.65). The strategic nature of uncertainty arises from the opportunistic behaviour of the transaction partners (Williamson 1990, p.66). The behavioural uncertainty is also called internal uncertainty and is associated with the risk that actors display opportunistic behaviour.

Before the closing of the contract the contracting authorities may withhold information, falsify or distort by using existing information asymmetries to their benefit (Schoppe, 1995, p.153). The behavioural uncertainty, which is caused by opportunistic behaviour after closing of the contract, is associated to the aspects of specificity. As Rindfleisch et al. (1997, p.44) remarked, the transaction cost approach argues that high specific investments increase the cost of protecting the contractual arrangements due to opportunistic behaviour. With an arising uncertainty, increase both the ex-ante and ex post transaction costs (Ebers et al., 2002, p.221).

### **5.3.3 Transaction Frequency**

The frequency of transactions causes costs to decrease with regular repetition of similar exchange transactions. The costs of production and transaction will sink with increasing frequency of transactions, both scale up, synergies and specialization advantages. According to Picot (1991, p.148) this is owing to a declining trend in fixed costs, learning effects (simplified processing) and economies of scale. However, it is essential to separate the frequency of transactions, and the quantities of a transaction. The transaction amount in a given period is a major factor influencing the realization of the experience effects. Companies strive for as large a market share as possible to take advantage by the learning gains and related economies of scale contained therein (Arnold et al.,

1997, p.39). All other factors influencing transactions will be referenced to the so-called transaction atmosphere (Williamson, 1975, p.37ff). The significance of the transaction atmosphere resides in the fact that [*... alternatives modes of organization sometimes differ in nontrivial atmospheric respects*] (Williamson, 1975, p.38). Picot (1991, p.148) has given home for the issue regarding uncertainty of changing framework conditions related to legal, political, and social facets of each transaction. Numerous framework conditions can have an effect on the opportunities and limitations of the transaction structuring, which is also likely to directly affect the amount of the associated transaction and production costs. The transaction atmosphere includes all relevant coordination for performance relationship towards social and technological conditions (Picot, 1991, p.148). To simplify an analysis, the cost effects of the transaction atmosphere are usually analytically considered to be not valid and will be ignored, just as Ockham's razor intended.<sup>80</sup>

### 5.3.4 Legally binding agreements

A contract is the model case of private autonomy in society; it is based and confirmed on a free concurrence of wills among two actors. At a broad sense a contract is an indicator of fair market prices and thus for overall social efficiency and prosperity. A contract is formed and subjected to offer and acceptance. (Peukert, 2013, p.1)

The transaction cost approach follows the postulation that the examination of an isolated single transaction or contract agreement is out of touch with reality to provide a clear link between agreement and performance. Contracts can be ambiguous and require a differentiated consideration with focus on the particular purpose of the contract (Williamson 1975, p.235-236; Furubotn et al., 1991, p.18-24). For this purpose, classical, neoclassical and relational contracts are distinguished.

(1) Classical Contract: The classical contract (standard form of contract) is a complete one and subjected to the perfect market like a jurisprudential equivalent. The identity of the contracting partner (actors using the market) is not considered

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<sup>80</sup> Ockham's razor is a principle attributed to the 14<sup>th</sup> century logician and Franciscan William of Ockham, his principle states that "Entities should not be multiplied unnecessarily." In recent wording: Keep things simple!



and the traded services and goods are fully specified. For such transactions, short-term contracts are generally concluded in which formal contractual terms are more important than informal arrangements. In addition, if there is any a non-contractual fulfilment of contract despite the comprehensive and foresighted planning of contract formulation, the contract will be carried out by strict enforcement and subjected to a lawsuit. (Williamson, 1975, p.236ff.; 1990, p.78, Goebel, 2002, p.142).

(2) Neoclassical Contract: A neoclassical contract is based on a longer-term transaction relationship. The contractual terms are not fully specified. In this respect, problems due to changed conditions or transaction-specific dependencies can ascend which are not coped by standard classical contract. A termination of the contractual relationship would ensue for both contracting parties with far-reaching disadvantages. It is a characteristic feature of the neoclassical contract that in the event that any dispute occurs an independent third party acts as a mediator and interprets the original text of the agreement, taking reasons by the changed conditions.<sup>81</sup> (Williamson, 1975, p.237ff; 1990, p.78ff; Goebel, 2002, p.144). If efforts of mediation fail, the parties may terminate the contract or go to court.

(3) Relational Contract: A relational contract is often incomplete formulated in the first place, since the later appropriate decisions due to unforeseen constellations are not stipulated already in the contract. Many contract terms and norms may remain implicit.<sup>82</sup> In contrast to the neoclassical contract, the spirit of a relational contract changes in the course of time. Starting point for disputes is thus not necessarily the original text of the treaty. Rather, all the formal and informal rules of the resulting relation must be applied, irrespective of whether they were initially fixed by contract or not. The courts are reluctant to become involved, as a trial would destroy the climate and thus the possibility of trusting cooperation. The settling of any disagreements should be done by internal negotiated conflict resolution. (Williamson 1975, p.238; 1996, p.97ff.; Goebel, 2002, p.144)

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<sup>81</sup> Should any provision of the contract be wholly or partly invalid, this shall by no means affect the validity of the remaining provisions. In this instance the invalid provision shall be replaced by one nearest to the mutual commercial intent which is lawfully permissible.

<sup>82</sup> A well known example of a relational contract is the employment contract (Goebel, 2002, p.84; Richter et al., 2003, p.158).

### 5.3.5 Coordinating structures

Object of the transaction cost theory is to identify what kind of form of organization is needed that leads to the exchange of goods beneath the predominant settings at the lowest cost and ensures the maximum efficiency of exchange and hedging the implemented investments (Beukert, 2006, p.106). There are three main forms of organization or coordination of transactions that are associated depending on the framework conditions and with different transaction costs: (1) the expenditure of the operation on the free market (supplement market coordination); (2) within organizations (hierarchical form of coordination); (3) on long-term contracts (hybrid forms with standard market and hierarchical elements).

### 5.3.6 Supplement market coordination

The supplement market coordination form is suitable on perfect markets with its low specific investments, irrespective of the frequency of the transaction. The instrument of coordination on perfect market is the price. The basis is classical contracts of short duration with defined conditions. Services and considerations are tightly coupled and smooth to calculate. According to the short duration of these contracts transactions can be simply dismissed and substituted by other transaction partners. The competition from other providers restricts effectively the range of opportunism. According to Richter et al. (2003, p.183) the market is an efficient coordination form to control and monitor transactions in which the capital invested is not specific.<sup>83</sup>

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<sup>83</sup> For further reading towards the traditional neoclassical equilibrium theory see Goebel (2002, p.28ff).

### 5.3.7 Hierarchical form of coordination

The hierarchical coordination is characterized by high complexity. A full hierarchical coordination is vertically integrated<sup>84</sup>. The central management instrument of coordination for this framework and its monitoring structure are arrangements and instructions (Richter et al. 2003, p.184). In contrast to vertical integration, horizontal cooperative approaches are more flexible. One example of a conceptual hierarchical coordination (vertical) integration of a company is a pattern where a manufacturer required purchase in advance of the goods, or related obligations. The service provision is thus incorporated into the company. The transactions are characterized by high specific investments or through long term business relationships. As stated before the higher the specificity, the more increases the risk of opportunism. Consequently, in the hierarchy specific investments can be done without growing of the opportunistic potential of the business partner.

Using neoclassical market and competition elements for these transactions would lead to significant transaction costs to cover expenditures supplementary with planning, follow-up, monitoring, reviewing and assessment activities. The foremost elements of vertical integration are costs savings and assuring or enlightening the excellence of goods or services.

### 5.3.8 Hybrid forms of coordination

Besides transaction costs, the choice of coordination for market based views or hierarchical structures, there are numerous mixed forms or so-called hybrid forms of coordination. If a transaction relationship is characterized to be close and built on long-term agreements (in opposite to a spontaneous purchase on the market), but without being fully integrated within a company, it is called a hybrid form of coordination. The unique instrument for coordination of these transactions is negotiation. Examples of this nature are institutional arrangements like long-term supply contracts, joint venture agreements. If processes are not unified across

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<sup>84</sup> Vertical integration indicates that the exchange of goods as well as services between neighbouring stages of the commodity chain occurs within a single company, governed under single ownership. This single ownership does not mean that units or subsidiaries cannot operate at the market autonomously.

different business partners and all actors are subjected to great uncertainty the hybrid coordination form is less suitable, but at low specific investment and high transaction frequency, however, very suitable. The potential for opportunistic behaviour to a transaction partner is lower because the cooperation is settled and fenced by longevity. Short term profits or gains due to opportunism could be negatively sanctioned.

### 5.3.9 Clan Mechanism: Operational control and supervision

In addition to Williamson, Ouchi brought in 1980 another option into the game to monitor transactions. From the perspective of Ouchi (1980) all organizations are structured and designed nearby the model with the best matches towards the transactions cost framework which [*"... mediating exchanges between individuals"*] (Ouchi, 1980, p.129). He claims that organizations which seek efficient transactions will settle on the balance between two factors, by name of performance and goal congruence. This approach is based at three models<sup>85</sup>: the market, bureaucracies and a clan.

(1) The market model is the almost efficient when [*"... performance ambiguity is low and goal incongruence is high"*] (Ouchi, 1980, p.129). The market mechanism governs the transaction costs by mutual contractual dependences. Each party of a bargain is subjected to produce or sell only what is specified under contract. All market relationships are defined by a contract. One actor needs goods or services and another actor provides the sought-after product or service and supply and demand determines the price, the market establishes the value.

(2) The bureaucracies model is the most efficient when [*"... both goal incongruence and performance ambiguity are moderately high"*] (Ouchi, 1980, p.129). According Henslin (2009, p.124-125) a bureaucracy is, [*"... a formal organization with a hierarchy of authority and a clear division of labour: emphasis on impersonality of positions and written rules, communication, and records"*]. The determination of typical characteristics that bureaucracies have [*"... clear levels, with assignments flowing downward and*

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<sup>85</sup> Ouchi argues that models of transactions are useful in defining relationship in organizations. Identifying the model in use will help to prognosticate pattern of behaviours in future transactions and indicate the need to readapt when the transaction costs are out of balance.

*accountability flowing upward. A division of labour, written rules, written communications and records. Impersonality and replace ability*"]. The bureaucracies' apparatus governs the transaction costs through the rise of incomplete contracts. When this circumstance happens, bureaucracy is the most efficient model because there is a ["*social agreement*"] that the value of the transaction is equitable (Ouchi, 1980, p.130). A worker or agent obtains his salary by accepting to have a superior above him. He acts under close supervision and control of results. However, here is monitoring, but an atmosphere of trust can also be developed because the employee is aware of that if his objectives are in compliance with the firms one the superior will reward him (Ouchi, 1980, p.132). This bilateral instrument is adequate for organizations to apply in the perspective when performance ambiguity and related goal incongruence are high.

(3) The idea of the clan model is the most suitable when ["... *goal incongruence is low and performance ambiguity is high*"] (Ouchi, 1980, p.129). When both are congruent, the parties to the transaction goals, a clan will be the most efficient model. Ouchi's terminology of a clan, is conform with Durkheim's meaning of an organic association which corresponds to a kin network but must not include blood relations (Durkheim, 1933, p.175, cited in Ouchi, 1980, p.135).<sup>86</sup> A well-known example of a clan is the apprenticeship of craftsmen. Apprentices would be socialized into the goals of the trade. Clans can be very efficient when the parties to the transaction are interdependent.<sup>87</sup>

The clan mechanism governs transaction costs through a system of authority but not calculation of cost (Ouchi, 1980, p.137). Evaluation instead takes place through subtle signals among close contributors. Strict evaluation is unnecessary because the institution clan has socialized its participants first to accept the goals of a clan (organization, via an apprenticeship). Ouchi summarizes how mutual this was in preindustrial guild companies. His focus is its rising significance in recent times, notably in Japan. The conditions that Ouchi identifies are frameworks where mutual harmony or increased functionality is essential. Here are interactions and a

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<sup>86</sup> see also Durkheim (1984).

<sup>87</sup> Clan control relies on values and beliefs, corporate culture and common shared norms to regulate employee behaviours and encourage the reaching of organizational goals. Organizations that apply clan control need trust among their employees (Barnat, 2005, p.10 eBook).

solid sense of community is demanded, in simple words, opportunism must be evaded. Ouchi discovered no other form of operational control and supervision in addition to market and hierarchy. Earlier research by Williams (1975, p.55f) found analogical forms of organization in the [*peer group*] and the [*simple hierarchy*]. The peer group is related to social ties and mutual responsibility (clan mechanism) and the simple hierarchy combines measurement and monitoring of performance. In a current interpretation Goebel (2002, p.151) summarized these aspects with the term "corporate culture": common values and beliefs, a trustworthy atmosphere and mutual responsibility.

In a nutshell: The idea of transaction costs considers the firm as an organization form, whereby the preeminent alternative (make or buy) is acknowledged principally on source of the cost evaluation (Rindfleisch et al., 1997, p.31; Williamson, 1991, p.269). The chosen form of organization influences the level of costs corresponding to the transaction characteristics and dimension. The higher the asset specificity or the related uncertainty, a hierarchical coordination is recommended. Safeguards against opportunistic behaviour are agreements of information duties and monitoring or penalties. Transaction costs are unfortunately still far removed from an exact quantification. In particular, two reasons are to blame for this: (1) opportunity costs are calculatory variables and often subjective data that can be only directly observed by the affected actors. (2) A precise definitional distinction between transaction costs beside manufacturing costs are still problematic (Albach, 1988, p.1143-1170).

The TAC approach provides a pattern to identify considerations, which give growth to the costs of negotiated exchanges among actors: goal disparity and performance ambiguity. Furthermore, the transactions cost approach provides a suitable tool for evaluating organizations by the sound basis of effectiveness because it allows the characterisation of the operating conditions that give growth to the costs by interceding exchanges between individual actors. Increasing transaction costs are to be expected when it is problematic to conclude the value of articles, goods and services due to the lack of trust between the actors, if the transaction is specific, uncertain and often. Contracts and other institutional ties are suitable in this state of affairs to limit the costs of transactions.

## 6. RISK MANAGEMENT

Judgements on forthcoming events or occurrences create risk and uncertainty. Technically speaking, uncertainty is a situation where there is a medley of possible outcomes and little is previously known to guide and safeguard a well-rounded, adapted decision (Garlick, 2007, p.3). From the perspective of Knight (2012, p.21) every business is exposed and subjected to risk, uncertainty and profit. Due to the nature of risk it does not matter if the risk is an internal or external one. Knight brought into existence the contrast between risk and uncertainty: an occurrence which is un-measurable named "uncertainty" although the other is measurable in terms of "risk" (Samir, 2008, p.54). Risk is the expectation that a mischance will occur, a danger ahead (Brian, 2001, p.3). Samir (2008, p. 54) gave shape to risk as uncertainty based on a concrete probability. The definition of risk is full of terms of vague definition like a probability or threat of damage, injury, liability, loss, or any other negative occurrence that is caused by external or internal burden, and that might be evaded by pre-emptive action<sup>88</sup>.

Risk is the possibility of a negative development and not a totally solid, unchangeable object. It could come into latent existence even before a development. The economical interpretation includes also positive developments or the facet of "chance" regarding a risk as a variable of economic success (Scholz, et al., 2009, p.21).

Strategic foresight performance aims to stretch or spread the decision interval and thus the amount of alternatives and recommendations for action by timely detection of weak signals to identify future jeopardies and risks at an early phase of incoming existence (Wulf et al., 2010, p.17; Becker, 2001, p.183). The quest for weak signals is a tactic and exercise, a structured procedure for risk identification, and evaluating the consequences by track and tracing the efficiency at the end of the day.

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<sup>88</sup> See Springer Gabler Verlag (Editor), Gabler Wirtschaftslexikon, Search: Risk, online see: <http://wirtschaftslexikon.gabler.de/Archiv/830359628/risk-v1.html>, last access 16.02.2014.

Monitoring the business environment, timely information, analysis and effective communications are the key to the success of the process. Risk management is a must to safeguard an organization as it attempts to identify and understand the risks to which it is exposed. Risk management also acknowledges that an organization constructs and executes an effective plan, a strategy, and monitors to prevent losses or shorten the range of impact if a loss occurs (Gleissner et al., p.119f). The risk management plan merges strategies and business techniques for recognizing and facing these threats. In view of the light of a supply chain Zsidisin et al. (2008, p.4) outline that operational administration of risk can be ordered by a graduated step-by-step scheme into four stages:

(1) Risk identification and risk modelling are the merger to identify the sources and characterization of risks; (ibid, p.4)

(2) Risk analysis, risk assessment and impact measurement in the light of probability of happening and potential impacts and consequences; (ibid, p.4)

(3) Risk Management is to generate and consider alternative scenarios, trends and solutions. Calculating or finding reliable indicators, selecting solutions and endeavour the implement them and (ibid, p.4)

(4) Risk Monitoring and Evaluation - To keep control by monitoring, controlling and managing predicted solutions and assessing their impact on business performance outcomes (ibid, p.4).

The management task is to collect raw data - information to identify risks - and to analyse, monitor and overcome them. Risk management is involved with detecting and the determination the risks encountered by a firm, organisation or by local authorities. It assigns and forms the issue that the probability of an occurrence can be shortened, or the follow up consequences can be mitigated.<sup>87</sup> As an impact risk can reduce forecasted profits or impair business operating efficiency. Scholz et al. (2009, p.21) characterised risk as [*“... the threat or probability that an action or event, will adversely or beneficially affect an organisation’s ability to achieve its objectives”*].

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<sup>87</sup> For further reading see Garlick (2007) and see Standards Australia (2004).



In addition, food safety risk has an effect on consumer buying behaviour, so the consequences affect both producers within the supply chain and customers at the end of pipe (Nemery et al., 1999; McMeekin et al., 2006). Olsson et al. (2008, p.49-50) reveals that previous studies in food safety are limited within each party and do not cover the whole supply chain. Risk analysis is performed mostly within only one company autonomously from supplementary actors in the supply chain. Their study illustrated the necessity of collaboration, integration and bidirectional communication among all actors within a supply chain of food; and the need for risk examination in an incorporated manner.

According to Palmer (1996, p.17) the BSE crisis caused a significant decrease in sales that happened in the beef markets in the EC and it produced great damage in export trade and national sales. Therefore, consumer attentiveness of risk and the consequence on buying performance in food safety issues caused development of risk assessment strategies by those who are responsible of public healthiness and food sector itself (Yeung & Morrise, 2001).

#### 6.1 COMPANY'S BENEFITS TO MANAGING RISKS

Risk management provides a flawless and well-structured tactic to identify ubiquitous risks. Having a clear understanding and a guideline of all expected and foreseeable risks, such a system provides the possibility to allow an organization to measure and prioritize them. Risk management has even other benefits for an organization: (1) saving valuable resources: assets, earnings, time, property and people; (2) preventing or reducing legal liability; (3) safeguarding the reputation and public image; (4) protecting stakeholders from harm; (5) protecting the environment and (6) assisting in clearly defining insurance needs (Gleißler & Berger, 2007, p.22-23).

Though caution is the mother of wisdom, an effective risk management rehearsal does not exclude risks. In the light of joint and or partial liability, it can be understood as a culpability-mitigating or exonerating circumstance. Seen from a technical point of view, risk management is a systematic and operational approach.

## 6.2 STANDARDS TO RISK MANAGEMENT

The standard ISO 31000:2009 describes the processes and implementations of risk management. In recent past, a lot of standards and commonly used techniques for analysing and evaluation of risk have been created. The scenario analysis that rates the probability and the impact of an event, the failure mode and effect analysis (FMEA) outspreads the influence and likelihood by its detection possibilities. Other instruments at hand are the program evaluation and review technique (PERT) and the use of the critical path method (CPM). The standard's underlying principle is an administrative function, established on the PDCA cycle. The ["*Plan*"] contains the risk politics, order and liability of the organisation and the ["*Do*"] contains the real risk management process: identification, analysis, evaluation and handling and the ["*Check*"] is the adapting risks coping organisations strategy and the ["*Act*"] deals with taking them down. In divergence to the inventive-creative approaches towards risk management mentioned above, the ISO 31000 standard shapes risk management as a responsibility and obligation of all decision makers (Löffler, 2008, p.24).

## 6.3 REGULATIONS TO RISK MANAGEMENT

Regulations on risk management have always been reactions to different major financial scandals. As a legislative counteraction, regulations and reinforced controls have been realized. In Germany, the Act on Control and Transparency in Enterprises (KonTraG) was conducted as a share of the responsibilities and culpabilities of management boards. The boards have to safeguard that an competent risk management is embedded in place and that future risks facing the organisation are a fundamental part of the reporting. According to §91 Abs.2 AktG risk should be detected at an early stage. Recognized risks could pose a main menace for the existence of the company and stock endangering risks.<sup>88</sup> The article concretizes two principal obligations for the executive associates. On first, it

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<sup>88</sup> Article §91 II AktG: The board of executives is required to provide tools, particularly a supervisory system, which allow developments recognized timely, if they are threatening the existence of the company. Author's translation from: [http://bundesrecht.juris.de/aktg/\\_91.html](http://bundesrecht.juris.de/aktg/_91.html), last access 15.06.2014.

commits the company leader to install an information system. It must be capable of detecting threatening developments to the existence of the company close to their occurrence. Second is the introduction of a supervisory system, such as internal auditing, which monitors compliance with the first system. Though this clause is entitled with the headline "organisation and bookkeeping", it is remarkable that the clause does not mention any various kinds of risks. Members of boards are individually legally responsible for injuries followed-on negligent breach, if they have violated their obligation to exercise diligence. Furthermore the responsible management, according to §§289, 315 HGB. must consider in its consolidated financial statements all risks and opportunities for the existing and upcoming development of the company (Wolf & Runzheimer, 2003, p.216). A characteristic criterion of KonTraG is the compound of top management's duties and duties for serious control. From paragraphs wording §92 Abs.2 AktG and the statements of reason accompanying the regulations, the legislature demands most crucial management tools: (1) risk management; (2) early warning systems, (3) internal monitoring and (4) controlling system.

KonTraG affects not only stock corporations in Germany. The legislature makes the following major point that there is a general spill-over effect from §91 Abs 2. AktG towards capital companies (Bundestagsdrucksache 13/9712, 1988, p.15). In accordance with the 9<sup>th</sup> annex of the official printed matter of the Bundestag 13/9712 related to the KonTraG was no regulation provided according to the Limited Liability Companies Act (GmbHG). It should be assumed that the scope that will attract Limited Liability Companies is in each case relative to size, due to the complexity and structure.

The question arises in this state of affairs, what is minimum corporate size needed to be covered by this regulation? Following Gleißler & Berger (2007, p.91), the classification is done by §267 Abs. 1 HGB, grading of the size classes. Current legal consensus related the obligation to exercise diligence even to SMEs (ibid, p.10). The Higher Regional Court in Düsseldorf (OLG) sentenced a GmbH-managing director to damages. Against the legal liability from §43 Abs. 1 GmbHG,

for failing to demonstrate due care and accurateness as a prudent businessman, the manager had not put into force a risk management system.<sup>89</sup>

Resume: Risk management is an important function for SMEs, especially in the challenging markets of food packaging. A logical decision-making process is applied to enable the owners of SMEs to cope with the identified risk. The objective of a firm is to promote shareholder well-fare, by dropping risks and shorten lost opportunities. It is not simply to design a process in place to fulfil corporate governance demands. For effective risk management process to comply with proposition, but more essentially, to improve the quality and returns of the commerce and trade and in certain cases it can be beneficial and suitable in terms of joint and partial liability (Gleißler, 2000, p.1629).

#### 6.4 PUBLIC RISK MANAGEMENT RELATED TO FOOD

A nation state and a community of states are very different compared to public limited companies in the private segment. Within the municipal sector, there is no market environment similar to business operations. An administration stands in direct interaction with the economy assigned to it. Within the instance of tax jurisdictions, the existence is ensured and granted. Federal, provincial and local administrations represent no separable economic benefits and cannot become insolvent or bankrupt. By stringently deviating, the view of the facts public risk management aims to encourage the communal good and values for the population. Law and decrees protect the common good; the law is applied very rigidly and is enforced by numerous controls. The business operator or marketer is responsible for the security of his products and compliance with the rules. Competent surveillance authorities shall assume the obligation to examine and monitor the products (Droß, 2010, p.7). On the German federal state level, the authorities involved in the control of foodstuffs are national offices. The legal framework are the EC Framework Regulation 1831/2003, Regulation EC 178/2002 of the European Parliament and of the Council of 28<sup>th</sup> January 2002 laying down the general principles and requirements of food acts, establishing the European Food Safety Authority and laying down measures towards food safety and the German LFVG.

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<sup>89</sup> Refer to OLG Düsseldorf, judgment from 26.04.2001, Az.: 6 U 94/00, p.10.

The Federal Office of Consumer Protection and Food Safety (BVL) manage the activities of all national offices. Quality reassurance, methodology for scientific feedback to government is granted by the scientific support from the German Federal Institute for Risk Assessment (BfR), incorporated within the Federal Ministry of Food, Agriculture and Consumer Protection. The department deals with scientific matters concerning all aspects of health protection. The BfR is Germany's partner organization to the European Food Safety Authority (EFSA). Below the level of BfR, public veterinary offices are the local food inspection board. Responsible for food inspection is the local authority; they carry out one-point checks to validate correctness. Authority is regulated in §42 LFGB: (1) unlimited right of access and of inspection; (2) full rights of access to all internal information; (3) take pictures and copies and (4) collection of samples for laboratory examination

The businessman is subjected to this check in accordance with §44 Abs. 1 and 2 LFGB. He is obligated to cooperate and to bear the inspection. Where necessary, the length and scope of inspections will cover the entire production area, operational and personnel hygiene, the standards of the products after processing, supporting documents and traceability in case of materials and articles (Baumann, 2010, p.7). The conclusion of the examinations may provide reasons for complaint. Subsequent actions to the complaints are limiting the source of the risk, providing information to other related authorities, fencing in contaminated products and distribution channels and food legislation's measures: (1) to impose and enforce a total ban of movements; (2) securing articles and matter; (3) recall or withdraw from shelves and (4) information to the public.

In cases of complaints, laws carrying penalties may take effect in accordance with §58 LFGB and all lawful implements relating to foodproducts protection covered by LMRStV. If necessary, information to the public eye will be controlled via the Rapid Alert System for Food and Feed (RASFF) which is founded in Regulation EC 178/2002 §50ff. This regulation administrates the general principles, rules and requirements of food law, it establishes and marshals the European Food Safety Authority (EFSA) and lays down the framework of food safety. The ambition of the RASFF is to offer the national authorities effective instruments for interchange of data and facts on actions taken to safeguard food and animal feed.

## 6.5 THE EUROPEAN MONITORING SYSTEM

With increasing concern about risks to public health in the EU, consumer reliance in the food industry has declined. More or less fiascos such as Salmonella or the BSE-disease (bovine spongiform encephalopathy), chemical and environmental impurities such as dioxins, broaden consumer's attentiveness of food safety and gave shape to buying behaviour (Yeung & Yee, 2002). There is growing call for safety and regulations calling for more exertion on risk analysis within the food supply chain, like the EU regulation No 178/2002/EC (European Parliament) that determined new doctrines and requirements in food safety laws. The key issues of the reviewed food safety law involve: (1) an integrated approach to food safety within the complete food network, (2) the precautionary principle, (3) the responsibility of the actors in the food industry, (4) traceability along all stages of production, processing and distribution of food networks, (5) the transparency of public information, and (6) the requirement that food law be measured by risk analysis (Hugas et al., 2007).

The Directorate General for Health and Consumer Protection (DG SANCO) performs its inspection programs through the Food and Veterinary Office (FVO) within the Member States. Legal basis of the aforementioned bodies is regulation EC 882/2004, article 45-53, to grant EC-Harmonisation and perform required inspections. For an independent scientific risk assessment, the European Food Safety Authority (EFSA) has been founded and settled in Parma (Italy). The operating of EFSA shelters all phases of food and feed production and supply from farm to consumer. The EFSA collects data and information to analyse new trends about potential risks in the food supply chain, to identify, as well as to evaluate them. Risk management is conducted by the Directorate General for Health and Consumer Protection (DG SANCO) mandated by the EU Commission. In case of need information to the public will be handled via the Rapid Alert System for Food and Feed (RASFF), related to Regulation EC 178/2002 §50ff.

## 6.6 THE GERMAN MONITORING SYSTEM

The German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) is responsible for the risk management in the field of food- and feedstuff. Subordinated to the ministry are the German Federal Institute for Risk Assessment (BfR) and the Federal Office of Consumer Protection and Food Safety (BVL). At national level in Germany a breakdown of activities between risk assessment and risk management is performed. The BfR prepares risk assessments as decision support for government and consumers: Quality assurance and methodology for scientific input into government is provided by the scientific support. The BVL, however, serves the risk management of the Federal Government in the field of food and feed safety. In addition, the BVL is the countrywide body responsible for the European Rapid Alert System for Food and Feed. Underneath of BfR, public veterinary offices are the local food inspection board. Responsible for food inspection are the local authorities, who perform on-the-spot checks to verify and grant compliance (Brauer, 2010).<sup>90</sup> The business operator is subjected to this process in accordance with §44 (1) and (2) LFGB. He is obligated to bear the inspection and to cooperate. Where necessary, the duration and scope of control may include the entire production area, operational and personnel hygiene, the standards of the products after processing, supporting documents and traceability in the case of materials and articles (Baumann, 2010, p.7). The consequence of the examinations might give reasons for complaint. Subsequent actions to the complaints are limiting the source of the risk: (1) providing information to other related authorities, (2) fencing in contaminated products, (3) control its distribution channels and (4) food legislation's measures: (a) to demand a total ban; (b) securing articles and matter; (c) recall or withdraw from shelves and (d) provide information to the public.

In cases of complaints, laws carrying penalties may take effect in accordance with §58 LFGB and all legal instruments relating to foodstuffs protection covered by LMRStV. Public bodies of veterinary offices work in silence, nevertheless diligently towards turns of inspection (Baumann, 2010, p.22; Brauer, 2010, p.24).

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<sup>90</sup> Authority is regulated in §42 LFGB: (1) unlimited right of access and of inspection; (2) full rights of access to all internal information; (3) take pictures and copies and (4) collection of samples for laboratory examination.

The business operator or marketer is straight liable for the safekeeping of his products and compliance with the rules. Competent surveillance authorities shall assume the duty of evaluating and checking the products (Droß, 2010, p.7). The foremost mission of the any nutrition supervision is the safeguarding of the consumer from sanitarily dubious foods as well as from misinformation from the food manufacturer. Unanswered up till now remains the question, whether the European system of national consumer policy with high costs for business operators and end consumers is the economically viable option or not to secure the food supply (Hesse, 2008, p.32). In contrast to European legislation Brewster & Goldsmith (2007) summaries the US-American legal system as a balance of market forces, a strong complaint and tort law for injured consumers and a reserved government intervention. Dissuasive high damage claims discipline the food business operator. Due to their research, both approaches include a similarly level of consumer safeguarding.



## 7. THE GERMAN INK ORDINANCE IN A 360° VIEW

The following section will introduce the framework, which is related to the future ordinance. It covers raw materials, the issue of migration, the dilemma of paper recycling, and the regulatory framework. It introduces the documents of compliance (DoC).

### 7.1 CARDBOARD, CORRUGATED BOARD AND RECYCLED PAPERS

Fátima-Poças & Hogg (2007, p.219) states that paper and board are essentially mixed of watery pulp from different vegetable or recycled sources and are most frequently manufactured in surface contact layers with dry foodstuffs. Additional compounds or additives are used in this field of application include starch or by-products, wet strength agents, retention aids, fillers, fluorescent whitening agents, lubricants, plasticizer and grease-proofing agents, aromatic hydrocarbons, volatile organic compounds, UV-curing agents, amines, biocides and surfactants. Paper and board may also be coated or laminated with polymers as polyethylene or waxes for barrier properties. Reused fibres are deliberated to be the major source of migrants (Aurela et al., 1999; Binderup et al. 2002; Grob 2002; Sturaro et al., 2006; Triantafyllou, 2007; Grob 2009, 2010; Thiel, 2011, 2012). Corrugated board is widely used as secondary transport packaging component and due to recycled fibres not assigned to come into direct contact with food or feed. Volatile substances in this type of material used as a secondary package may be transferred via the gas phase through the primary packaging into the food. (Jickells et al., 2005; Grob 2010; Kersten et al., 2011; Harling et al., 2012; Thiel, 2012).

### 7.2 CARDBOARD AND CORRUGATED BOARD

The term paper is borrowed from the papyrus bush. Schwoch (2012) outlines that papyrus plants were ordered in plain rows, and then covered with a second layer of strips. The two layers were beaten with wooden hammers until they formed a linked, bonded smooth surface. The original form of our present paper came from China. It is assumed that in the earliest fist century AD a civil servant

named Ts'ai Lun has made paper from various vegetable fibres. For sure, the art of papermaking was known before, but his research has been documented (ibid, 2012). From China came the knowledge, or better said the secret of papermaking, via the silk road to the north coast of Africa, and later via Spain thus to Europe (Schwoch, 2012, p.1; Finlay, 2005, p.1-70ff). In our days the best paper is made from natural, virgin fibres named cellulose. The major basis of cellulose today is wood. The length of the fibre determines the properties of the paper: the longer the fibre is, the stronger the paper will be. Twede et al. (2005, p.266) states that with the strength provided by fresh and virgin fibres, kraftliner (Kraft-paper) offers exceptional performance even in settings with high moistness and cyclical climate changes. Therefore, softwood fibres are best used for paper or paperboard that requires strength, like grocery bags. Short fibres make paper smooth and absorbent like blotting paper. A compound of hard- and softwood fibres is an excellent mixture to acquire printing or writing paper. Twede et al. (2005, p.175) describes the process of paper making in the following. The papermaking machine forms the paper web and therefore watery pulp (the gross mass of papermaking) is sprayed from a huge vat onto a giant plastic screen which moves quickly round the front end within the paper machine. The fibres in the pulp are bonding with each other and form in the direction of flow a giant watery sheet of paper. During the pulp is conveyed along the screen in machine direction, water begins to drain out. The virgin web of almost dry paper pulp is pressed now between felt-covered and heated rollers to extract further water and to create a smooth and dry surface. The combination and lamination of several yet damp webs of paper in the press section of a papermaking machine arises in solid stiff, durable paper known as cardboard. Haack (1996, p.6-10) reported about changing paper properties by adding surface agents or binders. This issue will not be deepened here. A completely different manufacturing technology identifies the manufacture of corrugated board. The starting point by now is not liquid raw paper pulp but raw paper on a reel. The worded raw paper is employed in the following in the meaning of corrugated base liners. There are various types and kinds of corrugated board, all made by combining raw liners, the forming of a corrugated roller, heat, adhesives and pressure. Further distinguishing characteristics are the flute scope and position and the number of layers creating the final corrugated board. The corrugations are defined by the calibre of the flute and the repeat intervals (Twede et al., 2005,

p.406). An essential feature is visible at the edge of corrugated board. There is a row of air columns, the fluting. The air between the rows acts as a cushion restraint system, while the paper columns give stability to the material as a result of conduction of mechanical physical force similar to latticework structure known from static determined constructions. A single liner, glued on the outside, the corrugating medium, creates single-face corrugated board. The corrugating medium glued and flanked among two liners forms a single wall, adding another corrugating medium or a third flat liner creates so called double wall. Afterwards creating and drying the web in the corrugated-board plant (corrugator), the web is cut into flat, plain sheets, just the right size for making the boxes. At the very end of the flow-process the corrugated sheets are stacked and set aside, the still wet glue can dry now properly to reach residual moisture ready to convert. Converting machines transform flat corrugated sheets into boxes and shippers. The most typical kinds of converting machines used in the field of box making are flexo-folder-glue and die cutters. Casemakers or flexo-folder-glue feeders with corrugated sheets, print, slot, fold and glue the boxes. Diecut-machines generally cut the corrugated board into a flat pattern which later will be put into the box shape. For ecological and economic purposes, cardboard and corrugated packaging materials are largely manufactured by using loop-recycled fibres. Corrugated board is the most highly recycled paper and packaging material in our days for several reasons relating to volume, logistics and technology. According to recent research (Wenzel, 2012, p.42; Twede et al., 2005, p.408) it represents almost 75% of the paper based packaging industry.

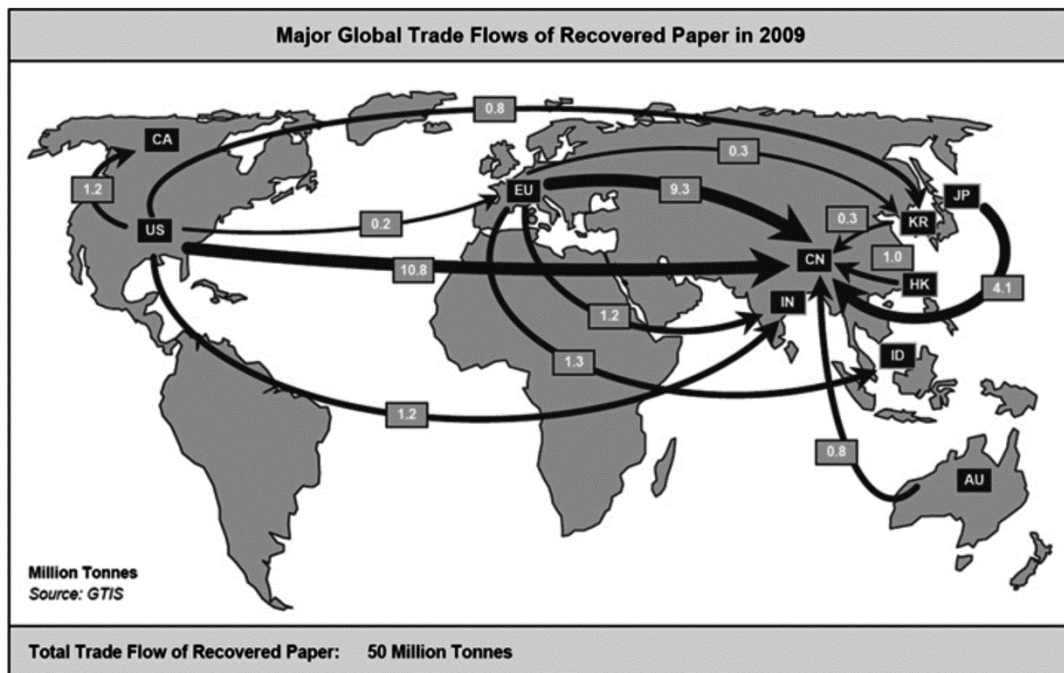
### 7.3 RECYCLED PAPER: CAUGHT IN A DILEMMA

Another significant source of fibres for papermaking is recycled paper collected for recycling. Regrettably recycling will never replace using trees (virgin fibres) for papermaking. One reason is that not enough recovered paper is available to meet the demand and some paper is too contaminated to be reused. Characterized and according to the production flow-process fibres can only be recycled five to seven times before they become too small to be used for papermaking (Twede, et al., 2005, p.406), therefore a constant stream of virgin fibres is needed in the overall paper supply to maintain the durability of recycled

papers. The first step in the technical recycling process is repulping. Bales of sorted waste paper are soaked and disintegrate into fluffy and fibrous material again. At this moment chemicals are added to the mixture (pulp) and ink particles start to separate from the paper, washed out and bound to the flotation foam. Due to surface agents, they cannot reattach back to the pulp. The deinked pulp now is treated just the same as fresh fibrous material made from wood in a papermaking machine. The recycling and papermaking industry have developed a successful infrastructure for collecting waste papers and boards. Twede et al. (2010, p.406) named this structure a coordinated network for collecting. Old newspapers and used corrugated boxes, shippers and containers are recycled in the largest volume in fact in this efficient collection system. Thiel (2010a) refers to the fact that recycled paper and OCCs were the most considerable fibrous material used in the German papermaking industry in 2009 with 14,8 mil. tons or 73% of the whole cycle of fibres. In 2010 recycled paper increased up to 16,3 mil. tons (Brabender, 2011). This is approximately twice as high as the production of graphic papers (4.4 million tons) for the printing industry and approximately seven times higher than the production of sanitary, hygienic papers and specialty papers (1.2 mil. tons).

Leaving the paper manufacturing branch and turning towards the sector of the recycling industry, the German Federal Ministry for the Environment (Angrick, 2010, p.6) estimates that the paper recycling industry has a turnover of €50 Mrd. and almost 200.000 employees. Angrick (2010, p.5) showed that the overall advantage of the use of recycled paper is due to the fact, that the process' water requirement is up to seven times minor and the entire energy expenditure in the flow of production is 4-6 times lower for papermaking as opposed to using virgin fibres. Following Thiel (2010, p.12) the use of virgin fibres instead of recycled fibres raises the requirement of energy up to six times, five times more sewerage and an growth of costs up to 1.3 times. Put most simply, the answer is: The compensation for purely fresh fibres instead of recycled fibres causes maximal resource requirements for wood, water and energy. This is an economic and ecological nonsense. Another option to solve the problem is a better deinking technology for recycled pulp to sustain cleaner fibres. Regarding the final report of a recent research project by the Technical University of Darmstadt (Schabel, 2009; Thiel 2010, p.8) these techniques exist but the loss of fibres during the deinking process is economically not acceptable. The loss of fibres in this case was for flotation

deinking is 10-15% and for wash deinking up to 40-50% of the considered fibre mass. Harling et al. (2012, p.187) states that beside the loss of fibres recycling process has got only a small cleaning effect, it is far from sufficient to reduce the oil content to a level that would be compatible with the TDI by JECFA (2012, p.11-20). Swiss studies by Grob & Biedermann (2010) have shown that recycled material can contain a certain amount of mineral oil, much more than expected. The mineral oils stem from printing inks as stated before. Due to economic needs, the papermaking process must use recycled fibres and waste paper is a globally traded product, in 2005 up to 41 mil. tons (Schabel, 2009, p.9; Palm, 2010, p.8-9). Even if the whole European printing sector changes immediately to mineral oil free inks, the migrants will be resident in the recycling loop process for 7 years still to come (Thiel, 2012).



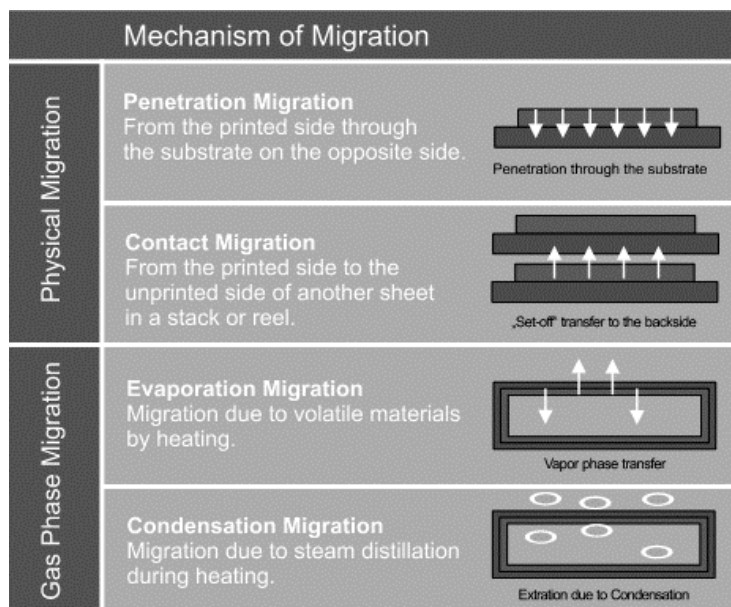
**Figure 11:** Major global trade flow of recovered papers in 2009, source: Global Trade Information System (GTIS, 2009).

#### 7.4 THE COMPLEX MECHANISM OF MIGRATION

Migrants are compounds which are able to diffuse (migrate), which means a transfer through a material layer with recondensation within another substance or a physical set off at coupling surfaces. This is founded due to their chemical characteristics and molecular size (Dietrich, 2012). Food packaging layers can interact with the packaged food inside by high rate of diffusion. Underpinning research by Munke (2009) and earlier findings from Arvanitoyannis & Bosnea (2004) detected that these interactions depend on the filling- and packaging conditions, storage time in stock or shelf life. This interaction lixivates food contact materials from the packaging towards the foodstuff. This procedure is known as diffusions migration. As stated before hydrocarbons are in the focus, but aside from them there are others. According to Harling et al. (2012, p.186) frequently these are plasticizers (softening agents) or [*“non-intentionally added substances”*] (NIAS), which need toxicological characterization too (Munke, 2009, p.4549). In addition, raw materials, starting substances or multifaceted additives can contain impurities. These compounds (NIAS) also include sideproducts or break-down products. Following Grob (2002), Bradley & Coulier (2007) the classification and clear identification of NIAS is not always known and is corresponding with the not separable [*“Forrest of Peeks”*] descript by Harling et al. (2012, p.182). The actual decision support study for the BMELV from May 2012 (Harling et al., 2012, p.186-187) summarized in its final conclusion, that it cannot be excluded that much more new migratable substances will enter the stage. The recent findings confirm the ongoing transformation of the pattern of contaminants in recycled fibres. An effective control or supervision seems to be impossible, since no information of the use of substances is present. The migration from recycled papers towards food is fast: at room temperature in a day up to 1mg/kg, after a month 10mg/kg hydrocarbons are exceeded, at higher temperatures may 1mg/kg be reached in less than one hour.

Beside to the chemical or physical volatility migrants can move in a mechanical way from one surface contact layer to one more, by means of a surface printed layer to the virgin reverse side which is later to come or brought into contact with food itself. If these happen in a direct or close encounter like in a reel or a stack after printing, the so-called “set-off migration” can occur (Vincent et al.,

2011, p.19). Langhammer (2011, p.4) states that the set-off depends on the actual mechanical pressure existing in the reel (web printing) or a stack (sheet printing), just as unclean working with auxiliary materials. Another cause of set-off migration is uncured or even still wet ink and varnish from the printing process. Any visible set-off from the printed substrate must be avoided by appropriate printing conditions and to all cases when its occurrence is foreseeable and avoidable. Due to demand for the use of "Good Manufacturing Practice" (GMP) in the manufacture of food packaging materials and articles for complying with the requirements EC 2023/2006 on good manufacturing practice. Getting a full circle with varieties of migration Fritz (2009, p.19) supplemented evaporation Migration: migration by evaporation of volatile substances on heating (e.g. cooking, baking or warming of refrigerated and frozen products in its primary packaging or pouch). The last appearance of chemical-physical migration is the issue of migration via distillations by steam during a cooking, baking or sterilization process. Luch (2010, p.9) showed that the mass transfer via evaporation and distillations are absolute foreseeable and therefore avoidable in time.



**Figure 12:** Mechanism of Migration, authors own graph, based on Sun Chemical (N.N.).

#### 7.4.1 Hydrocarbons from the perspective of migration

The entire research of Grob, official food control authority of the Canton of Zurich, lead to him giving names to his findings of hydrocarbons related to migration. This detail has to be stated here because he established a nomenclature that entered into scientific community and actual literature. He determined hydrocarbons in his lab through analyses that were available and possible for the first time. Thiel (2012, p.2) reports, that Grob's analysis techniques for migration detection is close to the noise floor limit. Grob (2010, p.785) identified and characterised them in a first analysis as mineral oil saturated hydrocarbons (MOSH) and mineral oil aromatic hydrocarbons (MOAH). MOSH is here the collective name of paraffins (open-chain hydrocarbons) and naphthenes (cyclic hydrocarbons), which are usually highly alkylated and either directly from the mineral oil derived or made due to the hydrogenation of aromatics and other transformation processes in the refining, i.e. n-alkanes, isoalkanes, cycloalkanes (Dietrich, 2012, p.5; BfR, 2012, p.2). MOAH is the collective name of mineral oil aromatic hydrocarbons, short-chain aromatics which consist of highly alkylated mono- and / or polyaromatic rings. In partially hydrogenated mineral oils are also saturated and aromatic rings beside each other. Hydrocarbons with at least one aromatic ring are attributed to the MOAH in this issue. In the course of analysis additional hydrocarbons were detected. They could not be described by the entrance of auxiliary, surfactance or printing inks into the recycled papers. This had to originate from other causes, for instance fragments of "plastic chains" that do not have many thousand chains but only a few molecules like short-chain hydrocarbons C<sub>10</sub>-C<sub>24</sub>. This is a dilemma, according to Dietrich (2012, p.5) they react as well as mineral oils and are detected as such in the analysis, although they are not mineral oils. Grob named them polyolefin oligomeric saturated hydrocarbons (POSH). A subgroup of POSH is explicit mentioned by the BfR analytics: Poly alpha olefins, paraffinic hydrocarbons (POA), i.e. mainly from hot melt adhesives of packaging (BfR, 2012, p.2). Later research of Grob (2011, cited in Thiel ,2012 and Dietrich, 2012) on the preload of food with hydrocarbons showed that also oligomeric saturated hydrocarbons exist that have their origin in nature itself. Like apples are naturally covered with a layer of wax, not applied by the farmer, thus natural oligomeric saturated hydrocarbons (NOSH). Yet unpublished findings of Dietrich (2012, p.5) recent research refer to a certain aspect of NOAH, natural oil



aromatic hydrocarbons, by means aromatics can also be of natural origin. Referenced to Thiel (2012) and Dietrich (2012) the behaviour of different hydrocarbon compounds with the same chain dimension is just the same in view to the technical-analytical detection. The origin of the molecule is unidentified, from the standpoint of the analyst, it has went into existence, detected and will be quantified.

Resume: if the analyst detects in cereals a C<sub>24</sub> hydrocarbon chain (MOAH), he cannot tell whether this is a carcinogenic molecule or it is a fragment of a hydrocarbon chain of NOAH from hazelnuts in cereals or a part of a natural resinified wax of an apple peel. It also could be POSH, a fragment of a long hydrocarbon chain of polyethylene (PE) from the inner pouch of the cereal's consumer packaging (Dietrich 2012, p.4, Thiel 2012, p.7 and Kersten 2011, p.2.). The complexity of relations between similar types of short chain hydrocarbons has again been independently confirmed by Harling et al. (2012, p.182). The [*Forrest of Peaks*] is the label of the analytical as well as legal misapprehension (ibid, 2012). The German Federal Institute for Risk Assessment (BfR) also confirmed these positions properly (BfR, 2012, p.2). If uniqueness is not given in the detection method and the body of evidence is a legal grey area, the question arises how authorities can check compliance with regulations. How liability issues concerning confirmation for any economic damage related to recalls will be judged. The subject will be addressed later in chapter 7.5.

#### **7.4.2 Introduction into instrumental analytics**

Two widely spread approaches are known to monitor the rate of occurrence of migration transferred from packaging into food: the first approach is a sensory one, the so-called Robinson test. A trained panel assesses packed food to determine whether contact (set-off or via the gas phase) with packaging layers has affected sensory properties. Data obtained from a Robinson test are of enormous relevance to a packaging or food manufacturer because the panel uses the same instrument for analyse as the final consumer particularly the olfactory senses, odour and taste (Brown & Williams, 2003, p.89, Brown et al., 2011, p.80).

The disadvantage of a sensory approach is the inability to diagnose acknowledged sensory problems. Wherever problems have been detected, it is

suitable to use instrumental substance analysis. Chromatographic techniques can be employed to classify and to proof differences between a suspect packaging sample and a reference, retention sample. This chemical, analytical method of examination can provide detailed information and detection on problems such as residual solvents, high levels of plasticisers and the presence of impurities (NIAS). Following Brown et al (2011, p.80) instrumental chemical extraction can identify impurities and targeting for potential migrants.

A typical commonplace chemical investigation would start with headspace analysis, using a gas chromatogram/mass spectrometer (GC/MS), and reference samples for corresponding testing. To those categories of hydrocarbons described in chapter 7.4.1, one must have basis knowledge about the fields of measuring and appliances technology for analytics. In the following, a brief abstract will outline how a gas chromatographer (GC) with flame ionization detector (FID) operates.

Dietrich (2012, p.15) summarised that in GC/FID, the FID detector identifies molecular compounds or analytes by quantifying the electrical resistance induced by electrons from burning carbon elements from the sample. The FID is a non-selective detector and is used in conjunction by a gas chromatography. Owing to the nature of quantifying by the electrical resistance, there is a potential of distortion related to non-target agglomerates existing in the sample, concerning the "Forrest of Peaks" (Bhanot, 2012). Whether the hydrocarbon molecule is a linear one, even branched or a cyclic one it always delivers the same equal signal (peak). The problem's solution lies in the coupling of a FID with a measurement in a mass spectrometer.

With a mass spectrometer one can evaluate each position of the chromatogram curve and a mass spectrum by clear separation of the signals and arrive at an indication of which compound is involved (Dietrich, 2012, p.15). As far as the manner as to how the gas chromatogram is evaluated and the arithmetical amount of the concentration is determined, there are different interpretations within the scientific community. For creating a uniform method of evaluation and to come to comparable results, the BfR (2012, p.1-14) developed a uniform method of evaluation, based on Grob's method from 2009. Despite analysis at the molecular level, it is not possible to separate hydrocarbons, to determine them clearly and quantify them. It remains a constant uncertainty. The basis of any expert opinion is

an analytical report, however, the method will not hold up in court, justice prevails over freedom of evidence; therefore, no evidence can be bound on a single particular method (Hartwig, 2012, p.17).

Thiel (2012, p.7) refers here to the nested problem: “Forrest of Peaks” and no comprehensible results from different laboratories and methods. Recent findings by Harling et al. (2012, p.87) postulate that in many spectrums there were no convincing matches found and the retention behaviour has doubts about the identification of hydrocarbons.

Harling (2012) and Thiel (2012) argue that the derivation of universal statements on the basis of measured migration alone in a packaged food sample is difficult since no data on the foods body burden, the age of the sample; storage conditions, inserted printing and adhesives are available. Following Mattisek & Rathers (2012, p.2) the source of environmental body burden within raw food by hydrocarbon compounds, can be assigned to the exhaust from gasoline motor-engines, emissions from power plants and industrial facilities. Fine dirt of asphalted roads could also be suspected. In a nutshell: uncertainty due to origin, concerning detection, method of proof and compliance to regulations or guidelines (see also Juterzenka & Heupel, 2014, 2015).

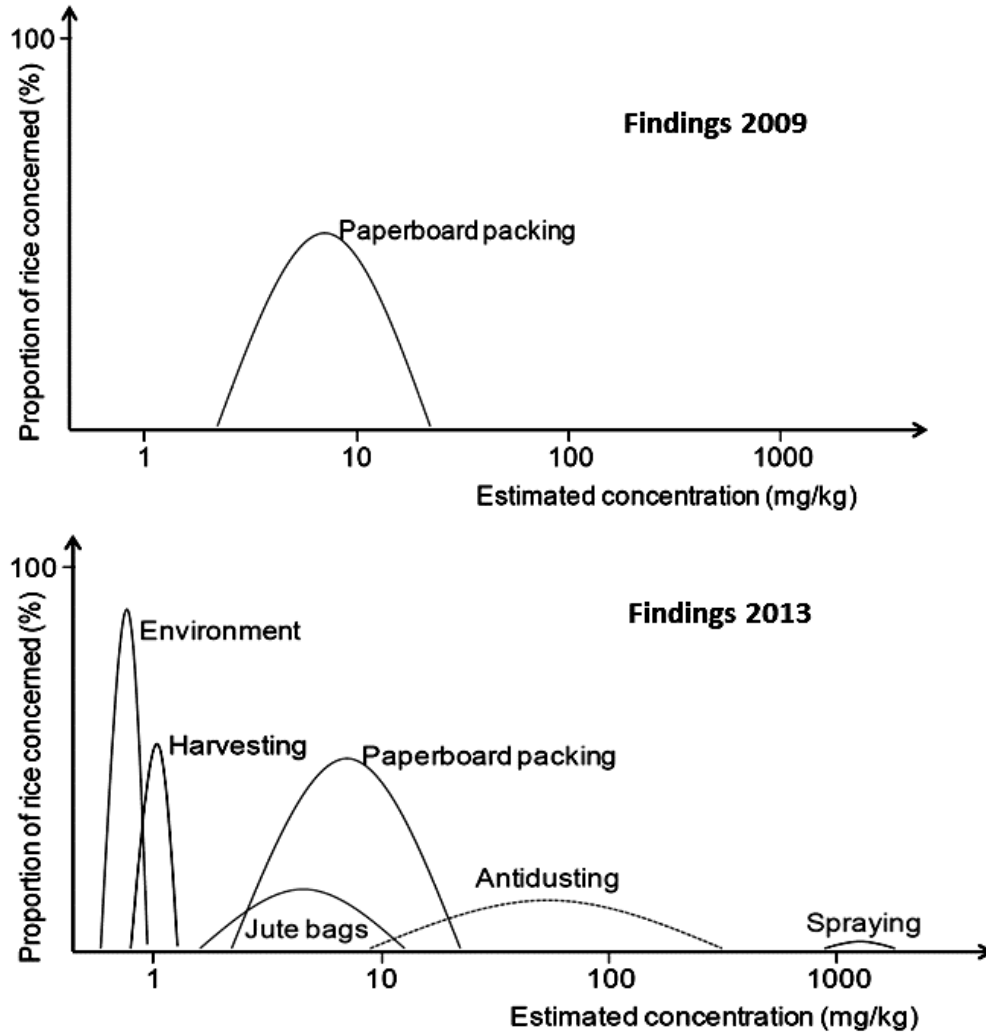


Figure 13: Body burden, authors own graph, based on EFSA 10(6), 2704, p.52.

### 7.4.3 Scientific Assessment

The European Union funded the project "Biosafepaper" from 2002 to 2006. Here are recycled papers extracted regarding to food contact. Scientist tried to determine CMR-Substances, which are cancer-causing, mutagenic or toxic to reproduction. The researches were carried out by GC-MS-Evaluates. Final findings of the project "Biosafepaper" by Bradley et al. (2008) came to the

conclusions that the extracts of water and Tenax<sup>91</sup> showed no toxicity at all, but the extracts with ethanol (hydrocarbon) were toxic positive. On this former stage, it was not possible to isolate analytical individual substances. At times, in parallel with this project stated above, the BMELV decision support project (Harling et al., 2012) was carried out from 2009-2011. Here were 50 food packaging, also carton boards examined for migratable substances. Depending on the previously used printing technique, the subsequent components have been identified: Mineral oil (as a solvent and binder), plasticizers (softening agent), photoinitiators (from uv-cured printing) and acrylates (adhesives). Harling's et al. research, published in 2012, identified a total of 65 potentially migratable substances, of which 41 were detected also within the food or the food's simulant (Tenax). Twenty of these substances were not known or have had no official toxicological evaluations. In November 2010, the BfR, organized a conference, focused on mineral oil steams in the fibre recycling loop, the 9. BfR Consumer Protection Forum, entitled "Food packed safely - health risks of recycled materials?" The focus was on the risks to the consumer as well as migration from recycled paper/cardboard. Although a final health risk assessment of mineral oil migration was not possible, they recommended that a solution be found for the decrease of mass transferral of mineral oil into food. Another problem highlighted was that only a few laboratories were able to provide reliable and robust data (Angrick ,2010; Brauer ,2010; Büning ,2010; Droß ,2010; Franz et al. ,2010; Grob ,2010; Hellwig et al. ,2010; Horst ,2010; Luch ,2010; Schabel ,2010; Thiel ,2010). In September 2011, managed from the Federal Institute for Risk Assessment a conference took place titled "Mineral oils in food packaging - Developments and Solutions." Besides the use of low migration inks and mineral oil traces reduced papers, another approach to the topic, the barrier effects of plastic materials has been discussed (Harling et al., 2012, p.12). At the conference, the subject of "Instrumental analysis of mineral oil" came up what was finally published in May 2012 as the analytical method of BfR in cooperation with the Cantonal Laboratories in Zurich (BfR, 2012). In December 2011, the Food Standards Agency (FSA, 2011), the UK, published a study on the migration of ink components from printed food packaging into food. The amount

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<sup>91</sup> Tenax is a trademark of Poly 2,6-diphenyl-p-phenylene oxide (PPPO), a very porous polymer resin used as food simulant.

of 350 packaged foods was analysed; all samples were packed in boxes made of virgin fibres and recycled board. The study was unable to distinguish between mineral oil inks of the printing process and mineral oil out of the recycling loop. The described exposure of the examined packaging with mineral oil reached up to 5000ppm MOSH and 383ppm MOAH. In its risk assessment, the FSA comes to the final conclusion that human health is not at risk. From FSA's point of view (FSA, 2011b, p.1) there was no indication to change the eating habits or to strengthen technical-regulatory requirements for packaging rules in Britain. The Joint FAO/WHO Expert Committee on Food Additives (JECFA) assessment (JECFA, 2002, p.11-20) concerning mineral oil, from which a TDI of 0.6 mg / kg could be deduced for MOSH C<sub>16</sub>-C<sub>24</sub> is not supported by the FSA, since the allocation to a particular mineral oil steam do not exist, no existing method of analysis is unequivocal and therefore, the TDI is not applicable for British authorities. The FSA study (FSA, 2011a, p.1.) concluded that the [*"...risk assessment on the findings from this survey did not identify any specific food safety concerns..."*] and [*"... that there is no need for consumers to change their eating habits with respect to food that has been packaged in virgin or recycled carton-board"*]. The EU risk assessment body for food and feed safety (EFSA) published in May 2012 its scientific opinion concerning the mineral oil issue. EFSA's scientific opinion was not grounded by own research only based on existing literature and former proceeded studies. In summary, it can be concluded in the scientific opinion is that there are different pathways to take into account and the prevailing knowledge is imperfect. The EFSA scientific opinion concluded, that [*"... foodborne MOAH with three or more, non- or simple-alkylated, aromatic rings may be mutagenic and carcinogenic, and therefore of potential concern..."*], but it must be mentioned that [*"... revisions of the existing acceptable daily intake for some food grade MOSH is warranted on the basis of new toxicological information..."*] (EFSA, 2012, p.1) Therefore, EFSA has expressed no specific recommendation, due to recent studies that [*"... are all based on toxicological studies with poorly characterised products with regard to chemical composition"*]. However, even the term barrier appears in the report: [*"...it can be effectively prevented by the inclusion of functional barriers into the packaging assembly"*]. (EFSA, 2012, p.8,146.) The FSA has noted the publication of scientific opinion as a reason for a press release, in which FSA also agreed with EFSA's scientific opinion but for the UK rules the valid paradigm [*"... today's opinion does not identify any specific food safety concerns"*]. (FSA, 2012, p.1). Since a consistent toxicological safety assessment is not

given and risk cannot be excluded, the JECFA has withdrawn its temporary TDI (Mattisek et al., 2012 p.3). The scientific bodies at the European level agreed to a common statement that toxic substances are not validated, if they are below a concentration of 10ppb. Now mineral oil is not a substance, but a mixture of compounds (Römpp, 1990, cited in Hellwig et. al., 2010, p.14). Therefore must the 10ppb-Principle must be set in force for the specific molecule to meet specifications, which currently applies to the limit of detection by the analysis, not as a specific migration limit (SML) or an tolerable daily intake (TDI) (Thiel, 2012, p.3).

Resume: The Scientific Committee on Food (SCF), of EFSA identifies the field and range of compounds with a molecular weight of less than 1000 Daltons (Da) to be of toxicological concern because it can be assimilated by the gastrointestinal tract and metabolized in the body (European Commission, 2005, Wall (EFSA), 2007). The considered hydrocarbons for MOSH and MOAH fulfil this criterion (SFC, 1995; JEFCA, 2002; EFSA, 2006.). Hellwig (2010, p.17) reports of distinct feeding studies which give cause for concern. According to Matissek (2012, p.2), it is stated after animal studies that low-viscosity mineral oil mixtures are stored in the body and can harm liver, heart valves and lymph nodes. The temporary ADI for MOSH smaller than C<sub>25</sub> carbon chain is 0.01mg / kg body weight.

The reception of mineral oil mixtures with a high aromatic content (MOAH) should be avoided totally due to the opinion of BfR from 2010. In the BfR's opinion it is not ruled out that, the MOAH Group contains carcinogenic polycyclic aromatic compounds of hydrocarbons (PAHs) (BfR, 2010, p.3). The conclusions of scientific opinions from national authorities or European authorities conflict between ["... *identified potential concern...*"] and ["...*today's opinion does not identify any specific food safety concerns.*"] (FSA, 2012, p.1). For further reading see actual EFSA<sup>92</sup>- and BFR<sup>93</sup>-Opinions as well as Juterzenka & Heupel (2014, 2015).

The aim of this chapter has been to give a brief overview of the technical and scientific knowledge for migration to food contact layers, and the interaction

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<sup>92</sup> [https://webgate.ec.europa.eu/sanco\\_foods/main/sector=FCM&auth=SANCAS](https://webgate.ec.europa.eu/sanco_foods/main/sector=FCM&auth=SANCAS), external link last checked on 27.04. 2013, Food Contact Materials, see "Documents".

<sup>93</sup> [http://bfr.zadi.de/kse/faces/DBEmpfehlung\\_en.jsp](http://bfr.zadi.de/kse/faces/DBEmpfehlung_en.jsp); external link last checked on 7.04.2013. Database BfR Recommendations on Food Contact Materials.

between them. An extensive collection of applicable literature can be noticed in Harling et al. 2012), appendix 9 of the BMELV's report. For further reading see Frede (2006, p. 845, 896ff.). Normally compounds with a molecular mass above 1000Da cannot be metabolized and absorbed in the human body, the latent risk for these chain-compounds itself is small (Ebnesajjad, 2012, p.370). The closing words of this section will remain in respect to Dr. Koni Grob: [*"Migration depends on the history of an analysed sample."*]<sup>94</sup>

## 7.5 TRACEABILITY AND RECALL

Following Gellynck et al. (2007, p.47) traceability outlines that manufacturer or conveyers are in charge to identify their own pre-suppliers and the flow of goods of its raw materials on a transaction basis. Tracking refers to ongoing storage and flow of location of raw materials and items during their manufacturing route through the entire SC. Tracing means to admin the composition as well as the process treatments due to the various levels in the flow of production.

Consistent with Article 17 of the Regulation (EC) No 1935/2004, traceability must be safeguarded at all stages of manufacturing and flow of goods. Vincent et al. (2011, p.26) pronounces that the regulation demands the labelling and assignment of upstream suppliers of raw materials as well as the flow of finished products downstream to the final customer. Following ISO 1994 traceability is characterised as the competence to trace the assembling-history or storage location of any good by means of recorded files (ISO, 1994, 8402). According to Talib et al. (2012, p.96) traceability also indicates that packaging is absolutely identified at critical or hazard junctures. Picó (2012, p. 466) adds that traceability must also entail distribution and storage of the product after delivery. Raspor (2005) supplements that in case of food-borne illness or contamination it must be probable to trace the cradle of origin at once. Zuurbier (2010, p.30) extended the trace-chain downstream to the final consumer, he argues that traceability is the ability to track and trace a specific amount of ingredient or component to the

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<sup>94</sup> 9. BfR Forum for health and safety and consumer protection, 28.-29. Oktober 2010, Berlin: Migration von Mineralöl aus Kartonverpackungen in trockene Lebensmittel –Daten, p.3.



product that contains it, and also to track and trace a finished product to the primary external customer or destination. Another definition is found by Codex Alimentarius Commission (2004, p.10), they define traceability of food and products as the ability to follow the movement of food through specific stages of production, processing and distribution. Furthermore, is complicated by the numbers of actors within the food chains and by the perishable nature of its products (Dalvit et al., 2007; Ruiz-Gracia et al., 2010 cited in Picó, 2012 p.466). The overall goal, the aim of traceability is to upsurge product safety, by identifying impurities and contamination and to give the reliable ability to perform a recall procedure (Raspor, 2005). The legal wording was defined in the European Regulation (EC) 178/2002 as [*“... the ability to trace and follow a food, feed, food producing animal or ingredients, through all stages of production and distribution.”*] The regulation implies that it a must to trace food and feed from farm to fork and even to track it back from the plate to its source (Picó, 2012, p.467-468). According to Moe (1998, p.213) traceability can be discriminated between internal besides chain traceability. The internal issue implies the ability to track and trace product information within an entire company. Moe (1998) denotes the linking of the end product of the manufacturer and its characteristics and commodities at entry of the company. Chain traceability is the ability to trace product information through different actors and stages of a supply chain (Moe, 1998, p.213; Picó, 2012, p.467). Moe's (1998) points of view are related to the “Document of Compliance” and the demanded “Supporting Documents” by the official authorities that will be discussed later in sub chapter 7.9.

A study published by Elahi in 2002, from the Food Chain Strategy Division of the FSA, defines the basic characteristics of traceability systems as follows: (1) identification of all ingredients, intermediate goods and final products; (2) registration of information where batches and units have been moved or have been processed; (3) a system to collect and link these data 4) to spread all relevant information with the product to the next step in the supply chain. However, all explications given before have one thing in common, they do not specify or name which feature sizes or parameters must to be measured or how the origin of goods should be determined afterwards (Dalvit et al., 2007, p.438).

Traceability is the possible opportunity to retrieve reliable information and data with regard to raw materials and intermediate products that were used for their production. The composition, production methods, storage, shipping and forwarding and other relevant features on packaging materials are documented too. With this information close at hand, the cause and extent of possible failures and even fraud in the production, within the distribution chain and in the use of the packaging materials can be identified whenever necessary.

The Regulation (EC) 178/2002 requires traceability at all stages of production and distribution, but it is not clear when it arises to the matter of packaging in the whole supply chain, the Framework Regulation gets more concrete: the traceability of articles and goods need to be ensured and granted by all actors of the packaging chain. The main features are at a glance: Art. 17 of the Regulation (EC) 1935/2004 the so called "Framework Regulation" demands the traceability even of printed materials and articles at all stages of the packaging supply chain in order to ease control and enable a recall of defective products in time and place. In order to be functional for recalls, a traceability arrangement must be capable to trace backwards to locate the source of a food and animal feed defect, and trace forwards to find all other products at a later time affected by the defect (Regulation EC 1935/2004, p.9).

As soon as a product or article is put in the market or is traded and widespread in use, there might be unforeseen complications; this can introduce an immediate recall of products and articles by official authorities or in quietness by the vendor. In the instance that a regulated product is defective or potentially harmful, a recall is by no means a must. It could also be removed from the market. A recall can be identified as succeeded if customers have sustained no harm or damage. According to FSA-Study in 2002, there are various stages of recall escalation: (1) dangerous or defective products that probably could cause serious health problems or death; (2) products that might cause a temporary health problem, or pose only a slight threat of a serious nature; (3) products that are implausible causing some adverse health reaction and or that violate EFSA labelling or manufacturing laws (Elahi, 2002, p.18). In fact a lot of recalls of low endangerment class took place secretly within the inner cycle of the RASFF. The RASFF's annual report of 2010 points out 598 EC relevant alerts relating to food

contact layers as well as packaging materials (Dalli, 2011, p.16). Resende-Filho (2010, p.1) pronounces that many spot-lighted food recalls in fact of contamination of pathogen impurities have contributed to private or legal initiatives demanded to enrich and improve quality inspections. Research capture by Trienekens & Zuurbier (2008) identified that the European food sector has contributed to food and feed safety crises by implementing quality assurance systems and private standards with traceability requirements beyond demands of public regulations. A recall or a market withdrawal from shelves is a financial disaster. It can even bring financial ruin upon a company. In 2005 Nestlé recalled two million filled packages in the EC due to a packaging problem. The fault was the migration of ITX into the inner container and recall costs about 1.6 mil. Euro (Ahmed, 2005, p.1). In the summer of 2010 Kellogg's recalled over 28 million boxes of popular children's cereals in the USA due to a NIAS breakdown product (Methylnaphthalene) migrating from the liner of the inner back, that caused nausea and diarrhoea in some people (Lunder et al., 2010, p.1). According to Brooks (2010, p.1) the reaction of financial markets came immediately for the stock listed global player, resulting in 15% profit tumble for defective packs. It is not necessarily true that solely millions worth brand owner must be involved within a recall, this could face SMEs too. Hütterer (2007) and Hartwig (2012) report that costs of two million euros are predominate in this context. Even though only a few products are faulty the marketer or brand owner recalls for security reasons the whole charge (Hütterer, 2007, p.3). Voerste (2009, p.1) confirmed millions high costs and continues to an average at 540.000 USD for a recall and followed up withdrawal from shelves.

The purpose of this subdivision has been to give a survey and to explain the characteristics of traceability systems in the packaging supply chain. For further reading about analytical track and trace for foodstuffs see Picó (2012, p.467-492).

## 7.6 FRAMEWORK OF LEGISLATION

Horizontal legislation is relevant for all articles and goods in European common market. The most considerable goals of European food-law rules should bring together the following facts: (1) the safekeeping of public health concerning food safety regulations, (2) public trust in food and feed safety within the

European protection appliances and (3) the effectiveness of the inner market concerning foodstuffs.

Due to vertical legislation, directly applicable provisions of European Community law rule over national law. Therefore, the regulation, which is due to its legal status directly applicable, takes priority over domestic legislation. Nationwide regulation in so far may not contradict community law in the EC. EC directives are European Community laws too, but they are not straight pertinent and must be embedded in individual member state law. For the reason that a member state has unsuccessful not met the deadline to implement a directive or does not realize the goal of the regulation, a directive is directly applicable (Riemer & Weber, 2009, p.21). Lozo (2011, p.1) defer to the inadequacy of defined directives, due to this very fact France, Germany, Italy, and the Netherlands have set up their own national provisions concerning paper and board.

#### **7.6.1 Evaluated substances**

European regulations concerning direct food contact, e.g. plastics, demand that industry must grant the approval of harmlessness for substances, which are formulated and present in food contact packaging (Riemer & Weber, 2009, p.48). This rule is founded on the positive list principle. This kind of approval process is also demanded when there is an intention for use of any new substances that are not yet listed on the positive list. A toxicological evaluation is a must (Goldbeck & Lenz, 2011, p.7). The toxicological evaluation of substances in general is assigned and performed by toxicologists and authorities. In case of EC legislation this is done by the EFSA (Hellwig, et al., p.3). As a consequence of the toxicological data they induce acceptable daily intake grades (ADI) to which the consumer unscrupulously can be exposed. The legislator ongoing remodels the toxicological evaluation, as a specific migration limit (SML) into a positive list, which is embedded in the regulation (Riemer, 2009, p.68). This value is a limit value which indicates how much of a specific substance in the package can migrate into the foodstuff. The limit refers to the transition but not in itself, but to the maximum allowable intake of an adult (60kg) at a daily food intake of 1kg. The food packaging regulations classify a roofing limit for substance migration, the overall migration limit (OML). The OML is determined as the sum parameter of entirely

substances (Grob et al., 2007, p.201). By way of writing this thesis, printing inks as well as printed layers on food packaging in the EC and Germany are currently not regulated via positive lists (Riemer & Weber, 2009, p.40). SMLs of substances which are manufactured in printing inks, lacquer, glues etc. and which are therefore present in the printed layers must be complied with by the final printed packaging in addition. According to Sille (2006, p.3) this regulation demands a high level of attention from the ink manufacturer, packaging company and converter.

#### 7.6.2 Non-evaluated Substances

All compounds and substances, which are formulated for printing, litho-laminating and box-gluing which are not toxicological approved, are predominantly characterised as “non-evaluated”. According to EFSA (2012, p.5) the EFSA is forced by Article 10 of Regulation (EC) No. 1935/2004 of the European Parliament and of the Council on materials and articles intended to come into contact with food and feed to implement a risk-assessment on the possible risk originating from the migration of substances from food contact layers. Consequently, the EFSA has to provide scientific opinions on new ingredients intended to be formulated before proceeding into a positive list. All legislators in the EC agree in the same manner that substances without or with poor toxicological data made available by the industry, are not automatically considered as safe. Hartwig (2012, p. 15) has shown, that it is incorrect to debate that if the health hazard of a substance is not proved positive, it is allowed to migrate smoothly, but the fact is that as long as the health and safety is not attested and indicated, substances should never migrate. EC relevant and in force regulations determine that non-evaluated substances or compounds must not be detectable in food and animal feed anywhere. The common accepted fact is a general understanding that “detectability” means that a default threshold limit of 10µg/kg.<sup>95</sup> As outlined above, this limited threshold can only be ignored in a case where favourable toxicological data substantiate a higher safety margin. Vohr (2010, p.12) states that toxicity means poisonousness. Toxic substances have an

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<sup>95</sup> 10ppb are 1g x 10<sup>-6</sup>, a µg/Kg is 1 thousandth of a mg/Kg.

effect on the organism, which leads to illness and death. Today toxicology examines health effects of chemical substances or mixtures of substances on living organisms. From this facts and data, one can estimate the risk. Reichl & Schwenk (2004, p.62) state that the toxicologist assumes that there is a threshold value for each substance, in which the risk is zero, the so called [*"No-Effect-Level"*] (NOEL). The only exceptions to this assumption are carcinogenic, mutagenic and reproduction toxic substances for which there is generally no NOEL defined, but a threshold value is determined to reduce the risk to a scientifically accepted measure (Vohr, 2010, p.12). The threshold of regulation concept is not currently accepted in Europe, therefore any submission to BfR for evaluation of substances must be accompanied by 3 negative mutagenicity studies even when no migration is calculated with a diffusion model or detected. The level of migration (or calculated migration) dictates the level of toxicological data needed for the submission (Wemken, 2010, p.14): (1) a threshold value of 50ppb requires three mutagenicity tests; (2) a threshold value 50 ppb but bigger than 5ppm requires three mutagenicity tests, 90 day rat feeding study plus data on bioaccumulation (Hellwig et al., 2010, p.5); (3) below a threshold limit of 5ppm demands all the above and in addition an extra 90 day feeding study on a different species supported by a long term reproduction study. For further reading, see Fátima Poças et al. (2007).

As well documented by Haack (2006) and Muncke (2009) the migrants mentioned above are polymeric materials, ink binders and ink additives, starting substances, monomers, catalyst, solvents, additives and NIAS. All these substances should be risk assesses and authorized (Ebnesajjad, 2012, p.370, 372).

### 7.6.3 Functional Barrier

A novel concept in the EC regulation is the "functional barrier". Functional barrier means a safeguard, comprising of one or several layers of any material, which grants that materials or articles are in compliance with Article 3 of Regulation EC1935/2004 and with all provisions of this regulation. Functional barriers are multilayer structures suitable to prevent migration of chemicals and NIAS dismissed by food contact layers into food. Feigenbaum et al. (2005) showed that functional barriers are embedded or within food contact layers, formulated to

stop the diffusion of contaminants which are not sufficient evaluated by health authorities, or which have the potential to cause harm. Consequently, functional barriers are met in three situations:

(1) By use of recycled plastics that may be contaminated; (2) in the field of active packaging (both aspects will not be discussed in this thesis); (3) by formulating compounds, which are not accepted in positive lists, so they are not detectable (ibid, 2005).

Such substances are named in the Framework Regulation (EC) 1934/2005 [*functional barrier substances*"]. Compounds formulated in packaging locked out by a functional barrier do not require authorization, as long as they not exceed the toxicological threshold of 10ppb and they are free of carcinogenic, mutagenic or toxic to reproduction characteristics. Following Altkofer et al. (2010, p.114) in European legislations, there is no defined law for threshold concentration or exposure below which the toxicology risk can be considered negligible. The detection limit of 0.01mg/kg in food or feed is recognized for the functional barrier concept when the substances used are not known to be carcinogenic, mutagenic or noxious to reproduction. Altkofer et al. (2010, p.113) supplemented CMR materials due to recent legislation with volatile nanoparticles. According to Brandsch (2010, p.12) it is possible to argue, that where a functional barrier can be demonstrated that one must not demonstrate compliance with the SMLs, but to demonstrate the efficiency of functional barriers is not a simple matter in itself. Specific adaptations of functional barriers are permanent barriers such as glass, metal or special foils. In case that an absolute barrier separates, the packaging from the food and animal feed there will be no migration. The European Packaging Ink Joint Task Force (EuPIA, 2011, p.3) finalises the attributes of an absolute barrier: just glass and metal, in case of aluminium layer with a thickness of above 8µm without pinholes, can be classified as an absolute barrier. The EuPIA (2011, p.3), Brandsch (2010, p.14). and Haack (2006, p.10) well documented that paper and cardboard do not constitute barriers, unless they serve as bonding material and have been reinforced with synthetic substances or metal. Paper and board have a permeance. Therefore they are poor barriers to gases and also various volatile organic compounds.

#### 7.6.4 Framework Regulation (EC) 1935/2004

This sub chapter presented an abridged version of the EC Regulation 1935/2004, for further reading refer to the original document for complete information.

The fundamental underpinning law related to the market in the EU is Regulation EC 1935/2004, the so-called "Framework Regulation". As a regulation, it is straight applicable and in force, legally compulsory to all member states. It lays down the common principles to eliminate differences between national laws concerned to food contact layers (Ebnesajjad, 2012, p.369). It is prohibited by no means to place unsafe or hazardous food and feed on the market. These goods shall be banned if considered to be harmful (Vincent et al., 2011, p.12). This regulation came into existence in November 2004 and displaced two previous directives ruling the use of food contact materials, 80/590/EEC and 89/109/EEC. The Framework Regulation (EC, 1935/2004, p.7) is to be considered to all materials or articles which [*"... in their finished state: (1) are intended to be brought into contact with food; (2) or are already in contact with food and were intended for that purpose; (3) or can reasonably be expected to be brought into contact with food or to transfer their constituents to food under normal or foreseeable conditions of use"*].

The nucleus of the Framework Regulation is found in Article 3, which requires that materials and articles shall be produced in compliance with good manufacturing practice (GMP). Consequently, under reasonable or foreseeable conditions of use, they do not transfer impurities to food and feed in quantities, which could (EC, 2004, p.7): [*"(1) endanger human health; or (2) bring about an unacceptable change in the composition of the food; or (3) bring about a deterioration in the organoleptic characteristics thereof"*]. The overall spirit of Article 3 is deliberate because it deals with the issue of the transfer of substances, migration by name, from food packaging materials or contact materials into food. It also requires a proof that the concentration of the substances in the food is at a level, which will not pose a risk to the healthiness of the final consumer. According to Irvine (2010, p.4) the way in which this requirement has been written in the Framework Regulation, has brought the philosophy of migration testing into existence, which has been applied to plastics before (EC 10/2011 (PIM)). Irvine also points out (2010, p.4) that this also



means that any compositional migration limit needs to be linked in some way to an estimate of the level of the substance passing into foods.

One viewpoint leaves room for debate in Article 3, it is the fundamental demand that impurities do not migrate to food in ["... quantities which could endanger human health"] (EC, 2004, p.7). Behind this lies the assumptions that: (1) Consumers eat 1 kg of packaged food every day, and (2) that this food would always be packed in the material under same considerations and that (3) this food would come into contact with 6dm<sup>2</sup> of packaging's specific surface (Fátima Poças et al. 2007, p.223; Grob et al., 2007, p.201). To review information about the migration behaviour of commodities, they must be grounded on the same unit of measurement. For this intent, the EU cube model is being employed, as a reference for packaging of 1kg food. The EU cube has an edge length of 1dm, and therefore one liter volume, by a relevant surface of 60dm<sup>2</sup> (Ebnesajjad, 2012, p.373). It is also assumed that an EU citizen of 60 kg and maximum daily 1 kg of food. In words of the legislator ["... the overall migration limit of 10mg per 1dm<sup>2</sup> results for a cubic packaging containing 1kg of food to a migration of 60mg per kg food"] (EC, 10/2011, p.12/4). Fátima Poças et al. (2007, p.224) completed that there must be no other significant source of exposure. Significantly and explicitly, the Article 3 of the Framework Regulation also contains a demand for the use of "Good Manufacturing Practice" (GMP) during the production of food packaging layers, materials and articles to comply with the Framework Regulation. The issue of GMP and the GMP-Regulations will be discussed later in sub chapter 7.6.6.

To reach the goal of this regulation it is necessary to create specific individual regulations for particular materials or objects. Such individual regulations are currently in existence for synthetic materials and ceramics. Plastics in general are covered by the Plastics Implementation Measure (PIM), Commission Directive EC No 10/2011 of 14 January 2011, Cellulose is covered by Commission Directive 93/10/EEC(10), Vinyl Chloride by Council Directive 78/142/EEC and Ceramics are covered by Council Directive 84/500/EEG. Coatings, printing inks, glue or bonding agent are not covered by EU legislation and therefore not subjected to the obligation of a declaration of compliance (Ebnesajjad, 2012, p.374 ). Article 16 of the Framework Regulation requires that all objects that get in close contact with foodstuff products have to have an attached declaration of compliance (DoC)

stating that they are in “compliance” with current regulations (Riemer & Weber, 2009, p.47). As an incorrect deduction of this, grocers who buy printed folding cartons and cardboard containers also try to demand a DoC from the packaging company. Article 17 mandates that at every step of manufacturing a complete tracing of all materials has to be guaranteed. As a result of this, a commercial printer and a manufacturer of packaging must obtain the necessary information (supporting documents) about the complete packaging and content requirements respectively. The DoCs of the subcontracting industry within the packaging supply chain, e.g. ink and cardboard manufacturers, are to be summed up and appraised by the packaging manufacturer in the light of the Framework Regulation.

Resume: The Framework Regulation EC 1935/2004 defines the community framework for the packaging supply chain: production, warehousing, placing and putting into circulation on the market of materials and articles in surface contact with foodstuff. It contains fundamental definitions, general rules and production requirements, approval and labelling obligations. According to these underpinning obligations, a migration of substances into food and feed is not prohibited at all, but as long as it asserts no risk. According to EC regulations, the manufacturer and the marketer of foodstuff are in charge for compliance with the law and regulations, but the Framework Regulation does not shield paper as well as board. (Vincent et al., 2011, p.12). Traußing (2011, p.2) states very clear, that papers as well as boards are not synthetics made of on cellulose; due to this they are not sheltered by European legislation. Following the conclusions of Harlin et al. (2010, p.38) and Lozo (2011, p.3) the Framework Regulation only provides the principle; it does not determine how to demonstrate safety.

#### **7.6.5 Regulation (EC) 2023/2006 (GMP)**

This chapter yielded an abridged rewording of the EC Regulation 2023/2006. Since 1<sup>th</sup> August 2008, the marketer of materials intended to be exposed to food or feed must demonstrate compliance with GMP practice, harmonised for the whole EU. The overall ruling and guiding principle is that these materials do not represent (1) a danger for the consumer, (2) nor change neither the composition of food (3) nor the organoleptic characteristics thereof. The rules that regulate manufacturing processes under the GMP requirements pertain, amongst other

issues, to the usage of printing inks on the non-food contact side of the substrate under stipulated conditions that aim to limit migration and set-off to levels that match to regulatory requirements, beside other safety measures. GMP specifies that detailed documentation must be kept of many aspects of the manufacturing process, including prescription, formulae, processing, performed manufacturing operations, along with the results of testing and other quality commitment systems. Such a system is also intended to monitor and correct any failure to achieve GMP.

The regulation sets out the minimum requirements on GMP for materials and articles intended to come into contact with food (Vincent et al., 2011, p.11). It relates to all the types of materials identified and summed up in Annex I of the Framework Regulation 1935/2004 (Riemer et al., 2009, p.34). Irvine et al. (2010, p.8) outlined that it similarly applies to combinations of those materials and articles and to recycled materials, therefore it clearly applies to paper and cardboard and to multilayer structures containing paper and cardboard. It covers the same area of operation as the Framework Regulation 1935/2004 but the GMP-regulation covers all materials, not just synthetics, and in the absence of a regulation for paper or cardboard, so it can consequently be applied as a general regulation. From August 1<sup>st</sup> of 2008 onwards, upstream suppliers within the packaging supply chain as well as brand owners or marketers can be held accordingly responsible for defects, in case that they have missed on their disclosure duties. GMP shall safeguard the article 3 of Framework Regulation No 1935/2004 and at least to ensure that the packaging will comply with the Waste Directive 94/62/EC (Heckmann, 2011, p.10). Seen from this perspective the GMP-regulation seals the gaps that occur in European food contact legislation. Paper and board are not regulated, but with regards to multi-layer packaging here is a legal grey area if they are not covered by the PIM. The GMP-Regulation demands the establishment of quality assurance and quality control systems. Both must be covered with adequate documentation systems. The most essential topics are:

(1) Article 5: The firm has to have an effective and documented system for quality assurance. The starting materials have to be preferred to comply with predetermined specifications.

(2) Article 6: Quality Control System: The system of quality control has to include the on-going supervision of the execution of a good manufacturing process (GMP).

(3) Annex: Printing inks must have characteristics in their formulation that substances cannot migrate from the printed layer to the interior side of the packaging where food contact may accrue to comply with the requirements of Article 3 of the ordinance EC 1935/2004.

Heckmann (2010, p.2) states that the GMP-Regulation is a management tool. It provides methods by which these goals can be achieved. These methods can be adopted by the industry and their proper implementation can be audited by authoritative bodies. Heckman (2010, p.26) goes on that it must be [“... *hooked on to*”] and [“*embedded*”] in a quality management system like ISO9001ff. The regulation demands in addition a detailed structure and process organization, and a complete system for hygienic control to be applied. A significant element in the GMP Regulation is the demand that raw materials must be selected to have conformity with pre-established specifications. These specifications must ensure compliance of the goods and articles with the rules and directives applicable to them. Following Irvine et al. (2009, p.8), two significant consequences arise for packaging company or a commercial printer, because they have just a limited influence on raw materials: (1) any guidance or supporting document has to include some control on the assortment of paper, liner and board (2) and also given to the nature of papermaking with recycled fibres.

As stated before, every business operator within the packaging supply chain must establish, implement and ensure an effective and documented quality assurance system by himself. Due to the FEFCO Guidelines (2003) attention must be drawn to the adequacy of staff, their training in the job, the process-flow knowledge and the qualifications of the organisation and management to safeguard that materials and articles in their final stage comply with the rules and legislation applicable to them. Baumann (2010, p.9) points out appropriate documentation with respect to prescription or manufacturing formulae, and the process-flow within fabrication. The documentation must be stored and made accessible to the competent local authorities upon request at operations control (Ebnesajjad, 2012, p.374 ). It is to be expected (Stähle, 2010, p.5) that all

stakeholders in the packaging supply chain have to communicate with each other to warrant that the packaging complies with relevant regulations (FEFCO, 2003, p.16).

Resume: Commission Regulation (EC) No 2023/2006 ordain prevailing rules on good manufacturing practice (GMP) for all bodies of food contact materials and articles listed in Annex I to Regulation (EC) No 1935/2004 and also in combinations of those materials, even on recycled materials. Before the demands of the regulation can be adopted the stakeholder's technical processes must be prearranged in such a manner that they can be sure to produce only packaging materials that are in compliance with their conditions. The GMP-Regulation also requires a complete embedded framework for hygienic measures (Stähle, 2010, p.19; Vincent et al., 2011, p.7). The Framework Regulation and in addition the GMP-Regulation complement each other. GMP depicts a management system to agree to abide the Framework Regulation. If the design of a box, its manufacturing, storage or its final use may indicate a significant risk of migration in the light of foreseeable conditions, there is a demand given to minimize that risk by applying best practices guidelines (GMP). Stähle (2010, p.2) states that GMP means having a total control system in place, all considerations of quality, sanitation and traceability are monitored.

Vincent et al. (2011, p.27) shows that hygiene can be separated into three segments: (1) workplace hygiene to avoid product contamination by individuals and equipment during manufacturing, (2) personal hygiene which rules about personal care, eating and smoking and procedures in case of illness, (3) machine hygiene by the purity of raw materials, clean equipment and cleaning instructions to prevent migration, because wash-ups are by nature both liquid and prone to migration. The Regulation (EC) 2023/2006 (GMP-Regulation) made clear, that there are no unregulated articles of daily use and unregulated substances that may migrate from food contact materials: Article 3 of the Framework Regulation applies to packaging as a whole. However, there are many substances and food contact materials, for which the legislature has so far engaged no explicit regulations in order to refine these general requirements, but the Regulation (EC) No 2023/2006 (GMP-Regulation) closed this indeterminate legal area (Altkofer et al., 2010, p.111).

### 7.6.6 Plastics Implementation Measure - Regulation (EC) 10/2011

This sub chapter presented an abridged version of the (EC) Regulation 10/2011 named PIM.

Plastics used in food packaging are subject to Commission Regulation 10/2011 of the EU, known as the Plastics Implementations Measure (PIM), a comprehensive set of requirements for categories of plastic materials applied to the production of food packaging. This regulation offers a list of additives, monomers, polymers, excluding solvents that may be formulated for the production of food and feed flexible packaging.

The categories of these materials are: (1) exclusively plastic materials, articles and parts; (2) plastic multi-layer materials or compounds that are married by adhesives; (3) materials and articles mentioned that are printed or coated; (4) plastic layers or coatings forming functional sealings that integrate different types of materials.

The PIM went into existence on 4<sup>th</sup> February 2011 and as of 1<sup>th</sup> May 2011 it's became relevant for all member states (Langhorn, 2011, p.1). This regulation however, applies only to materials and articles, which are completed entirely out of synthetic compounds. The PIM-Regulation does not apply to paper, cardboard and corrugated packaging or for packaging with composite substrates. Composite substrates are compounds of two or more multi-layers with at least one layer completely made out of synthetic material.

The 4<sup>th</sup> Amendment Guideline to the guideline about synthetic substances 2007/19/EG (today Plastic Regulation) for the first time mandates that with multi-layered materials for the non-contact surfaces with food products now materials can be employed that are not explicitly mandated in the guideline of synthetic substances, as long as the migration does not exceed 0,01mg/kg. Here in paragraph 27 is the key definition of a [*functional barrier*].

### 7.6.7 REACH- Regulation EC 1907/2006 (REACH)

This sub chapter outline an abridged version of the (EC) Regulation 1907/2006.

The Regulation EC No. 1907/2006 came into force on 1<sup>th</sup> June 2007 and is known as the acronym "REACH", the registration, evaluation and authorization of chemicals. The striking issue of the legislation is to promote safekeeping of human health and the environment (Brandhofer et al., 2011, p.5). REACH implemented a massive change into the routing for chemicals, including inks and pigments throughout the whole European Union, demanding that all existing substances are considered by one regulatory framework. A main innovation is the reversed proof, now the marketers are required to demonstrate by studies that their products and goods are not dangerous to consumers or end-user. The core-concept of REACH in a nutshell means: no data - no market (Handels, 2009, p.8). REACH is dedicated to all EC member states as a horizontal law and will be set to force on national basis. The regulation demands that any chemical substance formulated or imported within the EC in quantities of 1t or more per year must pass and fit in the specific requirements detailed in the legislation.

The reason why REACH is being mentioned here is the fact that the lion's share of the entry of mineral oils in the recycling loop process are uniquely identified as inks from newspapers (Kersten et al., 2011, p.18; Thiel, 2010, p.12). Newspapers are not commodities due to this they are not subjected to any food or feed regulation. This is a political dilemma. The chief responsible cause for the entering and impurity of recycled paper streams with MOSH and MOAH is legally bound to REACH-Regulation and not tangibly bound by food legislation. However, it is for this very reason that BfR is researching for exposure to aspects of skin contact by coldset inks for newspapers (BfR Opinion No. 008/2010, p.5). This approach is supported by recent research and findings by Kezic et al. (2010, p.2): [*"Experimental data indicate that the tumour-promoting activity of alkanes is related to their chain length, with maximal activity found in C<sub>12</sub>-C<sub>14</sub> alkanes. It is plausible to assume that repeated, long-term exposure to dermally irritating petroleum hydrocarbons may pose a carcinogenic risk, which is minimised if long-term irritation is prevented"*].

It may be expected (Goldbeck & Lenz, 2011) that for this reason there will be changes to legislation concerning the German LFGB, as the 20<sup>th</sup>. legal amendment

to the “Inks Ordinance” and the 21<sup>th</sup> legal amendment to the “Mineral Oil Ordinance” with general validity for consumer goods and not only for food packaging

### **7.6.8 Recommendations of the Council of Europe**

For the sake of completeness, the recommendations of the Council of Europe (CoE) will be discussed in a short abstract in the following chapter. For further reading refer to the original documents for more facts.

As stated earlier there is currently no harmonized EU legislation on paper and board articles as materials for food contact materials, in addition to the use of recycled paper fibres in direct contact with foods. In addition, there is also a lack of specific directives about paper and board coming into contact with food and feed. The Framework Regulation only provides the principle, whereas the exact methodology of how to prove safety is missing (Harlin et al., 2010; Lozo, 2011) In the absence of the specific directive, some European countries have developed and set in force their own national provisions specific to paper and board (e.g. Germany, the Netherlands, France, Italy). In addition to national authorities, the Council of Europe (CoE) has published non legal binding resolutions on paper, liner and board materials and articles proposed to come into contact with foodstuffs. The CoE-Regulations may act as a reference for countries that have not yet established national regulations of their own, but all resolutions adopted by the CoE are merely recommendations and they have no legally binding character in their wording. Since 1969 the following resolutions were passed by the council:

(1) Resolution AP (2004) regarding coatings that should come in contact with food products.

(2) Resolution AP (89) regarding the use of colorants in synthetic substances that come in contact with food products.

(3) Resolution AP (2002) 1 regarding paper and paper materials - products that should get in close contact with foodstuffs.

(4) Resolution AP (92) 2 regarding the control over the auxiliary materials used during polymerization of synthetic substances and products made out of synthetic substances.



(5) Resolution AP (2005) 2 regarding printing inks that does not get in contact with food products or for articles which do come in contact with food products.

The so-called Ink Resolution (AP (2005) 2) from 14<sup>th</sup> September 2005 was passed by the Committee of Ministers of the Council of Europe. It is however not yet complete and parts are still missing such as ingredients, GMP during the formulating and producing of inks including standardized testing methods. According to Forrest (2007, p.36-37) the resolution is not accomplished due none assistance of the industry: no disclosure of ink-formulations. Technical document No.1 brings out three main points: An inventory list of substances, an exclusion list and the remark, to specify migration limits where possible. This document has, however, not yet been completed. Regulations on the measurement of migration are in preparation. Technical document No.2 is a kind of a GMP-guideline. In its first part it addresses inks and has been designed by CEPE. It is addressed to paper, board and plastic.<sup>96</sup> Following Lozo (2011) the aim of this document is to provide a single text that can be used by all operators in the PPSC in order to establish compliance: (1) Packaging inks should be manufactured by GMP-guidelines and used according to their formulation. (2) A printed or varnished layer should not come into contact with food. (3) No visible and invisible set-off or migration shall apply to the food contact material. (4) The SML of the substances of the inventory list shall apply. (5) Printings inks that are considered for migration shall be subjected towards the detection limit of 10ppb or below.

The Resolution AP (2005) 2 has attracted some controversy with industry groups in the EU due to its implementation. The EuPIA stated that the (1) inventory is incomplete and many key materials are missing (2) that the majority of substances have already not been evaluated and (3) due to the 10ppb detection limit some inks could become unavailable (Forrest, 2007, p.37).

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<sup>96</sup> The documentation was constituted with the support of the European Forum of Flexible Packaging Industry and the International Confederation of Paper and Board Converters.

### 7.6.9 German Regulations: LFGB, BGVO and BfR Recommendations

The food regulatory framework in Germany is primarily ruled by the EU regulations. The focus of EU food legislation is called the ["*food chain*"], well known are the buzzwords ["*From farm to Fork.*"] In place of the national law LMBG on 01. 09. 2005 the regulation on feed and food and consumer goods (LFGB) went into force. It has been the annexation of the food chain principle into German law. The goals of the LFGB are health and fraud protection and consumer information (Voerste, 2009, p.24; Hahn et al. 2005, p.398). At a national German regulatory level, the Food, Commodity and Feed Act Legislation (LFGB) and the German Consumer Goods Ordinance (BGVO), govern and rule with the challenging area of food and feed packaging. These national regulations are the implementation of horizontal legislation in the EC: (1) Basic Regulation EC No 178/2002; (2) the Framework Regulation 1935/2004 and (3) Regulation EC No 882/2004 for official controls for verifying compliance on site. According to Riemer (2009, p.22) the LFGB expressly declaring the goals of health protection and declares the protection of consumer interests as fraud protection. The LFGB is so stipulated that the articles for foodstuffs must not release any ingredients in an amount that may affect the safety, composition and sensory characteristics of the packaged food. A clause on mass transfers that are "technically unavoidable" in the revised Food and Commodities Act (LMBG, valid until 2005) led to many misunderstandings and is not included in the Regulation (EU) 1935/2004 or in the new LFGB. According to the existing absence of regulation, the German BfR Recommendation XXXVI is the supreme recognized standard all over Europe for food contact testing of papers. As a common accepted fact, it is used, even in those Member States without their own legislation, to demonstrate compliance of foodstuff contact paper, liner and board with the safety demands of the Framework Regulation. The BfR Recommendation is split into four sections:

- (1) XXXVI Paper and board for food contact
- (2) XXXVI/1 Cooking Papers, Hot Filter Papers and Filter Layers
- (3) XXXVI/2 Paper and Paperboard for Baking Purposes
- (4) XXXVI/3 Absorber pads based on cellulosic fibres for food packaging.

As stated before, on the legal side the LFGB and the guideline for articles for consumption as the national German framework law cope with the complexity of

aspects involved in with packaging for food products. A number of BfRs recommendations regulate how to use materials for packaging for food and feed products. These recommendations are, like those from the Council of Europe, in the same manner not legally binding at all (Keller et al., 2009, p.61). Seen from a technical point of view they do define the present state of knowledge and technology in every stage of application (Riemer et al., 2009, p.24). As hard facts they can be applied to manufacturing companies like terms of trade. The most important articles for a manufacturer of packaging or commercial printer for food stuff of the LFGB are §2 (6) with the definition for articles of consumption. The §30 restricts in the same kind as Article 3 of the EC Framework Regulation 1935/2004, the processing and trading of articles of consumption that can expose a danger to human health. According to §31 LFGB no substances in articles of consumption are permitted to migrate into food products that carry the potential to endanger the health of humans, lead to an inexcusable change in the consistency or bring about change in the organoleptic characteristics. Exceptions to this rule are components, which are innocuous with respect to healthiness, odour and taste.

#### 7.7 GERMAN INKS ORDINANCE YET TO COME

In the end of year 2009 the German Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) published a draft proposal to amend the German Commodities Regulation include printing inks and printed food contact materials (Gierisch, 2011, p.10). The chronological sequence of the draft bill has been a draft paper by the BMELV (14.12.2010), comments of the industrial associations (05.01.2011), an expert hearings procedure of BMELV (11.04.2011), due to be in force 2013 after official notification of the EC (Schiffers, 2011; Traußing, 2011). This "German Inks Ordinance" is structured along similar guidelines as the Swiss Ordinance from 2011. By the time of writing this thesis, it is still a law bill with an annex of a positive list of evaluated substances that are permitted to be formulated for packaging inks. Migration limits for these substances are nailed. It must kept in mind that the German draft, released for early stakeholder consultation, has a different range of evaluated substances with corresponding SML as compared to the Swiss Ordinance (see sub chapter 7.8) (Hartwig, 2012;

Schiffer, 2012). Following Frank (2011) this German proposal may become the basis of EC-level legislation in the longer term.

The scope of application of the ordinance refers to inks for printed layers on food utility items, including all materials for stabilization, surface adhesion and value added printing. The ordinance focus is a positive list with permitted, evaluated substances. Moreover, formulation and applications of ink are regulated including foodstuff contact layers, materials and articles by demanding the 10ppb legal principle as ultima ratio. The draft bill expresses its concern about the toxicity of synthetic nanomaterials and characterized and defined them by having a particle size of at least about 1-100nm (Langhammer , 2011, p.18) and will be treated like CMR materials (Gierisch, 2011, p.10).

Another priority will be drawn on non-intentionally added substances (NIAS), to some extent any type of cross-contamination is to be avoided under all circumstances (Goldbeck & Lenz, 2011, p.12). The ordinance should be in force for materials and articles in general and not only restricted for use in food and animal feed packaging. The compliance with legal requirements passes on to an upstream member of the packaging chain to the packaging company, co-packer and marketer (Gierisch, 2011, p.11).

A close collaboration with the Ministry of Economics has not yet taken place, although many different branches of industry will be directly affected (Goldbeck & Lenz, 2011, p.13). The notification process for EC legislation was planned for 2016, a must when a national regulation has come in force, shall take place in 2017/18, including a transitional period with 2 years for largely completed sale of foodstuffs and commodities that are not complying with the imminent German Ink Ordinance (ibid, p.33).

In 2012 silence fell over the German Ink Ordinance and supporting research and studies (Harling et al., 2012), but in December 2012 a new food scandal came into existence, mineral oil traces in chocolate (Berg, 2012, p.1). Plöchinger (2012) reports that the Federal Government wants to ban mineral oil based inks for printing food packaging and that a draft bill is being discussed between ministries and industrial associations.

## 7.8 SWISS ORDINANCE SR 817.023.21

The ordinance of the Federal Department of Home Affairs (FDHA) for articles and materials was firstly introduced and discussed on 7<sup>th</sup> March 2008 and came into force on 1<sup>th</sup> April 2010 detailing certain provisions relating to packaging inks. This ordinance contains a positive list of evaluated substances which are permitted for food packaging inks: binders (monomers), dyes and pigments, solvents and additives, and photo initiators. The catalogue is divided into lists for evaluated and unevaluated substances. Additionally, the migration limits applicable to the substances must not be exceeded and Good Manufacturing Practices (GMP) for printing ink manufacturing and printing must be used.

The Swiss legislator defines printing inks as mixtures of substances or further combinations of such mixtures, which are used to achieve images on packed food. Furthermore, within the scope of the Swiss Ink Ordinance are printed coatings such as primers or overprint varnishes that provide protection or additional technical functions to the printed packaging. Thus transparent lacquers and varnishes may not contain pigments or dyes in order to fall under the definition as set out in Art. 26f. Inks applied on the food contact side and which are in direct food contact materials do not fall under the scope of SR 817.023.21 (see FDAH 2005, Art. 26e and 26f 1).

The FDHA implemented a modification to the Ordinance on materials and articles relating to packaging inks. Inside this adjustment, introduced on 7<sup>th</sup> March 2008 with a transitional period of two years and coming into force on 1<sup>st</sup> April 2010. Article 26g set to force the demand that only permitted, evaluated substances should be formulated for packaging inks for packaging in Switzerland. Nowadays it is well known as the "Swiss Ordinance". This regulation demands that packaging inks for packaging articles that come into contact with food and feed can only be manufactured from lists of permitted substances. All substances included in the Ordinance, that is listed in List A or in List B are permitted in the production of food packaging. Substances that are not listed are absolutely not permitted. The Swiss Ordinance similarly demands that the Framework Regulation EC 1935/2004 must be met. That migration limits for substances listed in Annex 1 and Annex 6 must be met and that GMP practice must be used. The Swiss Ordinance is only enforced for packaging materials for foodstuffs that are

manufactured in Switzerland, or imported into Switzerland. There is no legal status in any further EC member state. The Swiss Ordinance is aimed at controlling what is used in the packaging and has a potential for migration: (1) the duty to comply lies with the printer, packaging converter and the marketer; (2) the ink manufacturer has the duty to handpick raw materials that are registered in the annex.

When comparing the first draft of the German Ink Ordinance with the Swiss Positive-List (already in force) it had been found, 160 substances are listed without toxicological data. Thus, the Swiss legislator has given a free ride towards the ink industry for low-migration inks that actually does not meet the required standard, since they contain unevaluated substances (Hartwig, 2012; Schiffer, 2012). According to the Swiss Food Act (LMG), Article 23, anyone involved with foodstuffs, additives and commodities produced, handled, imported or exported, as part of his business activities has to ensure that the goods comply with the legal requirements. Gude (2009, p.56) explicitly refers to the Swiss legal obligation for self-monitoring of compliance for all business operators.

## 7.9 SPECIFICATIONS VERSUS DOCUMENT OF COMPLIANCE

A specification is the methodical, formal description of a product, system and possibly rendered by a production process. The specification has the objective to define quantifying parameters or to supplement requirements concerning the nature of a product. It can be used by the customer to examine and confirm the product of a supplier upon delivery. From the operational point of view specifications do not contain all product requirements; it is a technical document that can also be compiled for safeguarding commercial or legal interests like liability or a warranty. In the best arrangement, a specification is a document which is contracted among all parties. It is the result of an in-depth mutual communication process within the supply chain; it provides clear responsibilities, mutual process safety and defines reasons for a warranty claim. According to Stähle (2011, p.6) the key aspects for packaging specifications are: (1) result of well-timed anticipatory communication; (2) clear definition of the binding contract; (3) clear assignment of tasks and responsibilities; (4) defined scope and is compulsory for mutually parties; (5) as specifically as possible, as detailed as necessary; (6)

technically sound, appropriate information; (7) comprehensible description of the entire packaging system; (8) does not serve as a declaration of conformity with law; (9) becomes effective with acceptance and signature and (10) specifications are voluntary agreements and must not be disclosed.

Stähle (2011, p.5) adds in addition that the specification is a key element of the contractual, mutual agreements between the supplier and the customer; it identifies and nails the terms of purchase and delivery. Bergmann & Hartwig (2013, p.304) broaden this perspective; they add the obligation and duty to test.

In commerce and sale with materials and articles that come in contact with food and animal feedstuff, it is collective practice to issue certificates that demonstrate compliance for the suitability with the relevant food law. This legal demand is not given for packaging made of paper and board, but required in actual practice due to the power of international trading concerns and supermarkets (Bergmann & Hartwig, 2013, p.304). This declaration of conformity eases the traceability which is closely related to the liability of the packaging manufacturer. This liability is addressed in ordinance EC 1935/2004, Art. 17, Abs.1: [*“The traceability of materials and articles shall be ensured at all stages in order to facilitate control, the recall of defective products, consumer information and the attribution of responsibility.”*] Inside the food packaging supply chain, DoCs and declarations of law-conformity play a critical role. Packaging specifications and a declaration of compliance are not equivalent terms; they are dissimilar kinds of documents with diverse objectives. Due to their nature, they cannot replace each other in the handling and processing of food packaging within the supply chain. The declaration of compliance is assigned to a certain packaging material and indicates the suitability for food contact under pre-defined conditions. The issuer is responsible for it and legally bound to the facts and date provided in the DoC. Such DoCs have to be provided to the customer within the packaging supply chain and given to the official bodies during inspections.

According to Article 16 of the Framework Regulation<sup>97</sup>, declarations of compliance are compulsory. The measures due to their legal binding form, as EC Regulation has to be embedded within the national Commodity Ordinances. The manufacturer or the contractual party who is responsible for the first placing on the market shall put the DoC in place. It shall contain all information adjusted in Annex 12 of the German Commodity Ordinance<sup>98</sup>: (1) conditions and results of testing; (2) calculations, other analysis and (3) evidence on the safety or reasoning demonstrating compliance.

The packaging and printing company's assessment of the regulation is absolutely different, because their substrates are not considered being plastic materials, because they are paper and cardboard. As stated before specification for plastic materials does not relate to inks, surface coatings or even for paper substrates modified by added plastic material. In practice, this grades in highly complex situations. This takes place when the food contact layer or articles are further processed in the flow of manufacturing. In these cases, the DoC must be distributed by the producer of the article as the initial placing on the market. In the case that a modification takes place in the down-stream packaging process (e.g. printer, converter, co-packer) and the article is placed again in the market, the downstream operator is in charge and is subjected to provide his own DoC. (Irvine et al., 2009, p.52). Consistent with to the requirements of the legislature, it [*“has to be issued new in case significant modifications in the production process will cause migration or if newer scientific findings are present “*] (see wording of Directive 2007/189/EC, annex VII, suitable documents)”. In this context, one must also refer to the European regulation on GMP for materials and articles intended to come into contact with food. Seen from this point of view, the GMP documentation in the company is the basis for the compilation of the declaration of compliance.

Altkofer (2010, p.118) states that BfR recommendations and EFSA assessments are considered to be sufficient arguments for demonstrating conformity with Article 3 of the Framework Regulation. This legally prescribed

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<sup>97</sup> Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27<sup>th</sup> October 2004 on materials and articles intended to come into contact with food and rescission of Directives 80/590/EEC and 89/109/EEC, Official Journal of the European Union L 338/4 of 13.11.2004.

<sup>98</sup> German Consumer Goods Ordinance, last amended on 13<sup>th</sup> December 2011.



system admits the manufacturers maximum secrecy: If compliance work is completed, no data and facts may be provided to others except authorities which have insight into the internal documentation (Altkofer, 2010, p.122) The compliance work includes all works, documents, processes and tests, which provide evidence that materials and articles intended to come into contact with food and feed, do not affect them, so here is no injury to the healthiness of customers. Nearby are two categories of documents: (1) the first is the product accompanying declaration (written declaration), (2) the second is the in-house documentation of all confidential documents and receipts. The product accompanying declaration is a written statement, which is passed along with a product to the buyer. Synonymous terms for product accompanying declaration are "certificate of compliance" or "declaration of compliance" or "conformity".



## 8. SCENARIO ANALYSIS OF A RECALL

Sub Chapter 8 analyses the liability risk within the packaging chain. The manufacturers of inks are used interchangeably for the suppliers of raw papers, lacquer and glue etc. The chapter starts with a description of the relevant details of a media-effective recall, a summary of contractual and other legal relationships of any kind of all business operators within the packaging chain and will examine material defect liability. This chapter accommodates results of my research that have already been presented at international conferences or published in scientific journals (see Juterzenka & Heupel, 2014, 2015).

### 8.1 MEDIA-EFFECTIVE RECALL ACTION

Founded on the contractual relations, who will be outlined in general, two dreadful scenarios for damage claims due to recall actions will be presented. After a food manufacturer has circulated his products and articles on the market, through instrumental analysis, (for example, a consumer safety organization like "Food Watch", it is strongminded that traces of mineral oil or non-evaluated (therefore considered as toxic) substances from the whole packaging have moved into the foodstuff, or that substances that endanger human health are found as well. Food Watch makes a large campaign and it ends up in all daily newspapers and news.

Nevertheless, in both cases, the food producer, brand owner or retailer of private label recalls his delivered products from the point of sale. Consequently, the company suffers massive financial losses and will claim compensation from one of the echelons within the PPSC. The marketer demands indemnity, the final customer might suffer damages and will call for compensation too. These demands will still be reassigned to the packaging manufacturer. Food manufacturers take back the goods and claim compensation (lost profits, recall costs, compensation for

damages to the trade and the waste disposal of the product)<sup>99</sup> from the supplier of the packaging (Hartwig, 2012, p.6). National surveillance authorities will respond to that incident because they see themselves exposed to public interest. The authority also draws samples. The authority comes to the same conclusion as Food Watch<sup>100</sup> and initiates criminal proceedings. The criminal measures may be established against all echelons of the packaging chain, because the authorities may have no idea, who is exactly responsible (Baumann, 2010, p.10).

Resume: With this scenario in mind, retrace-ability is now possible through the declaration of conformity, which is narrowly knotted to the liability of the manufacturer. Assuming that in the above described situations a liability of the packaging manufacturer is not agreed due to the nonattendance of a warranty declaration, a liability under §§437 ff. BGB can come into consideration. Here the food product manufacturer can lodge a claim against the packaging manufacturer for additional delivery, avoidance, as well as compensation or withdraw from the contract entirely. All claims due to defects of the manufacturer of food products assume that the produced and delivered packaging is in fact defective in accordance with §434 BGB: (1) liability of a packaging company; (2) component supply chain; (3) packaging manufacturer and grocery producer; (4) merchant and customer and (5) possible legal consequences.

A material defect is given when the actual state of the packing does not correspond to the contractually agreed on condition. In this case the question to be answered in an investigation is whether a quality agreement was signed among the packaging producer and the manufacturer of food products. If such a contract has been closed and signed mutual by both parties, it is now the sole ground for target condition, in conformity with §434 Abs.1 S.1 BGB. A quality agreement is in place when the content of the sales contract obligates the seller to deliver or sell the packaging in a specific condition. A description of the condition is sufficient. Both parties can also enter into an "implied" understanding of the condition of the product without a specific declaration (Koch, 1995, p.29). An example of this kind

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<sup>99</sup> The German food law prohibits that once delivered food is withdrawn back and reprocess again.

<sup>100</sup> Foodwatch is an independent, non-profit organisation. The NGO reports food-industry practices and misleading advertising the interests of consumers.

is while the supplier pronounces the form of the product and the buyer, evident to the seller, makes his purchasing decision based on this description, or if the consumer describes to the supplier which conditions he expects from the product and the seller then sells the product without providing any additional explanations (Saenger et al., 2012, §434 see recital 8). If in the described scenario the packaging is not in the state pronounced in Art 3 EC 1935/2004, it constitutes a material defect according to §434(1) BGB, because the real condition of the product is not synonymous with the declared responsibility according to Art (3) Abs.1 EC 1935/2004 of the declaration of conformity.

This legal situation also applies, when toxicologically non-evaluated substances migrate from the packaging into the food product when the health safety of the substances has not been systematically proven, for the reason that in both cases the condition of the packaging is unequal to the condition that was agreed to in the declaration of conformity (Hartwig, 2012, p.13).

#### **8.1.1 Claim to supplementary performance**

If, as in the described scenario, the manufactured packages are defective, the producer of food products can, in accordance with §§437 (1), 439 BGB, demand the elimination of the defect, the so-called subsequent improvement. This is not possible in this instance because the packaging has already been printed and manufactured and a removal of the used inks, papers and glues is technically not possible. In addition, the subsequent improvement is not a choice in conjunction with §275 (1) BGB because [*"a claim for performance is excluded to the extent that performance is impossible for the obligor or for any other person."*] It is also possible however, that the marketer demands the renewed delivery of packaging free of defects (see §439 (1) BGB). In this scenario, the packaging manufacturer has to deliver to the food product manufacturer packaging free of defects, and is subsequently in charge for all supplementary costs: [*"The seller must bear all expenses required for the purpose of cure, in particular transport, workmen's travel, work and materials costs"*] according to §439 BGB.

On the other side the packaging manufacturer can demand the return of the defective packaging or is responsible for taking back the defective packaging if asked to do so by the manufacturer of food products. If the supplementary performance (new production!) of the packaging without the defect cannot easily

be accomplished by the packaging manufacturer or necessitates a costly redesign of the production process, he can refuse the supplementary performance, because it creates for him disproportionately high costs and expenditures in accordance with §439 Abs. 3: [“Without prejudice to section 275 (2) and (3), the seller may refuse to provide the kind of cure chosen by the buyer, if this cure is possible only at disproportionate expense.”]

### **8.1.2 Withdrawal from the contract**

If the adequate period of time for supplementary performance demanded from the manufacturer of food products has expired and if the packaging manufacturer refuses supplementary performance, the food product manufacturer can cancel the contract following §§437, (2), 323, 440 BGB, and can request the reimbursement of the purchasing price by return of the defective packaging to the manufacturer. This is an option when the food product manufacturer no longer has an interest in the cooperation with the packaging manufacturer. This case does not rule out the right of marketer to demand compensatory damages linked to §325 BGB: [“The right to demand damages in the case of a reciprocal contract is not excluded by revocation”].

### **8.1.3 Appropriate reduction of the price**

As an alternative to the withdrawal from the contract the food product manufacturer can claim a proper discount of the purchasing price according to §§437(2), 441 BGB. It can be assumed however, that the food product manufacturer does not have the intention to gain a reduction in price and at the same phase place a defective packaging (endangering human health or toxicologically not-evaluated substances) into the market in accordance with the Framework Regulation EC 1935/2004.

### **8.1.4 Claims of damages**

Dramatic significance can be applied to the option the food product manufacturer has towards the packaging manufacturer to demand damages for defective packaging. Here it is essential to distinguish between [“damages instead of delivery”] according to §§437(3), 281 BGB and [“damages in addition to delivery”]

according to §§437(3), 280 BGB. Damages instead of delivery is a reimbursement for the worse delivery of the packaging manufacturer, i.e. when an acceptable period for supplementary performance was not kept or the packaging manufacturer refuses the supplementary performance in accordance with §§440(1),439(3) namely disproportionately high expenditures and costs for supplementary performance.

It can be economically dramatic (threatening the livelihood) for the packaging manufacturer when damages are demanded in addition to the delivery in accordance with §§437(3),280 BGB. From the point of view of the food product manufacturer the consequential harm caused by defects can include lost profits, costs to recall the product (withdrawal from shelves), costs for transportation, storage and waste destruction of the goods. Depending on the individual case which is here not examined in detail, liability in damages from the end-user against the merchants (customers of the food product manufacturer) could be passed on to the packaging manufacturer in accordance with §823 BGB: [ *“A person who, intentionally or negligently, unlawfully injures the life, body, health, freedom, property or another right of another person is liable to make compensation to the other party for the damage arising from this.”* ]

Resume: A compensation of damage must presume under all circumstances that the packaging manufacturer is in charge for producing the defect in the packaging. Otherwise no responsibility exists in accordance with §280 (1) BGB: [ *“This does not apply if the obligor is not responsible for the breach of duty.”* ]

Following Bergmann & Hartwig (2007) the phrase [ *“...if...not...”* ] has a significant meaning, it encumbers the packaging manufacturer. In general, the party that claims damages has the burden of proof to indicate the liability and fault of the other party. Nevertheless, the choice of wording in §280 (1), BGB [ *“...if...not...”* ] this imply that, the burden of proof for safety has been reversed, the packaging manufacturer (plaintiff to the food product manufacturer) is already liable, when he cannot prove that he is not at fault. For the packaging manufacturer this means that a complete documentation without gaps of the whole business and production process has to be provided, to show acceptable legal evidence, that the packaging manufacturer is not liable for any defect. The magnitude of the fault is regulated in §276(1), BGB, when intention or gross

negligence on the packaging manufacturer (plaintiff) is proven: [*"The obligor is responsible for intention and negligence, if a higher or lower degree of liability is neither laid down nor to be inferred from the other subject matter of the obligation, including but not limited to the giving of a guarantee or the assumption of a procurement risk. The provisions of sections 827 and 828 apply with the necessary modifications (see §276(1), BGB)"*].

The §276 BGB corresponds with the DoC from the packaging manufacturer which is not and cannot be an interpretable warranty declaration from the point of view of the packaging manufacturer. Since therefore no warranty declaration exists, for damage claims intention or gross negligence has to be present. Intention means the will and sure knowledge regarding the occurrence of a goal-oriented success of an action. Since the packaging manufacturer however, trust through GMP regulations and documentation, that no foreseeable damage may occur, a deliberate criminal activity act can be set aside. A problem however, is presented by the set-off migration or migration of non-evaluated substances from the packaging. Here, at least some form of malicious intent could come into existence. The packaging manufacturer practiced GMP and showed compliant behaviour within the production plant and successive flow of production processes and carefully avoids or discards contaminated sheets with visible set-off from inks and lacquer traces on the inside of the stack of printing sheets or the paper role and in no way intends that this will end up on the market, willfully premeditated action can be ruled out.

The packaging manufacturer however could be charged with negligence. According to §276 (2) BGB negligence is the case that [*"... a person acts negligently if he fails to exercise reasonable care."*] This charge is fended off through the good manufacturing practice based on GMP Regulations which ensure the actions of the packaging manufacturer are subject to an objective obligation to exercise due care. It remains to be discussed, if the packaging manufacturer could have foreseen and therefore avoided the negative situation when there was an adaptation of the GMP Regulations and the Framework Regulation EC 1935/2004.

The packaging manufacturer therefore acts carelessly, if the defect of the packaging was foreseeable as well as avoidable. An example of this is when dry noodles or breadcrumbs are filled directly into a packaging, the substrate and printing inks however foreseeably have a huge migration potential. For the



assumption of foreseeability, the general foreseeability of the damage is sufficient, the concrete causal connection is not predictable. If it were technically possible for the packaging manufacturer to avoid this foreseeable migration from substrate, printing inks, lacquers and glues in any reasonable way, the transfer of the substances from the packaging into the food products or animal feed could be avoided.

Under these circumstances the packaging manufacturer is acting carelessly and is therefore culpable. If an expert opinion however, came to the conclusion that with the present level of available technology and knowledge the migration is unavoidable, there would not be a liability on the packaging manufacturer and he would not be compulsory for compensation (Hartwig & Bergmann, 2007).

The packaging manufacturer in general receives a request for a packaging without having any information concerning the content (food product or animal feed) or any notice on the existence of a functional barrier for protection. If the animal feed or food product manufacturer exposes himself with contributory negligence, the result will be a drop in the claim for compensations in accordance with §254 (1) BGB: [*“ Where fault on the part of the injured person contributes to the occurrence of the damage, liability in damages as well as the extent of compensation to be paid depend on the circumstances, in particular to what extent the damage is caused mainly by one or the other party”*].

The food product manufacturer who suffered damages from the packaging manufacturer is partially to blame if he does not fulfil his responsibility to apply due care, which can be expected of a knowledgeable human being to prevent, damages and thereby causes the damages.

In accordance with the Framework Regulation EC 1935/2004 the one introducing the product into the market (food product or animal feed manufacturer) is not exempt from carrying out tests of his own regarding migration. He can however, free himself from the requirements to carry out tests himself by giving a detailed order to the packaging manufacturer with exact specification regarding the composition of the packaging (Westfahlen, 1997, §25, recital 42, cited in Bergmann & Hartwig, 2007).

At this time, the reasonableness of the extent of testing will not be debated, due to the requirement for expensive and short-term laboratory analyses. If the food product producer does not apply any required testing, he violates his

obligation to imply due care, for the reason that this case he actively, foreseeably assists in the development of a defect, therefore according to §254(1) BGB he is partially liable.

### 8.1.5 German Product Liability Law

With an eye towards consumer protection, the law describes the producer's strict and direct liability for damages follow-on from faulty products. Moreover, it is typically classified as indispensable and compulsory law (Westphalen, 1990, p.92). Apart from warranty to be claimed the German legislation implemented Council Directive 85/374/EEC into national German Law of Liability for defective products (ProdHaftG), this came into force 1990. A product in congruence with §2 ProdHaftG is each mobile article related to §90 BGB.

The preamble of the Council Directive 85/374/EEC states, that the legislator is summarising the issues concerning liability in a SC: [*“that all producers involved in the production process should be made liable, in so far as their finished product, component part or any raw material supplied by them was defective, whereas, for the same reason, liability should extend to importers of products into the Community and to persons who present themselves as producers by affixing their name, trade mark or other distinguishing feature or who supply a product, the producer of which cannot be identified”*] (see Council Directive 85/374/EEC, p.1).

Defectiveness of a product is defined as fault of construction, of engineering or of documented instructions and is to be judged at the stage of its market kick-off regarding to Art.6 of Regulation 85/374/EEC. This leads to two deductions: (1) the later promotion of a renewed, improved article does not cope the imperfection of the former version; (2) later awareness regarding product security based on surveillance and aftermarket launch, do not adjust the article as safe.

This examination shows that there is no alternative to a recall according to §44 Abs.1 and 2 LFBG, these products are deemed to be withdrawn. According to §1 Abs.2S2 ProdHaftG the producer shall not be liable. It may also be expected that the defect be created during the phase when the product was given into the flow of circulation or it came afterwards into existence, through transportation, warehousing and the shelve-life in the markets. This unprecedented risk potential may be covered by the producer's general terms and conditions. The transfer of risk, delivery and acceptance are beyond the producer's sphere of influence.

The industrial sector of printing and packaging is not a distinguished representative concerning product-liability, boxes and displays are in general non-hazardous products, but not always risk-free as stated before. Toxic substances from ink, glue, toxicity of photo initiator and cleavage products may cause allergic reactions. The packaging company has the obligation to ensure the correct selection of materials, including risk assessment following the opinion of the court OLG Frankfurt in 1987.<sup>101</sup> A considerable criterion is the state of scientific and technical knowledge by the time while the manufacturer puts his products into the flow of circulation by §1 Abs. 2 Nr.5 ProdHaftG.

With regards to §1 (2) Nr.4 ProdHaftG the producer will not be legally responsible in the incident that the defect is in compliance with mandatory regulations issued by the public authorities. By the time of writing the BfR Recommendation XXXVI still states that recycled fibres and pre-consumer papers are permitted for food contact. To avoid legal grey areas large food corporations therefore try to protect themselves by issuing their own guidelines for packaging and printing as integral parts of the contracting (Huber, 2011,p.14). On a comparable basis §1Abs.2S5 ProdHaftG regulate that if the current state of technical and scientific knowledge was insufficient at the time when the manufacturer put the product or article into circulation. §1Abs.4S.1 ProdHaftG states that the plaintiff embraces the burden of proof for the defect of the product, damage and causation.

In contrast to this, the defendant has to demonstrate disclaimers and limitations to liability. The producer is able to establish proof based on knowledge and supporting documents already available in his sphere. In simple words, claims on product liability by §823 Abs.1 BGB are founded on the violation of the legal duty to take care, by means tortuous liability in fact of negligence or intention. The legislation which has become law with §1Abs.4 ProdHaftG reversed the proof of burden as well. The producer is already liable when he cannot demonstrate to be free of fault. For easing the burden a wide-ranging documentation without gaps has to be in place, of the whole business and production process, to show acceptable legal evidence.

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<sup>101</sup> OLG Frankfurt, NJW-RR 1987, p.1386 and see Jordans et al.,2009, p.57.

## 8.2 ASSESSMENT OF THE SITUATION

Since 2009, mineral oil is known to migrate into food and feed. The issue came into existence due to the research and studies and published scientific literature by Grob (2009), from the Cantonal Laboratories in Zurich. He has detected in unprinted, recycled carton 300-1300 mg per kilogram of mineral oil (Biedermann & Grob, 2009). The primary source of particulate pollutant inputs that could be identified was printing inks used for printing newspapers. Additional transitions from mineral oil to food have been confirmed when the printing ink on the packaging contained mineral oils too. Highlighted by the media<sup>102</sup> this issue was resonated and recommended for discussion in politics.

As shown in chapter 7 the migrating group of substances where MOSH, MOAH and derivatives. Mineral oil fractions encountered in very complex chemical compositions, occur in carbon chains of variable size and broken in unequal pieces, which have a characteristic behaviour of MOSH, and MOAH. The continuous intake and absorption of smallest quantities of mineral oil is of toxicological concern. Toxicology specialists do expect and assume that the accumulation of MOAH is of potential carcinogen concern, but now there is no evidence to indicate and conclude that in food and feed detected MOAH deal with cancerogenic substances (Bergmann & Hartwig, 2013, p.297).

According to the studies, findings and scientific papers of Biedermann & Grob in 2009 the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) addressed a law bill towards several industrial associations within the packaging supply chain. The 22<sup>th</sup> legal amendment of the Foods and Commodities Act (LMBG) was introduced, specifically the Foods and Commodities Ordinance (BedGgstV), the expected German Mineral Oil Ordinance (Goldbeck & Lenz, 2011,p.33, Bergmann & Hartwig, 2013, p.298). In the draft a hard limit was given. It may be expected that lawyers with no chemical, technical and economical expertise, who did not know what was feasible in practice, designed it: A specific

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<sup>102</sup> Mineralöl in Lebensmitteln. German TV, Channel ARD: Plusminus from 02.11.2010, Mineralöl in Lebensmitteln: Aigner will Giftfarben verbieten, „Schwarz auf Reis“. Öko-Test-Magazin, September 2010, p.14-21, „Keine runde Sache“ Stiftung Warentest, November 2010, p.1824, <http://www.spiegel.de/wirtschaft/service/>, last access: 13.02.13.

migration from packaging into the foodstuff should not be detected<sup>103</sup>. The entire packaging system as a whole should be ruled by a value limit, a sum parameter: the amount hydrocarbons having a carbon number of C<sub>10</sub> to C<sub>25</sub>. The sum parameter shall not go beyond 0,6mg per kilo foodstuff. The law bill's transition period before enforcing was limited by the end of two years.<sup>104</sup>.

Nevertheless, in its recent form the law bill provide the impression of being a rush job, it does not recognise the diversity as well as complexity of the subject matter, which may demands interdisciplinary examination. It may be expected that the law bill's approach might be not workable (see Juterzenka & Heupel, 2014, 2015).

The overall quantities limit laid down by law bill are defined not to be with the foodstuff but solely defined per se as overall quantities referred to the packaging itself. If an analyst detects in foodstuff a C<sub>24</sub> hydrocarbon chain (MOAH), he cannot determine whether this is a carcinogenic molecule or it is a fragment of a hydrocarbon chain of NOAH from hazelnuts in cereals, a part of a natural resinified wax of an apple peel or lubricants of a tractor or combine harvester. It also could be POSH, a fragment of a long hydrocarbon chain of polyethylene (PE) from the inner pouch of the cereal's consumer packaging. The "Forrest of Peaks" is the tag of the analytical and legal misapprehension<sup>105</sup>. The recommended answer for this predicament may be given by Bergmann & Hartwig (2013, p.299). They argue that it could be meaningful and compatible with the law bill's idea to establish the amount of permitted maximum of the overall content on the food itself.

The law bill respondents also criticize the maximum permitted levels of migrants. The establishment of harmonized maximum levels does not base on reliable facts of recent and most accurate scientific findings and realistic assessment of the risk. The base of evaluation is the toxicological worst case

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<sup>103</sup> The result "not detectable" means 0,10mg per kilo foodstuff in sum of aromatic hydrocarbons having a carbon number of 10 to 25.

<sup>104</sup> The German BMELV has previously issued on 14<sup>th</sup> December 2010 a national provision, the 21<sup>th</sup> legal amendment of the Foods and Commodities Act (LMBG), the so called Ink Ordinance, a separate national approach.

<sup>105</sup> For further reading see Bergmann & Hartwig, 2013, p.299; Dietrich 2012, p.4; Thiel 2012, p.71; BfR, 2012; p.2.; Harling et al., 2012, p.182; Kersten 2011, p.2.

scenario as stated before: migration by no means or 10ppb limit. This supreme stringent parameter is not settled on objective grounds. Bergmann & Hartwig (2013, p.299) draw attention to the recommendations of the German BfR, that the intake of hydrocarbons, linked to a bodyweight basis, may be higher.<sup>106</sup>

In view of the uncertainty of some of the factors, which influenced the DIT of hydrocarbons, especially the necessity of having reliable underlying data, the uncertainty concerning the appraising of evidence still remains.

As stated in sub chapter 7.4.2 technics as well as methods are accessible, but recent, comparable results are not reliable. However, one cannot fail to agree that the compliance with legislative rules and provisions cannot be verified whether in adapting self-regulatory practices or related to the official controls. On or after a regulatory point of view or related policy perspective, the freedom of evidence must be allowed (Hartwig, 2012). Again high uncertainties remain, because if it is difficult to prove concretely. To reduce the scope of uncertainties the BfR is developing a corresponding, uniform evaluation approach. The method, which although perfectly legitimate, has not been validated or subjected to tests with large numbers of samples in different laboratories.<sup>107</sup>

There is no let-up in the chain of serious incidents of uncertainties, the origin of migrants and NIAS are still unknown or migration cannot be clearly demonstrated or precisely determined. High volatile substances may be transferred by diffusion via the gas phase right through the primary packaging into food and feed. It may be stated and expected that mineral oil stems from various sources. Various known and unknown risks, uncertainties and other factors could lead to the representative assessment of the state of affairs that the widely distributed spread of mineral oil in food and feed is ubiquitously: (1) primary packaging, (2) protective packaging, (3) transport packaging or tertiary

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<sup>106</sup> The daily intake of saturated hydrocarbon compounds from C<sub>10</sub> to C<sub>16</sub> may be tolerated. For further reading should be referred to the BfR Protocol 7. Sitzung der BfR-Kommission für Bedarfsgegenstände - Protokoll vom 14. April 2011, page 10 and BfR, Kantonales Labor Zürich: "Messung von Mineralöl Kohlenwasserstoffen in Lebensmitteln und Verpackungsmaterialien – Analysenmethode, p. 7).

<sup>107</sup> For further reading see BfR, Kantonales Labor Zürich: Messung von Mineralöl. Kohlenwasserstoffen in Lebensmitteln und Verpackungsmaterialien – Analysenmethode.

packaging, (4) risk of cross-contamination within the packaging supply chain, (5) risk of cross-contamination during shelf life, (6) significant background level in food due to crop cultivation and (7) naturally occurring substances.

Having regard only to the packaging supply chain, a substitution of recycled fibres to virgin fibres cannot be taken into account. Wenzel (2012, p.42) showed that the majority of FMCG and foodstuff is packed up to 75% in recycled materials. The complete compensation for virgin fibres instead of recycled fibres has a result of maximal resource requirements for wood, water and energy; this is an economic and ecological nonsense.<sup>108</sup>

At least initially, the law bill is a national move that may harmonise regulations in horizontal EU legislation and it may increase them. By now is the separate national approach is a danger to the goods or international supplier relations within the EU. There can be a risk that national regulation in Germany could lead to isolation from the EU market for packed food and feed (see Juterzenka & Heupel, 2014, 2015).

If these yardsticks are applied British FMCG are largely non-marketable at the present time, if they have been made by conferring to the guiding principles and recommendations for action by the British FSA. It is not without reason to demand a common, uniform European solution, apart from of the diversity of interests (Bergmann & Hartwig, 2013, p.300; Thiel, R. 2012, p.16; Horst, M. 2010, p.3).

Summarising, it has to be acknowledged that the law bill will not be a quick and smooth solution. The Swiss authorities demonstrate a careful handling in the past and a strictly controlled process with their ink ordinance. Swiss law only affects Switzerland, but it has drawn attention the complex issue of migration and to the underpinning causes.

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<sup>108</sup> This deduction is according to the official statement of the German Federal Office for Environment addressed to the BLL (22.09.2012), cited in Bergman & Hartwig 2013, p.300.

### 8.2.1 Developments and consequences

However, it was not possible to promptly implement the law bill measures due to massive criticism from packaging business and industry associations. Due to this result, a revised draft agreement was kept in desk until the scientific-based study project provided appropriate knowledge for decision support<sup>109</sup>. In order to make clear if printing inks and printed packaging materials are in compliance with Article 3 of Regulation (EC) No. 1935/2004, a survey about the amount of migration of ink components hooked on foodstuffs was conducted on the German market. It had to be clarified if certain kinds of printing methods, inks or foodstuffs are particularly disputable. The manufacturers or their suppliers within the packaging supply chain were asked for information about the layer composition of the packaging materials, printing conditions and the formulation of printing inks. The samples were analysed for migrating substances with GC with FID as shown in sub chapter 7.4.2. On the basis of the migration results a risk assessment was carried out. The main detected migrants are mostly high boiling solvents by name of mineral oils.

The valuation of the significance of the study should be restricted. Bergmann & Hartwig (2013, p.301) argue that the selection of samples has been done in April 2010. In the meantime low migration inks free of mineral oil and based on non-volatile or polymeric photo initiators respectively are available, so at present, the pollution and the scope of the impurities, NIAS and mineral oil migration cannot clearly be indicated. Despite all the criticism regarding the government's draft law to the Ink and Mineral oil Ordinance it should be further pursued. As mentioned before a Europe-wide regulation should be grounded on the roadmap of the EU Commission<sup>110</sup>. It is may be possible in the years yet to come to solve this problem

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<sup>109</sup> The final report of the scientific study about the migration of waste paper is available in German language from the Federal Agency for Agriculture and Food (BLE) funding code 09HS007, available at the internet at [http://service.ble.de/fpd\\_ble/index2.php?detail\\_id=1081&site\\_key=145&stichw\\_suche=09HS007&zeilenzahl\\_zaeher=1](http://service.ble.de/fpd_ble/index2.php?detail_id=1081&site_key=145&stichw_suche=09HS007&zeilenzahl_zaeher=1), last access at 20.05.2013.

<sup>110</sup> For further reading see EU SANCO - E6 Initiative Food Contact Materials - Specific provisions for materials other than plastics – implementing measure, published 07/2012.



at the European level, but faced with the extensive media coverage<sup>111</sup> the BMELV can or will not deal with it at the general European level at all<sup>112</sup>.

Notwithstanding from the state of affairs stated above the subject of liability ascends in the context of migration. The scope and impact of liability has been examined in the beginning of chapter 8 before. Indication as well as instrument of the horizontal European legislation is the German Food and Feed Code (LFGB). Substantial for the PPSC as an echelon-network within the foodstuff and feed supply chain are §2 (6) with the description for articles of consumption, as well as §§30, 31. Here are clear words and intentions from the lawmakers, but on the foundation of present technical and toxicological knowledge being ubiquitous, a considerable element of uncertainties still exist: no reliable information exists about whether packaging materials made of waste paper are to be applied for foodstuff materials and articles that release substances of MOSH and MOAH, which could endanger human health. Scientific grounded assessments and related evaluations are diametrical as stated in sub chapter 7.4.3.<sup>113</sup>

Considering the above, Bergmann & Hartwig (2013, p.302) widen and deepen the debate with the question, if migrants of mineral oil are suitable substances to bring about a degradation in the organoleptic appearances. An intolerable change in the composition of the foodstuff is for certain, if a substantial change makes food unfit for human consumption, as provided for in Article 14 (1) b) of Regulation EC Nr. 178/2002, Basic Regulation (BasisVO). In this framework, it must be noted that the Basic Regulation demands a contamination of foreign substances to become "unacceptable" for human consumption. As stated in sub chapter 7.4.1 a pre-load of food with hydrocarbons could be expected that have their origin in nature itself or due to external environmental influences and local

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<sup>111</sup> Consumer awareness by publications of "Stiftung Warentest" from November 2012 about the issue that Advent calendar filled with chocolate were containing impurities of mineral oil. See also BfR 41/2012 "Mineral oils are undesirable in chocolate and other types of food". For further reading see investigations conducted by the Stiftung Warentest from 24.03.2011 (noodles) and 05.11.2010 (dumplings).

<sup>112</sup> Press statement of the BMELV from 29.11.2012, p.2 concerning the Mineral Oil and Ink Ordinance shall [*"as soon as possible to get under way by immediately practical implementation."*]

<sup>113</sup> See German BMELV scientific-based study project for decision support, the British SFA" 4-year rolling programme of surveys on chemical migrants".

cultivation conditions. They affect the value of the blank sample and conduct to improper results.

In light of uncertainty that predominate authorized methods of detection, the often inaccurate evaluation of the scientific data and the extent of scientific uncertainty, the current situation regarding the migration of MOSH and MOAH it can be summarised, that MOSH and MOAH in recent scientifically proven quantities do not lead to a status “unacceptable” for human consumption (Bergmann & Hartwig, 2013, p.302). In the light of uncertainty which may influenced the wording of the BfR Opinion and the conclusion of the decision making project it just merely says [“... *undesirable in any type of food*”].<sup>114</sup>

These reports contain many examples of ambiguous and infelicitous wording like “undesirable”, because there is still a lack of robust assessment regarding toxicological studies and a validated method of analysis. Some official authorities offer a completely different standpoint. Bergmann & Hartwig (2013, p.302) report that some public investigations offices articulate the view that the detection of MOSH and MOAH in foodstuffs would be in violation of the principle of Art. 3 Basis Regulation EC Nr. 178/2002.

### 8.2.2 Business processes of a focal company

Mutual trust is expected to be the key issue regarding the success of cooperation in the supply. In the past, they only considered the market and the hierarchy as convenient coordination forms. Meanwhile, however, the paradigm has changed, cooperation and networks for many businesses are more advantageous. Cooperation is to be a form of coordination between market and hierarchy (Siebert, 2001, p.9f).

Kaluza et al. (2003, p.10) remarked that with the help of mutual coordination processes, benefits are optimized, which result in lower production, logistics and in addition transaction costs. The delegation of tasks and the division of labour

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<sup>114</sup> The BfR evaluates the results of a study conducted by Stiftung Warentest: “Mineral oils are undesirable in chocolate and other types of food”. See BfR Press Release 41/2012, from 28.11.2012, page 1. See also the final report from the Federal Agency for Agriculture and Food (BLE) funding code 09HS007, page 191.

between echelons of the SC must be crafted and executed. According to Seuring (2001, p.50), supplier pyramids or supplier networks come and go. A typical example is the use of system suppliers, which in turn coordinate other parts suppliers.

The focal company expects the system suppliers to provide goods under fulfilment of contractually specified criteria, such as type, quality, quantity, place, time and price. Furthermore, the focal company strives to achieve a minimization of the "relationship costs" (Kaluza et al., 2003, p.10). These include the performance-based remuneration of the supplier, setting minimum purchase amounts and the necessary monitoring and transaction costs. The system supplier in turn is committed to provide the agreed services with the least possible effort (burden of work) to achieve and carry out a risk hedge.

Lambert & Cooper (2000, p.69) conclude the relevant actions for the focal company, criteria for delegation are: the complexity of the product, the frequency of purchase, the number of available suppliers, access to resources, the meaning of a single part for the whole product and the number business process throughout all phases of the value-added chain. In addition (ibid, p.74-75) indicates that four essentially various kinds of managed business process relations can be recognised between and within the members of a supply chain:

(1) Managed business process links are relations that the focal company determines as vital to participate and must be managed; the focal corporation is dynamically involved within these business ties. Affected are mostly companies, which are downstream straight near by the focal company, but also other companies like service providers, which have an extraordinary tactical significance. Within the supply chain illustration drawn in figure 14, the managed process links are defined by the thickest solid lines as tier 1 customers and/or suppliers (ibid, p.74).

(2) Monitored business process links are relationships that are not so thoughtful to the system head. It is sufficient here; if linked upstream and / or downstream companies take over the coordination. The focal company confines itself to monitor and occasionally to audit the processes. The thick dashed lines in figure 14 indicate these processes (ibid, p.75).

(3) Not-managed process links are not critical enough to spend company resources for monitoring. The focal company completely trusts the further echelons to accomplish this suitably. The thin solid lines in figure 14 indicate the not-managed process links. A marketer has several potential suppliers for cardboard at hand. The focal company will not vertical integrate these links afar the cardboard manufacturer. The only demand is certainty of supply (ibid, p.75).

(4) Non-member process links occurs often in practice. A supplier of the focal company is at the same time also supplier in a competitive supply chain. So there are processes in which echelons and outside suppliers of a SC are involved (ibid, p.75).

This particularly problem occurred for the supply chain when e.g. limited resources between multiple supply chains are split. It appears, therefore, that this form of business can have a substantial influence on the outcome of the entire supply chain. The thin dashed lines in figure 14 illustrate examples of non-member process links.

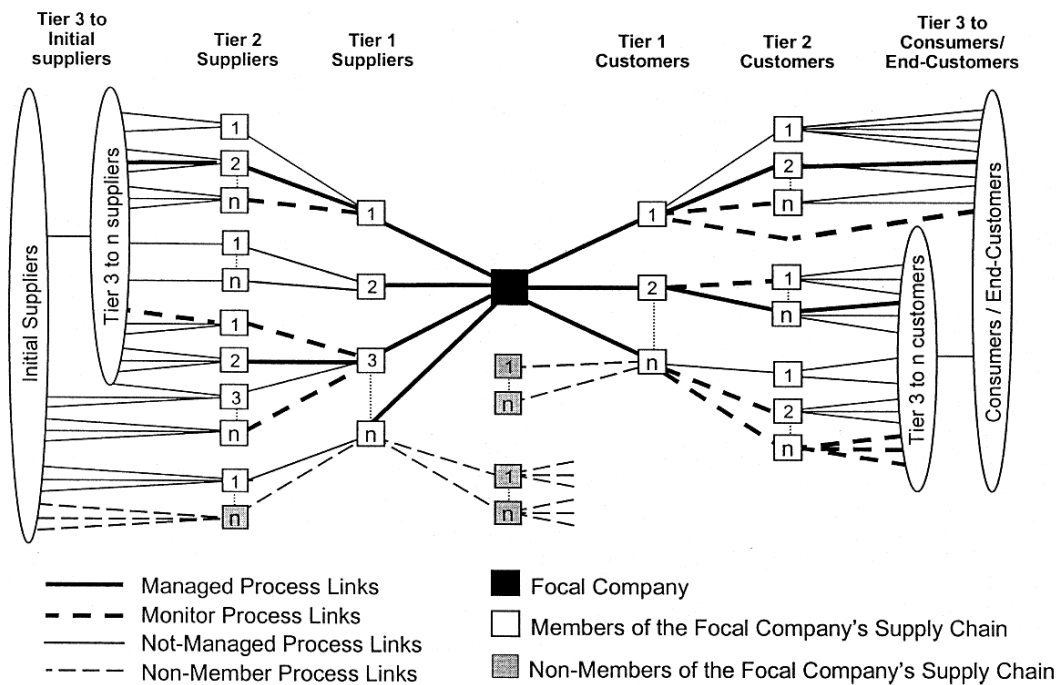


Figure 14: Types of intercompany business process links, Lambert & Cooper (2000, p.75).

Kaluza et al. (2003, p.31-32) acquire Lambert & Coopers (2000) characteristics and enhance or rather expand their view by adding additional features with which agents can affect results:

(1) The share of value creation added to the product. The first criterion is the effort completed by the agents as a share of the value of a product. The less the share of the agent's level of influence to the value that have been added towards the product, the shorter his influence to impact the principal earnings (ibid, p.32). In addition to the value added the strategic relevance of the product must be consider too. If it is a "make or buy" decision by the focal company, the case of outsourcing and the resulting decreasing manufacturing depths increases the dependence of the principal. The agent can affect the results very strong here (ibid, p.32).

(2) Complexity of the supply parts, here it may be assumed that for very complex assemblies the agent's added value is huge. Furthermore, if the production required the use of special assets, capacities and resources it is appropriate to look at transaction-cost theory considerations (ibid, p.32). In case of low asset specificity and uncertainty within the marketplace, it is the optimal form of coordination to perform, where the transaction costs are lowest. With increasing specificity and levels of uncertainty, cooperation and hierarchy displace the market as a cost-optimized form of coordination (ibid, p.32).

(3) R & D performance. The third criterion depends to the ratio from R & D services in relation to the goods. A large proportion of R & D performance and services requires a corresponding level of skills, knowledge and resources and is significantly related to contribution of value creation. Thereby the supplier (agent) directly affects, the innovative potential of a product or good and thus determines the market success on behalf of the principal (ibid, p.33).

(4) Access to critical resources or assets<sup>115</sup>. The fourth criterion concerns access to critical, technical or confidential resources like barrier coatings or polymers to prevent migration. This is an essential prerequisite for the principal's success. Upstream echelons in the SC with remarkable trade relations for rare

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<sup>115</sup> Assets can be substantial, e.g. plants or machines as well as human capital, knowledge, working time or management knowledge.

materials and / or exclusive access to asset technologies have a direct influence on value creation (ibid, p.33).

(5) Other specific skills. The fifth criterion relates to specific assets like commercial, technical or organizational skills. An additional typical example can be the systematic further development of a commodity supplier at the market towards a module or system supplier (Wildemann, 2001, p.90f). A module supplier systemizes his vertical range of manufacture, a skilled and trained sales- and workforce with a network of reliable sub-suppliers. They also take responsibility for all services provided by upstream echelons. It may be asserted, that module suppliers shorten the range of market related commodity suppliers, and this also decreases all efforts for coordination and installation costs, but also lowers transaction costs (ibid, p.33-34).

Module suppliers are further characterized by providing an independent R&D service, in performing this service they also tie up subcontractors (Kaluza et al. (2003, p.33). As a result of dependency from module suppliers the amount of switching cost rises.

If the agents, value adding results are predictable and not influencing the integrity of entire supply chain the switching costs are low for the principal. According to Porter (1995, p.33), switching costs are to be understood if a contractor or contracting party makes a change of institutional arrangements like changing subordinated suppliers. With increasing influence of the agents and their significance for the principal, switching costs are rising higher.<sup>116</sup>

To optimise and improve the entire value chain along the packaging supply chain, it is mandatory to generate long-standing relations. In particular, the behaviour of all echelons must be synchronised so as to maintain the structure of their alliance and the bidirectional responses between them. The focal company has to deal with existing behavioural uncertainty and mistrust (Kaluza et al., 2003, p.13).

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<sup>116</sup> Within the paper based packaging supply chain these module suppliers can be classified as print-finishing companies which offer value added printing or converging for boxes and displays' like spot varnish, hot foil stamping, foiling, large format printing and co-packing.

## 9. EXPECTATIONS

Chapter 9 deals with the expectations due to the analyses stated before. It is unusual that in an internal market a law bill creates problems that assume a peculiar state of suspension. From early findings to final toxicological margins of exposure for public health protection, both regulations, Ink Ordinance and Mineral Oil Ordinance, have been sitting idle for nearly four years. This element of uncertainty brings us to the question of whether the regulations will ever come into existence and effect. Will there be an impact on fibre-based packaging? The expectations set down in this section have previously been presented at various international conferences, lectures or published in scientific journals (full peer review), see subchapter 13 and Juterzenka & Heupel, (2014a,b, 2015).

### 9.1. A EUROPEAN RESPONSE OR SPILL OVER?

Since the first disputes in 2010, all stakeholders and involved parties would prefer a European-wide approach. Under the light of these concerns, DG SANCO<sup>117</sup> concludes that, from a legal perspective, there is no motive to give priority towards the German national approach, and no need or interest for regulation (Matissek, 2014, p.11):

(1) The very most fundamental, underlying law relating to the safety of food contact layers and materials in the European Union is the Regulation EC 1935/2004. The overall spirit of Article 3 is deliberate because it deals with the subject of the diffusion of substances (migration) from food packaging materials into food.

(2) The GMP regulation sets out general requirement for contact layers to come into contact with food, and apply to all the categories of materials identified in Annex I of the Framework Regulation. It also applies to combinations of those materials and articles, to recycled materials and articles used within those materials and articles. It therefore clearly applies to paper and cardboard and to

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<sup>117</sup> Directorate General for Health and Consumer Affairs.

multilayer structures containing paper and cardboard. One of the most significant elements in the GMP Regulation is the requirement that starting materials must be selected to comply with pre-established specifications.

(3) To shorten the negative impact of impurities and contaminants in food the EU took measures. Council Regulation (EEC) No 315/93 states in Article 2: [*“... food containing a contaminant in an amount which is unacceptable from the public health viewpoint and in particular at a toxicological level shall not be placed on the market...”*], and furthermore, [*“... contaminant levels shall be kept as low as can reasonably be achieved by following good practices at all the stages referred to in Article 1”*].

(4) Regulation (EC) No 178/2002 safeguards the quality of foodstuffs determined for human ingesting and animal feedstuff. No foodstuff should be brought into circulation if it is hazardous. It shall be condemned if it is inequitable to be harmful to health.

The above mentioned regulations demonstrate the legally important aspect that national authorities are enforced on European level. They can act in conformity with existing laws or collective agreements or other jointly agreed arrangements: consequently, there is no need to act. The EU has only to consider whether there is opposition to EU law or follow-up at EU level. Member States are entitled at any stage set more rigorous thresholds in force. Only Austria has a recommendation published for the use of barriers and no other Member State has developed activities. For that matter the German BMELV fully acknowledges the need for a separate national approach. The EU Directorate SANCO has refused to start regulatory process. This decision may be for financial reasons or due to insufficient time and resource scarcity, respectively. It may be also estimated that they know what it means to regulate a ubiquitous substance with multiple use characteristics like MOSH and MOAH. Both the German and the European regulator may have one thing in common: and that is a “sit and wait” attitude. The



thought-provoking problem is, nevertheless, why do they agree on this issue? Why does the industrial branch behave like a boiling frog?<sup>118</sup>

From a German perspective, the proposal on mineral oil in food packaging is a national approach - though a common approach would be more effective. Seen in an international context, Swiss authorities regulate the characteristics of inks used for food packaging, Austria, contrarily, gives just a non-legally binding recommendation. The date of the expected German paradigm change may be subjected to the bargaining power of buyers or bargaining power of customers; on the other hand by threats of substitutes such as specially-sealed flow wrapping packaging versus paper based packaging.

Is the fixed date of minimum durability of foodstuffs before the launch of the transition period, nevertheless the expected scenario will take place earlier, inventory and market clearances must take place before the end of the transition period. It may be assumed that this is the milestone for the late majority that will have been committed to new regulations. If laggards are still in the field, they may focus on leaving the market or may bear high costs to overcome market entry barriers in short time. The late majority and the laggards profit from the extra time of the transition period. Everyone else will be the losers like the innovators, early adaptors and early majority, they do not gain a first mover advantage. For that reason, the "sit and wait" behaviour may succeed (Juterzenka, 2015).

There is no need to regulate at European level, proper implementations of framework regulations and directives are in force, every EU member state may act due to public health. For Europeans this means that they must find responses and may reflect alternative courses properly because an "island solution" that might come into existence due to the possible change of the German market for FMCG. The EU internal market is a source of sound and competitively priced supplies, but

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<sup>118</sup> The "boiling frog" is a modern myth. The anecdote states that a frog put into a pot of hot water will at once jump out. However, a frog sitting in a pot of comfortable temperate water may stay there, even if the temperature is very slowly raised to boiling water, thus leading to the dying of the frog. Anecdotally it is said, that the frog cannot determine the slow linear increase in temperature, until it is too late to escape. The boiling frog syndrome is a warning towards complacency: a useful metaphor if one ignores the consequences of a negative change if that shifting took place gradually.

by now, one is subjected to design and execute a three-road strategy. At first, one can separate the marketplace for FMCGs into two subdivisions - i.e. an EU-wide internal market with or minus the presence of the German market - for the reason that there are no exit barriers except profits as well as economies of scales in production. Nevertheless, it can be presumed that the German marketplace for FMCGs is too huge to be dropped down, but that the extra effort unnecessarily increases the associated costs as well as sales menaces.

In contrast, food manufacturers as well as operators can adapt early and increase the range of future German paper-based packaging for FMCGs all over the EU. For this instance, two kinds of packaging quality might be in the market; and in fact, this hallmark of quality might not be recognised by the customer and might be not meaningful to sale. The consequences of the proceedings are a "lemon problem"<sup>119</sup>, the good quality will not do well do to pricing. At last, we can adopt that by equivalence to former sectorial crises accompanying economic restructuring, German regulations may impetus European jurisprudence.

The key assumptions stated directly above regarding the economic future of paper-based food packaging in Europe might lead to the question when it is time to jump out of the water like the "boiling frog"? Will there be a change of paradigm at EU level too? From the perspective of the assumption of the stated "lemon problem", it might be expected that early adaptors as well as the early majority will not prevail, in addition actors that perform a second mover strategy might will do so (Juterzenka, 2015).

## 9.2 SITUATION ASSESSMENT

The scientific assessment is alienated into twofold separate groups who claim different opinions concerning the carcinogenic potential of MOSH and MOAH. The British FSA study (FSA, 2011, p1.) brings the discussion to an end and concluded that the ["...*risk assessment on the findings from this survey and did not identify any specific food safety concerns...*"] and points out in addition ["... *that there is no need for*

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<sup>119</sup> This form of market failure is also described as the "Lemon Problem" according to Akerlof (1970): The Market for Lemons - Quality Uncertainty and the Market Mechanism. The Quarterly Journal of Economics, (84, 3) p.488-500.

consumers to change their eating habits with respect to food that has been packaged in virgin or recycled carton-board.“]. The European EFSA report outlines, that [“... foodborne MOAH with three or more, non- or simple-alkylated, aromatic rings may be mutagenic and carcinogenic, and therefore of potential concern...”] but [“... revisions of the existing acceptable daily intake for some food grade MOSH is warranted on the basis of new toxicological information...”] (EFSA, 2012, p.1). The BfR (BfR Opinion 008/2010, 2010, p.1) came to the final conclusion in its risk assessment that [“... there is an urgent need to minimise the migration of mineral oils to foodstuffs ...”].

The approved results to support risk assessment from official national or European authorities vary between identified potential concern, that today's opinion does not identify any specific food safety concerns, and that the human health is hazarded. At hand are no specific recommendations, because recent toxicological studies are untrustworthy as well as unreliable concerning chemical compositions. Regarded from these perspectives the scientific assessments conclude in uncertainty.

In the law bill a hard limit on migrations was given to residue limits for transition of hydrocarbons into food contact materials and articles that are produced done by the usage of recycled fibres: a specific migration from packaging into the foodstuff should not be detected. The entire packaging system, the entity of components such as inner liner, container, secondary container, folding box, closures, printings, labels etc. should be ruled by a value limit: the sum of aromatic hydrocarbons (MOSH) having a carbon number of C<sub>10</sub> to C<sub>25</sub> shall not exceed the certain value of 0,6mg per kilo foodstuff. The transition period was defined in the law bill to be two years. Products that had already been manufactured may continue to be in circulation until remaining articles in stocks are exhausted. As the only member of the European Union, Germany sets out a national provision, without having to wait for further analysis of the facts as established through the research and voluntary initiatives from industry (Thiel, 2014).

By its existing entity the initiative is a rush job and does not recognise the diversity and complexity of the subject matter, which calls for an interdisciplinary research effort (Bergmann et al., 2013, p.298).

A substitution of recycled paper fibres by way of virgin fibres cannot be taken into account. The bulk of FMCGs contains up to 75% recycled fibres (Wenzel,

2012, p.42). Following Thiel (2009, p.14) single use of virgin fibres will upsurge energy consumption up to six times. Water consumption will rise to five times and overall papermaking cost will rise to 130 percent. Better deinking technology for recycled pulp is another perspective, but these cleaning, deinking techniques shorten the amount of usable fibres up to 15-50% (ibid, 2009, p.8).

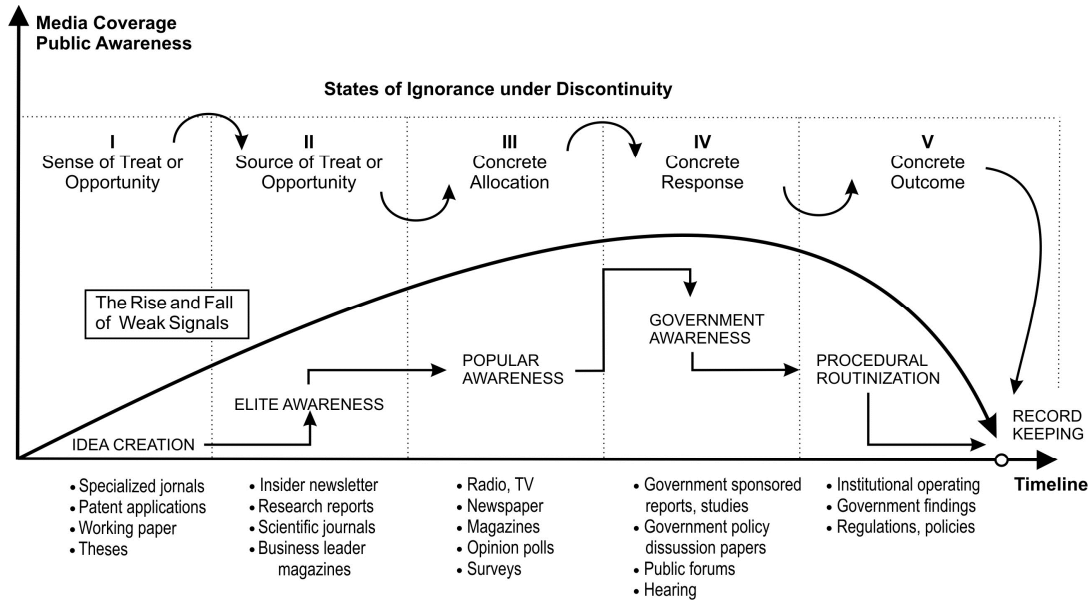
In the light of the surroundings of uncertainty regarding the suitable functioning of the PPSC, liability as well as limitation of liability of the supplier or retailer, may be pronounced as a “wait-and-see” attitude (Kam, 2004, p.190) as well as a [*“paralysis by analysis”*] situation (Harremoës et al. 2001, p.181). The [*“...political and economic fog of uncertainty”*]<sup>120</sup> makes it necessary to prepare and to arm a company to be able to reduce the response time to weak signals.

The courses of events have already reached a concrete outcome. Ansoff (1975) augured that a period of some years is usually between the stakeholder’s first awareness of unknown weak signals and implementing of a new behaviour-strategy. Due to these findings and deductions, the transfer of knowledge based on sources of information which are generally accessible and considered to be reliable aids in the improvement for recommendations in operative business. The first general expectation can be assumed as follows:

General Expectation 1: Due to the fact of clear and logical sequences of steps, the industrial branch of paper-based packaging supply chain as a whole is prepared for the ink and mineral oil ordinance yet to come.

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<sup>120</sup> Leslie Smith (Chairman of the BOC Limited, London), personal communication (cited in Ansoff 1975, p.24).



**Figure 15:** Media Coverage and Ansoffs (1975) states of ignorance, author's own graph as an extension of Hiltunen (2008, p.24) and Choo (n.d.), published in Juterzenka & Heupel (2015).

### 9.3 A PAN-EUROPEAN SOLUTION

From the time when the first disputes and debates in 2010 take place, all stakeholders and involved parties of industrial associations from raw material suppliers to the gatekeepers in retailing, all would prefer a pan-European solution. In the perspective of these requirements and considerations, the European DG SANCO<sup>121</sup> get to the point that, from a legal aspects, there is no need and reason to set priority towards the German national approach, there are no reasons (or interest) for new regulations (Matissek, 2014, p.11). The justification for that amendment might be in the perspective of the following enumeration (Juterzenka & Heupel, 2015):

(1) The underlying law concerning the safety of food contact materials in the European Union is the Framework Regulation EC 1935/2004 and is still in force.

<sup>121</sup> Directorate General for Health and Consumer Affairs.

The complete essence of Article 3 deals with the diffusion or transfer of substances (migration) from packaging contact layers into food and feed. It also calls for reliable proof that packaging will not pose a risk (ibid, 2015).

(2) The Regulation EC 2023/2006 on Good Manufacturing Practice (GMP) outlines already general requirements for food as well as feed contact layers. The rule relates to all groups of materials identified in Annex I of the Framework Regulation. It also applies to amalgamations of those materials and articles and to recycled materials as well as articles combined in compounds. Conclusion: One of the most noteworthy features in the GMP Regulation is the requirement that starting as well as raw materials in the flow of production must be screened as well as selected, to meet the terms of pre-established specifications. These former predicted specifications must grant compliance with the regulation applicable to it. It is already regulated; the rest should continue to be subject to national rules or as well as corresponding contract designs (ibid, 2015).

(3) Another manner of solving this problem is to shorten the negative range of contaminants to avoid risks to human health as stated by Council Regulation (EEC) No 315/93. This regulation gives shape to community procedures for contaminants and impurities. Article 2 states [*“... food containing a contaminant in an amount which is unacceptable from the public health viewpoint and in particular at a toxicological level shall not be placed on the market...”*], and in addition [*“... contaminant levels shall be kept as low as can reasonably be achieved by following good practices at all the stages”*] (ibid, 2015).

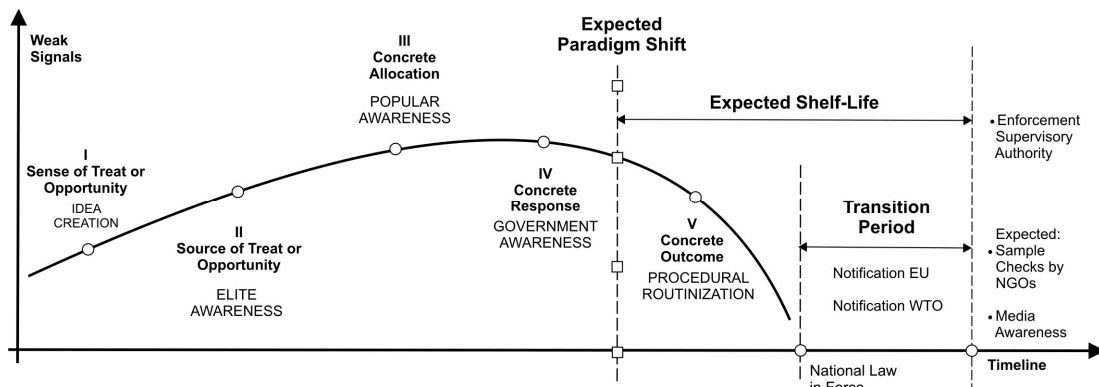
(4) Regulation (EC) No 178/2002 spells out the quality of foodstuffs intended for human consumption and farmed animals. They shall not be put on the marketplace if they are hazardous; they shall be condemned if considered injurious to health or unfit for human consumption according to [*“...reasons of contamination, whether by extraneous matter or otherwise, or through putrefaction, deterioration or decay”*] (see Regulation (EC) No 178/2002) (ibid, 2015).

The above-mentioned principles determine the legally significant issues that authorities might enforced on European level. These bodies can act in toeing the line with existing, enforced laws as well as directives or other jointly agreed legal arrangements: as a result, there is no necessity for legislative action. In case of need

and situation, member states are authorised at whatever time set stricter and rigours thresholds or parameters in force.<sup>122</sup>

The EU Directorate SANCO has rejected to establish a future regulatory process. This decision may be founded in financial reasons, insufficient time as well as resource scarcity. Nevertheless, it can also be expected that they have recognised before, what it means to try to regulate a ubiquitous share of substances with multiple characteristics corresponding MOSH as well as MOAH. The second general expectation can be assumed as followed.

General Expectation 2: In a first step we will not have a pan-European solution in form of an EC Regulation or amendment of applicable law. In adaption to scandals in meat production (BSE, scrapie, foot and mouth disease) Germany shall implement national regulations, if it will work proper, the EU can take into consideration to adopting it into European regulations.



**Figure 16:** The expected German change of paradigm related to Ansoffs (1975) states of ignorance, author's own graph, published in Juterzenka & Heupel (2014).

<sup>122</sup> Only Austria has a recommendation published for the use of barriers. For that matter the German BMELV fully acknowledges the need for a separate national approach.

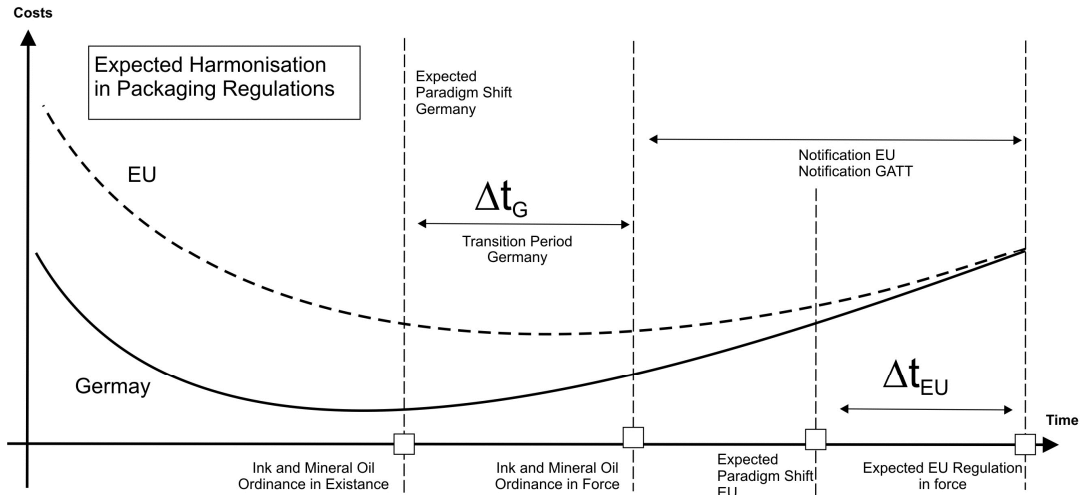


Figure 17: Expected German and EU Spill over (authors' own graph).

#### 9.4 A CHANGE OF PARADIGM

From a German standpoint, the law bill on packaging inks and the blamed spread of mineral oil is a national approach. In the international European context, Swiss authority bodies for example just standardize the characteristics and specifications of packaging inks, the ingredients of formulating of selected substances used for food packaging. Austria has only given non-legally binding recommendations in the meaning of GMP. The point in time of the expected German paradigm change might be exposed to the power of consumers, on the one hand the grocery business and on the other the bargaining power of customers. The initial weak signals of a future paradigm shift might be placed upstream within the PPSC, located by the suppliers of raw materials. A lot of raw paper manufactures are optimizing existing papermaking machines by now to improve their devices for suitable migration-preventing surface coatings. Ink manufactures, for example formulate by now low migration inks in a spirit of anticipatory obedience, before future law forced them. Concisely, upstream echelons within the PPSC developed and sheltered their inverter delivery capacities of LMQ materials before the shift of paradigm takes place. Even the retailers are reacting to this matter - for example by demanding packaging with virgin fibres. Recent research



of Simat (2013) confirmed that from 2010 to 2013 there has been a solid demand and growth for fresh, virgin fibres instead of recycled packaging materials.

Its existence cannot be argued away, there are threats of substitutes, and specially-sealed flow wrapping plastic packaging versus fibre based packaging. They offer a functional barrier, inline coated on recycled fibres. Moreover, it is discovered that substitutions occur from paper based packaging towards sealed bags and stand-up pouches.

General Expectation 3: The grocery business fulfil its role as a gatekeeper, a smooth transition towards the new rules will take place.

General Expectation 4: There are threats of substitutes for paper based packaging by sealed flow wrapping packaging (plastics).

#### 9.5 THE FUTURE OF RECYCLED FIBRES BASED PACKAGING

In the light of the sole packaging supply chain, a substitution of recycled fibres to virgin fibres cannot be taken into account and is not an alternative. However, the entire and complete compensation for virgin fibres instead of recycled fibres results in maximal resource requirements for wood, water and energy; this is economic and ecological nonsense. Thiel (2009, p.14) pointed out that the sole use of virgin wood fibres will increase energy consumption up to 6 times, 5 times waste water consumption and increase papermaking cost 1.3 times. A further complication is that a better deinking technology for recycled pulp is also limited for providing a solution. These techniques are available but the loss of fibres during the deinking process is from to 15-50% and therefore not economically acceptable (ibid, 2009, p.8). By keeping the status quo of recycled fibres, the supplier industry researched for solutions to meet economic and ecological demands. A long-lasting economic workability means to develop specific measures generated to proof new services and technologies aimed to overcome migration into food and feed. A line of attack, which talents well for the reduction of the problems mentioned, is the use of barrier coatings, direct on the food contact layer (BIB, flow wrapping packaging or stand-up pouches). These

initiatives in technological perspectives, in process technology are addressed to all echelons with in PPSC, which work closely together, but for sure, this is not good for profits.

In the light of plastics, this analysis is fundamentally based on the outcomes on GE4<sup>123</sup>, but another expectation arises, addressed towards raw material suppliers for “possible” barrier coated solid board or corrugated board base papers in deliverable quantities.

**General Expectation 5:** The paper based raw material supply chain will transform into oligopolistic structures. Paper and corrugated board with barrier coatings will be limited resources.

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<sup>123</sup> General Expectation 4: There are threats of substitutes for paper based packaging by sealed flow wrapping packaging (plastics).

## 10. EXPERT INTERVIEWS

Based on the conclusions from the review of available literature and presentations on conferences, the researcher conducted qualitative interviews with experts in the field of the PPSC to validate and complete his previous results from theory. The aim of these interviews was to survey external experts first, with the intention of discover up-to-date best practices. With the interviews of external experts, the author also wanted to get a stimulus from outside to assure learning from others. Expert interviews are the research methodology of choice when the research project requires a conducive field of research with interviewees that are difficult to reach due to their position, scope of their profession and their usual abode. An expert interview deals with a person's unique knowledge, life- and work experiences, and findings from taken actions in the past. In addition, responsibilities and obligations of their specific job function or functional status within organisations or institutions are of interest. To employ expert interviews is a suitable and fitting qualitative tool, when the research interest has a lens on decisions, recommendations for adapted behaviour as well as discrete knowledge (Meuser & Nagel, 1991).

### 10.1 THE METHODOLOGY OF THE EXPERT INTERVIEW

The expert interview is one of a range of interviews like problem-centred interview, focused interview, ethnographic interview and group discussion methods. It is applied as an investigation strategy. Bogner & Menz (2005, p.33) postulate that expert interviews are subjected towards a lack of the methodological foundation, because they are problematic to review; moreover, they cannot be precisely designated and prescribed so their status as part of the whole span methodological approach is more or less an anecdotal one (ibid 2005, p.17).

Another way of looking at this bias is, that any expert interview has to be conceived as an argumentation chain in which meaningful knowledge, positioning of minds and communicative impacts play a central role. Due to these drivers within the implementation of an expert based interview, the interviewer has to

concentrate to the grade of subjectivity borne during the interview so that he may be able to lead, through a complex and context-sensitive background, to expert responses (Bogner & Menz, 2005, p.15).

Meuser & Nagel (1991) gave shape to expert interviews as a clear-cut form of crafting semi-structured interviews. Contrary to personal, portraying related interviews, here the interviewee himself is of less interest (as an individual person) than his capacity as a well-known expert in a certain field. The experts are integrated into the study as a representative of a group, the sample. The variety of hypothetically significant information and data provided by the interviewee is restricted; consequently, the interview needs a directive function like strategic guidelines, in order to ensure the gathering of further knowledge through involvement in practical understandings.

Corresponding to this Meuser & Nagel (1991, p.449ff.) gave shape to a series of problems and sources of failure in executing expert interviews. The overall winning principle behind conducting expert interviews is whether or not the researcher manages to restrict and focus the interview to the expertise of interest and to shorten the range of thoughts.

Problems of directing arise here more intensely, because the interviewee is less interesting as a person than in a certain capacity in the field of research. The researcher has to make clear before and during the proceeding of the interview that he is on a high level familiar with the interviews topics and issues to realise a meeting of minds. The analysis of expert interviews primarily targets at examining and comparing the content of the expert knowledge.

## 10.2 INTERVIEW GUIDE

To support the interviewer in making the interviewed experts address all key issues, an interview guideline had been developed; a list of guiding questions, like a set of strategic guidelines was compiled and used to guide the expert interviews. Attention has been drawn to the chief research questions and the derivative sub-research questions too. This guideline also helps to compare different experts (different and joint views) and facilitate their analysis without forcing the interviewee to follow the guideline's structure exactly.

The interview guides have a double function here: The work, which went into developing an interview guide, ensured that the researcher does not present him or herself as an incompetent interlocutor. In addition, to design an interview guide also safeguards that during the course of the interview topics come up that are of no relevance (Meuser & Nagel, 1991, p. 448). The interviewer must also make sure that all the respondents in the interview process address the topics that are important for this study. Nevertheless, the interview guide was not used for standardizing the data collection procedure, it provided only a framework and was intended to trigger and guide the expert's narratives. During the interview, it was possible to leave out some questions, to change the chronological sequence of the questions, for adding new questions, or to deepen specific discussion points. This demands high competence from the interviewer to extract the relevant information from the experts.

### 10.3 SAMPLING FRAME AND METHOD

Recruiting research applicants can be challenging when research focuses upon specific individuals, because the sample for the study is very few and far between and restricted to a very small subgroup of all actors in the PPSC. To recruit participants exponential discriminative snowball sampling was the method of choice, contacting one participant via the other. Snowball sampling can be characterised as an influenced sampling technique, a biased one, considering that the sampling is not subjected to random, in opposite it actively chooses persons by mutual social networks as well as from a networks of relationships (Baxter & Eyles, 1997, p.513; Faugier & Sargeant, 1997, p.792-793; Biernacki & Waldorf, 1981, p.141-142). This kind of sampling technique operates like chain referral. After interviewing the initial subject (expert), the researcher requests support from the subject to help identify other experts with a similar trait of interest or to recommend an additional person. According to the advice, the researcher then contacts the nominated subjects and carries on in the same manner up to attaining a satisfactory number of subjects. This sampling method has pros and cons. The process is modest and cheap, needs little planning and requires a manageable amount of work.

On the other hand, the researcher has limited control over the specimen, representativeness may not be assured. Selection bias is also a fear; initial subjects have a tendency to recommend persons that they know well, so they may share the same traits and characteristics.

Therefore, the selection of the experts for the qualitative survey was done according to certain criteria, which were considered as important for both the research question and for the subsequent analysis of the results. The furthest significant criterion was the professional expertise of the persons concerning the paper based packaging supply chain, upstream as well as downstream. Concerning the sampling of the industry sectors and the respective companies and industry organisations which have come into consideration, the author clustered them into five target groups: (1) supplier of raw materials, (2) packaging supplier (folding cartons and corrugated board), (3) food manufactures, (4) industry organisations on German and European level and (5) consultants in the field of packaging and printing. Within these selected target groups the study tried to find interviewees who fulfilled the expert profile. Following the circumstance, that this study is exploratory, a suitable and representative sample of respondents was selected on the ground of pragmatic reasons, like access to discrete information and willingness to participate.

A total of 41 respondents found by snowball sampling promised to contribute. All 41 respondents were subjected to a uniform pre-tasking, a rough guide to the research aim of the thesis and to shorten the range of themes; on request, each respondent received the authors' publications.<sup>124</sup>

After feedback of the pre-tasking phase, a sample-size of 17 respondents agreed again to take part for expert interviews. The interviewees were representatives of the most central actors in the decision-making process: 17 senior managers on decision making levels as CEO, CSO or COO level, head of industrial associations at national and European level. The research project considered five focus groups: Industrial associations (n=5), suppliers of raw materials (n=3), packaging manufacturer (n=4), food manufactures or processors on European level (n=2) and consultants related to the packaging industry sector (n=3). The expert

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<sup>124</sup> Juterzenka & Heupel, (2014a), (2014b).

interviews were semi-structured in that they aimed at answering a similar core set of open questions for each case.

Face-to-face interviews were executed at the respective expert's place of work. The discrete interviews were voluntary; no consulted expert was rewarded for contributing the study. Any identifying hints or facts concerning the identification of the participants were deleted in the transcript and not mentioned within the analysis process. Every attendee was given copies of the transcription (member checking) in order to edit or make any amendments to their responses. The interviews were transcribed separately to ensure reliability and compiled into one report. Correspondingly, for reasons of discretion it is ensured that it is not probable to deduct conclusions about discrete companies or interview partners.

Finally, as with any exploratory research based on the grounded theory strategy, the author adopted an iterative research process of data collection, analysis and validation so that timely feedback leads to improvements. Established on the qualitative research characteristic of flexible reporting (Creswell, 2007, p.80), the findings of the study are present as a textual summary in the sub chapter 11.

#### 10.4 CREDIBILITY OF INTERVIEWS

As stated in sub chapter 2, member checking has been performed to increase the credibility of the study, also to demonstrate high concordance between transcription and the performed and recorded expert interviews. This operating procedure is assigned to qualitative research; here the researcher submits significant investigative information or materials back to the respondents for validation, because they were the source and origin of those materials. The most common form of respondents' validation in practice takes place when the researcher submits a report or interview transcript for checking.

Bryman (2002, p.1) gave concrete form to criticism of this method, he stated that it is a crucial issue as to how far the [*"...researcher's understanding of what was going on in a social setting corresponds with that of members of that setting..."*] and the main problem when conducting a member validation exercise is deciding what is to be validated: (1) [*"...the kinds of interpretation that a researcher engages in when writing up findings..."*] (ibid, p.1) or (2) the uncertainty of the researcher as to [*"...how to handle suggestions by members that there has been a failure..."*] (ibid, p.1) of understanding. In a

nutshell: [*“... it is crucial to be sensitive to the limits of member validation when seeking such reassurance.”*] (ibid, p.2).

In respect to private and work related privacy of the participants, the voice recorded interviews have not been a must. This alternative form of consensus and data gathering was created and offered to the interview partners. All respondents were free to choose whether they would participate and were free to withdraw at whatever time. The respondents were the exclusive decision-maker on how the semi-structured interview should have been documented automatically and comprehensibly, documented by field notes of the researcher or just the researcher was allowed to write a verbatim from memory after the interview-session has been closed. All interviews have been accepted by implying equal treatment of all respondents, either: (1) anonymous, untraceable; (2) anonymous, field notes only; (3) anonymous and recording; (4) mentioned by full name, voice recording or (5) other kinds of agreement.<sup>125</sup>

#### 10.5 QUALITATIVE CONTENT ANALYSE

To find hypotheses and developing theories are primary duty of qualitative research (Mayring ,2014, p.10). He emphasizes the importance of the following fundamental aspects of the analysis (ibid, p.39-42):

(1) The materials must be embedded in the context of communication (ibid, p.39): Every material arises in the background of the communications process, here the interpreter must determine to which part of this process his analysis refers to.

(2) A systematic, rule-governed approach to the analysis, with clearly defined and describable units, need be established in the beginning (ibid, p.39)

(3) The purpose and objective of the examination is the elaboration of a system of categories. The category system is the essential tool of examination; it permits to understand and reenact the analysis for others and shows the intersubjective comprehensibility of the analyses algorithm (ibid, p.40). The determinants of text analysis must fit to the research questions (ibid, p.10). Text-

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<sup>125</sup> See appendix.



segments were hooked in categories, which were painstakingly created and reviewed within the course of the analysis in terms of feedback loops.

(4) The object to be examined stands in the foreground. The applied techniques target the object and if necessary are adjusted to fit (ibid, p.40).

(5) Examining the specific instruments through pilot studies. This objective reference allows no standardized procedures. Instead, each individually developed process is tested in a pilot study. This could be in the form of a dry-run analysis (ibid, p.41)

(6) Theory-driven analysis: the research status in relation to the object of inquiry itself should be applied to every procedural decision (ibid, p.41).

(7) Taking quantitative analysis into account. Above all, for reasons of general applicability, quantitative steps are duty-bound to be counted in the process of analysis (ibid, p.41-42).

(8) Quality criteria: because of malleable methodic standards, one should take special care evaluating the results of classic and content analytical quality factors (ibid, p.42).

According to Mayring (2014, p.48) one of the basic principles of qualitative research is to endeavour, to pick as well as to master the full intricacy of the issue. As of this integrated perspective emerge concepts and theories that manifest themselves as a system of groupings. The striking issue of Mayring's (2014) perspective of qualitative content analysis is a program flow chart, a systematic step-model, which divides the analytical assessment into alone-standing interpretational segments. The cardinal idea behind the step-model is to shape unique criterions of definitions, grounded on the theoretical background and the guiding research questions (ibid, p.53-54). Following this principle, closely the transcripts are worked over and done and categories are step by step deduced. If the first amount of data or results is generated a feedback loop is demanded towards those categories. The feedback loop contains self-monitoring and self-evaluation to reduce categories (to avoid double entries) and validate their

reliability (Mayring, 2000, revised 2/2009, n.p.)<sup>126</sup>. Mayring's step model is general model, which one can adjust and adapt to every situation.

Following Mayring (2014) the following basic techniques of analysis are available:

(a) Summary of findings: the goal of the analysis is to reduce the content to the essential core to create a manageable body of material through abstraction that still reflects the starting material (ibid, p.64).

(b) Explanatory analysis: the goal of the analysis is to bring clarification to individual questionable textual content (concept, phrases) so that the text is clarified, explained or interpreted (ibid, p.64).

(c) Structural analysis: the aim of this examination is to screen out assured facets of a material using predetermined organizational criteria to create a cross-sectional view or evaluate the material on the source of clear evident criteria. The methodical approach of the research presented here closely follows this process model, which is also the fundamental structure. The final settlement of the analysis is to determine in an accurate, clear-cut way which segment components are addressed to which category (ibid, p.64-65).

## 10.6 COMPUTER ASSISTED QUALITATIVE DATA ANALYSIS

However, the computer assisted qualitative data analysis (CAQDAS) is a tool to be intended to help and assist researchers with analysis operations. To employ CAQDAS does not supplant the need for sharp-witted analysis. The instrument is a software device for data administration rather than a tool for data analysis. The researcher can handle overlapping codesegments for the same textsegment and sequences of searching codes. It must be born in mind that CAQDAS supports coding and relating of codes but that this is no substitute for thoughtful coding and intelligent analysis. The computer and related QDA-Software play in this light a multiple role: (1) structuring the textfiles, render precisely categories as well as coding rules; (2) database handling as well, (3) recording all steps of investigation,

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<sup>126</sup> See <http://www.qualitative-research.net/index.php/fqs/article/view/1089/2385> (last access 16.08.2015)

forming the analysis comprehensible and replicable and to traceable back to the material. (4) To offer interfaces to quantitative analysis: to compare frequencies of categories (Mayring, 2000, revised 2/2009, n.p.).

#### **10.6.1 Methodological characteristics**

Along the lines of the method employed in the framework given by Mayring (2000, revised 2/2009, n.p.) a suitable algorithm for decoding the text strings has been developed by the researcher. It was part of the project goal to propose a highly integrated software platform (MAXQDA) with a systematic analyse of data in a transparent manner to help to obtain the information required in the study. The code system particularly created for this research ensures that research questions and sub research questions are suitable for empirically investigation. Two code systems have been developed:

(1) The NIE code structure to answer the key research demand regarding the impact of the New Institutional Economics to avoid opportunistic behaviour in the PPSC (see appendix).

(2) The SRQ code system to answer the business process oriented analysis of the forthcoming German Ink Ordinance to avoid food safety scares. The step-by-step coding of the transcriptions were executed in separate holistic views of two linear independent code systems. The overall goal was to avoid contradictory judgements (see appendix).

#### **10.6.2 Frequency Tables by MAXQDA**

Frequency tables created by MAXQDA will be the key and primary instrument for analysis employed in this research besides a systematic evaluation of the interviews. The software MAXQDA generates graphic or numerical evaluations of how many code-segments exist in ratio to the sub-codes. Due to the unique code relation assignment of NIE and sub research questions required by the chosen method, an unequivocal and comprehensible academic foundation of the analysis is provided.

### 10.6.3 The Code Matrix Browser

The embedded matrix browser for codes (CMB) draw up how many codes have been addressed to quantity of transcripts (n=17). For CMB analyse MAXQDA takes into account only whether a code is present in a document, and not its frequency. The matrix makes available an indication of how numerous segments from each transcript have been assigned to a specific code and this for every predefined code. Due to the graphical display of the CMB, the subsequent table provides an overview of the main code elements discussed in this thesis to demonstrate a homogeneous distribution of the reliable responses to the questions raised during the interviews.<sup>127</sup> The columns are compounds of document sets. The anchors of the text-base in every relevant group will be added. The columns are related towards document groups. The anchors of the documents in every single document set will be enumerated. The study treated MAXQDA in that way that the CMB only indicates whether a code was addressed to a single transcript, document group or the whole document set - it does not matter how often it was used. Only the activated documents and activated codes were displayed as rows. No use of weight filter. The computed clusters in the matrix indicate how manifold document fragments in each transcript have been addressed to each code and subcode.

### 10.6.4 The Code Relations Browser

A similar key instrument is the Code Relations Browser (CRB), a visualization of the relationships between codes. A table shows how many transcript segments any two codes are close to each other. The representation stands for the number of co-occurrences of codes within all transcripts. All codes of the MAXQDA code systems were mentioned. The designated most important codes and their related subcodes will be generated as columns; MAXQDA calculated how often a code was used in all transcripts taken into consideration. Only real overlaps of codes will be employed in this study, which means that a

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<sup>127</sup> Key setting for CMB options dialog: (1) Columns: Documents, (2) Type of analysis: Unit of analyse: Documents; (3) Setting: Only for activated documents, activated codes. All coded segments have the weight filter with "zero".

segment has been assigned to both codes systems and the codes need to overlap for a unique match. The CRB only shows whether codes overlap each other - it does not matter how often this happens related to all transcripts.

As a result, there is no relationship between the frequency of codes provides by the code system, the figures created by from frequency tables and analyse of real overlaps of codes. All three considerations of frequencies are absolute independent by the other variables and merely evaluated as an argumentation approach to specific significance for the context of this study.<sup>128</sup>

#### 10.7 INTRODUCTION OF RESPONDENTS

This thesis follows Meuser & Nagel (2005, p.73) for the course of research action, that the expert status is awarded to a certain extent by the researcher, limited to a specific question. In addition to Meuser & Nagel (2005) the thesis adopted Welch et al. (2012, 2002) definitions of corporate elites. Welch et al. (2012, p.7) gave shape to the entity of an expert, that it is expected that he is settled in a senior position or a member of the firm's management team of a board member. The expert in principle has functional responsibility in business, due to his work- and life-experience, he has considerable industry experience, possesses a network of personal relationships; and a respectable exposure (Welch et al., 2012, p.7).

For reasons of confidentiality, the author of the thesis ensured that it is not possible to draw conclusions about individual companies, associations or interview partners. The study avoids extensive quotation, verbatim citation in order to protect the privacy of interviewees and to prohibit a halo effect, because the national Ink and Mineral Oil Ordinance is still pending at the time of writing this thesis. The face to face interviews (n=14) and via telephone (n=3) have averaged about 32 minutes and have been conducted in German or English in two instance.

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<sup>128</sup> A Near Code Analyse was not performed, only real overlapping was of interest. The function „Near codes“ and chose distance „0“ will find more hits than searching for co-occurrence of codes. „Near codes“ only indicates that two codes are directed to the same paragraph – not at the same segment.

The interviews covered the period from calendar weeks 06 to 16 in 2015 and a totalled almost 47.000 words in the transcripts. The respondents shall be introduced in alphabetic sequence:

**Mr. M. Boltersdorf** is CEO and managing associate of Brohl Wellpappe GmbH & Co. KG a medium-sized family business, manufacturer of value added packaging made of corrugated and solid board. The group of companies includes plants in Mayen, Föhren, Niederzier and Fleisbach. Printing services are based on flexoprinting technology, flexo pre-print, offset printing and non-impact digital printing. Core competences are founded in bundling different strengths and resources: dedicated client focus, development skills and print standards at high level, high productivity and direct delivery.

**Dr. Jürgen Calmbach** is CEO of the consultancy firm Dr. Calmbach & Partner GmbH, specialized in the administration of commercial printing companies and publishers. He studied Economics and Business Administration leading to the qualification of Diplom-Kaufmann (business diploma) in Munich and subsequent PhD. The fields of consulting are SMEs and groups of integrated companies embedded at European level.

**Dr. Erik Frank** is a senior manager at the FLINT-Group with over 30 years of professional work experience. He holds a doctoral degree in chemistry and owns impressive experience in the fields of ink- and coating manufacturing. His primary duties included interfacing between regulations, standards applied to inks and coatings and customer support. Dr. Frank represented the German coatings and printing inks industry in 2011 at the BfR hearing.

**Dr. Monika Huber** works for Mondelēz International as a senior manager for regulatory compliance in Europe and partly on global level. She is responsible for environmental issues, packaging safety and harmonisation. Mondelēz International is the largest chocolatier and biscuit baker in Europe, the second-

largest producer of coffee and candy. In addition third largest manufacturer of chewing gum.

**Mr. Ulf Krause** is CEO and managing associate of Lohmann Printing and Sales GmbH in Bullay. The SME has been in the market for 60 years and is engaged in manufacturing labels, wrap arounds for food and non-food packaging and commercial printings.

**Ms. Imke Memmler** is a legal representative and partner of the international law firm ZENK - Partnerschaft von Rechtsanwälten mbB. The law firm has decades of experience in the field of food and consumer goods. Among their clients are large and mid-sized national and international businesses and industrial associations related to consumer goods, foodstuffs, cosmetics and pharmaceuticals. Consumer Goods Law are in the middle of their key competencies, chemicals and packaging companies are their clients. Besides manufacturers, they also advise prominent retailers. Simultaneously, she is an occasional member of BfR's commission of consumer goods (articles of daily use, commodities like packaging) in Berlin.

**Mr. Roland Rex** is a member of the management board of Weig-Karton in Mayen. He is responsible for strategic marketing and sales, manufacturing and resources planning and logistics. Beside this, he has recently become chairman of Pro-Carton, the umbrella organisation of European carton and cartonboard manufacturers. Pro-Carton's primary purpose is to promote cartons and cartonboard, to brand owners, retailers as well as designers. They encourage carton and cardboard to the media, politicians and the public eye as a well-balanced packaging medium from an economically and ecologically perspective.

**Mr. Christian Schiffers** is CEO of the German folding carton industry association FFI (Fachverband Faltschachtel Industrie). The industrial association represents 90 folding carton manufacturers, 36 associated industrial members and 75% of the sector's overall sales in Germany.

**Dr. Siglinde Stähle** is a senior manager and head of scientific direction of the Bund für Lebensmittelrecht und Lebensmittelkunde e. V. (BLL). The BLL is the German Federation for Food Law and Food Science the leading association of the German food sector. Dr. Stähle is responsible for all areas of law relating to hygiene measures, consumer goods and nanotechnology. She formally represents the BLL in many official bodies like BfR', DIN, German Society for Hygiene and Microbiology (DGHM) and the German Stakeholder Commission on Nanotechnologies of the German Government. The BLL is the German leading umbrella association within the German food sector. The BLL's tasks include tracing the growth of German, international food laws. In addition the BLL actively maintains its clients in scientific fields.

**Mr. Bernhard Stradner** he is CEO of Rudolf Reproflex GmbH, a packaging design agency in Goslar, he gathered over 20 years' of business experience in the field of packaging. Since 2013 he is President of DFTA, the German subject section for Flexo printing. The DFTA represents approximately 300 member companies in the packaging industry.

**Dr. Reinhardt Thiel** has a doctoral degree in chemistry and offers broad knowledge in papermaking application technology and D&R. By profession Dr. Thiel is technical managing director of the German Pulp and Paper Association (VDP), which is the umbrella organisation of the German pulp and paper industry. His primary duties included interfacing between papermaking technology, environment issues, food packaging and regulatory affairs. In addition he is a member of BfR's commission of consumer goods (articles of daily use, commodities like packaging) in Berlin.

**Mr. Marc van Damme** is COO of the VPK packaging group in Belgium. The VPK is one of the leading European industrial packaging groups. Beside this, he is the recent president of the production committee of European Federation of Corrugated Board Manufacturers (FEFCO), which is the umbrella organisation of the European corrugated board industry.



**Mr. Collin Weber** is CEO of Collin Weber Personalberatung GmbH, a HR specialist for recruitment and executive search in the field of packaging. Mr. Weber has gathered over 30 years' professional experience in the field of packaging and packaging machine construction. Client's business covers manufacturers of food and non-food, pharma packaging construction, converting and brand owners.

**Dr. Oliver Wolfrum** is CEO and leads, since July 2007, the business of the Federation of Corrugated Board Manufacturers (VDW) in Germany. He represents the industry in public, to government agencies and politicians. VDW was founded in 1948, now represents 30 corrugated packaging companies with about 100 plants in Germany - so it represents about 80 percent of German corrugated board production.

**Anonymous Participants:**

**Anonymous\_1** is a consultant and CSO in the field of packaging and food manufacturing on European level.

**Anonymous\_2** is a CEO of a leading manufacturer of paper based packaging company in Germany.

**Anonymous\_3** is a senior manager in the fields of ink and coating manufacturing.

Interviewees	Consultant	Industry Association	Folding Box	Corrugated Board	Supplier	Food Operator	CEO, COO, CSO	SME	Group	BfR Com.	EU wide
Anonymous 1	●		◐	◐			●				●
Anonymous 2			●				●	●			
Anonymous 3	●					●	●		●		
C. Schiffers		●	●				●				
C. Weber	●		●	●			●				
Dr. Calmbach	●		◐				●				
Dr. Frank					●				●		
Dr. Stähle		●				●				●	
Dr. Thiele		●			●		●			●	
Dr. Wolfrum		●		●			●				●
I. Memmler	●		◐	◐		◐		●		◐	●
M. Boltersdorf				●			●	●			
Dr. Huber			●	●		●			●		●
M. v. Damme		●	●	●			●		●		●
P. Stradner		●	●	●			●	●			
R. Rex		●			●		●	●			●
U. Kraus			●				●	●			

**Table 1:** Classifications of respondents, scope of profession and relevant industry association.  
 Legend: full circle = full match, half-circle = in certain areas

## 11. MAIN FINDINGS

To answer the research questions the researcher employed a two-step approach: at first a QDA analysis in the perspective of NIE contributions to identify the structures (see appendix). In a second step, a different QDA analysis has been executed, this time in view of all sub research questions (SRQ) which are related towards real life issues to provide recommendations for further behaviour. The aim is a conceptual, practical guideline for the analysis of qualitative data. The following actions were taken:

- (1) Data collection by interviews and transcriptions
- (2) Member Validation or Checking
- (3) Classification themes, codes and sub-cods

(4) Database construction: a database was developed using MAXQDA. The transcripts were imported from MS Word (2010) as RTF-Files, pre-defined that every answer of the interviewee is a single text paragraph as a unique segment for coding.

(5) Mapping NIE codes separate from SRQ codes: both themes and code systems could be toggled on or off to shorten the range of coding and focusing on the two-pronged research approach. When both approaches have been separately performed, an overall general analysis was calculated: (a) the Code Matrix Browser (CMB) visualized which codes have been allocated to the documents. The matrix illustrates how all codes / anchors of the code system have matched by the performed interviews. The coverage of the CMB is around 88% and can be accepted as reliable. (b) The Code Relations Browser (CRB) visualises overlapping codes of theme categories, NIE contribution and SRQ.<sup>129</sup>

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<sup>129</sup> Intercoder reliability is not provided to improve reliability. No other researcher verified the allocation of themes, codes and subcodes. The reasons for this lack are the privacy and protection of the doctoral thesis and also recent and future publications.

(6) Graphical representation gives a visible presentation of the findings.

(7) Narrative heading results will give shape to the findings. This narrative provided the basis for all further analysis. The previously mentioned limitations of the considered approaches will be argued later in sub chapter 12.4.

(8) Due to the ethical considerations of this study and with respect to all respondents who are contributing in this study, no verbatim quotes from applicants will be published. The processed themes, codes and subcodes (MQDA) have been anonymized and aggregated before being used and identifying factors have been removed by the researcher.

The findings yielded an empirical study of the future behaviour of the PPSC in Germany. The outcomes yielded and include: (1) a detailed profile of the challenges yet to come to cope with the law bill of the German Ink and Mineral oil Ordinance and (2) brief technical and non-technical attributes of recycled papers.

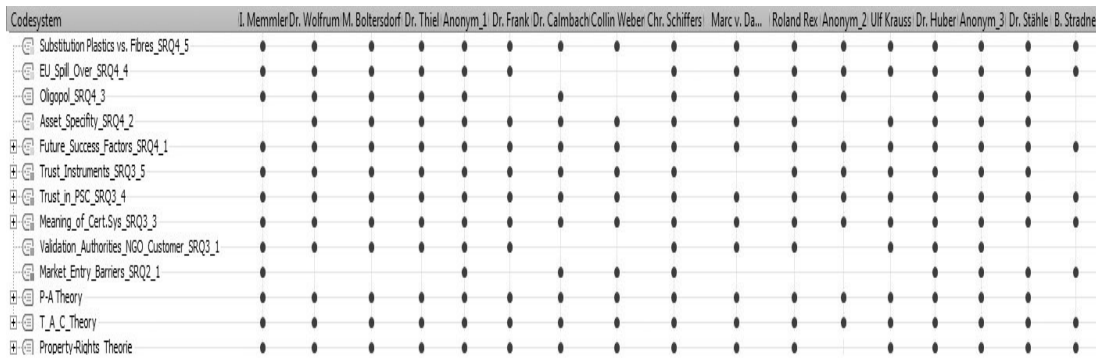


Figure 18: Degree of coverage between respondents (n=17) answers and codesystem is 88%.

This includes the undesirable conditions or consequences of migration from hydrocarbons (MOSH and MOAH) into food and feed and barrier materials to cope with them. The limitations of the study are outlined towards the end of the thesis with closing conclusions. In addition, avenues of research for future studies are provided here. In a summary of responses to the research questions:

**(1) What is the contribution of the NIE to prevent opportunistic behaviour within the paper-based packaging supply chain?**

It has been found (n=17) that the key contribution of the NIE are the concentration of Property Rights, the prevention of unilateral opportunism and the use of signalling. In a holistic view: the NIE theoretical foundation has been verified and not falsified experimentally by this study.

Property rights within this study are employed in the light of Demsetz (1967, p.347) as an [*instrument of society*] and institutions in addition, that originate their significance after the fact that they help an actor to form expectations which he can realistically hold in his transactions with others. These expectations gather manifestation in laws, rules as well as customs of a society (ibid, p.347). Here PRs classify, how and what kind of stakeholders might be benefited or harmed. In addition they answer the question, who must pay whom. The remembrance of this issue leads to the close affiliation between property rights and surrounding externalities. This gives the contracting parties enforceable, effective, just rights (including effective sanctions) and responsibilities in dependence to the work and services to be performed. Concentrations of PR give shape to transactions, which are concluded, in the marketplace, where bundles of property rights are exchanged. A bundle of rights is frequently assigned to a physical product or service. The value of the tradeable rights frequently governs the value of exchange.

Unilateral opportunism and the use of signalling are conclusions that may be recognised, above all, because of logical conclusions made from the findings and by making an allowance for the normal run through in the relevant commercial sector for the PPSC as well as all the other circumstances of the issue.

**2) What are the challenges for companies to cope with the demand of the ordinance?**

The exploratory empirical findings imply that the industrial sector of the PPSC is not well organized for the forthcoming German Ink and Mineral oil Ordinance.

The independent SMEs, which are significant for the welfare of the domestic economy, will wait and discuss what happens, like laggards they will act only in the very last moment. (n=16)

In view of segment market share of the paper based packaging supply chain the cardboard and folding box industry is well prepared as regards to a possible future situation and the effect on their customers' future trade patterns (n=14).

The corrugated cardboard industry is not prepared. Future developments are being traced by long distance reconnaissance, but are not an issue requiring prompt processing due to pre-analyses.(n=12).

Most major business operators of both folding box and corrugated cardboard are organised into federations and/or associations and both have access to detailed information and recommendations for actions. Associations can work to mitigate the effects of future legislations. (n=14)

On the supply side there will be different varieties and choices of barrier materials in combination with the right processing methods. Infrastructural endangerment of supply security within the relevant supply chain will not be a problem at the moment. Packaging solutions will be available, but such innovations or technical change will not obtain full effect by now, associated with the transition period which least two years. (n=14)

The combination of the suitable barrier materials and precision processing and conveying technology may guarantee a securely sealed long-shelf life package as a second best solution. The first best solution would be the control and auditable administrative of the separation process in recycled fibres flows under the maxim of parallel work activities with requirements regarding the prevention of contamination and inadvertent dispersion of undesirable substances. (n=15)

The actual risk of substitution of paper fibres with plastics in packaging is small at present, however. The future dynamics of plastic-based flexible packaging and the innovative power of polymer-based solutions cannot be disclaimed in short to medium term (n=11). In the long run closed loop recycled fibre based concepts will succeed (n=13).

### 3) Which instruments are being used?

It has been expected that trust is a key instrument in coping with uncertainty and asymmetric information. The exploratory empirical findings imply that the development of dependable trust and consequently gain of long-term competitive advantages are only founded and based on prudent and honest use of conformity assessment procedures and applicability tests for migration. For the migration tests, production methods and ingredients control of the finished packaging product, trust and credibility should not play a role. The only thing that counts is regular and meaningful analytical testing and measurement supervision during the execution of manufacturing work to grant compliance. Trust-building means safeguarded by transparency are necessary to engage bilateral communication, to generate a meeting of minds with all involved echelons in the flow of process to achieve an accurate realisation of customers' and authorities demands for marketable packaging. (n=15)

The contractual safeguarding of the pursuit of liability law will be performed and charged upstream on a back-to-back basis. As a rule of thumb for passed on liability: whoever has failed to prove his innocence, that he is not at fault, has already lost (n=15).

From a scientific perspective and for public officials in this field, the greatest hindrance to the forthcoming regulation is the fact that here is no authenticated technique of analysis in existence for the enforcement of the maximum levels. A serious baulk can be identified due to the fact, that official authorities and bodies failed to offer any practical instrument or idea by which the ban of mineral oil compounds could have been enforced. (n=16).

It may be assumed that local authorities will attempt to trigger installed QS-Systems and relevant compliance, by means of technical criteria, technical guidelines and conformity assessment procedures like GMP (n=17).

The empirical findings attest that in early future stages, available barrier materials with suitable, reliable permeation characteristics will be tested and evaluated to be approved for foodstuff packaging per se. Taking into account the general recommendations and priorities of BfR XXXVI for Paper and board for food contact from 01<sup>th</sup> October 2014 (n=15).

**4) How can the field of paper based packaging be improved facing the future ordinance?**

It has been found (n=17) that the future factors of success, when it comes to international competition, are the weighting applied to price in ratio to the further criteria, but first of all to be cheap. Cost savings and sustainability in packaging along the entire supply chain must be achieved, combined with the machine and plant layout the supplier to provide a cornerstone for a decisive part in the effectiveness of the entire manufacturing process and the overall enhancing supply security.

Necessary and sufficient conditions for a successful future performance to cope with regulatory demands are certification systems, private standards to rely on. The improvement and incorporation of automatised logistic systems will lead to a kind of vertical integration (n=10).

Private standards will replace a future EU regulation. Germany dominates the EU market with major distribution chains, a German packaging ordinance will be per se a European solution too, introduced instead of a law through the back door by private purchasing standards like the Nestlé guidelines. For leading food manufacturers and operators there are no national markets anymore in Europe, big players think, design and act at European level. (n=12)

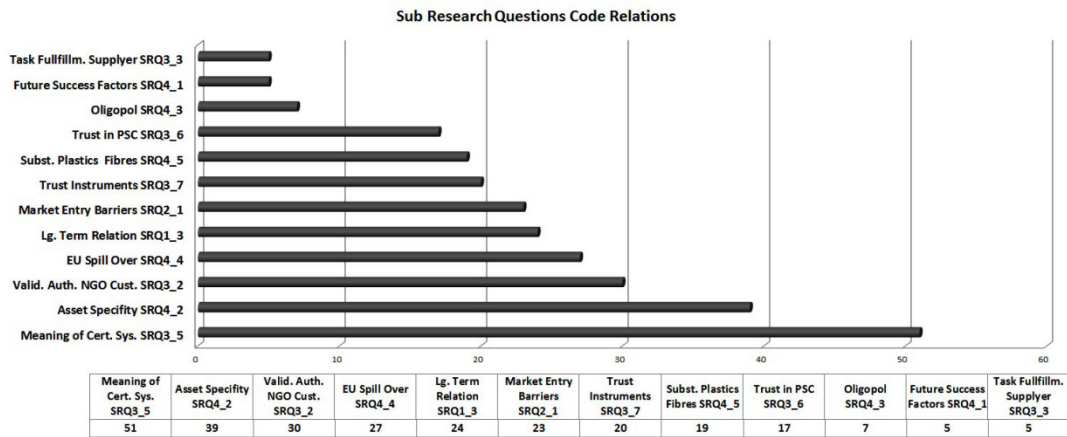
A comprehensive EU-wide legal regulation for packaging inks is possible and reasonable based on the lowest common denominator principle. (n=14). A comprehensive EU-wide legal regulation for residues and migration of mineral oil components will not occur. In attendance are pragmatic reasons: the processing capacity of the competent authorities and bodies on the matter, the financial and human resources and a content-related agreement to avoiding detailed, bureaucratic rules for future EU legislation. The EU agenda 2030 shall buttress the development and implementation of regulations to answer back successfully to chief environmental and societal challenges.<sup>130</sup> Bearing in mind the conflict

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<sup>130</sup> A resource-efficient Europe – Flagship initiative under the Europe 2030 Strategy, see [https://ec.europa.eu/europeaid/policies/european-development-policy/2030-agenda-sustainable-development\\_en](https://ec.europa.eu/europeaid/policies/european-development-policy/2030-agenda-sustainable-development_en) (last access 25.08.2015)



between environmental versus economic objectives, a harmonious consent of the EU member states is highly unlikely (n=9).



**Figure 19:** All Sub Research Questions Code Relations.

### 11.1 THE CONTRIBUTION OF THE NIE

To outline the dimension of behavioural uncertainty in hierarchical relationships, the NIE seeks to analyse the favourability of institutional arrangements and thus suitable to offer mainspring solutions for the present real world problems and the research questions of this study.<sup>131</sup>

The framework of the NIE introduced the concept of governance structure. SCM is ruled by fundamental principles of networks. Sauvée (2002, p.1) outlined [*“network governance as the institutional matrix”*] that key in the model of multi-level business arrangements within a given structure. These governance mechanisms combine institutional arrangements for exchange among the echelons.

The focal company is the core element of every SCN. It correspondingly has the market authority to align and synchronize the actions of the network actors. Due to this primary task, the focal company needs instruments to aid the enforcement of power and of legal claims, beside the business managerial tasks of cooperation and coordination. The reasoning is formal and logical, regularly evaluating the efficiency of current progressions and then identifying and implementing the measures necessary for improvement. In simple words, power and control, by providing a supporting environment for focal companies as system heads. Such an achievement can be a proven by theoretical advancement, a systematic comparison, a derivation or deduction based on the conclusions of this

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<sup>131</sup> Frequency tables created by MAXQDA have been the primary instrument for analysis employed in this study. MAXQDA calculated as how often a code was used in all transcripts taken into consideration. Only “real” overlaps of codes will be employed to find frequencies for the NIE contribution, which means that a segment has to be coded with both codes and the codes need to overlap for a unique match. The analysis of the NIE code relations frequencies was exclusive calculated at the base of NIE coding, exclusive all sub research questions, to receive an isolated frequency distribution. The CRB only shows whether codes overlap each other – it does not matter how often this happens related to all transcripts, therefore the frequency counting of the isolated NIE contribution, is not, however, directly similar with the value attributable to the frequency distribution of all code relations (NIE plus SRQ). For example: the frequencies of code relations of the TAC code relations for opportunism are based for evaluation on the mentioned population of 34 matches of NIE code overlaps only. In contrast the overall code relations of all coding of NIE and SRQs’ the frequencies relations are 38, because the evaluation based on the mentioned population is different. NIE code relations in total are 554 matches and the amount of code relations of NIE and SQR in total are 886 matches.

thesis. Moreover, this is sustained by the results due to the concentration of property rights, which reflects a clear trend to leaner structures and especially with today's increasing number of consolidations with a growing proliferation of networks and corporate syndicates. The market is not driven by physical resources and services, but rather defined by the exchange as well as the transfer of bundled rights. The sum of bundled, concentrated PR can be understood in the meaning of effective goods (Demsetz, 1967, p.347), the sole right of disposal or the sole property are titles to goods and resources. Another supporting instrument for the concentration of PR is the principle of pass-through liability, on a back-to-back basis, to nail the liability of the service or good providing agent. The findings of SRQ Risk Allocation and SRQ Concentration PR support the analysis of Hartwig (2012, p.13) and Bergmann & Hartwig (2007). Bundled, concentrated PR can be labelled as a tool for due diligence within the PPSC, especially detectable by the rendering conformity work in this study.

Notwithstanding from disciplinary roots, there is a significant consensus on a key proposition: institutions matter. Institutions serve many functions, but their supreme, essential role is to decrease uncertainty by determining norms of suited behaviours as well as shaping boundaries of what is legitimate (Peng et al., 2009, p.66). Considering all conclusions of the thesis, it can be accepted that the NIE is an appropriate instrument within PPSC which implements the necessary control measures on production, placing in the market, conformity and consumer protection. The integrated ranges of solutions provided by the NIE can be transmitted from theoretical foundations towards real world issues and problems to be solved.

On an industry level with incorporated supply chains these rules affect how focal firms organize to produce and provide goods or interact with other actors via transactions. In the eye of this thesis the NIE is able to fit and to shorten the breach between current administration oriented SCM examination and its theoretical justification. The nature of NIE stands out as highly interdisciplinary and from this large variety of available assumptions and predictions is able to provide rigorous analyses based on economic principles. SRQ 4.1 (Future Success Factors) supported these findings, with 80 segments of central anchor point with just 4 overlapping code relations it must be regarded as the most influencing, separate and specific

category of fundamental importance. A supply chain embraces all flows of services, information, financial resources and demand and forecast among the different chain members (echelons).

In the ongoing analysis on this thesis, it is important to emphasise an overall perspective. This holistic view has enormous advantages for individuals or actors who hold power over relevant functional areas within the focal company or the supply chain in the fields of R&D, strategic procurement, flow of production, sales strategies, dispatch, and accounting).

If one weights the pros and cons, a problem appears for institutional cooperation among a number of echelons within the supply chain: information asymmetry, behavioural uncertainty, power to control, technical feasibility, related costs as well as advantages, see findings of SRQ 4.1 (Future Success Factors).

Before considering the NIE framework, it is useful to sort and characterise the existing research and approaches by the subset or class of institutions targeted. On a common level, NIE has been structured according to the institutional level under investigation elaborated by Joskow (2004). He identified four tiers or levels of analysis:

(1) [*“Embeddedness, or Social or Cultural Foundation”*]: the fundamentals for a society’s institutions are provided by informal institutions, traditions, customs, social norms and ethics (ibid, p.7).

(2) [*“Basic Institutional Environment”*]: this level encompasses the formally defined political, legal and economic means, which govern political systems and institutions, laws, human- and property rights (ibid, p.7).

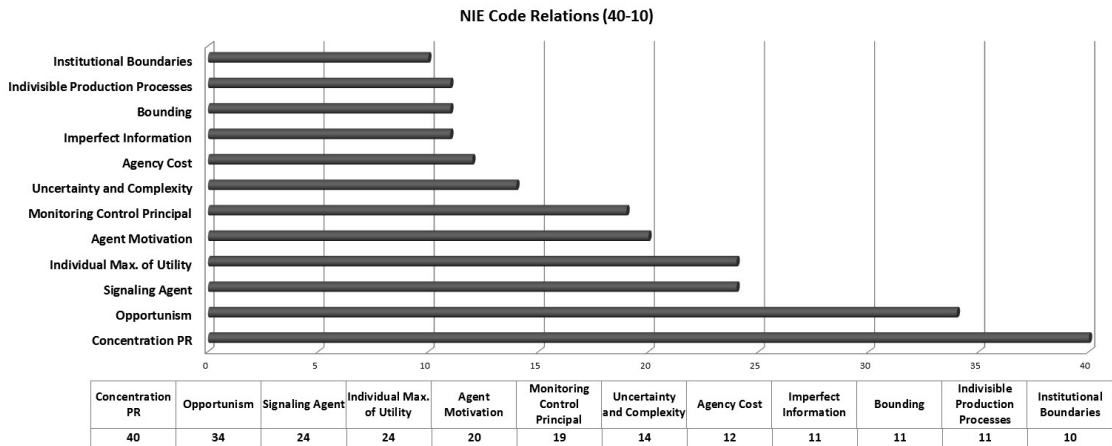
(3) [*“Institutions of Governance”*]: these include governance arrangements, which give shape to institutions such as competitive markets, contract and firm structures and the like (ibid, p.8).

(4) [*“Short-term Resource Allocation”*]: neoclassical economic parameters such as costs, earnings, prices as well as quantities which are traded are determined here as given due to imperfections of the market (ibid, p.8).

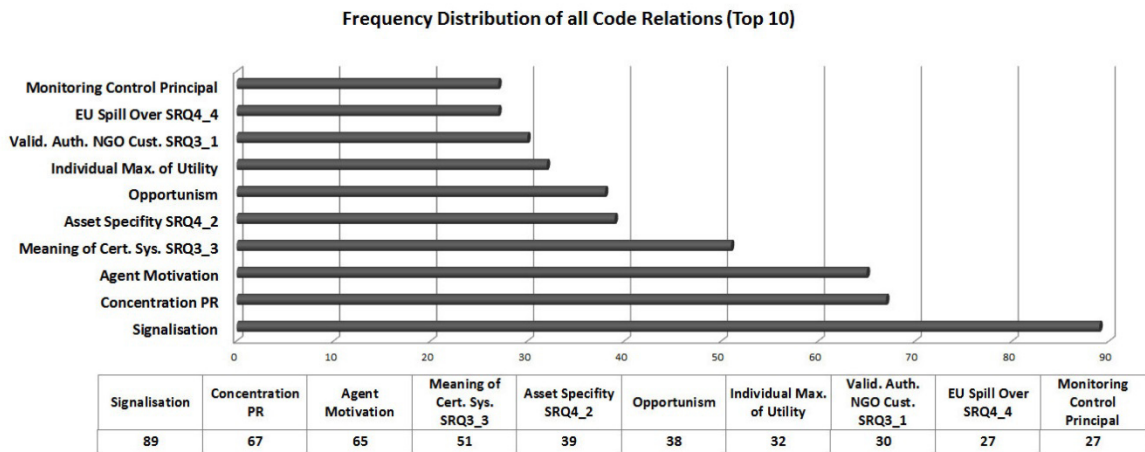
As Joskow (2004, p. 10-11) notes, most NIE research so far has focused on Level 2 and Level 3. Nevertheless, it should be noted that the classification schemes used by Joskow (2004) largely correspond with the findings of this study. The

frequency of all code relations (Top 10) concern the basic institutional environment, systematically documented in SRQ 3.1 (Validation Authorities NGO Customer with 46 segments) and SRQ 4.4 (EU Spill Over with 42 segments). The institutions of governance by arrangements, competitive markets, contracts and firm structures are supported by the findings of SRQ 3.5 and code “Concentration of PR”, code “Signalling” and all findings belonging to code “Opportunism”.

It has already been stated above that behavioural uncertainty and information asymmetry are influencing factors in the entire business procedures. The SC network is impaired by a latent, generalized distrust concerning all of these partial theories.



**Figure 20:** NIE Code Relations, frequencies 40 to 10.



**Figure 21:** Frequency distribution of all code relations.

### 11.2 ANALYSIS OF P/A RELATIONS IN THE PPSC

The focal company delegates during the operational process tasks to subordinated companies to ensure the continuous availability of a defined services and goods. The results of this process must be embedded into hierarchical, tired constructions and lead the focal company into the role of principal. The other companies are assigned the role of agents, which participate in the supply chain. The typical hierarchical structure of the PAT can be identified by Pratt & Zeckhauser (1985, p.2): [*“Whenever one individual depends on the action of another, an agency relationship arises. The individual taking the action is called the agent. The affected party is the principal”*].

It is important that the information provided by each pillar of the NIE is not used in isolation, the pillars are used simultaneously, but it may be expected that the relative weighting of the criteria within the packaging supply chain will promote the aspects of the PAT. Governing parameters stated above and the first raw analysis support the supposition that the PAT will have the strongest impact. The significance of PAT can be understood in its wide range of applications, in

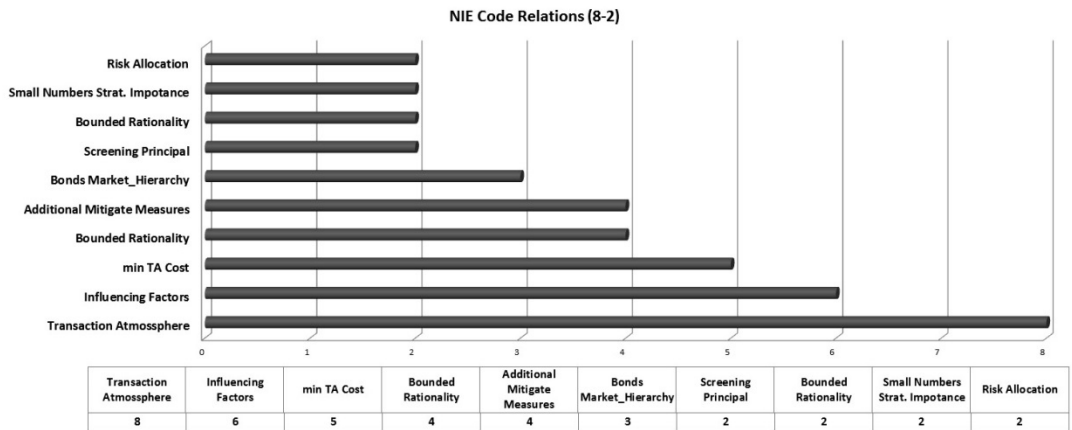


Figure 22: NIE Code Relations, frequencies 8 to 2

which managers are seen as experts (agents) with particular knowledge, as well as [*“stewards of their organizations”*] (Zajac & Westphal, 2004, p.436). It is an economic problem that in all kinds of business transactions wherein a customer’s or a client’s profit or payoff depends on the behaviour of an opposed contractor. Subject and shape of PAT is the complex interrelationship among the customer / client (principal), who compensates for services or goods, and the hired agent. PAT is concerned with how agency relations problems affect forms of contracts and how they can be reduced, as soon as contracting actors are subjected with different levels of information or uncertain in decision-making. Agency theory also takes benefit due the [*“the existence of market and institutional mechanisms that complete contracts to reduce these problems”*] (Padilla, 2002, p.4). The principal’s ability to monitor and judge the hired contractor is limited; these influencing parameters lead to suspicion and can merely be avoided under high monitoring costs (Keil & Sullivan, 2005, p.1). PAT focuses on situations where two or more actors in business operations, individuals with conflicting objectives, contribute to a production process and merge into a bilateral specific working result. Optimal ex ante incentive schemes usually involve finely tuned systems between monitoring of output or effort and a link between measurable performance and the agent’s compensation by the principal. If uncertainty is present in the flow of production, like the hazard of migration, it is proper to link payment with expected risk. The

focal company usually launches supply chain projects. Primary, the initiative is aimed towards better competitiveness of the focal company by improving inter-organizational optimizations.

The management of the SC is faced with uncertainty, effects of future market dynamics and complex competitive conditions. These influences must be taken into account. Not only do products, material and flows of information, delivery times and quality aspects matter, but these factors also relate towards the social and strategic relations between the actors in particular. Insights from PAT are clearly relevant to the problems of the food and packaging SC design and administration. The focal company [*“works with employees and/or independent trading partners to deliver a high quality product as efficiently as possible”*] (King, 2002, p.10-11).

The instruments for doing so are provided, principals screening and bundling purchasing power into common procurement projects. This is supported by SRQ “Signaling Agent and Signallisation” with 45 segments. The principal screened the market to find a meeting of minds, a structure or an interface to couple organised on a key and lock principle. The agent signalled (transmitted) success factors for the principal. Strategic factors for success in this setting are custom-made, GMP accreditation - the across many countries accepted quality standard for purchasing of basic materials and semi-finished products, private standards like IFS and certificates of conformity manufacture confidence that the agent is manufacturing products according to stringent guidelines.

This conclusion has its grounds in the behavioural assumption that the management board and the workforce as well, do not act as interest-balancing but as egoistic agents who implement their own interest. They see themselves at first glance not in a partnering and advisory role; they represent as a function head the interests of their own business and functional divisions. As such, they do not solve integration problems, but rather induce integration needs (Reiß, 2000, p.25). At the dawning and course of the business dependence, the focal company is not knowledgeable about fine points, regarding the interests and incentives of the other echelons (agents) in the SC. Although all supporters of the SC reach the same decision that performing a cooperative collaboration will be the overall economic benefit of all echelons, but contrariwise each member in the SC is suspected of promoting its own interests at the expense of the whole SC (Ebers & Gotsch, 1995,



p.196f). These deductions are congruent with the findings of SQR Opportunism with 34 Code relations.

Due to different points of views on the benefits distribution frequently conflicts of interest occurs, and this lead to mistrust enforced by asymmetric information (Wolters, 1995, p.152f). Keil & Sullivan (2005, p.1) argue that there are four pillars which contribute the completely theoretical analysis. The underlying core assumptions are:

(1) Both parties demonstrate rational behaviour and share rational expectations. Their mutual interaction is based on institutions common granted by the freedom of contracts as well as the framework of private property (ibid, p.1).

(2) The actions and efforts undertaken by the hired agent as well as the results of his business activities [*“have external effects on the principal’s profits and success”*] (ibid, p.1).

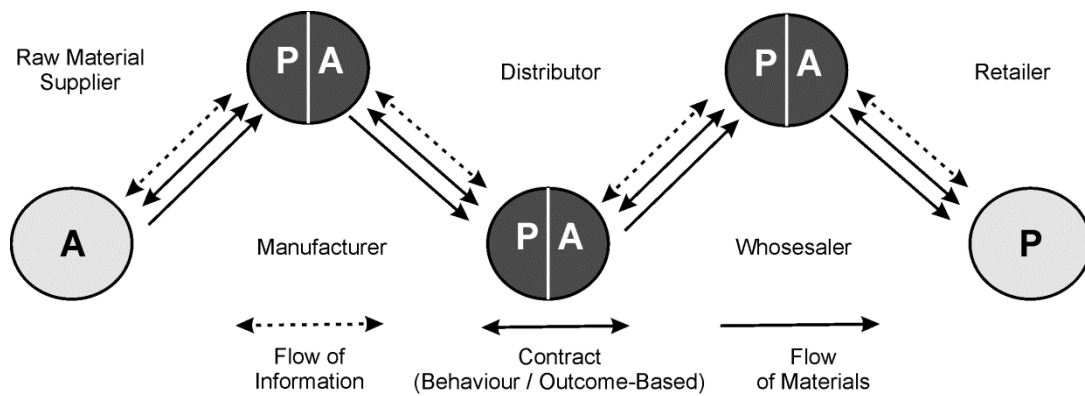
(3) The hired agent has non-compulsory or discretionary freedom ultimately to provide incomplete and/or asymmetric information. The self-control of the contracting agent to perform largely unobserved [*“leads ex ante to uncertainty (since the principal cannot rely on any reliable motivation like loyalty or conscientiousness)”*] (ibid, p.1). Concrete ex post disadvantages may come into existence. The lower and modest the ability to control the agent’s activity as well as performance, the bigger is the principal’s uncertainty, corresponding to the inherent amount of information asymmetry (ibid, p.1).

(4) In the latter case a divergence of interests occurs, by way of the agent demonstrates self-interested, opportunistic behaviour to maximize his own expected benefit, instead of acting and conducting himself consistent by means of the recognised goals and guidelines of the principal (ibid, p.1). The trinity of opportunistic behaviours are hidden characteristics, hidden intention and hidden action. The aspects presented before lead to the three elementary sorts of coordination as well as motivation problems (Goebel, 2002, p.113-115).

**11.2.1 Economic perspective of the PA-Problem**

Within the perfect market all actors are subjected to the same conditions and transparencies, agency problems due to information asymmetries are absolutely unknown, accurate free information, no opportunistic behaviour, and a riskless future, because the perfect market does not involve time-constrained decision making.

In the sections yet to come, these problems are evaluated in the light of the PPSC and practical approaches are suggested to avoid them or mitigate their impact by aligning the possible conflicting interests of the agent by disciplining him.



**Figure 23:** P/A Relations within the PPSC, authors own graph based on Fayezi et al. (2012).

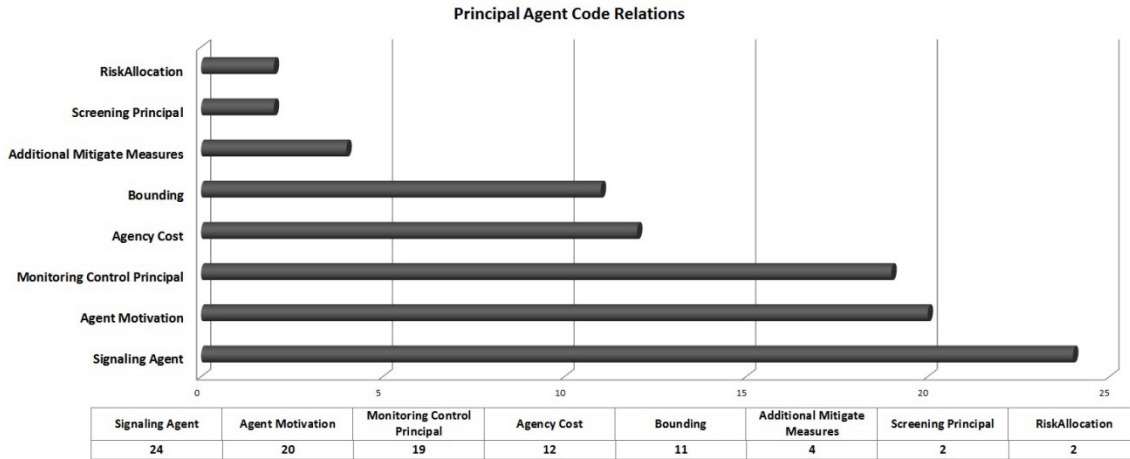


Figure 24: Principal Agent Code Relations.

11.2.2 Adverse Selection

As stated before, before the start of the ex-ante interaction, the principal (focal company or customer) cannot properly assess the situation or determine the agent’s suitability indicated by productivity and outcome etc. (hidden characteristics). This scenario like market entry barriers is being shaped before the request for quotation according to the findings of SRQ 3.3 (Meaning of Cert.Sys and sub code Cert.System Barriers).

Food manufacturers or operators, food processors and packagers need packaging material that fits all commercial (first of all to be cheap), marketing and regulatory needs. Due to modern communication tools like EDI, SAP web based applications and Email correspondence a wide range of quotes come into existence as stated by SQR 3.4 (Trust in PSC and sub code Vertical Integration). If the packaging supplier cannot refer or rely on a quality management system and certificates to demonstrate compliance for safeguarding the brand image as well as corporate reputation, then the inquirer may be faced with corresponding market prices but also with uncertainty. In addition, the consumer is not conscious about the agent’s very personal motives and reasons (hidden intentions) for a quote: The roadmaps of the agent to make the most of his own benefit, by improper performance or shirking in terms of improper business practices.

This leads to quality uncertainty (Stigler, 1961, p.223), which means that the customer (principal) is subjected and bears the risk to yield a price higher than the real market price in the situation that the packaging company did not deliver food grade packaging.<sup>132</sup> The findings of SRQ 4.1 (Future Success Factors) are associated with such elements of uncertainty and risk. To cure these concerns top quality in the meaning of well-known market presence and a customer-driven mind-set is needed. Consequent customer orientation and tailored products for specific requirements will embrace the desired advantages compared with competitors in all areas, which lead to a close cooperation with customers and suppliers besides to multiparty technical developments at a high sustainability level.

Another way of considering at this problem is Akerlof's "Lemon-Problem". Akerlof's analysis (1970, p. 489-490) of adverse selection and its significance and consequences on the market for used cars can be circumscribed in the following matter: On the market for used cars, the vendors (agents) can better witness and conclude the excellence of cars that they sell. Customers (principals) in contrast can only acknowledge the average quality or price comparisons due to their own investigations finding a new preowned car. The significance is that the sellers (agents) ought to have an informational gain over the buyers (principals) and, in addition to this; the seller (agent) can sell low quality cars at the same price as high quality cars since buyers (principals) cannot judge the difference in most cases. The elementary effect of this adverse-selection problem is that it leads to inefficient market allocations. In consequence, the used-car market will essentially consist of "lemons": the miserable cars tend to drive out the good ones.

The quality of the offered boxes and containers is not obvious or traceable for the customer; therefore they refuse to pay for high quality and only low-quality, unsuitable goods are traded if there is no regulative framework that regulates the producer of the packaging and the marketer.

A key issue of SRQ 4.1 (Future Success Factors) is to achieve quality and cost leadership in these product sectors. The overall important principle is "first to be

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<sup>132</sup> It has to be mentioned that food packaging is an article that needs trust. The suitability for food related packaging can only be confirmed by laboratory investigations. In real life it takes weeks for analysis in contrast to time to market.

cheap”, but also demonstrate standards and implementing instruments and methods that claim to ensure compliant behaviour in the company. The findings support that the main charge is to generate a business environment, which demands conduct in conformity. In addition, the second research question introduces an additional tool to avoid the down cut of quality or unfair rivalry for economic actors within the domestic market. It is the recommendation to make use of contractual safeguarding of the pursuit of liability law charged upstream on a back-to-back basis.

A possible solution to prevent adverse selection would be to have verification by independent authorities as. If market research firms look for proof of reputation or other independent institutions carry out independent audits due to certification’s requirement, the issue of uncertainty can mainly be reduced. Evaluations and rankings of suppliers are cherished and trustworthy only if they are performed independently. The reviews must follow the same appropriate methodology like independent certification systems stated in chapter 3.9. This issue is supported by SRQ 3.3 (Meaning of Cert.Sys) and the need for private standards, because legal requirements only meet minimum requirements. In addition, the findings of the 4<sup>th</sup> research question defend this application-centric approach.

### **11.2.3 Screening and Self-Selection**

The screening device is the first instrument that allows principals to face adverse selection. The idea is according to Spence’s findings (1973) due to the labour market, that principals will use a bundle of observable characteristics and quirks, which are positive or negative, correlated with the parameter of interest. So they screen and rank applicants’ prospective job performance on the assumption of their adequacy of characteristics.<sup>133</sup> Monitoring and observing the chosen agent is costly for the principal, supply chain process in terms of price, information

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<sup>133</sup> The observable characteristics that HR principals can use to screen applicants are numerous in the labour market like gender, race, appearance, educational records, past work experience, work review and evaluations, certificates etc.

procurement and effort of time, tools and money to evaluate the agent's quality of work or of a service offered by him.

Anecdotally trust is often mentioned to cope with information asymmetry and in all practices of the HOE, trust significantly reduces transaction as well as agency costs, but a surprising result not in this study: the findings of SRQ 3.4 (Trust in PSC) and related subcode "Trust Label Hallmark" demonstrate that interpersonal trust is not an option. Technical security, proven by migration tests will be the routine of excellence. Practical safekeeping is unlike to security among individuals: To trust in instruments implies trusting in codes of processes and their computability, to faith in people, in opposite, means to give credit be treated in a trustworthy manner.

The fundamental principles of the Framework Regulation (EC) 1935/2004 apply to the packaging system as a whole. Single components and ingredients of the packaging respectively are not tested for their toxicological effects. It is common in packaging to test the final packaging system and no single layers or intermediate products. As the lawmaker has made clear, the toxicological threshold applies to the packaging as a whole. The SML of individual substances in each layer of the packaging and their deducted effects are summed up for the general migration limit (GML). The GML is the gatekeeper for the marketability of the packed food and feed.<sup>134</sup>

Nearly every packaging in general must be manufactured in diverse steps of manufacturing are leading to the product. Attributable to the requirements of certification systems or private standards, a QMS must be at hand that traces and controls seamlessly every sole phase of production, based on hazard prevention concepts as stated in chapter 3.9. Therefore, a suitable approach could be a screening mechanism to cut the agreement or duty in parts and acceptance or inspection of production will take place in good professional practice in the prior stages of the production process. In a nutshell: The manufactured output will be evaluated and the agent's deal will be protracted or not consistent with to the

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<sup>134</sup> The argument is as follows: The natural ingredients or the exposition of process-related risks are nor been mentioned here, but must kept in mind, because the GML is the joint summary of all environmentally, toxicological pertinent data.

principals concentrated property rights in which scope an scale the agent operates as stated by the findings of the 1<sup>th</sup> main research question.

Of course, there are disadvantages for the agent; he is forced to act understandable for the reason that his freedom of action is subjected to the principals of a PR framework. All aspects of agency costs and all ranges of solutions offered by the PAT must be seen within the portfolio of this framework of restrictive conditions of principal's PR. In the first place the agent must be disciplined, but second the principal benefits from this screening mechanism: (1) the quality of the amount produced can be adjudicated by every step; (2) the characteristics of the output is not related to unidentifiable, incoherent exogenous impacts or on if he can distinguish between external factors and the results can be explained to the agent's efforts and actions; (3) in the concluding instance, the principal can decide if only partial production is allowed. The principal can replace the agent (supplier). The so called switching costs means a new agent must obtain the required knowledge and thus guarantee a high degree of production trustworthiness might be minor than the costs to go ahead with the first agent, who has been proven formerly to provide low quality.

Fenced in by principal's framework of PR, the disciplined agent will do everything promising to create high switching costs, retaining his focus on core success factors found by SRQ 4.1 (Future Success Factors): hinnoventigh switching costs due to quasi-functional vertical integration by synchronous connection of procurement and logistic systems (EDI, SAP). The agent's cost-benefit ratio is established on economies of scale and related cost savings, human specific assets, and cost advantages based on the experience curve influence and impact, which is associated to large sales volumes as SRQ4.2 (Asset Specificity) contribute.

In addition to mechanism of screening there exists another device, a real needs approach that allows disciplining the agent, this more complex idea is the mechanism as stated in sub chapter 5.2. The less informed party (principal) offers a pricing scheme to the agent which forces the anticipated agent to release true information about his respective quality. For instance, in the initial stage of a business relationship the price paid could be beneath otherwise identical to market levels and higher in the next phases of production in the case that the evaluation of

the box making leads to a positive result. This methodical procedure provides a minimized risk to the principal.

Annual invitations to tender or the issue of tender offers are present, different modes of usage of self-selecting. Another issue, which ascends, is the option of the kind of segment-market: Food or non-food for the packaging company. Seen from a strategic global bird's eye, both paper based packaging markets are attractive: Food in total 43.2kt, growth 4.4% 2016, Non-Food in total 47.9kt and 4.3% growth.<sup>135</sup> The agent (packaging supplier) uses whereby the same invests in technology and machinery, but less conformity work, demands for third party certifications and private industrial standards and all above back-to-back liability. This option is supported by the findings of SRQ 4.1 (Future Success Factors) and SRQ 3.4 (Indicators Success). The arising question, how long the agent (packaging supplier) will be a market participant will be discussed later in chapter 12 with recommendations for action.

Of course, there are many limitations due to transaction and bounding costs, the agents would only agree to such a contract scheme if the superiority of the production depends linear on the quality of his work. The agent's work outcome can be assessed and adjudicated properly, based on mutual, contractually agreed criteria for the agent's conceded compensation. Under different conditions, the risk of such a screening mechanism is too high for the agent, he will not agree to such a step-by-step contractual compensation due to findings of SRQ 3.2 (Task Fulfilment Supplier) and the incorporated back-to-back liability. To be an officially listed, as an approved supplier is a monetary value and has a positive effect in reliability, reputational improvements and legal confidence for principals. Nevertheless, one must keep in mind due to upstream back-to-back liability; the agent is in need for a risk premium according to findings of sub code Agent Motivation.

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<sup>135</sup> According to "The Future of Global Packaging to 2016," from Pira Intl., the global packaging market is expected to get to \$820 billion by 2016. Corrugated board consumption will rise due to processed foods, household care, chemicals, electrical goods, and other issues. Folding carton takes advantage by the growth of healthcare products, electrical devices, and frozen foods. Pira own research notes that technological developments in lightweight packaging will promote the use of biopolymers, adding value with functional barrier coatings, and by light weighting across all materials.



#### 11.2.4 Signalling

The method of choice to shorten the range of adverse selection in the market is Signalling. As stated in chapter 5.2.8 it was investigated in the perspective of the employment or labour market. Within the segment market of the PPSQ, the signalling device works in the same way, box makers or packaging companies, which are sellers, will try to signal their quality by offering guarantees, certification, and reputation efforts.

Signalling is grounded on the perspective that an agent favours an action which credibly, trustworthy signals of private (as a sales representative) or company information and business affairs in the past. Nevertheless, the principal still does not know the real characteristics of the agent, but he can lower his personal or contracting uncertainty over reliable cornerstones and anchors like indices or signals. Indices could be the companies' information and data about the economic situation, turnaround and achieved net revenues, number of employees and stock and manufacturing area etc. Signals are related towards securities prearranged by the agent, superior qualifications, specific assets or certificates and reviewed analysis of supervisory activities of the competent authorities etc.

Keil & Sullivan (2005, p.2) interpret such an approach as the [*“optimal situation of a separating equilibrium in which different types of agents get different prices is reachable and the market efficiency increases, compared to a pooling equilibrium in which all types of agents are paid equally”*]. A further complication is that signals like certifications are only useful to drop information asymmetries if the efforts and cost for signalling are higher for agents with lower quality. Only if certifications are reliable barriers to entry can a truthful agent reap benefits. Other reliable signals, i.e. credible signs of the agent's quality, are commitments (bounding cost) to lower the price ex post if the packaging does not meet agreed requirements and demands or to perform the demanded subsequent fulfilment (recertification, contractual penalty and compensation or replacement delivery if regulatory needs are not met) free of charge, subjected to the fact that only high-quality principals will negotiate and accept such contracts.

The agency costs concerning formulation, implementation and enforcement of agency agreements are necessary (Feldmann, 1999, p.135). During the pre-contractual period, the principal might screen and monitor the market for a proper,

well-suited agent. Screening mitigates as well as shorten the risk of adverse selection (Goebel, 2002, p.111).

Examples for day-to-day screening are the calling for tender, soliciting offers, presentations and previews, visits to reference sites or contractual negotiations. The agent provides credible evidence about his reliability and reputation, signalling is the method of choice. The agent himself has an interest to reduce information asymmetries by credible, reliable signals. As stated in sub chapter 5.2.8 signalling is generally understood as a prior information transfer in the pre-contractual phase. The objective of this approach is the minimization of uncertainty associated with the selection of new agents (adverse selection), establishing business relationships between the contractual parties (hold up). Signalling permits an agent with serious qualifications to differentiate him by fostering his market position. Nevertheless, the trustworthiness of signalling is based on the mutual recognition of professional qualifications and reputation.

The reasoning's of this strategic derivation are the findings in the framework of certification issues concerned in this study. Beside a prudent and conscientious declaration of compliance and conformity work, the only trust generating instrument is successfully passing certification in accordance with private industrial standards.

In their role as agents, echelons of the PPSC provide measures in order to signal their trustworthiness. This is significant, as often the principal (retailer, food operator) cannot directly observe the agent's actions and has to rely on informational substitutes. It has been found through the code relations and segment analysis of SRQ 3.3 (Meaning of certification systems) that signalling serves to convey the interest of an institution or company for additional information on behavioural dispositions. Signalling plays an important role in enabling cooperation, as a meeting of minds, when other kinds of access to up-to-date and reliable information, such as personal experience or reputation, are not at hand. However, signals are useful as informational substitutes only insofar as they are credible, which means they can be neither imitated nor copied. These empirical examples gave powerful evidence that the signalling function does indeed play an important role next to certification systems and private standards.

### 11.2.5 Moral Hazard

Finally finding a contractor and closing a contract, the principal is subjected ex post to have limited control concerning the activities undertaken by the agent. The principal can risk the disadvantage of only being incompletely informed or being charged for positive information costs to locate the agent's hidden actions, trust is not an alternative. As specified previously the principal can trace and trigger the agents efforts throughout the various different stages of processing boxes and displays, but a moral risk is close at hand if the principal can completely supervise and monitor the agent's actions, but has limited ability to judge them properly, if he lacks understanding of the production processes then the agent can take advantage.

The main underpinning obstacle is the information advantage in the perspective of information asymmetry of the agent dealing with the quantity and quality of input and of the produces flow of goods. If the boxes are packed with food, and are shelf-ready been offered at the grocer, they may be sold and consumed before customer groups or local authorities demand a withdrawal from the market.<sup>136</sup> All this influencing factors provides the agent an opportunity to utilize his possible discretionary freedom and to maximize his profit. Several subcodes corresponding "Monitoring and Control Principal" and "Screening Principal" "Individual Maximisation of Utility" and "Transaction Atmosphere", moral hazards due to "first to be cheap" mantra are close at hand.

### 11.2.6 Monitoring

In fact, information is characterised as a purchasable commodity. The principal can empower monitoring systems in order to counterbalance information asymmetry (Eisenhardt, 1989, p.59). PAT monitoring comprises all means of continuous control and administration of all flow of processes of the agent. This

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<sup>136</sup> In February 2013, millions of consumers in Europe were outraged and disgusted due to declared horsemeat as beef in lasagne, tortellini, kebab or sausages. Hundreds of tonnes of horse meat were sold to the food industry, manufactured and packed. Later when the excitement cool down, the issue disappeared from the main evening news and minds - even though the authorities had to call back several times, often the corpus delicti was already eaten there (Hecking, 2014, n.pag.).

procedure ensures that the principal intends measuring and counting to decrease his information disadvantage. Moreover, the major intention is to achieve an information symmetry or balance between both contracting business partners. It is a must that the principal needs to admin the exertion undertaken by the agent. This monitoring activity generates costs and efforts. Some principals may measure how many hours the packaging development team invests, data service for printing plates, printing and converting. The process time acquired hereby will be mirrored against the agent's postulated production cost. Penalties can be negotiated for issues in which the principal recognizes or detects opportunistic behaviour. Related to the cascaded flow of processing of integrated box making this is not suitable due to difficulties in characterising such behaviour. Does the agent follows the GMP instructions, is every detail of the product right: the careful choice of LMQ materials, the independent design of the box or the precision workmanship. More fundamental, goal-oriented monitoring requires course of actions that means the principal must have a good understanding of packaging development in general and knowledge of where problems can occur. In a nutshell: the thought-provoking questions be present: (1) which issues and measures have the major influence as well as impact on the quality and proof of suitability of the resulting packaging and (2) inevitably the costs of monitoring does not exceed their value. The subcodes of "Additional Mitigate Measures", "Monitoring and Control Principal" and "Agent Motivation" offering solutions towards this issue. The strongest influence and impact on the quality and proof of suitability of the resulting packaging, including a cost perspective, are bidirectional communication, design and marketing related to a technology transfer and collaborative product development and a framework of necessary and sufficient conditions for conformity based work. The costs of monitoring will emerge, in addition to the principal, local authorities will inspect and carry out verifications. They impose designate disciplinary measures against operators who fail to respect the related due diligence scheme or fulfil the demands of the regulations of the German Food and Feed Code (LfbG). SRQ 4.4 (EU Spill Over), SRQ 4.2 (Asset Specificity), SRQ 4.3 (Oligopol) and the subcodes "Bounding" and "Uncertainty and Complexity" illustrate this future trend.

### 11.2.7 Corporate guidelines, restrictions and contractual agreements

The principal can decide not to count the effort devoted to the agent and instead formulates rules and guidelines that shorten the agent's choices and limit his range of possible opportunistic behaviour as stated by sub code "Uncertainty and Complexity". Cases of technical guidelines, conformity assessment procedures are coding guidelines or project management rules.<sup>137</sup> Nevertheless, this also bears supervising costs, since the compliance with these claims needs to be controlled, see SRQ 3.4 (Trust in PSC).

It may be emphasised, nevertheless, that the presence of various mechanisms back up or hedge contracts to counteract agency problems in an all-embracing manner. In literature are found some distinctions between two kinds of regulation mechanism: the private /market and the public/political one.

Corporate governance might be understood as a framework of a law system, regulations as well as judicial decisions (Lipton & Lorsch, p.59). In this case agent's opportunistic behaviour is encapsulated by a property rights framework like that introduced in chapter 5.3.9. [*"Mechanisms such as competition and reputation"*] (Padilla, 2002, p.12-13) as well as trust are the most mentioned issues to shorten agency problems. The market itself is an institutional mechanism, a rule providing, organized trading hub, to sell or not to sell. Therefore, the market belongs to private mechanism. These private mechanisms, also labelled market mechanisms, are spread out and in attendance is no dominant, rule providing authority to organize and enforce these mechanisms, but individual voices correspondingly point toward the self-regulating powers of the market: the market will decide, see sub code "Signalling Agent & Signalisation".

On the other hand, there are political mechanisms that do not need consent of the affected individuals and actors in the market. These rule giving mechanisms are authoritatively enforced, to shorten the range of uncertainty, see SRQ 3.1 (Validation Authorities NGO Customer). Political mechanisms such as property rights take the form of commands and interdictions, which are enforced by the

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<sup>137</sup> The Nestlé Initiative on Packaging Safety and Compliance addresses the ink usage for decoration (printing and value adding finishing on packaging materials. For further reading see [www.nestle.com/asset-library/Documents/.../Nestle-NQRV.pdf](http://www.nestle.com/asset-library/Documents/.../Nestle-NQRV.pdf), last access at 01.12.14.

governmental authorities or their embedded agencies. Padilla (2002, p.13) remarked that the best way to conclude is, while agency theory refers a framework of property rights, [*“it refers to government/public regulations of economic guided activities, the objective of which is to minimize agency problems”*]. Examples of regulations or mutual agreements which attempt to prevent agency problems are (1) licensing; (2) industrial criterions of quality and safety in all means; (3) antitrust regulations; (4) insider-trading regulations (ibid, p.13) as well as (5) consumer protection.

The regulators agreed in their justification for the establishment and enforcement of government regulation of product standards, that competitive market forces and industry self-regulation are incapable of accomplishing an suitable level of safety to customers (Padilla, 2002, p.19).<sup>138</sup> Owing to Padilla’s facts (ibid, p.19) it can be concluded that the forthcoming regulation is compulsory because individuals like consumers at the market, are not capable to protect themselves and in addition the market itself as well as the PPSC do not provide mechanisms necessary to demonstrate an acceptable level of quality and Consumer-safety and quality, see findings of subcode “Opportunism” and SRQ 3.1 (Validation Authorities NGO Customer).

The increase migration alerts<sup>139</sup> highlighted by NGO’s, consumer protection organisation and the media are aware in the public eye. For that matter the German legislature has concluded to act due to the impossibility or inability of the all potentially affected industrial branches to solve the ubiquitous dissemination of MOSH and MOAH or packaging related food crises. Therefore, it is far from evident that government regulations of quality and consumer-safety are both necessary and more successful than voluntary (industrial) processes, like SQR 3.1 (Validation Authorities NGO Customer) reaffirms this principle.

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<sup>138</sup> For further reading see Padilla (2002, p.19ff).

<sup>139</sup> See food safety scares: ITX (2006), Benzophenon (2009) and mineral oil traces (2010, 2013, 2014).

### 11.2.8 Incentive-compatible Contracts

As a common accepted fact, one can state that it is difficult to measure the input invested by the agent. Due to this very fact, the principal had better focused on further instruments to assure that the agents output and working result meet the principal's needs and requirements. An additional effective technique of control is to bring into line interests for decreasing moral hazard. This perhaps might be completed by introducing an incentive system, which harmonises the intentions of principal as well as agent, by means that the agent's payoff should be a function dependent upon the principal's profits (Keil & Sullivan, 2005, p.3). The principal's problem is consequently to design and negotiate an incentive contract that shoves the agent to agree to arrangements that will maximize the principal's welfare. The principal is subjected to uncertainty due to the causality between the agent's efforts and the work results. Even if the principal would relate the contract to his observation, a risk neutral agent would not sign the contract due to the shifted risk and burden of proof. This management of affairs avoids designing complete contracts that make agent's compensation contingent on the one hand to his actions and on the other to the outcome of his unobserved actions. As stated before the principal cannot contractually assign to all future bound consequences of the agent's actions yet to come, the costs of designing unambiguous contracts as well as costs of enforcement are too high. As far as the latter is concerned, the agent is able to engage in discretionary behaviours, to undertake actions that may undermine the utility and welfare of the principal. Owing to this fact, it is ideal for the agent to behave in behalf due to the principal's interests and to follow the incentives incorporated into the mutual contract.<sup>140</sup>

In real life and practice, this is managed through variable payments; this might be a pre-agreed bonus if the excellence of the delivered packaging exceeds a given level and all migration testing have been done (if there is enough time to market). The challenge for both is to agree upon mutual accepted indicators or parameters for the quality or demands of the packaging, e.g. the packaging system,

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<sup>140</sup> Contracts must be designed and closed in a ["*carrots and sticks*"] manner, were the donkey (agent) tries to reach the carrot and run in the principals behalf; for further reading see Mirrlees (1997) or his Nobel Prize Lecture, December 9, 1996, The Nobel Foundation, S-10245 Stockholm, Sweden.

which has been delivered to the grocers or retailers. SRQ 3.3 (Meaning of Cert.Sys) offers these indicators at first as a meeting of minds where the principal mentally docks on to a structure of processing that will fit the industrial private standard of the focal company. Further measures and a set of indicators are provided by joint product development and ongoing bilateral communications. SRQ 4.1 (Future Success Factors) offers this lowest common denominator and may be the potential new approach of the authorities, paper based packaging with an integrated barrier layer, combined with an official batch release per se. LMQ inks, varnish and value added printing are available and already introduced in the market, see 3<sup>th</sup> main research question and SRQ 3.4 (Trust in PSC). Both segments of findings demonstrate what factors influence their predictability, as well as a quantification of the implanted hazards and supplementary risks.

### 11.2.9 Exogenous Factors

Indicators' as well as parameters' are able to measure the result of the agent's work might not the only criterion for their significance (Keil & Sullivan, 2005, p.3). Let's dare to indulge the thought that the principal may well rate the return on investment of packaging projects. If the mutual agreed variable compensation is directly linked to the principal's return on investments, the principal and the agent have a harmonised adjustment of interest. The profit maximisation intension of both is the same hereby (ibid, p.3).<sup>141</sup> A risk neutral or averse agent may hesitate knowing there is a risk that even if the performance and productivity of the agent is remarkable, and the packaging is adequately, it may not be rewarded due to sale figures in the market. The agent cannot influence this objective risk. A risk-averse agent may be hampered from entering into the contract even if he is best in class and attributable to his reputation.<sup>142</sup>

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<sup>141</sup> Nevertheless, such an indicator has got little value, the compensation depends on many issues, which cannot mainly influenced by both (Keil & Sullivan, 2005, p.3). At the end of the day the final consumer determines the market successes.

<sup>142</sup> Observed and announced opportunistic behaviour reduces the agent's reputation. If the reputation of a contractor is gone, it limited opportunities for future projects in perspective of long contracting business cooperation (Keil & Sullivan, 2005, p.4).



From the analysis stated above, one can draw the conclusion that metrics, key performing indices or branch specific indicators must be related to the agent's actions as clear and unambiguous as possible to be useful for deriving the bonus-malus system. The striving issue about supporting this fact is that the appearance and impact of exogenous influences and factors needs to be limited and must be reliably excluded. This implicates that the principal must invest additional time in defining specifications, project and packaging guidelines, before contracting with an external packaging company. Here the agent has a sound understanding of his responsibility and compensation, see findings of sub code "Additional Mitigate Measures", SRQ 4.1 (Future Success Factors) and SRQ 3.2 (Task Fullfillment Supplier). Keil & Sullivan (2005, p.4) postulate that the deeper the passionate bond of the agent, a lesser amount of [*"opportunistic behaviour will occur since values like loyalty, fairness, or friendship are parameters in the agent's utility function"*]. From all this it follows, even if it is not explicitly mentioned here before, how important it is to maintain regular and close contacts, close cooperation and bidirectional communications. The idea that a close relation of trust is a kind of reliable and valued glue between the contractors is not given; regarding the finding of sub code "Transaction Atmosphere" and the 3<sup>th</sup> main research question, the exploratory empirical findings imply that dependable trust and consequently gain long-term competitive advantages are only founded on conformity assessment procedures (conformity work), applicability tests for migration and an adequate third party liability insurance.

#### **11.2.10 Hold-up Situation**

Let's assume a situation where a principal recognises and observes that an agent make the most of his own profit as a replacement for the goals of his principal or did so in packaging projects before. As far as that is concerned, in some issues it might be reasonable for the principal to continue to employ an agent due to irreversible assets or investments (both subjected towards sunk costs). It might be more costly (switching cost) to build up a new supplier or service provider (new agent) compared to keeping the old agent, as introduced before in sub chapter 8.2.3 (see also *ibid*, p.4). This case could have been arranged by the agent as a hidden intention, for instance in the course of the transition period when

the agents stock is filled with unsuitable raw materials. The principal may order low migration quality for box making, but attributing to the fact that it is none unlawful behaviour; the agent sells it to the customer with a wrong declaration, to empty his warehouse. The agent may do so because switching cost and phase for market entry are essential to the principal; here implicit knowledge as well as exclusive skills of the agent lead to hold-up problems.

This above assumed situation is of an extremely low probability, as SRQ 4.1 (Asset Specificity) contributes; single sourcing is no option within the PPSC. Due to accessibility of raw materials and a sophisticated procurement strategy that strictly bans single-sourcing, the focal company do not solely obtain critical raw materials from only one echelon. Vertical integration is the opportunity to reduce supply disruptions.

#### 11.2.11 Specific Investments

An alarming dependence by the purchase of goods by the principal (on the agent) is given if a replacement of the agent [*“would create costs that are high enough to give the current contractor the opportunity to increase prices above market value”*] (ibid, p.4). From the principal’s perspective imminent switching cost govern the cooperation and bind the principal to the agent. This scenario represents a considerable potential hazard for the principal, for that matter the principal had better claim to apply standard packaging norms like FEFCO and well-known, wide spread printing and converting technologies to guarantee that there are a sufficient number of other packaging companies who could handle the established packaging system. Also established manufacturing processes, industrial standards and branch specific guidelines are steps to assure maintainability and by reason of comparability avoids hold-ups by opportunistic agents. If innovative packaging projects are outsourced as an access to critical resources or assets to an independent technology specialist for the first time, more than one external company should participate to the project to avoid dependence from one specialised supplier and to assure that in the future only a price at arms' length<sup>143</sup>

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<sup>143</sup> That a transaction sandwiched between associated firms must be completed only on commercial rooting, both companies try to make the most of their benefit,

will need to be paid. An agent will not agree to subordination in case for not being considered for near future projects. Economies of scale and scope are only being achieved and repeated in stable conditions (transactions). Over and done with repeated interaction, the agent can size up respectable reputation, human- as well as social capital. A transaction atmosphere of loyalty, partnership as well as personal trust can help to avoid the agent imposes potential hold-up opportunities (ibid, p.4). The segments of sub code "Transaction Atmosphere" gives shape to this scenario.

#### 11.2.12 Sourcing strategy

PAT can also be applied in the decision-making procedure of purchasing, to serve as a supportive instrument or to the establish a sourcing strategy. The approach takes into account the field of market uncertainty and provides behavioural as well as outcome based contractual solutions. For that matter PAT (and TCE) provides a supporting framework for make-or-buy decisions.

PAT is a valuable tool to establish the right arrangement to categorize raw materials and commodities to give shape to a procurement strategy. Nevertheless, as supply risk increases, behaviour-based contracting seems more appropriate. Eisenhardt (1989, p.61) outlines to one of the major striking features of this issue that [*"... outcome uncertainty is positively related to behaviour-based contracts and negatively related to outcome-based contracts."*] Zsidisin & Ellram (2003, p.18) supported this issue too; they state that behavioural based contracts will discipline supplier to act in conjunction with the purchasing function's interest, if a certain degree of supply risk is involved: (1) supplier certification, (2) quality programs, (3) target costing and (4) supplier development.

As stated in chapter 3.9 supplier certification involves determining standardized performance thresholds, such as quality, price or delivery. Furthermore, due to the intensive bilateral communication, it can be assumed that this certification-process shorten supplier choice to opportunism, as information asymmetry is mitigated (Eisenhardt, 1989, p.60).

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and neither firm gives preferentiality to the other one in any way (keeping an arms' length distance).

The implementation of QMS increases the capabilities of the supplier, which in reoccurrence will decline the supply risk (Zsidisin & Ellram, 2003, p.18). In this way, a companies' purchasing organization develops successively a network of capable and reliable suppliers (ibid, p.18). The level supply risk involved in behavioural-based management implies two dimensions according to Kraljic (1983, p.111-112): (1) strategic items of high value and high market complexity, which demand a partnership with the supplier; and (2) bottleneck items, low value, high market complexity, which highlights the requirement for firms to centre on assuring supply.

Following Kraljic (1983) it may be asserted that the implications are matched with the behavioural approach towards risk management within a supply chain. The assurance of critical items introduces a close collaboration with the upstream supplier of raw materials or specific adapted commodities, the segments of sub code "Vertical Integration" contribute to this. From the PAT perspective, the benefits of both parties are joint together, which mitigates the range of opportunism, see segments of sub code "Additional Mitigate Measures".

The best way to prevent migration in packaging is demonstrate a suitable barrier concept. A reasonable approach to this obstacle is to design explicit barrier coatings. These coatings can be applied exclusively during papermaking, manufacturing corrugated board or specially-sealed wrapper to be engaged in the bag in box packaging system. It can be assumed that during the transition period of the ordinance or at the point of enforcement, these coating technologies are rare and limited as stated in the segments of SRQ 4.3 (Oligopol).

Due to these considerations, PAT compliments and enriches the decision-making process of finding a suitable, reliable sourcing strategy in a highly complex and uncertain supply market environment. By now, the resources of paper based barrier materials are limited, but according to the findings of the second main research question, various paper based applications that have different technical features are available now to test the runability in terms of processing techniques and will be available at an industrial level during the transition period.

Regardless of all scrupulous evaluations to pick a reliable supplier, the risk of adverse selection is present, which leads to bonding costs. (Jensen & Meckling, 1976, p.308). Jensen & Meckling (1976) stated, that the supplier (agent) signalling

the purchasing company (principal) guarantees that he will not act or behave against the interests and accepted guidelines of the purchasing institution; due to third party audits and certification systems supported by findings of sub code "Signalling Agent & Signalisation".

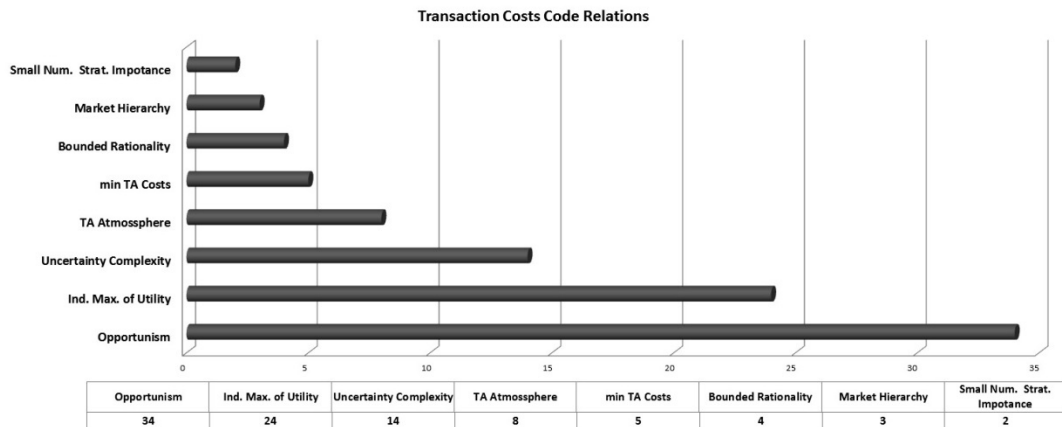
If initial commitments give shape to these contractual arrangements, the purchasing company can rely to a greater extent on the suppliers' capabilities, as the contractor is intended to subject himself to these bonding costs, see segments of sub code "Bounding", related code "Agency Cost".

### 11.3 ANALYSIS OF TCE IN PPSC

A transaction is a basic unit of analysis in a relationship, shaped by asset specificity, uncertainty and frequency. The relationship is subjected to changing costs and information sharing due to better performance within the supply chain. As stated before Williamson (1985, p.1) characterised this that [*"A transaction occurs when a good or service is transferred across a technologically separable interface. One stage of activity terminates and another begins."*] A transaction induces process costs for information, coordination and communication: searching, negotiation, execution, implementing, adaptation and controlling. The theory's core hypothesis is that [*"...transactions will be handled in such a way as to minimize the costs involved in carrying them out"*] (David & Hahn (2004), cited in Bremen et al., 2010, p.20). Consequently, transactions will be carried out in such a way as stated in SRQ 4.1 (Future Success Factors) "first of all to be cheap". Low transaction costs encourage market exchange, i.e. intermediary goods or articles are acquired from suppliers, like me-too-products of FMCG (see sub code "Transaction Atmosphere"). High transaction costs demand hierarchical governance bonds, like intermediate products remain manufactured in an in-house process or within a framework of vertical integration (see sub code "Vertical Integration")(see also Bremen et al., 2010, p.20).

The market for fibre-based packaging is a segment market related to healthcare products, electrical goods, frozen and chilled foods, pharmaceuticals among others; see SRQ 4.2 (Asset Specificity). Established market players are independent SME and integrated plants of national industrial groups or groups at European level; see SRQ 4.3 (Oligopol).

Every actor who uses the market for economic transactions is always faced with costs. These transaction costs (fees) are introduced beside regular production costs and come into existence implementing the aspects of property rights. They are the costs for information as well as bilateral communication, the commitment of time, competence, responsibility, risk, money and amount of work applied when handling exchanges. TCE's underlying idea is to ["... align transactions with governance structures in transaction cost economizing way"] (Williamson 1990, p.67). On the other hand they shorten hold-up problems linked to contractual hazards due to issues that lead to market failure, like information deficiencies or incomplete contracts with unintentional loopholes for opportunistic behaviour. Much of the issues are based on the role of asset specificity, ambiguity and uncertainty, as well as frequency in shaping whether or not branches or industrial sectors are moving towards markets exchange or rigid hierarchical structures, by developing productive, learning and participative organisations.



**Figure 25:** Transactions cost relations frequencies.

Neoclassical economics are grounded on the core assumption that full information is available to all actors without any cost, time critical decisions are absent. TCE assumes that a cost is attached to obtaining and gathering information. These costs could be arising in terms of exploration or handling costs. A growth in information should reduce the likelihood of bounded rationality as well as diminution the odds of opportunism among individual echelons in a supply chain.

Beside organizational structures such as joint ventures, franchising, and strategic alliances, networks might be determined as hybrids. Elements of market exchange and vertical integration are all closely interrelated. By means of this understanding in mind, cooperation of independent companies in the form of SCM can also be categorized as hybrid systems of authority in a rule giving, new institutional perspective (Lietke & Boslau, 2007, p.2).

Seen from a transaction cost perspective, an overall implementation of SCM across all supply chain members describes closest idea of vertical integration (Lietke & Boslau, 2007, p.3). Iyengar (2005, p.8) argues that an increase in asset specificity and incomplete contracts, due to bounded rationality, leads to firms preferring hierarchies (vertically integrated firms) in opposite to market (outsourcing) based transactions, the increase in information should lead to an increase in market-based transactions over hierarchy-based transactions due to an over-all decrease in transaction costs.

Future clear statutory provision applied in national and internal market of the European Union will prevent unfair competition for economic operators. Tailor made interfaces due to a quasi-interface are private industrial standards, married with a certification system, LMQ raw materials and a select range of printing barrier substrates will support this scenario. A future German packaging ordinance as a common minimum standard of reference, incorporated into private industrial standards will lower transaction cost. The findings of SRQ 4.4 (EU Spill Over) and the segments of sub code "Institutional Boundaries" support this in addition to the contribution to addressing the issues covered by answers of the 4<sup>th</sup> main research question.

### **11.3.1 Make or Buy Decisions**

To skirt friction-losses among costs as well as benefits, it is efficient to favour a hierarchical governance structure as alternatively using transactions offered by the market (Lietke & Boslau (2007, p.1). This must be taken into account when the costs for governance a market transaction are primarily high. This "make-or-buy" decision outlines whether a product is purchased or processed by own facilities (Shook et al., 2009 p.6; Power & Desouza (2006, p.3). So the decision of outsourcing or not can be characterised whether to make or buy. In Williamson (1981, p.558)

own words: [*"If assets are nonspecific, markets enjoy advantages in both production cost and governance cost respects: static scale economies can be more fully exhausted by buying instead of making; markets can also aggregate uncorrelated demands, thereby realizing risk-pooling benefits; and external procurement avoids many of the hazards to which internal procurement is subject. As assets become more specific, however, the aggregation benefits of markets in the first two respects are reduced and exchange takes on a progressively stronger bilateral character."*]

According to Roodhooft & Warlop (1999, p.364) outsourcing is not only a make-or-buy statement, it correspondingly includes a shift from the internal flow of production to external market based procurement. In addition to relevant transaction costs, sunk cost may also come into existence during an internal flow of production; so it is nearby to swap outside the equivalent assets, which are subjected to the outsourcing decision. Mody (2013, n.p.) give shape to reasons whether to buy: [(1) *Market firms (outside specialists) may have patents/proprietary information that makes low cost production possible; (2) Market firms can achieve economies of scale that in-house units cannot; (3) Market firms are subject to market discipline, whereas in-house units may be able to hide their inefficiencies behind overall corporate success (agency and influence costs)*]. The other side of the coin is to make rather than buy: [(1) *Costs imposed by poor coordination; (2) Reluctance of partners to develop and share valuable private information; (3) Transactions cost that can be avoided by performing the task in-house; (4) Each problem can be traced to difficulties in contracting.*] (ibid, n.p.).

Seen from the retailer's perspective or from a focal supplier of a SC, the make or buy decision for packaging materials is related to upstream echelons. According to the certification system or private standard that is employed to govern the procurement network, certified suppliers can choose whether to make or to buy, because related risk and liability remains by them exclusively. Changes in market conditions may adjust the terms of the make-or-buy decision; there are limits to the farsightedness of rational bounded actors.

Retailer's demands are packed foodstuff and freight forwarding and logistics services. The food processor or food packer will buy packaging materials and is responsible for the packed food as a whole, even migration. As stated in chapter 3, the packaging supply chain is dominated by industrial groups in the corrugated



market<sup>144</sup> or carton board<sup>145</sup>. International Groups with a European or even global focus with integrated mills and plants. On the other hand there are SMEs' with a regional focus, they act as independent producers or suppliers with superior technical knowhow and specific knowledge that might not be accessible in house for integrated plants. These independent technology specialist offer value added printing and converting. If in house facilities do not contain the performance that is more beneficial instead of using the market, then the firm should employ the market.

Other production factors in relation to specific assets, coordination problems (increasing the transaction costs), and the risk of losing on it must be considered very carefully before deciding to use the market. The problems of evaluating supplier performance under high uncertainty and of potential supplier opportunism subjected to high asset specificity are out of place, when the customer / principal has single side, unique control over the transaction by producing the components with own facilities.

Outsourcing or subcontracting is the act of transferring work or services to an external actors or parties. Beside all benefits of outsourcing in the perspective of TCE, the service or supplier used must have a confirmation of conformity for the implementation of security measures by audit or a certified private standard degree. This issue implies the ability to track and trace the outsourced production and product information within an entire company or SC. Chain traceability must be granted to trace the product and process information though different actors and stages of a supply chain (Moe, 1998, p.213; Picó, 2012, p.467). All make-or-by decisions are related and subjected towards conformity work, DoC and the demanded "Supporting Documents" by the official authorities. The DoC applies to the packaging as a whole and no distinction will be made between the different processes, categories of goods covered by subsidiaries or independent operators or

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<sup>144</sup> Smirfit Kappa, DS Smith, International Paper, Prowell, SAICA, Mondi, Stora Enso and Europack (Lorenz, 2014, p.11).

<sup>145</sup> MM- Packaging, Model Kramp Gruppe, Copaco-Gruppe, A&R Carton, Van Genechten Packaging, Edelmann Group, Crimpack-Gruppe, Panther Packaging GmbH & Co. KG -Gruppe, Gundlach-Gruppe, Schiettinger Gruppe and Chesapeake Deutschland GmbH (Latayka, 2009, p.13).

manufacturer. Williamson (1985) employed behavioural assumptions about three factors within TAC to differentiate among contracts:

(1) Bounded rationality in relations of players who are subjected towards limited mental abilities as well as knowledge. This implies perfect contracts that deal with all future contingencies, impossible to write *ex ante* or to fully enforce *ex post*.

(2) Opportunism, which implies individual actors, will misrepresent and fail to follow the agreements or contracts without monitoring and enforcement mechanisms.

(3) Asset specificity where the participants in the exchange invest in assets which have much higher value in that specific contractual exchange than they would in other uses.

This implies participants in the exchange must protect themselves from being exploited after they have made specific investments, which cannot be effectively shifted towards a second best use. Williamson's TAC generally assumes that organizations operate with bounded rationality and must assume others will be opportunistic like a self-fulfilling prophecy. Alternatively, where products cannot be easily evaluated or readily transferred or where no rivalling marketplace exists, then the tendency is to produce such products within the organization. LMQ packaging contributes towards research and development (R&D), it is hard to evaluate and transfer, and may be worth more to a given buyer than to others in the market-thus, R&D is often done internally. In case of outsourcing within the PPSC it may be assumed that higher levels of trust reduce the demand for supervising as well as enforcing agreements. Dealing with an unknown, not audited sub supplier, a full contract may be necessary due to conformity work and the need for contractual safeguarding, due to the finding that trust is no option, see SRQ 3.4 (Trust in PSC). One finding of the 3<sup>th</sup> main research question is that the instrument of contractual safeguarding of the pursuit of liability law will be performed and charged upstream due to a back-to-back issue, by the determinate: he who has failed to demonstrate his guiltlessness has even now lost. Business-policy decision compliance is not a doing that might be delegated to someone, but a mind-set and related to all process owners within the PPSC. The process owners supervise the risks or group of risks and propose process changes if the risks take

unexpected developments due to the conformity works. It relates to a company's internal monitoring system and to the correct operation of outsourced service processes by means of a preliminary risk assessment. To give an example, the plant of a packaging manufacturer owns or rents an outsourced stock; both can be considered to an entity of the identical economic and legal body although the outsourced depot is an extended, not tied factory gate. The risk of opportunism and cross-contamination arises. The code relations frequency analyse of TAC, computed by MAXQDATA, shows the most code relations in the light of TAC towards opportunism. Therefore, opportunism can be determined as the most relevant TAC problem within the conclusions of this thesis. In the wordings of Williamson (1985, p.32): [*“Organize transactions so as to economize on bounded rationality while simultaneously safeguarding them against the hazards of opportunism.”*]

Segments of subcodes “Agent Motivation” support this statement as well as “Additional Mitigate Measures”, some findings give shape to safeguards in terms of formal, with permission enforceable agreements, or of private ordering arrangements.

As stated before, foodstuffs and animal feed articles are normally not manufactured in vertically incorporated chains, but rather in vertical cooperating networks (Hanf & Dautzenberg, 2006). Incentives for collaboration, control mechanism via certification systems reduced or shared risk and the use of economics of scope. Anecdotally it is been said that quality perceptions have shifted, quality is no longer the concern of an alone standing single firm, but instead an issue of the entire packaging supply chain, because all characteristics of the packed food and the packaging appear as a whole (Hanf & Dautzenberg, 2006). The difficulty to support this announcement is that problems in cooperation arise because self-interested individuals that at first optimise their personal welfares afore they strive at second for collectively-beneficial outcomes (Gulati et al., 2005) and see segments of code “Influencing Factors” with underlying sub code “Opportunism”.

Cooperation and outsourcing in the view of buyer and seller involves two independent companies; each firm (agent) has different motivations, whys and wherefores and prerequisites to link and join the collaboration, which may lead to opportunistic behaviour or even hold-up scenarios. For that issue the primary

problem is the alignment of the involved firms' interests (ibid., 2005). Following Baker et al. (2002, p.41) and Grossman & Hart (1986, p.716) by establishing incentives these kinds of problems may be overcome.

As outlined above transaction costs come forth due to opposite interests and information asymmetries among the counterparts of a contract. The manner of incentive contracts can harmonise the intentions of principals as well as agents to cope opportunistic behaviour, hereby transactional efficiency will be increased. Incentives in the PPSC are recurring annual tenders, options to broaden scope of delivery and a gain in reputation for signalling to new marketers as a cornerstone for future success (SRQ4.1 Future Success Factors).

Three distinct approaches analyse economic organization in a situation of positive transaction costs: agency theory, transaction cost economics, and measurement. Following Holmstrom & Milgrom (1994, p.972) measurements focused on the dilemma of quantifying performance or characteristics of manufactured goods in a transaction. If the performance or attributes of goods and articles being traded are badly measured, adequate compensation or pay-for-quality is disputable. As a result, agents need to craft and execute appropriate governance instruments to admin and put into effect contractual arrangements. This issue is related to proper conformity work and self-control by periodical sampling tests for migration. It also takes efforts to demonstrate traceability of packed food products in supply chains in order to signal and pledge confident product characteristics to consumers or authority bodies, see segments of SRQ 4.1 "Future Success Factors" and sub code "Monitoring and Control Principal".

### **11.3.2 Human factors**

Williamson (1985, p.43-63) argues that bounded rationality, opportunism, uncertainty, small numbers and asset specificity trigger economic transaction costs. Behaviour expectations of bounded rationality and the danger to deal with opportunistic behaviour from a partner also influence the transaction costs in return (Noorderhaven, 1996, p.106). These behavioural assumptions are two different processes, which mutually interact. Bounded rationality may result from insufficient, asymmetric information, limits in management awareness or restricted abilities for data and information processing and related management decision

making. Instruments or devices for coping the threat of opportunism include safety devices as well as trustworthy assurances like long-term contracts, penalty clauses, equity sharing, and joint investments (see segments of SRQ 4.1 "Future Success Factors).

Following Hobbs et al. (2012, p.5) the impact of opportunistic behaviour inflates by the occurrence of small numbers of trade in case only few suppliers of key resources are involved or customers for outputs. Due to the occurrence and existence of informational asymmetries, given bounded rationalities and latent opportunism might lead to transactions that are more complex and in deduction to a break-down in the business or exchange relationship, transaction costs will raise in reducing exposure to this handy cap (ibid, p.5).

This case may come into existence when the issue of migration is answered by barrier coatings direct on the contact layer or if the inner pouch, according to the bag in box principle, will be a specific barrier. During the transition period or after the enforcement of the Ink Ordinance, it may be assumed that only a limited number of producers of recycled papers, corrugated board base papers, folding boards and polymer films can offer raw materials with barrier properties. Packaging materials with barrier properties might be a scarce resource, bargained in small numbers and consequently at risk of opportunistic behaviour, see segments of code SRQ4.3 "Oligopol", but this expectation or assumption is enfeebled by the conclusions of the 2th main research question, supply security is to be expected to perform.

### **11.3.3 Uncertainty**

Uncertainty causes teething troubles that get up because of bounded rationality and opportunism. Environmental uncertainty encircles unpredicted changes in environmental law, markets and technology. For that matter renegotiations of arrangements and contracts might be required to adapt, due to the nature of incomplete contracts. Behavioural uncertainty belongs to performance evaluation problems and complications in confirming compliance of recognized agreements or contracts. When a transaction is highly uncertain, a simple market transaction is unlikely to provide desired control mechanisms to govern this transaction, small amounts of uncertainty surrounding a transaction

makes markets more feasible (Hobbs, 1996, p.20). Due to the very fact, that the PPSC embodies a network of echelons, their input is cardinal to safeguard embedded quality of articles and services, see segments of sub code "Agent Motivation". The foremost challenge aimed at the bargaining firm (focal company) is to develop dependable buyer-supplier relationships and to acquire a kind of wedlock of contractors to reassure the quality they provide, see segments of SRQ 3.4 and related sub code "Vertical Integration".

External uncertainty in SCM can come into existence in many kinds; distrust how suppliers will fulfil their contractual agreements or future changes in the environs of business for instance fluctuating prices for raw materials or fast changing technology (Lietke & Boslau, 2007, p.4). As a matter of fact, uncertainty in sourcing is to be expected to create transaction costs, on the other hand certainty of supply reduces transaction costs as well as nurtures stability in the buyer supplier relationship; as a result, it encourages supplier firms to assure quality for buyer firms. Internal uncertainty deals with task ambiguity, the difficulty of obtaining or understanding information regarding a task or function or results when firms are incapable to consider their particular future performance (ibid, p.4.) Following Lietke & Boslau (2007, p.4) [*"... there is a need to more accurately and intensively control, coordination and monitoring the transactions themselves, the behaviour of the other parties and actors involved in the transaction and environmental changes"*]. The more complex the transaction (raw materials, printing, value added finishing and converting) the harder it will be to describe and determine the accountabilities for each contracting actor. Nevertheless, the level of complexity in producing, processing and co-packing, the acknowledged trace contaminant or background level of the packed food, the low migration packaging make it more difficult for a legal court to assess whether the obligations stated in the contract have been fulfilled or not, see segments of SRQ 4.1 and SRQ 3.2.

Other kinds of uncertainty discussed in literature are volume uncertainty, technological uncertainty, and behavioural uncertainty. Walker & Weber (1984, p.376) state that volume uncertainty is the inability to precisely forecast the volume requirements in a buyer and seller relationship. As soon as volume uncertainty is high, then suppliers are faced with unexpected production overheads or excess capacity, see segments of SRQ 1.3 (Frequency Long Term Relationship).

Technological uncertainty are rarely predictable and could subsequently adjust the cost of the transaction. This copes with the lack of ability to precisely estimate the technical requirements, needs and demands in a seller buyer relationship (ibid, p.377). Such uncertainty may follow from unpredictable changes in the industrial standards, or specifications of components from general technological developments or the legal framework that covers production like consumer protection. In opposite to behavioural uncertainty, technical as well as industrial uncertainty is coped more competently through market governance.

In the view of technical uncertainty, one must face the existence of NIAS that also enforces liability within the downstream packaging supply chain from raw materials, paper and board making or printing, finishing and conveying.<sup>146</sup> In the perspective of uncertainty that will predominate ways and means of sampling and detection analyses, the often inaccurate evaluation of the scientific data and the extent of scientific uncertainty, the current situation regarding a status of “unacceptable” for human consumption (Bergmann & Hartwig, 2013, p.302). Any judgement of related legal consequences must mention these grievances, grey arias in the legal categorizing of those facts. A completely different standpoint is held by some official authorities. Bergmann & Hartwig (2013, p.302) reports that some public investigations offices articulate the view that the detection of MOSH, MOAH an NIAS in foodstuffs would be in violation of the principle of Art. 3 Basis Regulation EC Nr. 178/2002. Owing to this fact, technical uncertainty may lead to outsourcing to shift liability towards an independent supplier on the market, but the damage of brand name capital it will not cover, see segments of sub code “Additional Mitigate Measures”.

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<sup>146</sup> As stated before in sub chapter 7.4 hydrocarbons are in the focus, but aside them there are others like NIAS. Starting substances, raw materials or additives can contain impurities, which might come from packaging; these compounds (NIAS) also include side products or break-down products. The identity and characteristics of NIAS is not always known (Grob, 2002; Bradley & Coulier, 2007) but can be set in relationship to the “Forrest of Peeks” detected and descript in resent research by Harling et al. (2012, p. 182).

#### 11.3.4 Environmental Factors

Noordewier et al. (1990, p.82) addressed environmental uncertainty to [*“...unanticipated changes in circumstances surrounding an exchange”*]. The adaption of the problem is caused by bounded rationality. The actors burden is to adjust contractual agreements consistent with the expected or unknown change in external environment yet to come. Conferring to transaction cost analysis, the transaction costs are increased by the high level of environmental uncertainty, particularly ex-ante by developing future bound exchange relationships. Williamson (1985) points out that firms prefer to diminish their transaction cost through vertical integration when faced with uncertainty environment. The findings of SRQ 3.4 and the segments of related sub code “Vertical Integration” support this statement.

#### 11.3.5 Small numbers of Trading

If only a small number of actors exist in a market place, parties in a transaction might have trouble to discipline the other parties to the transaction due to the possibility of withdrawal as well as the usage of substitute players. The possible threat of such opportunistic behaviour is characterised as a hold-up problem, related to the given or chosen governance structure. Williamson (1979, p.240) notes that contracting parties with specific assets put themselves in a doctrine of being held up at renegotiation when they use short-term agreements. The possibility or the opportunity for hold-up occurs because each contracting party could potentially extract, during renegotiation, the other’s benefits once the investments were made.<sup>147</sup> The findings within segments of SRQ 4.3 (Oligopol) and SRQ 4.2 (Asset Specificity) give shape to this possible threat, both adopt in a clear position and underpin it with convincing arguments: marketers, powerful operators play for safety to avoid bottleneck supplies and single-sourcing at any level requests to be curtailed insofar as possible.

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<sup>147</sup> The hold-up situation is one of the main economic explanations to why independent companies organize themselves in cooperatives or join downstream vertical integration.



### 11.3.6 Asset specificity

Rindfleisch & Heide (1997) conclude that asset specificity is the most influential aspect of the transaction; it consigns to a resource that is put into a specific, particular transaction and considered owning a high, unique value for this transaction but would not be redeployable for another transaction or just show little value to another use in production. Asset specificities always come into existence when a contractual bound actor employs specific resources, which have just limited value for second best use (Hobbs, 1996, p.17). Transaction specific assets are values, capital goods (tangible assets and intangible assets) that are tailor made to a specific transaction and cannot be easily re-employed (secondary use or application) outside the contractual relationship of the parties involved headed for the transaction. Geyskens et al. (2006, p.520) conclude that their adapted [*nature gives rise to safeguarding problems, because market competition will not restrain opportunistic exploitation*"]. As stated before a possible solution to the safeguarding problem is vertical integration in disparity to markets for the procurement: the authority relationships, hierarchical control procedures introduced by vertical integration are expected to have greater adequacies for protective safeguarding (ibid, p.520). In simple words: the more specific the characteristics of an asset, the less the profit in additional uses.

The findings of the segments of SRQ 4.2 (Asset Specificity) contribute to this, nevertheless here are no solid rules, since the corrugated board manufacturer or the folding box supplier can leave the food and feed market to enter the non-food segment market with similar growth rates according to the PIRA Report 2014 (cited in Lorenz, 2014, p.10). The established customer-focused sales organization, process-optimised planning, design and oversight of production and logistics are just the same. Companies also strain to upsurge their economies of scale in their buying decisions for specific assets to minimize their overall costs, see findings of segments SRQ 4.1 (Future Success Factors).

In the light of outsourcing, Arnold (2000, p.25) has characterised three dimensions of asset specificity:

(1) Low asset specificity; means goods and services like commodities and low exchange frequency that can be governed by markets. In addition to this Arnold (2000, p.25) states that further improved purchase conditions and good capacity

utilization by [*“external outsourcing partners are able to bundle demand and can exploit economies of scale”*]. The expenses of starting materials are divisible mainly to the cost of goods in employment; economies of scale will be acquired when companies pool their volumes in a purchasing cartel. This deduction contributes to the segments of sub code SRQ 3.4 “Indicators Success”.

(2) Objects, goods and services with extraordinary assets specificity, a small grade of uncertainty and high exchange frequency are subjected to a flow of bidirectional information. High assets specificity means that [*“much information has to be exchanged before, during and after the exchange of goods and services”*] (Arnold, 2000, p.25). These are packaging that are widespread in the market similar to standardized FMCG which can demonstrate a functional or absolute inner barrier within or packaging according to industrial standards like FEFCO which serve the non- food market, me-too packaging as postulated in the segments of sub code “Transaction Atmosphere”.

(3) Articles, goods and services with a high degree of uncertainty subjected to a high trading frequency. Under such situations, hierarchies are the best governance structure for firms, because there [*“are based on the centralization of property rights by management”*] and control mechanisms within a company simplify the orientation on given goals (ibid, p.24).

In view of individual risk perception and liability, small suppliers would not like to run goods and services with high assets specificity as well with a high degree of uncertainty. For the packaging supply chain these objects are packaging with direct food contact layers where the OML rules and the marketer can be charged for compensation and will be liable for damages caused by the absence of guaranteed characteristics.

The complexities of outsourcing such packaging increases the uncertainty and information asymmetry, high exchange frequency increases the costs of negotiations and it would be difficult to settle and close a contract that prevents opportunism. Consequently, the complexities of manufacturing and the related output in conjunction with the required monitoring will increase the likelihood of safeguarded in-house production; see segments of subcode “Vertical Integration” and SRQ4.4 (EU Spill Over). Concisely, outsourcing objects with low assets specificity, a great number of suppliers in the market could form effective

competitions, so the firms could govern the objects with price mechanism via markets. In contrast to this with objects of high assets specificity, the governance structure depends on the uncertainty of transaction and exchange frequency, it is better to be governed by hierarchies. Transactions in a reliable surroundings and commerce occur less frequently, so it is emphasised to build up a long-term mutual relationship.

Owing to the facts demonstrated before, it could be summarised according to the findings of segments of SRQ 4.2 (Asset Specificity), that the larger the asset specificity flanked by the contractors, the tougher is the positive relationship. These findings are highly congruent with the study of Lai et al. (2005): their findings confirmed the significance of managing relationships with echelons in the perspective of quality, and how characteristics of business processes give shape to the robustness of asset specificity.

### **11.3.7 Frequency**

The frequency of transaction refers to the number of the transactions between buyer and seller. Hobbs (1996, p.16) states that, if standard transactions are recurrent regularly among two contracting parties, both of them have an encouragement to not perform opportunism. If they do, future profits from the repeat business processes will be lost. Additional substantial follow-up orders from focal companies (principals) are the best proof of customer confidence and a very suitable means to discipline the upstream contractor, see findings on segments of SRQ 4.1 (Future Success Factors), agents shelter their reputation because it protects future business developments.

Repeated transactions increase information, due to this a minor grade of information asymmetry is introduced. If one party transacts more infrequently and has incentives to act opportunistically, transactions will be conceded in a more integrated governance form. Lai et al. (2005, p.8) supports this notion, this understanding suggests that, as transactions increase in frequency, upstream suppliers have more purpose to invest as well as to commit themselves to a reliable, long-term relationship.

Owing to this fact, the investments within corporate structures that shorten the costs of transactions can be well founded by the recurrent transactions in the

supply relationship. The commitment and the mutual willingness to create and design a long-term relationship provide reasons for upstream supplier firms to commit to quality with in the PPSC, see findings of segments SRQ 4.1 (Future Success Factors) and SRQ 1.3 (Frequency Long Term Relationships).

#### 11.4 THE PROPERTY RIGHTS PERSPECTIVE

From a legal perception Barzel (1994,p.394) defines property rights as [*“... an individual's net valuation, in expected terms, of the ability to consume the services of an asset, or to consume it indirectly through exchange”*]. Attention will be drawn here especially to the findings on the contribution of NIE within this study: the NIE code relations are dominated by the concentration of property rights in the meaning of how to govern upstream the PPSC and what instruments are used by the central governing bodies within the PPSC, the focal company (contracts) and the local authority bodies (binding national laws), see segments of findings of SRQ 3.4 (Trust in PSC) and segments of subcode “Contract design”.

Hart & Moore (1990, p.1122) suppose [*“... that it is costly for agents to write detailed long-term contracts that precisely specify current and future actions as a function of every possible eventuality and that, as a result, the contracts written are incomplete”*]. The incompleteness of contracts means that future returns on an agent's current action will be subjected to his marketability or future bargaining position in ways that cannot be controlled via the present contract.

Following Baker & Hubbard (2001, p.189) the PR approach introduces a precise definition of asset ownership: the owner is the only one who ought to have enduring rights to master physical assets, [*“... the right to determine how an asset is used in circumstances not covered by enforceable contracts, customs, or law”*].

The costs and effort of coordinating exchange and maintaining property rights will get up anywhere if some actors transact, in the view of Williamson (1985, p.1), [*“... across a technologically separable interface”*]. Such technologically, separable interfaces, also known as nodes, employed in this study as echelons, will come into existence for example in a simple input-output packaging production chain. At each juncture between the nodes of all echelons, every actor must face a decision of how to govern their upstream and downstream links. Their mutual

concern is to undertake business process activities that enhance total surplus. However, each transaction between contracting P/A involves a potential of conflict, because both contracting parties try to maximize their own surplus value, see segments of SRQ 4.1 (Future Success Factors) and SRQ 3.4 (Indicators Success)

Coase (1960, pp.2-15) gave shape to the importance of transaction costs, he considered that if there are conflicting property rights, the involved parties and actors can bargain or negotiate terms that are more beneficial to both instead of subjecting to any assigned framework of property rights. His theorem also proclaims that appropriate for this to take place, bargaining must be free of charge. If there are costs associated with bargaining and negotiating such as meetings or enforcement of rights, it will affect the outcome. If property rights are well defined, polluter and polluted persons can come together, bargain over the accepted level of pollution, and come to a pareto efficient outcome.

The Coase theorem demonstrates that wherever property rights are involved, the concerned parties do not reasonably consider by what means the property rights are safeguarded if they can trade them or step into a mutual agreement to share the outcome.

Keeping Coase in mind one can answer the question of why the lawmaker is regulating the pollution of packaging with MOSH, MOAH and NIAS. Not a single end consumer will negotiate his individual body burden with his preferred retailer. Under the scope of consumer protection the government has to perform action, the pollution is a ubiquitous legacy; individual property rights cannot be bargained due to purchase and enforcement. A rule giving framework of legal property rights like the Ink Ordinance must determine the economic property rights within the packaging supply chain; see findings of segments SRQ 4.1 (Future Success Factors) and related sub code SRQ 1.3. (Frequency Long Term Relationship); also SRQ 4.4 (EU Spill Over).

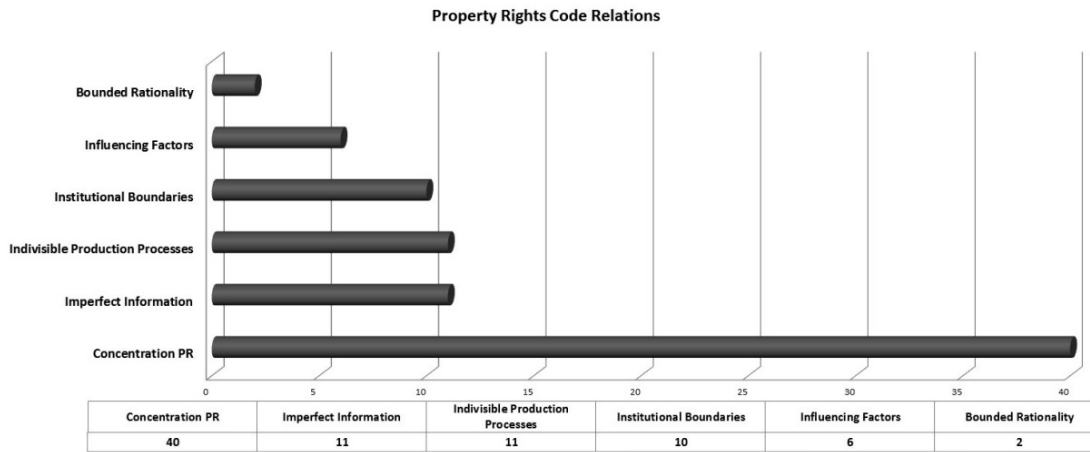


Figure 26: Property Rights Code Relations.

11.4.1 Externalities

This kind of state intervention is to compensate or to counteract the existence of externalities as stated in chapter 5.1.1. Edwards-Jones et al. (2009, p.35) showed that the [“... state of externality exists when firms or individuals impose costs or benefits on other agents in society and when these costs or benefits are not compensated”]. Seen from an environmental as well as economic perspective this is market failure. The demanded prices in the market do not cope all direct and indirect costs of production, pollution is not internalized (ibid, p.36). Due to market failure, government regulation might incorporate externalities.

As stated before, the lawmaker has given local authorities a new accountability; in the light of the pollution of packaging with MOSH, MOAH and NIAS, a high level of consumer protection while safeguarding competition is needed in addressing their statutory health and safety obligations: Not a single end consumer will or can negotiate his individual body burden with his preferred retailer or brand owner.

A framework that provides rules and governs legal property rights, to shorten the range of opportunism is the goal for safety obligations; see findings of segments SRQ 4.1 (Future Success Factors) and related sub code SRQ 1.3. (Frequency Long Term Relationship); also SRQ 4.4 (EU Spill Over). This directly

coincides with rule of law; matched by the findings of this study the major contribution of the NIE is the concentration of PR to shorten the range of opportunism.

#### 11.4.2 Contracting

The element of incomplete contracting inside of the property rights theory is settled on the very fact that authority as well as control count if contracts are incomplete, here the need for renegotiations may come into existence; see findings of segments of sub code "Concentration PR". Contracts govern the exchange of property rights while reducing uncertainty. In the view of Barzel (1997) and Hart (1995) property rights related to an asset be made of of three basics that hand over power: (1) the right of consuming or trade an article or good; (2) the right to control the manufacturing or the trade of a good, even (3) to exclude some traders. Nevertheless, PR do not just relay of access to them, the other side of the coin is, that they also grant the diametric corresponding item: exclusion. If the terms and conditions of a transaction can easily be renegotiated, the incentives of actors to undertake relationship-specific investments will depend on their ability to control the use of production assets when renegotiation takes place and the hold-up problem may arise unilaterally. In this context, it may be asserted that asset ownership turn out to be a crucial source of power. In the light of this thesis, the right to control will also be highlighted in the meaning of denying the market access of a product, elitist access to a scarce resource. The assessment of the situation to prevent migration into food and feed will lead to barrier coatings on direct contact layers for packaging or pouches<sup>148</sup> with suitable barrier properties and the market will decide. Together they assist to underpin competition and increase choices for all actors, by allowing the market to decide what kind of bargain best meets principal's needs (focal company and end customer), also taking into account the evolving demands of conveyers and market players; see findings of sub code "Externalities" and SRQ 4.1 (Future Success Factors).

As stated before, contracting aims to shorten the risk of opportunistic behaviour by designing, agreeing and closing into safeguards, guidelines and

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<sup>148</sup> Bag in a box principle (BiB).

predefined causes of action. Core elements could be applied, like national standards or technical specifications, an agreed price upon, or specifying a quantity that is sufficient to improve “sunken” investment costs; see segments of SRQ3.3 (Meaning of Cert.Sys). In the same way contracts may well shorten transaction costs of sourcing specific quality attributes (like LMQ) by demanding the practice of assured production processes (like GMP). Safeguards are also common in use to claim compensation in the event that a contractual agreement is broken, in the case where a product recall is mandatory. Up to that point, monitoring as well as enforcement costs can be crucial in the situation of contracting, although this depends on the effectiveness<sup>149</sup> of the institutional environment governing the transaction; see findings of segments regarding SRQ 3.4 (Trust in PSR) and related sub code “Contract Design”.

#### 11.5 THE ECONOMIC ROLE OF TRUST

The entity of trust has become a wide-ranging examined phenomenon in various disciplines, including economics, business psychology and sociology (Colquitt et al., 2007; Lewicki & Wiethoff, 2006, Lewicki & Tomlinson, 2003; Buchan et al., 2000). Trust is determined as a core element in provoking cooperation between individuals and groups, and is well known to have a positive influence on economic performance. Trust has been explored and characterised in a multidisciplinary perspective and is not clearly defined with a uniform approach. There are many definitions of trust, due to this matter trust is consequently well defined and termed according to the researching discipline and within the setting of each facet of research, by different approaches and with diverse levels of detail.

Mayer et al. (1995, p. 712) outlined trust as [*“... the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other*

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<sup>149</sup> This is a crucial point of the future Ink Ordinance recognised within the 21th regulation amending the German Consumer Goods Ordinance: the costs for the effected industrial branch are estimated with 660 Million Euro and the costs of the authority bodies for enforcement are one-off 5.445.000€ and in repeated years 1.510.000€. As far as it is concerned the lawmaker is repared to act after the transaction period of 2 years (FMFA, 2014, p.4-5).



party"]. Das & Tang (1998, p. 494) postulate that trust is [*"... the degree to which the trustor holds a positive attitude toward the trustee's goodwill and reliability in a risky exchange situation"*]. Rousseau (1998, p. 395) characterised it as [*"... a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviour of another"*]. Robinson (1996, p. 576) defined trust as [*"... one's expectations, assumptions, or beliefs about the likelihood that another's future actions will be beneficial, favourable, or at least not detrimental to one's interests"*]. According to Williamson (1993, p.464.), trust sandwiched between actors is based on [*"calculated risk"*] and not on interpersonal trust.

Following Eckel & Wilson (2004, p.463) to trust an actor is a risky decision, assuming that the soul is trustworthy. In their study they examined the relationship between risk attitudes and the decision to trust and they conclude at the end that [*"... no statistical relationship between the behavioural risk measures and the decision to trust"*] (ibid, p.447)<sup>150</sup>. The decision to trust a counterpart is made with reference to the reliable as well as obtainable information about the corresponding item.; trust here is not outlined as a problem of risk responsibility, [*"... but rather as a problem of judgment"*] (ibid, p.464). The findings of the study conclude that judgment is the striking issue to trust someone else.

When two contractors are trading goods and services both are subjected to the impact of incomplete contracts, where one party is incapable to supervise the fulfilment and diligence to the obligations taken under the contract, therefore trust is a needed (Beckert, 1997, p.35; Rößl 1996, p.313).

There will always be a small opportunity for opportunistic behaviour. In addition, this uncertainty of opportunistic behaviour as well as interdependent transaction costs creates a gap between both contracting parties. Anecdotally it is said that trust is a good thing, but control is a better one, but further inspections or control give rise to additional expense. Assuming the idea of trust, that trust

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<sup>150</sup> In their examination of risk towards trust, they employed laboratory experiments grounded on a [*"two-person sequential, binary trust game"*]. Here it must be mentioned that Eckel & Wilson (2004, p.464) are quite doubtful about their results because they are not taken from real life but from a controlled artificial environment.

becomes the glue<sup>151</sup> that holds contractors together, it can be deduced: (1) trust reduces transaction costs; (2) trust reduces complexity.

Clear words for the benefit of trust, but why does it not correspond with the findings of this study? Noorderhaven (1996, p.106f) postulates a difference among situational based trust as well as individual, personal character trust and concludes that the previous is more reliable in situational business affairs, in addition character trust is a more reliable basis for transaction relations, because situational trust is determined by the facets of the situation rather than those of the other party. In conclusion, trust can only play an insignificant role in TCE, because trust is subjected to a framework of property right, which encloses PA problems and TAC behavioural assumptions. In this context of situational trust, the assumption of opportunism is particularly relevant; Williamson (1985) does not assume that all individual actors are opportunistic: [*"Some individuals are opportunistic some of the time and ... differential trustworthiness is rarely transparent ex ante. As a consequence, ex ante screening efforts are made and ex post safeguards are created"*] (ibid, p.64).<sup>152</sup>

Noorderhaven (1996, p.75-76,107,112) developed a split core model, in which individual actors are both naturally trustworthy as well as opportunistic at the same time, both attributes (trustworthy/opportunistic) are linked together, two different poles of coping decision-making risk. The split core model provides the perspective that opportunism is ubiquitous as well as established or even embedded in every business process: managers are always agents by nature and

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<sup>151</sup> Castelfranchi & Falcone (2010, p.265) called attention to the fact that in the [*"literature (and common sense) it is now commonplace to find the slogan that trust is the glue of society, it is crucial, vital in economics (financial activity, market, management, and so on), in social cooperation, in organization, for institutional effects and acts in groups etc. One simple answer is not the need for reducing uncertainty, for feeling and acting in a more confident way: for relying on predictions: all necessary reasons it is true, but not sufficient to understand this phenomenon and all its implications"*]. Uphoff (2000, p.227) summarized in simple words, that trust – as social capital – [*"is recognized as the essential "glue" for society"*]. In the same manner Serageldin (1996, p.196) postulates a [*"glue that holds societies together."*]

<sup>152</sup> Williamson (1993, p.469) takes the view that [*"trust is irrelevant for commercial exchange and ... reference to trust in this connection promotes confusion"*]. This position is closely to [*"situational trust"*]. In the context of personal relations, Williamson called it [*"character trust"*].

not stewards; they are closely linked to the contributions of profits or benefits for the company they work for.

Seen in the light of these latter arguments the findings of SRQ 3.4 (Trust in PSC), sub code "Transaction Atmosphere" trust is no object within a framework of PR that govern and enforces liability in a back-to-back manner. The most important attributes of business relationships in the light of the future ordinance is the capacity to monitor regulations, bring sanctions against opportunistic agents and offer information and assurances nearby those seeking to be trusted within the framework of the PPSC. Mutual agreements or contracts must be enforceable, the debt of an action however remains with the causer, and he has to finance the costs of it, immediately by enforcement or due to damage or injury caused by the effects of restrictions for future transactions by injury to reputation, see segments of findings SRQ 3.4 (Trust in PSC) and segments of sub code "Transaction Atmosphere".

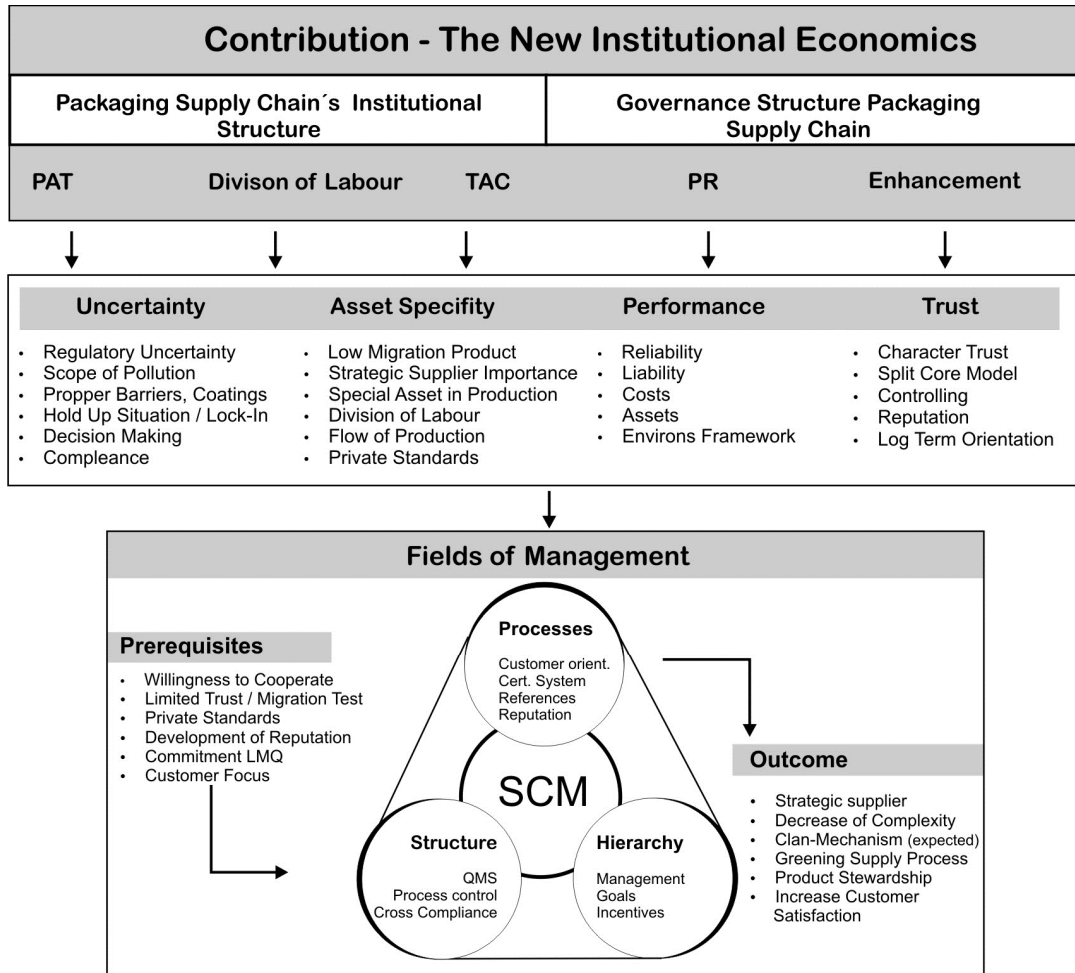


Figure 27: Contribution of NIE, author's own graph, based on Juterzenka & Heupel (2014b)

## 12. RECOMMENDATIONS AND CONCLUSIONS

*"It's not the strongest of species that survive,  
nor the most intelligent;  
it's the one most adaptable to change."  
- Charles Darwin, Origin of Species -*

Sub chapter 12 provides a compendium of the entire study and offers recommendations based on the primary data, as well as the secondary data gathered throughout the study. The chapter provides a consideration on the study, the recommendations drawn from the study will demonstrate an adapted, suitable behaviour for the PPSC. The concluding chapter 12 brings together the issues, concepts, and findings of sub chapters 2 to 11, all of which have made a key contribution to this thesis. This chapter outlines the studies' limitations as well as recommends further avenues for research. The recommendations of this chapter are related to all echelons that could be implemented by decision makers and all stakeholders to ensure the success of their business processes upstream and downstream within the PPSC.

### 12.1 NATIONAL REGULATORY AUTHORITY

Following the Encyclopædia Britannica Online (2015, n.p.) Occam's (or Ockham's) razor is a principle attributed to the 14th century Franciscan friar William of Ockham. The principle states that "Entities should not be multiplied unnecessarily".<sup>153</sup> Occam's razor is also cited as "law of economy" and might be transformed in the following statement: "If you have two equally likely solutions to a problem, choose the simplest." Alternatively, in the only form that takes its own advice: "Keep things simple!" The PPSC will be faced with a dilemma at the near future: (1) the legal requirements will change overall conditions in manufacturing; (2) used recycled papers contain ubiquitous traces of mineral oil, which may be banned by law, but the contamination of waste paper with mineral oil will remain

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<sup>153</sup> Latin original: "*Pluralitas non est ponenda sine necessitate*".

for the forthcoming 7 years even if the whole industry is switching to LMQ inks at once; (3) the sole responsibility of the marketer is gradually shifting towards the downstream supply chain; (4) tried and tested mineral oil technology in commercial printing must be switched in a short period of time and (5) a new averting of danger on the issues of legal responsibility, traceability as well as labelling must be individually engineered for echelons up- and downstream within the PPSC.

It's always quite imprudent to bring an issue into public debate, if there is no appropriate instrument to handle with the explicit requirements of the problems we are to be confronted with. Whatever are the furthestmost important milestones or critical turning points in the wake of recent developments? The German BMELV asked for an opinion from the BfR at 09.12.2009 to get a case-by-case risk assessment. In making those risk assessments the German Federal Institute for Risk Assessment (BfR) came to the conclusion that at hand is an urgent demand to minimize the migration of mineral oils, and in particular, NIAS migrating from food contact and packaging materials to foodstuffs. Timely recommendations for actions have been the limitations on use of recycled papers, no use as a direct food contact layer, substitution by virgin fibres, BIB principle and / or pouches with barrier properties. Notice has been offered concerning the analytics of MOSH and MOAH, no indisputable guideline can be drawn concerning the hazard level and measurement of sum parameters: testing and evaluation methods used to analyse an entire group of substances with many of the similar types. It remained not possible to demonstrate that there are substances, compounds or breakdown products that could be carcinogenic. Consequently, the precautionary principle must be employed; when there is no decisive indication of a causal affiliation between the inputs and the effects.

In the years since further research has showed that the derivation of universal statements on the basis of measured migration alone in packaged food sample is challenging since no facts or data of the foods body burden, the age of the sample; storage conditions, inserted printing and adhesives are available. The origin of a body burden by raw food materials with mineral oil hydrocarbon substances can be addressed to the exhaust as well as various kinds of fine dirt. In a nutshell: uncertainty due to origin, concerning detection, methods of proof and

compliance to regulations or guidelines. But ordinance building proceedings were well on target, with several further developed versions of law bills for both the Ink and Mineral Oil Ordinance.

The link between migration, ubiquitous distribution of MOSH and MOAH in recycled fibres, and the developments of functional barriers on paper and board has been recognised. It can be assumed that the authorities slow down the processes, to allow the industry time to design and adapt to these barrier standards; provisions will be made for the phased-in introduction of the future measures.

Laws and regulations must be adjusted to meet future requirements. It takes no complex theory to explain the need for enforcement: laboratories and scientific procedures cost money, a great deal of money in an uncertain transaction atmosphere, see segments of findings for sub code "Transaction Atmosphere".

Let us employ Occam's razor in the perspective that more than a few complications have to be answered systematically. In the past it was possible to find technologically advanced solutions to challenge these problems, tools have been approved and available.

### **12.1.1 Review and recommendations for barrier coatings**

BfR recommendation XXXVI, Paper and board for food contact, in the meaning of anticipation and managing expert opinion on publicly available general guidance or precedent decision-making practice or previous guidance to select the right paper based packaging. The BfR Recommendations are no legal norms, but globally respected, see segments of findings sub code "Trust Label Hallmark". However, in a broader sense they present the present-day state of science as well as technology, under which consumer products meet the requirements of §31.1 of the Food, Consumer Articles and Feed Act (LFGB) and Article 3.1.a of Regulation (EC) 1935/2004 in terms of their non-hazardousness for human health. Raw papers and value added papers for board and corrugated can be tested in accordance with the XXXVI<sup>th</sup> recommendations, if they fit the purpose and demonstrated the pre-promised results for use in the packaging sector, they receive the per se regulatory approvals essential to trade.

This is the concrete clue to find an approach for solving the problem of pretesting packaging materials before the assembling machine at the food packer. According to the findings of the segments of SRQ 4.1 (Future Success Factors) it is significant that the several kinds of barrier coating on recycled board are available in the raw material supplier market. Particular attention would need to be given to the integration of die cutting and scoring and folding characteristics, because migration must not be banned only in plain surface, but also sophisticated reinforcements within all concerning edges as well as borders. Such an innovation provides the packaging with exceptional protection countered to probable migration of undesired substances. These individual barrier solutions have to go through intensive trial and test series in private and official health laboratories previously being granted and acknowledged to be offered in the market. In this case a permanent per se expertise is granted. The packaging is based on local LMQ conditions, recognized diffusion calculation models for worst case scenarios, long-time experience in migrations test can shift the amount of MOSH and MOAH in return to the packed food itself, in case of a relevant body burden. The findings of SRQ 3.1 (Validation Authorities NGO Customer), SRQ 3.4 (Trust in PSC) and the segments of sub code "Risk Allocation" and "Trust Label Hallmark" indicate this. A very early weak signal has been put in existence by the Land Saxony's Health and Veterinary Research Institute, by Helling (2014, p.28): [*"... a possible approach to this problem is to develop unambiguous legal certainty concerning the application and the suitability of packaging materials before they are in use!"*]

### **12.1.2 Conformity work**

A control must be crafted and executed within the GMP framework, because the lawmaker at European level (Framework Regulation 1831/2003), the competent authority instructed the industry that all stuffs which are exposed to food shall be produced in agreement by good manufacturing practice. The demands for Good Practice rectify manufacturing procedures in the EC for the afore mentioned materials at all stages within the flow of production, from the upstream manufacture to downstream retailer. Manufacturers, as actors in the market must establish a quality assurance system and a quality control system following the detailed manufacturing regulations. This regulation includes an obligation for



manufacturers to implement a quality assurance system, adjusted to the economic size of the business operator. It covers materials in contact with food, such as paper and cardboard or those which could possibly, in all foreseeable conditions, transfer their constituent elements to food (e.g. inks and adhesives). Furthermore, manufacturers shall create and maintain documentation regarding the specifications, manufacturing formulae and product processing which are important for the compliance as well as safety of the finished article. They are required to submit the documentation to the competent authorities at their request.

As an incorrect deduction of this, grocers who buy printed folding cartons or cardboard containers also require a DoC from the packaging company. According to national and EC regulations, it is the manufacturer of the food packaging and the marketer of food who are in charge for compliance with the regulations, but the Framework Regulation does not cover paper and board, not a single specific regulation. Paper and board are not synthetics based on cellulose. No regulation, no DoC. The packaging and printing company's assessment of the regulation is absolutely different, because their substrates are not considered being plastic materials, because they are paper and cardboard. In addition to that, specification for plastic materials does not apply for printing inks, surface coatings and even for paper substrates modified by added plastic material. In manufacturing, this results in highly complex situations, because private standards or contractual, legal frameworks may demand a kind of DoC, a legally binding declaration of the applicable preceding manufacturer, co-packer or agent stating that they grant compliance by means of the responsibility to the extent declared will work for as proof. Today it would be advisable, that the packaging manufacturer avoids under all conditions, through suitable terms and terminology, to permit a definition of his DoC that would designate an inference of warranty engaged by the packaging manufacturer, he has to rule out any understanding as an announcement of warranty concluded by accurate wording. A warranty is an agreement struck between a consumer, seller as well as supplier, which guarantee a right or title for compensation. In a legal common sense, a warranty expresses a predetermined responsibility of the guarantor, here the packaging manufacturer. This no-fault, stringent obligation grants a high economic risk, it might massively entail costs. Today the DoC will be delivered by the supplier or the party who is responsible for the initial introduction in market. It intend to include all information regulated in

Annex 12 of the LFGB: (1) the applied conditions and evaluations of testing, (2) computed calculations of migration or other examinations, and (3) evidence of safety or demonstrating other kinds of compliance like an absolute barrier.

The findings of SRQ 3.1 (Validation Authorities NGO Customer) demonstrate that, it is inconceivable to have modern environmental services without precise analyses, but in the medium term and with the current state of knowledge, it must be considered that present analytics do not arrange any option for creating legally secure limiting values that are applicable in accordance with the future ordinance. In addition the German Health and Veterinary Research Institutes must massively invest in laboratory equipment and highly qualified professionals, as stated in the draft of the 21th amendment of the German Commodity Ordinance from 14<sup>th</sup> July 2014, direct personnel and material costs at the beginning with 5.4 Mil. Euro, later per year 1.51 Mil. Euro. Based on the findings, this study offers the following recommendations towards local authority bodies: the main concern of all enforcement authorities is the analytical gathering of evidence, shifting the focus from analytical adducing and appraisal of evidence based on migration tests towards a stringent monitoring and ensuring of compliance with conformity work.

The development of barrier layers has been identified as a key element to cope with the problem, if the lawmaker switches the burden of institutionally and legally binding DoC towards the PPSC. Soon a suitable amount of starting and auxiliary materials or other supplies with LMQ characteristics will be available for every echelon within the PPSC. Within the framework of conformity work LMQ printing inks have demonstrated that no individual assessment is needed. Per se operational approvals simplify the conformity process considerably and maintain its control of the market.

### **12.1.3 Play for Time**

After the first hearing and situation assessment of the BfR in December 2009, a law bill was close at hand, a rapid treatment by civil servants of the issue but it was not adopted. A rather superficial, incomplete and premature approach to the problem was attempted but the proposal was ill-conceived. The authorities did not have a finished solution ready for practical implementation, just policy aspects of

view. The gathering of data from across the PPSC revealed the extent of the problematic issue and made politically aware of the extent and the seriousness of the ubiquitous spread of MOSH as well as MOAH and the importance of reducing this pollution. The BMELV decision support project (Harling et al., 2012) was carried out from 2009-2011 and demonstrate the “Forest of Peaks” (see sub chapter 9.6.1), and the large number of various kinds of cross contamination.

The initial, underlying problem of the migration of MOSH, MOAH and NIAS into food and feed due to diffusion from recycled packaging raw materials are neither stoppable nor as a final point resolvable.

As postulated by the segments of findings of SRQ 4.1 (Future Success Factors) and SRQ 4.5 (Utility Substitution Plastics vs. Fibres) and the supporting sub code “Externalities” the use of barrier layers are the cornerstone of this problem construct. But this may lead to unforeseeable problems at a later stage; engineering skills and technical problem solving ability need time to develop dedicated technologies, customer-specific development as well as assembling of prototypes, together with testing and field trials and use of synergy effects in conjunction with a long-term development and market introduction strategy.

Nevertheless, the recommendation is to play for time, consequently a delay will allow the industry time to adapt as well as to make the necessary arrangements to find a trade-off between political, environment and economic benefits. Indicators for this recommendation are the course of the political investigations, that the transition period has been considerably lengthened and expanded equal to the two years’ time slot for the sale of stockpiled packaging and packed foods. Also, there is the idea of promoting a regulation on EU level by the BMLV.

The findings of SRQ 4.4 (EU Spill Over) give shape to a key issue that’s discussed in this study, will the German national approach finally support a harmonization and bring together a common shared EU level? The results point out that the issue should promote a more European approach, but the Directorate General for Health and Consumer Protection (DG SANCO) have limited capacities. In addition the EU attempts to muddle through with the expected high caseload, despite the fact avoiding in depth, bureaucratic rules for the Member States. A further complication is offered at the identical time, nevertheless, conflicting

assessments of risk by SFA, EFSA, BfR and FDA led to different problem solving solutions. An EU regulation is a law, direct in force and the voting requires unanimity, southern EU states and the UK, see findings of SRQ4.4 (EU Spill Over) and chapter 9.2 could refuse such consent.

#### **12.1.4 Cut off Ink Ordinance from Mineral Oil Ordinance**

As stated before an suitable flow of raw and auxiliary materials with LMQ characteristics will be available for every echelon within the PPSC, even at a global level. Furthermore, there is no need for individual assessment, if they are generally regarded as safe. The Swiss Ordinance SR 817.023.2, the Netherlands 328583-117560-VGP and Austrian Recommendations are regulations or recommendations to nail LMQ printing inks for packaging. The sole use of LMQ raw materials and value added printing are expressly and precisely defined within industrial guidelines like the “Nestlé Guidance Note on Packaging Inks”.

The findings of the 4<sup>th</sup> main research questions postulate that private standards will replace a future EU regulation, introducing a law through the back door by private purchasing standards (n=12). These findings are indicators for a future partial legislative success: The anchoring of sole and sound use of LMQ inks and coatings for packaging at European level. In simple words, good enough arguments, which are necessary and sufficient conditions to prevent losing face and in addition political credibility after the almost 5 year duration of the administrative procedure.

## **12.2 PAPER BASED PACKAGING SUPPLY CHAIN**

It is not an exaggeration to state that packaging is a strategic key enabler for the differentiation of products and creates consumer expectations at the point of sale. The shelf impact of packaging in-store, at its specific point of sale, relies on the colours, shapes, and health claims etc. and serves as a consumer relevant differentiation among competitors like brands versus private labels or even no name products (Pointlogic Study 2014).

Concerning the findings of the segments of SRQ 4.4 (EU Spill Over), large retailer groups in particular were growing in the competitive EU market. They

plan buy, plan process and act at European level. Their products range in recent times from a basic selection to higher-quality articles as well as luxury items. Not every retailer agrees to this trend, a quasi-brand appearance with private labels, but it may be considered for development of retail brands.

### 12.2.1 The Chasm

Moore's (2014) model "Crossing the Chasm" is related to the adoption lifecycle of technique from Rogers (1995). Five cardinal subdivisions are recognized in Roger's "Diffusion Theory" (1983, p.247): innovators (2,5%), early adopters (13,5%), early majority (34%), late majority(34%) and laggards (16%). The most troublesome step is the crossing between early adopters and becoming an early majority, here is the chasm that Moore (2014) refers to. In addition Christensen (2013, p.85ff.) articulates an ["*after the fact*"] perspective how companies crossed the chasm by building ["*value networks*"] in which companies recognize and respond to client's needs, responds to competitors acting and strives for earnings.

At least since the publication of the findings of the decision support project (Harling et al., 2012) it went into public, that the spread of MOSH, MOAH, NIAS and unknown breakdown products is ubiquitous within recycled fibres. In addition a body burden of the packed food must be considered too in case of claims for liability.

To cope and comply with the future ordinance the development of boards and raw papers with barrier properties is a must. By doing this the paper and board manufacturing companies are in place to perform as early adopters. Paper and board with barrier properties can be seen as a "whole product", as a reel or sheet ready for printing and processing to become a box or shelf ready packaging. Downstream within PPSC there are other early adopters who must learn to handle these new barrier boards. The main 4<sup>th</sup> research question has given the answer (n=17) that future success factors are cost savings and sustainability along the entire supply chain, efficiency and supply security must rule the entire manufacturing process.

At this time printing and conveying materials with adjusted barrier properties are a rarity, they claim just a niche market. But primary fibre paperboard producers and major paper suppliers should utilize the time to fortify

their standing in the market with preparations for an enduring improvement in profitability by developing recycled cardboard with sustainable, bio-based, recyclable and compostable barrier properties for food packaging.<sup>153</sup>

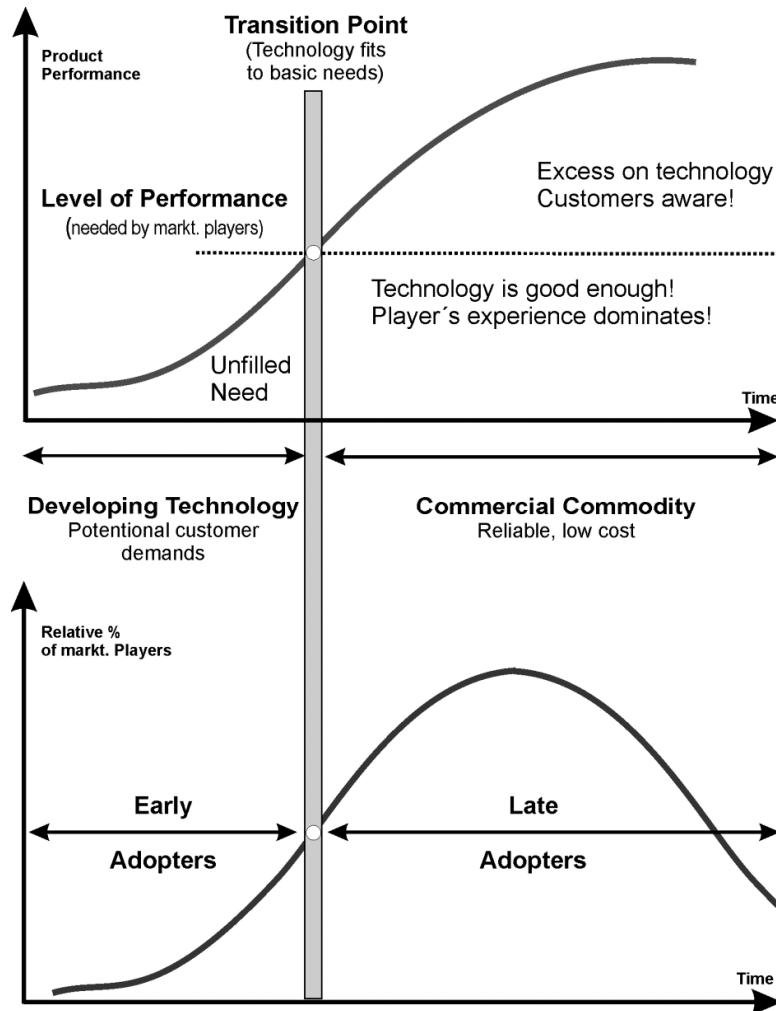
In our days, there is no call in the market to offer these barrier materials in packaging in general, so upstream and downstream echelons can use the time to improve their expertise and machinery, to build a set of relationships with value-based customers with in their B-2-B segment market.

The recommendation is to cross the chasm and provide a range of paper based packaging materials for printers and downstream processors in the supply chain. The market may decide what kind of technical form will be dominant, but the proof is in the pudding.<sup>154</sup>

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<sup>153</sup> Schuster Karton and BASF press release from 3<sup>th</sup> December 2014, traditional barrier coatings (PET) are losing acceptance, because they hinder recycling.

<sup>154</sup> Anecdotaly said: that one can just judge or give a spin to something after he has tried it.



**Figure 28:** the chasm and the drop zone for market participants, authors own graph, based and adapted on Bennato (2008, n.p.).

### 12.2.2 Private standards

Private standards play a major role in granting the safety as well as sustainability of products and production methods, they include proprietary standards established by (focal) firms or third-party standards established by independent bodies or NGOs and voluntary consensus standards established by industry associations (Ponte et al. 2011). In addition to these B2B standards, large retailer chains use their own "business to consumer" (B2C) labels. These labels

transmitting signals to consumers that these products are addressed towards sustainability and in addition have become important instruments of reputation managing, nevertheless they are hardly ever based on evidence-based risk assessment (The Guardian, 2013, n.p.).

The main drivers behindhand the growth of private standards are the international trade, the linking of logistic information technology, concentration within the foodstuff manufacturing and retailer chains, changing preferences of consumer behaviour as well as regulatory changes. Retailers and food manufacturers have constructed a control relationship to set their upstream suppliers liable for the safety of their products, through the development of standards for GMP, traceability and the requirement that suppliers need to be certified and confirmed by third party auditing and certificates. The conclusion might be drawn that private standards benefit producers by enforcing management, improved market access as well as stable product quality to support the corporate image as well as reputation. The findings of the segments of SRQ 2.1 (Market Entry Barriers) and SRQ 3.3 (Meaning of Cert.Sys) and the sub code "Transaction Atmosphere" indicate that the difficulty about supporting this statement is that the problem is compounded, the standard is de facto mandatory, a majority of large buyers and retailer chains demand it. As a result, SME may run the threat of being debarred from high volume and value markets due to market entry barriers.

Finally, private standards may clash with government regulations that generally just nail basic requirements. They even demand more in both stringency and scope than the regulations. Take the case of Nestlé Guidelines as a quasi-industry standard, which is recognized at a global level due to Nestlé's purchasing power.

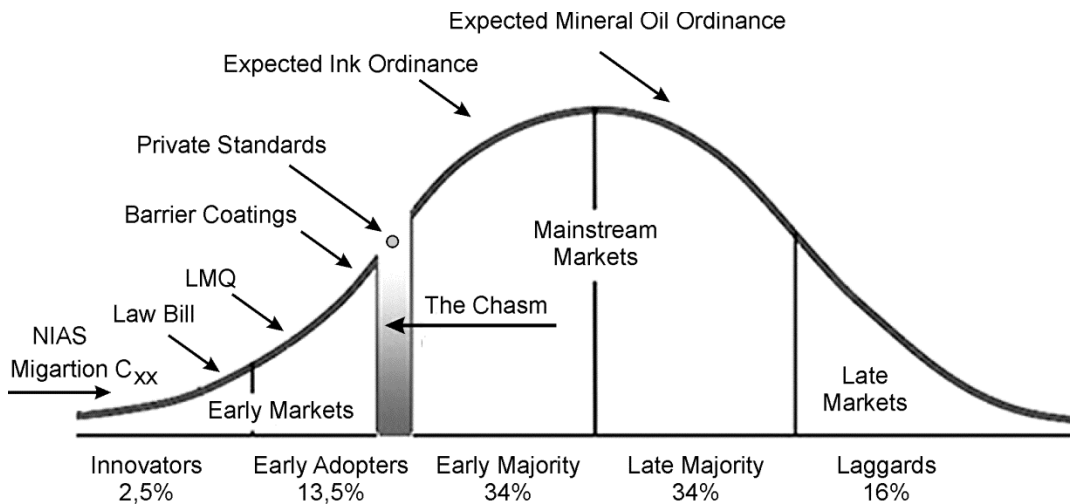
There are three ways of credentials that a standard is implemented and in force. In the first instance, a so-called first-party verification, a company decide to embrace a private standard and engage trained employees to verify that the whole flow of production and related company processes comply with it. In the second case, a focal firm as the system head of a SC demand that all of its upstream contractors have to match an assured standard as well as controlled by scheduled reviews, a second-party verification. Finally, a focal company may require that its



suppliers meet the private or official standard and demand that an independent body to control the compliance of the contractors. This stands for third-party verification, also called certification, a procedure by which a third party provides written testimony that an item, flow of process or service fits and complies with assured standards; but the auditor is not involved in the business relationship.

According to the findings of this thesis here are critics (n=8) towards third party certifications. The field of certification bodies is a business area with growth potential, it's a product or consultancy service to be sold and it provides market entry barriers and there are bounding cost, see segments of finding SRQ 2.1 (Market Entry Barriers) and SRQ 3.3 (Meaning of Cert.Sys). The other side of the coin is, however, that certification can be seen as a key success factor (n=9) in terms of bilateral communication along the supply chain, a kind of third party enforcement to reduce uncertainty as well as information asymmetry. From a neutral perspective, the certificate attests and grants to the customer that the upstream supplier fulfils certain standards. As a third party statement it is more convincing, then a self-made assurance. It is important to highline that this kind of certification by its nature is performed by a third, independent party, which is not involved in daily business within in the economic relationship flanked by the traders.

In general, the findings of the thesis establish that there are two main reasons for companies to govern the PPSC through private standards: (1) Private standards provide the novelty of differentiated products, which entitle companies to create a benefit. Constructing and executing this strategy demands close assembling and dispatch with all upstream suppliers of raw materials to meet changing future product specifications, see the 4<sup>th</sup> man research question. (2) Pressure is increasing on echelons within the PPSC to meet labour, environmental and product safety as well as quality standards, see segments of SRQ3.3 (Meaning of Cert.Sys) and the code relations in addition.



**Figure 29:** The chasm and private standards as a turning point, authors own graph based on Moore (2014).

According to the findings of the field research, this thesis suggests the subsequent recommendations for actions, they can be adopted to improve as well as support the future compliance of the German Ink and Mineral Oil Ordinance. As a share of the implementation of the ordinance conformity work is a must. In addition to GMP it must cover a framework of adopted and suitable behaviour of management as well as employees, instruments and databases to demonstrate product lifecycle management, as well as testing migration reports and integrated document management. As stated in sub chapter 7.6.6 authorities will focus and respond to these apprehensions. An additional facet is the duty to hedge the handling of liability cases; the PPSC is or will be subjected to contractual safeguarding of claims of liability and charged upstream on a back-to-back basis. As a rule of thumb for passed on liability: who has failed to demonstrate innocence to be not at in charge, has already lost (n=15). Private standards offer as well as demand a range of rules to govern the total flow of productions and related responsibility; they govern for traceability, quality and related hygiene-safety, environment principles are traced too. Technical knowledge, analysis of the business processes a model of the future situation for business processes and company organisation can be established by consultants or by previously completely qualified and skilled staffs. If a private standard is de facto mandatory

because a majority of large buyers demand it the answer should be linked to a cost-benefit analysis, crossing market entry barriers for future opportunities.

### 12.3 CONTRIBUTION OF THE NIE

Particular attention would need to be given to the integration of the findings of this study about the contribution of the NIE. Conferring to the frequency analyse of code relations, calculated by the QDA software MAXQDA, the most influencing factors found in this study about the PPSC are the signalling of the agent (Figure 24), the prevention of unilateral opportunism (Figure 21) and the concentration of property rights (Figure 26).

#### 12.3.1 Signalling

Some of the issues that emerge from the findings of this study relate to additional measures and main contributing factors that may be necessary for signalling in the light of the PA approach related to the PPSC:

(1) It needs to achieve and to maintain it's a production volume and a sufficient market share to realise economies of scales as well as of speed. Future success factors are related to principle of effectiveness and particularly short supply periods and a prim degree of supply security at affordable prices.

(2) Consequently, maintaining the corporate reputation and cultivating positive relations with value customers is a major challenge. The purpose of the agents signals are communication and its goal is to alter the principal's beliefs or behaviour.

(3) The clams for compensation and the damages of company's reputation result from a withdrawal from market, which attracts media attention. These costs can be superior to the nominal material damage and may give rise to huge costs. In spite of standardized norms, European private standards as well as mutual recognition, nearly all sectors face the problem of "Murphy's Law": whatever can go wrong will go wrong. A popular method of transferring risks is outsourcing. Outsourcing means that a supplier substantially bears the risk, and the contractor includes the risk in his pricing. Organizational and supervisory duties in the view of a subcontractor must come from the original risk bearer; he has to warrant that

the external sourcing contractor is capable to cope with the risk. Consequently, agents need to design designate governance mechanisms to inspect as well as secure mutual contractual arrangements.

The second important step to risk transfer is contracting insurance, to cover acts of God or human stupidity. Decreasing the residual risk to an adequate level stresses a contracting insurance to cope acts of God or human misbehaviour, misconduct as well as foolishness. It is recommendable for a company to yield its general liability cover in addition to product liability. The principal should oblige the agent to take out suitable third party insurance for personal and company liability, business interruption insurance and commercial liability insurance, which is to be maintained in anticipation of the realisation of the contract. To shelter product liability risks, the agent shall put in place an widespread business liability insurance, which copes the insurance the recall as well as all disposal costs too. According to the findings of the segments of the subcodes "Bounding", "Uncertainty and Complexity", "Concentration PR" and "Trust Label Hallmark" the coverage of pass-through liability, on a back-to-back basis is highly recommended.

### **12.3.2 Opportunism**

Organizations are conscious of the matter that concentrating on their core competences is the supreme way to endure economical improvements. One reason for failure is the opportunity to behave opportunistic. Companies could enter an agreement with a secret, self-interested agenda. Opportunistic behaviour has three unfavourable effects on mutual collaboration otherwise inside the context of transactions between players in the market:

(1) Opportunism increases transaction costs because covert behaviours looking for one-sided advances are problematic to detect and verify as stated in sub chapter 1.5.4. Principals that lay eyes on these threats are confronted with a greater demand for market screening, pre-sale negotiating, and timely monitoring the agent's behaviour, while he is sat work. This bundle of duties gives raise to costs of information.

(2) Opportunism is a barrier to foster confidence in mutual partner cooperation; consequently it leads to conflicts. Opportunistic actors handle their

own matter and focus, safeguard their own interests. This self-interested acting throttle down mutual collaboration within the SC.

(3) Opportunism increases coordination difficulty and coupling uncertainty between exchange parties, see sub chapter 3.3.

The control of opportunistic behaviour is limited to formal contracts. Formal contracts are agreements in writing between two parties, which are perceived as legally binding for both as well as mutual enforceable. Explicit contracts in form and content represent insurances to perform particular, foreseeable actions yet to come; in addition, they share responsibilities, specify and demand procedures for monitoring or safeguarding as well as even give shape to penalties, e.g. a malus for noncompliance.

In a P/A relationship is a crucial precondition that contract elements must be reliable and verifiable. Following Jost (2001, p.15) a contract element is only verifiable if it can be crafted, executed as well as reviewed, beside all costs of sampling testing due to migration. Conflicts of interest among counterparts can always be solved in accordance to the contractual agreements.

This sort of contract might be employed for design of supply contracts concerning principals as well as agents in the PPSC, if the quality and safety belongings of the article or the product remain not obvious, random checks (migration tests) must be carried out and transactions not so often take place, see subcodes "Concentration PR", SRQ1 3 (Frequency Long Term Relationship ) and "Contracts Design".

In such a contract the focal company can prescribe the processors, which quality criteria the packaging has to meet, and perhaps what kind of quality assurance system or private standard must be used for production, see sub code "Vertical Integration". Raw materials must not made clear if these the quality guidelines correspond. Neoclassical contract law provides flexibility in the face of uncertainty. Various means such as arbitration of settling, unforeseen conditions can be introduced so that contracts can be executed and people are comfortable with the prospects for equitable settlement. To prevent food scandals by contractual agreements neoclassical contracts are the best choice for all echelons in the PPSC, see findings of sub code "Contracts" and "Meaning of Cert.Sys". On the other hand, both contractors could certain of their own competence to work things

out in a bilateral relationship. The segments of SRQ 4.1 (Future Success Factors) support most important points about bilateral, relational contracting; it can therefore be presumed that vertical, relational contractual agreements have such advantages related to the PPSC in this study.

This proceeding makes it workable to find divergences and, after widespread analysis, to set tally countermeasures in force: every economic echelon must grand its quality as well as product safety by himself; he must do so regardless whether it was an outsourcing (make or buy decision) within the flow of production. Such an agreement can be designed in accordance with the German Product Liability Act (ProdHaftG) §1 (1), that an issue is recognized as a product defect, regardless of whether the firm who has accepted the order or a supplier is to blame or not; like an umbrella it must cope with any misdeeds by third parties, away from the control or possibility of risk. Such a framework of disciplinary action is fool-proof to implement, but to enforce it effectively; it must be crafted and executed from a focal company with a position of power. In the case of contract breach, the agent must be confronted with such costs as well as damage of his reputation, that the intention for opportunistic behaviour is not a choice. A cornerstone of such contract design and closing is the ability of the principal to supervise the agent's quality of working results: beside all benefits of conformity work just certified migration tests provide a ban of food safety scares in the light of recall campaigns.

The concentration of PR has to be regarded as the utmost major facet due to the contribution of the NIE regarding this thesis. The issue is essential, as it leads to legal securities. Contracts by nature are always incomplete due to human capabilities. Limitations as well as bounded rationalities. Principal's order confirmation must encompass a detailed specification. In addition promised attributes of the contractual goods must be clearly defined and linked the burden of proof to the product yet to come, see segments of findings of SRQ 4.1 (Future Success Factors), SRQ 3.2 (Task Fullfilment Supplier) and sub code "Additional Mitigate Measures".

Only use of LMQ materials that are technically tested, approved and certified by private standards, authorities or third party enforcers might be used in the flow of production. By the side of time complementary conformity work and documentation must be claimed, to be involved in pronouncements as timely as

probable and to react, see segments of findings of SRQ 4.1 (Future Success Factors), SRQ 3.2 (Task Fulfilment Supplier) and sub code "Additional Mitigate Measures". Within an inter-firm link, like alliances or supply chains, trust is one of the most widely acknowledged social mean for governing exchange as stated in sub chapter 11.5. Formal contracts protect parties against opportunistic behaviour through two mechanisms, contractual inclusivity as well as contractual obligation. Both mechanisms reduce opportunistic behaviour in inter-firm business processes.

In support of the above thesis when trust is affected by less monitoring, this can induce enlarged incentive for opportunistic behaviour. On the contrary, conversely, designing formal agreements can also expand trust and due to this mitigate prospects for opportunistic response. Three aspects cope with this:

(1) contracts are unavoidably incomplete; this is because of foreseeing all the possible future contingencies under which a contractual risk can arise is very problematic in relationships that are considered by high uncertainty and intricacy, which is often the case in a supply chain, see findings of segments of code "Concentration PR" and "Externalities".

(2) Designing and closing an ambitious contract is uneconomically; business fractions embark on such costs only, when the foreseeable consequences of a contractual breach are respectable such as, a withdrawal from market, see findings of sub code "Contracts Design".

(3) Trust among echelons engaged in a SC is important because close collaboration, bilateral communication as well as extremely demanding security of supply requirements is necessary for efficiency and to provide an appropriate price, see findings of segments of SRQ 4.1 (Future Success Factors).

Recommendation: Due to the findings that just "situational trust" is incorporated within the PPSC, the agent should raise his human capital by conformity work and needs-oriented private standards, which will reinforce his reputation for signalling. Since echelons of the PPSC will be virtually surrounded by passed through liability and contractual back-to-back safeguarding of claims, every actor must face the truth: he who has failed to prove, that he is not at fault, his innocence his already lost (n=15)!

#### 12.4 LIMITATIONS

This section presents the limitations related to this research. These limitations may have the strength for a bias, in the direction of affecting the findings and final conclusions. The study represents a cross-sectional analysis of a new technological approach towards consumer protection (LMQ) and job design within the PPSC. The cross-sectional nature of the study is a limitation as it is irreclaimable to examine and compare short-term and long-term occurrences. This study, being qualitative, deductive and explorative, had an imperfection on the number of participants, a total of 17 participants from the PPSC. These were all experts in the paper based packaging sector as well as senior executives at CEO, COO or CSO level. Some of them even had double functions as heads of umbrella industrial organisations. In case that a double function was given, the respondents were begged to speak for the industrial association. Recruiting was time-consuming and involved accessing them and their institutions. However, the response from respondents was positive, but limited due to knowledge about the latter case or willingness to be interviewed. (17 approvals out of 41 proposals, see chapter 10.3).

Representatives from public authorities refused interviews, but this lack and shortage had been mitigated owing to the fact that three respondents of the study are members of the BfR-Committee of German Commodity Ordinance. This proximity to public authorities was focused on during the interviews with an especially critical eye.

Firstly, one limitation was that no translation was carried of the interview answers from the respondents; just two were held in English and so transcribed. The word count of the interviews was almost 45.000 words and after consultation with the supervisors of this study not translated, due to time concerns. In the annex all segments of the interviews are all code related stored, n=15 in German language, n=2 in English language.

Due to a paucity of literature and journal articles, the researcher found that there were limitations regarding information about the PPSC. Most of the literatures on NIE contribution were related towards general SCM.

The interviews within the database of MAXQDATA were not subjected to intercoder reliability, where an autonomous coder confirms on the coding by the same content base and the diligence to apply the same anchors. The material was



not given to a second coder who had compared the results. A second review may be better coded for analysis and can enhance reliability, but even Mayring (2014, p.83) himself stated that this is not always possible: uniqueness of the thesis and for recent or future publication of the findings, see sub chapter 1.1.

Undoubtedly, the findings as well as conclusions of this study are bound to the industry-specific focal point of the research. Actually, the purpose of this study is not to improve applicable sweeping statements but reasonably to focus on possible future change. This bias is to be seen in conjunction with the most serious limitation of the latter study, the researcher himself: a 31 year career in paper based packaging and commercial printing provides an inevitable cultural imprint comprising a very direct, objective-driven, logical approach. Nevertheless, this could create a certain mind-set that needs to be both recognised and agreed upon. Insofar as concerned and possible to overcome this bias, it was achieved by taking an open-minded stance combined with greater criticism. Consequently, at every reflection point it was considerable to examine ones observations. To prevent biases as well as disruptions all conclusions and recommendations for action were carefully identified because they may have been influenced by the researcher's professional background. Ultimately, a deeper reading of the literature was necessary to ensure that NIE concepts and SCM were thoroughly understood in conjunction with their reasoning for research and the semi structured interviews. Owing to that fact, independence from the phenomenon of interest and objectivity must be questioned. Apart from in the pilot study (n=3), the respondents had no business or personal related contact with the researcher so this might allow and justify the assumption that the researcher did not directly influence the responses (n=17).

### 12.5 IMPLICATIONS FOR FURTHER RESEARCH

The present study of research is restricted in its range and deepness to carry out a new exploration of a segment of the PPSC in Germany under the light of the future Ink and Mineral Oil Ordinance. Stated by the respondents it has nevertheless, for the first time achieved a cross-relationship perspective towards the PPSC, that covers upstream raw materials to downstream retailers.

(1) This study has employed the PA approach to examine relationships within the PPSC. Contract theory has to do with a deep awareness of the balance between competency and rewards is achieved; it encompasses the demand for bilateral communication concerning an agent and a principal, so that there is a clear understanding of both the prerequisites of the principal as well as the capability of the agent to meet those needs in a competent manner. As soon as this constitution is recognised, contract theory is then employed to ensure that the agent obtains acceptable rewards for his efforts. The concept of signalling deals with the transmission of information on or after one counterpart to an additional, in order to achieve arrangement. Contract theory is also intermingled by the notion of moral hazard. For all intents and purposes, both the agent as well as the principal are exhibiting a certain degree of trust. Contractual arrangements within the process of contract theory might yield the arrangement of complete contracts. Within this sort of contractual settlement, every single thinkable state of affairs that is covered by local law is included in the terms of the agreement. One main finding of the latter study is that the most valuable contribution of NIE is the need and the understanding of the concentration of PR with a SC. This must be achieved by contracts. Undertaking further research may demonstrate the contribution of contract theory to concentrate PR.

(2) The proposed free-trade agreement "Transatlantic Trade and Investment Partnership (TTIP) between the EU and the USA is suspected of serving the interests of corporations and not of EU inhabitants. One position of these possible mutual agreements is that if production processes goods and articles that are legitimately permitted and have the permission for trade in the U.S., would also be legally allowed in the EU. This also involves packaging. In the light of the Ink and mineral Oil Ordinance, foreign packaging endangers our health, see scientific assessment in chapter 7.4.3. Due to German consumer protection, packed US-food is not marketable and needs to be banned at the border. However, TTIP is nearly irreversible. As soon as agreed upon, the contracts are fundamentally not amendable, as every change requires a unanimous assent by all parties. Germany could not biased agree to step out of the contract due to national ordinances. Nevertheless, it is the institution EU who enters into the agreement. This possible scenario takes all German political declarations and resolutions to the point of absurdity regarding the German Ink as well as Mineral Oil Ordinance.

(3) This research has focused on the German fibre based packaging supply chain business but similar problems due to consumer protection affect all major countries in Europe if they share the findings and recommendations of EFSA.

(4) It has been brought into existence in this study that use of a quality label like "LMQ" in packaging is not desired, according to the expert interviews, stated in the segments of SRQ 3 4, sub code "Trust Label Hallmark". Contrariwise, it has been presented that signalling is a future success factor. According to Voerste, (2009) this prevents a quality competition instead of price competition in the market, which could represent a higher protection in contrast to injury health and prevent at the same time economic damage. With regards to the PPSC this statement merits closer examination, if one weighs the pros as well as cons of this case, further research is advised.

(5) The development of a barrier layer has been identified as a key issue to implement LMQ packaging as a future perspective. Cardboard and corrugated board are made of recycled paper and both are applied in foodstuff packaging. If food is packaged in such recycled fibres, it is possible that MOSH and MOAH can migrate to the food and feed. In contrast, the mineral oil based printing inks for newspapers are classified and approved in harmony with appropriate regulations (e.g. REACH, IP346). Newspaper inks are designed for the production of newspapers, not for consumption. Consumer organisations refer to the harmful potential of the oil based binders within the ink, while industry tried to demonstrate that things were not that bad at all. The problem might to be seen in the uncontrolled, mixed use of the recycled paper streams for food packaging. How to solve this "chicken-and-egg" problematic between recycling and pollution?

## 12.6 CONCLUSION

The study's findings accomplished to respond all research questions and suit to the objectives of the research. The contribution to knowledge plus the inherent limitations of the study have suggested an agenda for future research which it is hoped will advance the PPSC fields and provide greater insights into the workings of closely coupled, business-to-business relationships. For that reason, it can be expected that the snow-balled choice of expert interviews led to an authentic picture of the PPSC in the field of future LMQ packaging. The interdependency of the strategic as well as operational levels correspond to be of characteristic relevance; specifically, the alacrity of high-level decision-makers to implement new LMQ-technologies, operational and production parameters to cross the chasm.

The main objective of this scientific study has been to validate the contribution of the NIE as well as related theory-based recommendations for actions on the basis of economic theories and an empirical study. Analytics and the empirical field study did achieve good results in many applications, so the NIE theories are approved by multiple cases and were confirmed. The study provided an integrated and structured, painstaking approach with respect to the implementation of LMQ within the PPSC on the basis of economic theories and an empirical study. The resulting findings and recommendations for actions are determined to offer executives clear and concrete guidance for adjusted behaviour in planning, organizing, implementing and operation due to the future German Ink as well as Mineral Oil ordinance. The following major conclusions can be extracted from the study: The contributions the NIE are to demonstrate importance of signalling, in consideration of opportunism and the ultimate need to concentrate PR with the PPSC to avoid food safety scares in terms of withdrawals from the market. A fundamental finding of this study is that there exists promising market niche or the right moment to cross the chasm is right ahead; contributed by available barrier coatings and LMQ materials. The third most important finding mentions the importance of conformity work and bilateral communication within the PPSC to prevent pass through liability according to the back-to-back principle. Communication is a trust-building instrument, but inadequate communication can also be a restraint to mutual cooperation by principals and agents. If the collaborating firms are unable to communicate properly or knowingly share

opportunistic information asymmetries, conflicts will arise. Lastly, the sensitive, explorative expert interviews with leading experts closed the gap between literature and existing, recent knowledge. At the end of the day, companies with a clear strategy that also copes the search for weak signals embedded in the firms' genotype, have a benefit in gathering weak signals for the strategic future. The results in this study indicate that early adapters should cross the chasm in the near future for the early implementation of LMQ materials to build up an appropriate flow of processing within the infrastructure of the PPSC.

Anecdotally it is said that Henry Kissinger is attributed to the citation that [*... an issue ignored is a crisis invited*] (Ruff et al., 2003, p.xii). Weak signals of a future change, have been spread by the lawmaker, highlighted to the public eye by mass media, as well as investigated by industrial associations and NGOs. The pollution of mineral oil compounds, NIAS as well as unwanted substances seems to be ubiquitous in foodstuffs, animal feed as well as fibre based packaging materials. The political wish is that Europe must aim for a closed circle economy in the years yet to come. This potential concern and striking issue cannot be solved just by modifying packaging. Packaging with barrier properties just relieves the symptoms, it is not a game changer on a broad-based improvement, and a holistic approach should be considered.



### 13. CURRICULUM VITAE

Matthias von Juterzenka was born in Herne (Germany) in 1965. He is a graduate engineer in printing science and technology from the University of Wuppertal (1992) and obtained a Master of Business Administration degree in General Management from the European University for Economics & Management (eufom) in Luxemburg (2012). Since 1995 he is a specialist in QS-Management (ISO 9000). He joined the German army forces and attended the Military Officer School (OSH) in Hannover (1989). His passion for printing and packaging started in 1986 as a certified offset printer. In his professional career he worked as a COO and CEO in the commercial printing and packaging industry for almost 23 years. He is married and has two daughters.

End of 2012 he started his PhD research at Catholic University San Antonio (UCAM) in Murcia (Spain) and the applied University FOM in Essen (Germany). His fields of research are the New Institutional Economics and the paper based packaging supply chain.

Most of the results of his research have been presented in international conferences as well as published in journals with full peer review. The body text of the thesis contains references to the corresponding papers. It follows the full list of all papers and lectures related to this thesis.

#### **Double peer reviewed articles:**

Juterzenka, M. von and Heupel, T. (2015), "Facts on the Horizon: Future German Ink and Mineral Oil Ordinance. A National Approach and its European Spill Over: Risk Management, Compliance and Avoidance of Liability", *Athens Journal of Law*, Vol. 1 No. 2, pp. 111-126.

Juterzenka, M. von and Heupel, T. (2014), "Prepare for change: The impact of the German Ink- and Mineral Oil Ordinance still to come. What's the contribution of the new Institutional Economics to avoid liability and market failure within the paper-based packaging supply chain?", in Jiri Rotschedl (Hg.) and Cermakova, K. (Eds.), *14th International Academic Conference, Malta: 28-31 October 2014*, Prague, Czech Republic, pp. 466-490.

**Conference Presentations:**

- Heupel, T. and Juterzenka, M. von (2015): From a Weak Signal to a boiling frog syndrome. Opportunities and Threats of legal boundaries in the paper- based packaging supply chain! 4<sup>th</sup> World Conference on Business, Economics and Management, BEM-2015, 30. April – 02. May 2015, İzmir, Turkey. Published in *Procedia Economics and Finance* (ISSN: 2212-5671)
- Juterzenka, M. von and Heupel, T. (2014), "Facts on the Horizon: Future German Ink and Mineral Oil Ordinance. A National Approach and its European Spill over: Risk Management, Compliance and Avoidance of Liability. BLE2014-0904, ISSN 2241-2894", Athens Institute for Education and Research ATINER (Ed.), *Annual International Conference on Business, Law & Economics 5-8 May 2014, Athens, Greece.*
- Juterzenka, M. von and Heupel, T. (2014), "Prepare for change: The impact of the German Ink- and Mineral Oil Ordinance still to come. What's the contribution of the new Institutional Economics to avoid liability and market failure within the paper-based packaging supply chain?" *14<sup>th</sup> International Academic Conference*, Malta: 28-31 October (The conference paper is the peer reviewed article, see above).

**Book chapters:**

- Juterzenka, Matthias von (2015): From a Weak Signal towards a change in the paper- based packaging supply chain! A branch with a boiling frog syndrome? , edited, second volume of FOM / UCAM Doctoral School of Business yearbook 2015, to be published in December 2015, Shaker Verlag.

**Lectures:**

- Juterzenka, Matthias von (2014): The Future German Ink and Mineral Oil Ordinance: Risk Management, Compliance and Avoidance of Liability" Lecture at EUFOM, Luxembourg, Supervisor: Prof. Dr. Martin Fontanari. 15.07.2014, <http://www.eufom.lu/aktuelles-storage/2014/strategisches-controlling-in-der-praxis.html>.
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- Juterzenka, Matthias von (2015): Digital Printing on corrugated board: Demands, consequences and future drivers. Keynotespeaker at the Canon Applications Summit in Venlo (NL), 11<sup>th</sup> September 2015.



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## 15. APPENDIX

In the following all codes, sub codes and text segments will be presented, due to the transcript of the interviews and coding with MAXQDATA:

<b>Fundamentals of QDA Analysis</b>	
Interview Persons	n=17
Interview Time (recorded)	9h 07min
Transcription Time	65h 34min
Word Count (RTF-File)	44.951 words
Processed Code Segments	822
Time of Coding	54h 16min
Condensed Segments after Coding	44.622 words

**Table 2:** Fundamentals of QDA Analysis

### 15.1 FUTURE\_SUCCESS\_FACTORS\_SRQ4\_1

<b>Theme</b>	<b>Subresearch Questions</b>
Code	Future_Success_Factors_SRQ4_1
<b>Sub Code</b>	
<b>Segments</b>	<b>80</b>

1. Entscheidend ist der Preis, die Nachhaltigkeit und das Recycling-Image, der Markt wird entscheiden
2. Zertifizierungssysteme ist ein Erfolgsfaktor, Prozesssicherheit und Hygiene.

3. Erfolgsfaktoren: Kostenführerschaft, Top Qualität, Abfüllsicherheit, Runability beim Abfüller Sicherheit für das verpackte Lebensmittel, Versorgungssicherheit in der PSC, POS-Print on Demand, Mikro-Markets,
4. Zukünftige Erfolgsfaktoren: Druckfarbenverordnung darf nicht teurer werden. Nachhaltigkeit, Kreislaufwirtschaft
5. Kostenführerschaft, Top Qualität, Sicherheit für das verpackte Lebensmittel, Versorgungssicherheit in der PSC.
6. Zukünftige Erfolgsfaktoren? Die Druckfarbenverordnung darf nicht teurer werden als der bisherige Status quo. Die Lauffähigkeit muss stimmen der Farben, Verarbeitbarkeit der Roh Hilfs Stoffe, Nachhaltigkeit, Kreislaufwirtschaft
7. Also wichtig ist, dass solche Gespräche geführt werden, dass solch eine Spezifikation vereinbart ist auf jeder Stufe in der Kette.
8. Dass sie größere Sicherheit haben von einer Rückrufaktion verschont zu bleiben. Das Ist ja ein sehr angenehmer Gedanke, dass ich etwas in der Hand habe mit dem ich mich sicherer fühle als bisher. Das ich keinen Rückruf alleine aushalten muss.
9. Ich beschränke mich auf Non-Food-Packaging oder ich steige gleich richtig ein. Beides machen und schauen wie ich meine Maschinen auslaste wird dann ja nicht mehr gehen.
10. Da gibt es die Möglichkeit 1. Dass ich den Karton oder den Mineralöl oder sonst wie unerwünscht stoffhaltigen Karton gleich bei der Herstellung mit einer Barrierschicht versehe, die muss dann rezipierbar sein und darf dass weiter Schicksal der Verpackung nicht stören.
11. Also der Wunsch möglichst kosteneffizient Verpackungen einzukaufen auf der einen Seite.
12. Das sind die beiden Treiber und die Beeinflussen letztendlich den Verpackungsmarkt massiv. Einmal Kosten und auf der anderen Seite Qualität.
13. Nein, überhaupt nicht. Also ich hab noch kein einziges Unternehmen gesehen dass die Systeme wirklich auf der Agenda hatte oder zumindest ist es mir nicht bekannt dass Unternehmen quasi an uns herangetreten sind

und explizit dieses Thema thematisiert haben. Die Branche bewegt sich erst dann wenn neue Vorgaben wirklich da sind.

14. Das sieht man letztendlich an den beiden letzten neuen Verordnung, das ist die Gefahrenstoffkennzeichnung in 2013 und die LMEV in 2014. Erst auf den letzten Drücker hat die Branche reagiert und hat die neue Verordnung umgesetzt. Kaum ein Unternehmen war wirklich langfristig darauf vorbereitet.
15. Wenn du die Volumina nicht hast, dann hast du so gut wie keine Chance in diesen Markt einzusteigen.
16. Die große Frage ist: Wer druckt in Zukunft? Druckt der Markenartikler selbst an den Abfüllanlagen? Druckt der Produzent selbst mit neuen Technologien? Digital? Und wenn Digital, da haben wir das nächste große Problem: Tinten, die noch feiner, noch dünner, also das wird ein ganz anderes Problem noch mit sich bringen. Wie wird Verpackung in Zukunft bedruckt und vor allem wo und wann wird sie bedruckt. Das ist etwas das die Branche im Moment bewegt und wo nicht nur der Drucker, aber in erster Linie sich der Markenartikler und da gibt es viele die sich intensiv damit beschäftigen wie sie ihre Produkt in Zukunft kennzeichnen, bedrucken, vermarkten. Da wird einiges passieren. ich fasse das immer so zusammen: Die Digitalisierung führte zu Revolution im Internet. Die nächste Revolution im mobilen Bereich. Jetzt kommt die Retailer Revolution und die Verpackungsrevolution wird kommen so sicher wie das Amen im Gebet.
17. Ja, die Faltschachtelindustrie, insbesondere die FFI-Mitglieder, vermutlich auch die Nicht-Mitglieder über die Lieferanten sind informiert über diese Regelungsvorhaben.
18. Insofern von jetzt auf gleich hat es nie irgendwo stattgefunden, sondern das war ein kontinuierlicher Prozess der Verbesserung im Sinne der Guten Herstellungspraxis um dahin zu kommen.
19. Um mich abzugrenzen gegenüber meinem Wettbewerb auf dem Markt
20. Also hier hat es auf jeden Fall Strategieüberlegungen und Umsetzungen gegeben in dem Bereich. Und wenn man sozusagen sich zukünftig Abgrenzen will, muss man natürlich so globale Veränderungen, die

feststellbar sind, wie zum Beispiel Wirtschaftskrise 2009, internationale Finanz und Wirtschaftskrisen hatte zur Folge, dass die Kunden ihre Work-in-care-Bestände abgebaut haben, Lagerbestände, die Sicherheitsabstände oder die Sicherheitsbestände wurden drastisch heruntergefahren, mit dem Effekt, dass heute Faltschachtelhersteller viel kurzfristiger, viel flexibler liefern müssen, dass sie kleinere Mengen in einem kürzeren Zeitpunkt zur Verfügung stellen müssen, dass sie zu festen Terminen liefern müssen. Alleine im Pharmabereich hat sich die durchschnittliche Auflagenhöhe von 35000 auf 17000 Stück reduziert. Das muss man natürlich adaptieren wenn man nach wie vor in so einem Bereich erfolgreich sein will.

21. Aktuell wird gerade sehr stark das Thema digitale Faltschachteherstellung, also sowohl digitaler Druck als auch digitale Verarbeitung, eben vor dem Hintergrund dieser Veränderung dieser Losgrößen diskutiert. Damit geht natürlich einher, das Thema Investitionskosten, damit geht einher das Thema Lebensmittelsicherheit, damit geht einher das Thema Qualität des Drucks und im Pharmabereich Wiederholbarkeit des Druckauftrags.
22. Aber es ist das erklärte Ziel, die BASF ist Mitglied geworden bei uns um hier natürlich auch in die Kundennähe zu gelangen
23. Und entsprechend wenn man natürlich Installationen sieht, Druckmaschinen mit einer Wendung, mit Lackieren, einer Wendung und dann erst Drucken und wieder Lackieren, dann kann man sich natürlich überlegen dass solche Installationen die Möglichkeit bieten in einem Durchgang auf der Druckmaschine eine Barriere aufzubringen, diese zu bedrucken und zu lackieren und am Ende kommt fertige Druckbögen raus, die mit einer Barriere versehen sind. In diese Richtung zielt BASF sehr stark, auch mit dem angehen, mit dem entwickeln von Lösungen, die aber nicht nur, und das ist auch wieder so ein Aspekt mit dem Absetzen auf dem Markt, natürlich eine Lösung bieten gegen Mineralölkohlenwasserstoffe sondern für alle möglichen Funktion. Das sind Barrieren oder andere Eigenschaften die hier auf der Rückseite z.B. aufgebracht werden können um andere Funktionen zu erfüllen, für Dichtigkeit etc.

24. Verpackung hat ja zwei Hauptaufgaben. Das eine ist natürlich die Schutzfunktion, Schutz des Produktes vor der Umwelt, Schutz der Umwelt vor dem Produkt. Das andere, immer stärker in den Vordergrund kommende Merkmal ist Verpackung als Marketinginstrument und da kommen natürlich die Strömungen Umwelt Verbraucher sehr stark ins Spiel. Da haben faserstoffbasierte Verpackungen einen Vorteil in der Akzeptanz der Verbraucher und das fließt natürlich in die Entwicklung auch ein. Inwieweit das fachtechnisch immer richtig ist, da machen wir ein großes Fragezeichen dahinter, aber man muss Verbraucherströmungen nachgehen um seine Produkte entsprechen zu positionieren. Das sehe ich als ein großer Trend für die Faserstoffe.
25. Das heißt, dieses Branding einer Marke, unabhängig von den ganzen technischen Siegeln die darauf stehen, die ohnehin niemand nachvollziehen kann, ist es meiner Ansicht nach wesentlich wichtiger das die Marke an sich Vertrauen schafft. Und das ist eben nicht nur ein Gütesiegel, das betrifft auch nicht nur die Verpackung, es betrifft auch das Produkt, vergisst man oftmals.
26. Es betrifft die gesamte Logistikkette, es betrifft: Wo wird es hergestellt? Mit wem wird es hergestellt? Sind da Kinderhände beispielsweise im Spiel oder nicht? Das sind alles Dinge, die meiner Ansicht nach einen deutlich höheren Ausschlag geben als irgendein FSC Siegel oder wie die alle heißen.
27. Welches Produkt liefert mir mein Lieferant sondern: a) Wie stellt er es her? Also nicht nur unter hygienischen und rein normierten Verfahren sondern: Was steckt für eine Philosophie in dem Unternehmen dahinter? Das heißt, was ich eben sagte: Wie geht man mit den Zulieferern um? Also auch ein Hersteller von Packmitteln hat Zulieferer. Wo kommen die Rohstoffe her? Sind die Rohstoffe nachverfolgbar. Wo man früher gesagt hat: Das ist mein Lieferant, der muss nach HACCP Produzieren, alles andere interessiert mich nicht, so was geht heute tatsächlich deutlich weiter.
28. Das muss ja dokumentiert werden. Das ist ja unstrittig.
29. Jede Branche besteht aus vielen Marktteilnehmern, die sich unterschiedlich positioniert haben, die auch im Wettbewerb unterschiedlich dastehen.

30. Durchaus, sie haben ja auch eine gewisse Marktmacht und stehen im Wettbewerb auch zu den kleinen und mittelständigen Unternehmen und wenn ich es sogar vorantreibe bestimmte Regelungen einzuhalten, wo es den kleinen mittelständigen schwerer fällt oder weil es dort teurer ist, hat ich sogar einen Wettbewerbsvorteil.
31. Nicht nur akzeptieren, sondern antizipieren. Immer einen Schritt voraus zu sein. Nicht erst warten bis es passiert und zu sagen: "Wenn die kommt, dann reagieren wir!". Das ist das was ich bei vielen Unternehmen, ob es nun kleinere oder größere sind, vermisse. Es wird zu viel reagiert und zu wenig agiert. Wieso soll ich nicht etwas vorwegnehmen was ohnehin, nicht nur kommt, sondern mit einem gesunden Menschenverstand ist, das es kommt und dann habe ich vielleicht weiter vor. Viele Unternehmen und Unternehmensführer wollen es auch einfach nicht wahrhaben und sagen: "Gut, wenn es kommt, dann kommt es.". Zu wenige Unternehmen, es gibt sie aber, die es antizipieren, die sagen, wir sind schon zwei oder drei Schritte voraus. Ich kenne Unternehmen im Bereich der Zertifizierung ISO sagen, klar haben wir schon lange, das interessiert unsere Kunden aber nicht. Wir müssen besser sein in bestimmten Dingen. Also, das ist meine persönliche Meinung: mehr agieren, weniger reagieren.
32. Und wie soll ich das denn noch nachher recyceln? Letztendlich ist es nur die Frage: Wie geht es wieder in den Kreislauf hinein? Wir haben ja den Punkt, den grünen Punkt, Anteil Kunststoff im Verhältnis zum Faserstoff. Und wenn ich den Anteil rechnerisch verkleinern möchte, mache ich den Anteil des Faserstoffes größer. Ich packe also mehr drauf, dann habe ich ja wieder Relation geschafft. Ist eigentlich nicht gerade vertrauensbildend, wenn man das mal nachvollzieht.
33. Gut, die gesamte Verpackungsindustrie, einschließlich des Maschinenbaus, wird über die demografische Entwicklung getrieben, so, wenn wir jetzt die demografische Entwicklung nur in Deutschland betrachten, oder nur in Europa oder weltweit, da sind es also schon große Unterschiede. Also betrachten wir sie einfach nur hier in Westeuropa, mit 1,8 Kindern, Singlehaushalten, das ist da eine, kleinere Verpackungen. Was noch viel wichtiger ist, ist die Individualisierung.

34. Stichwort Digitaldruck. Das ist der Trend, was uns in den nächsten Jahren enorm bewegen wird. Alle großen Druckmaschinenhersteller sind in dieser Entwicklung dabei, nicht im Akzidenzdruck um Fachzeitschriften zu individualisieren, unterschiedliche, individuelle Deckblätter, erste Seite zu drucken, nein. Nehmen sie Nutella, da können sie also Vorname Peter Nutella drauf tun.
35. Das ist relativ einfach: Im klassischen Mittelstand unserer Branche, sagen wir bei Betrieben mit 50 Beschäftigten, da sind alle Mitarbeiter in den Tagesablauf eingebunden, da gibt es wenig freie Kapazitäten, die sich mit solchen dispositiv-planerischen Fragen befassen können und meistens gibt es auch kein Geld für so etwas. Das können sich in der Regel nur die großen Player leisten.
36. Für uns steht ganz oben, die Marktausrichtung, die Kundenorientierung. Daneben haben wir quasi als Basis die Produktivität, die Wirtschaftlichkeit der Prozesse, die Workfloworientierung und als weiteren Punkt die Mitarbeiter, die Mitarbeiterqualität und die Mitarbeiterorientierung.
37. Und das ganze bezeichnen wir dann als strategisches Dreieck: Vertrieb, Produktivität und Mitarbeiterorientierung.
38. Wird es für einzelne Produkte immer geben. Wir sehen auch jetzt schon, es ist ja immer Bewegung drin. Nach wie vor haben die Faltschachteln ein recht gutes Image und die entsprechenden Industrien tun auch einiges dafür die Faltschachteln positiv darzustellen
39. Also ich kann nur die Wellpappenindustrie oder Faltschachtelindustrie... also ich glaube die Papierindustrie und die Faltschachtelindustrie ist schon in gewisser Weise vorbereitet, also sie hat Ideen.
40. Bei der Wellpappenindustrie glaube ich nicht das sie so stark sich im europäischen oder globalen Bereich sich damit auseinander gesetzt hat. Sie hat auch Ideen, aber das ist wirklich sehr zukunftslastig.
41. Also ich glaube Papier natürlich, oder faserbasierte Stoffe haben das Image nachhaltig zu sein, sind ja meistens auch Nachhaltig, weil es ersetzbarer Rohstoff ist.

42. Im Bereich der Faltschachtel sehe ich es ein bisschen differenzierter, aber auch da, wenn ich heute eine Faltschachtel hab, die aus Recycling Material hergestellt wurde, dann erwarte ich natürlich eine gewisse Beschreibung in dieser Faltschachtel. Aber auch die Faltschachtel werde ich nicht in direkten Lebensmittelkontakt für längerfristigen Lebensmittelkontakt einsetzen, muss aber, weil ich ja innen eine gewisse Barriere habe abschätzen können ob dieser Karton dann gut genug ist oder eben nicht, für diese Anwendung sich eignet.
43. Ja, ich meine Stichproben werden ja auch gemacht. Wir haben eigene Stichprobenprogramme die Lebensmitteluntersuchungsämter in den einzelnen Ländern machen Stichproben, nur muss ich eine Stichprobe unter sehr kostengetriebenen Aspekten angucken.
44. Es gab eine ganz lange Phase, gibt es glaube ich immer noch, der Konsument denkt ja, Recyclingfasern sind super.
45. Sehen sie Zertifizierungssysteme oder Audits durch dritte als Erfolgsfaktoren innerhalb unserer Branche?
46. Wir werden noch ein System an Zertifikaten, an Konformitätserklärungen hinzu bekommen. Es wird, zudem was bisher schon kommuniziert wird und was ja auch von dem Hintergrund der GMP Verordnung schon dokumentiert und bestätigt sein muss, wird es jetzt noch nach der konkreten Vorgabe der Druckfarbenverordnung inhaltlich ausgefüllt noch zusätzliche Dokumente geben die dann in der Lieferkette weitergegeben werden müssen, modifiziert werden müssen. Das ist ja alles ein Aufwand der nicht mehr ohne Kosten und Lasten bleibt.
47. Also sein Produkt wird keine Marktberechtigung mehr haben wenn er nicht beweisen kann dass er die Anforderungen der deutschen Bedarfsgegenständeverordnung für Druckfarben oder Mineralöle erfüllt.
48. Haben wir uns vorbereitet? Ja, ich glaube wir haben uns vorbereitet.
49. Wir haben uns also vorbereitet, der Markt wird in wenigen Wochen so weit sein, dass sowohl Frischfaserkarton, Recyclingkarton mit Barriere und Recyclingkarton ohne Barriere angeboten werden kann, so dass der Kunde die Möglichkeit hat, das ihm am geeignetsten erscheinende Material auszusuchen.



50. Aber der Lebensmittelverpacker hat eine größere Auswahl. Er kann, wenn er eine Barriere haben möchte, die Barriere auch erhalten, er kann auch Frischfaserkarton mit Barriere ausrüsten lassen und die Kontamination durch den Frischfaserkarton verhindern. Er hat eine breite Palette an Möglichkeiten.
51. Die Maschine läuft, wird gerade noch optimiert. Wie die vom Markt akzeptiert wird, weiß man nicht. Wenn sie akzeptiert wird, dann ist das ein Erfolgsfaktor, dann werden andere auch solche Barrierschichten aufbringen und werden entsprechende Maschinen entweder mieten oder online oder offline hinzu bauen. Es ist alles sehr offen. Wenn es gelingt, zu belegen, dass diese Verordnung so nicht umsetzbar ist, kann das auch eine Fehlinvestition sein.
52. Rein grundsätzlich ist die Haltung, die wir im Verband im Vorstand abgestimmt haben, dass Stoffe, die das Recycling behindern, nicht in den Papierkreislauf eingebracht werden sollten.
53. Wichtig aus meiner Sicht ist, dass die Verpackungen die Qualitäten die dem Kunden versprochen wurden auch standhalten damit er sie für die Anwendung für die er sie braucht auch sicher verwenden kann und die Produkte die darin verpackt werden, sicher beim Verbraucher oder Handel, also dahin wo sie gehen sollten, ankommen.
54. Ich glaube dass unsere Branche vorbereitet ist, weil wir schon so lange darüber diskutieren das Risiko einer entsprechenden Verordnung bekannt ist.
55. Aber ich weiß dass in der Branche vielfältig entsprechende Vorbereitungen getroffen wurden, mit Barrierschichten, Barrierematerialien zu arbeiten, so dass, sollte es zu einer gesetzlichen Anforderung kommen, aus meiner Sicht die Unternehmen relativ schnell sich entsprechend umstellen dürften.
56. Was es für andere Möglichkeiten gibt? Entweder dass man darauf Einfluss nimmt oder, das ist jetzt meine Aufgabe als Verband, das ist nicht die Aufgabe einzelner Unternehmen, dass ich zum Beispiel Einfluss darauf nehme z.B. auf die Zeitungsverleger mit mineralölfreien Druckfarben zu arbeiten.
57. Der Preis! Die Verfügbarkeit.

58. Es wird natürlich auch mal abgefragt, solche Fragen wie: Können sie garantieren dass keine Mineralölmigration usw. Aber ich glaube nach wie vor Verfügbarkeit und Preis sind für unsere Kunden die Hauptentscheidungskriterien.
59. Erfolgsfaktoren, wenn es zu einer solchen Verordnung kommen würde, wären eine rechtzeitige Vorbereitung auf die Möglichkeit. Das man entsprechende Materialien verhindert die Migrationen nur unterhalb der dann gegebenen Grenzwerte zulassen.
60. Da kann ich nur noch mal auf das vorhin schon kurz angedeutete Reflektieren: Besonderes Augenmerk ist zu richten auf die Druckereilobby und die Verwendung mineralöhlhaltiger Druckfarben im Zeitungsdruckprozess.
61. Die Signale haben natürlich dazu geführt dass mittlerweile sehr intensiv untersucht wird und schon untersucht werden muss. Ich stelle immer wieder fest dass die Leute sagen: Wieso ist das noch gar nicht in Kraft die Mineralölverordnung, jetzt muss ich mich doch noch gar nicht um MOSH und MOAH kümmern. So ist es natürlich nicht, sondern es ist so, dass die Verpackungsbranche sich im Prinzip jetzt schon daran halten muss, dass keine unvertretbare Veränderung der Zusammensetzung nach der 1935 auftritt und dass diese Mineralölbestandteile nicht in einem unvertretbaren Maße übergehen und wird auch durchaus heute schon diese Grenzlinien des letzten Entwurfes der Mineralölverordnung herangezogen als Maßstab.
62. Eigentlich sollte das selbstverständlich sein in der Konformitätsarbeit, aber ich stelle immer wieder fest, dass das gerade nicht der Fall ist, sondern viele versuchen den Kopf aus der Schlinge zu ziehen und eine Erklärung abzugeben die eben den Kunden zufrieden stellt ohne drauf zu schauen ob es vielleicht für ihn auch eine sinnvolle Hilfe ist bei seiner eigenen Konformitätsarbeit.
63. Ja, was immer wichtig war und weiterhin wichtig ist, ist der Lieferservice, das heißt dass der Kunde sich drauf verlassen kann, dass er die gewünschten oder vereinbarten Termine wirklich gehalten bekommt und er seine Ware bekommt. Das zweite, die grundsätzliche Geschwindigkeit. Dass die Lieferzeiten heute doch wesentlich kürzer sind als früher.

64. Ansonsten ist natürlich die Entwicklungsgeschwindigkeit nach wie vor ein Thema, das heißt: Wie schnell kann ich dem Kunden umsetzbare Vorschläge machen für sein Produkt.
65. First of all to be cheap.
66. Tendencies towards innovation for example towards sustainability
67. Towards logistic optimisation.
68. Deinking, plastic recycling, which could contaminate food, proofed by studies from the USA and Canada, especially to fruits, we are aware of this and that is focused by our marketing companies on industry level,
69. This will be a cost element, the customers are not willing to pay for it.
70. Die Markeninhaber haben ein großes Ziel. Sie müssen den Wert ihrer Marke schützen, dementsprechend muss ein Hersteller von Verpackungen dem Markeninhaber das Gefühl vermitteln, dass er durch seine Verpackung nicht nur seine Marke schützt sondern den Wert seiner Marke unterstreicht oder vielleicht sogar noch mehrt. Er muss dem Markenartikler das Vertrauen geben das die Verpackung nicht nur die gesetzlichen Anforderungen erfüllt, sondern darüber hinaus noch die Verbrauchererwartungen abdeckt, die ja zum Teil übergesetzliche Bedingungen hinausgehen können.
71. Das sind heutzutage hauptsächlich Nachhaltigkeitserwartungen. Die Verpackung muss aus einem ökologischen sinnvollen Material gemacht werden.
72. Da hat die Verpackungsindustrie recht schnell reagiert und hat insgesamt fast 100% in der Zwischenzeit das umgestellt.
73. So eine Situation ist durch eine reine Konformitätsarbeit nicht mehr regelbar, handelbar. Hier müssen meiner Erwartung nach die Lebensmittelhersteller neue Wege gehen, müssen alle beteiligten zusammenbringen und über das Gesamtsystem der Verpackungen eine gemeinschaftliche Vereinbarung finden, treffen die alle gemeinschaftlich tragen können und nicht wie in der Vergangenheit eine Kette abarbeiten von innen nach außen.

74. Vielleicht wird es spezialisierte Unternehmen geben die ganz andere Dinge zertifizieren morgen als heute, einfach die Stufen der Lieferkette einfach durch zu zertifizieren, könnte ich mir vorstellen.
75. Das beste Mittel ist einfach indem man die Kontrolle selbst übernimmt.
76. Nestle hat sich im Prinzip darauf verlassen, dass das was die Lieferanten ihnen sagen, dass das alles bare Münze ist. Ich möchte nicht sagen, dass da jemand geschleudert hat oder vorsätzlich etwas missachtet hat, aber Nestle ist seitdem intensiver als zuvor hingegangen und sagt: Wir analysieren alles selbst und das machen zum Beispiel wir als Kartonhersteller und andere eben auch. Wir verlassen uns nicht mehr blindlings auf irgendwelche Bestätigungen und schreiben vielleicht sogar Zertifikate der Zulieferer, sondern wir gehen selbst hin und analysieren wo unsere Produkte, die Produkte der Vorstufe und wir analysieren durchaus auch die fertigen abgepackten Produkte um festzustellen ob das was wir gegebenfalls drin haben, was unsere Vorlieferanten drin haben, ob das nachher auch im Lebensmittel landet.
77. Also blindes Vertrauen auf Bestätigungen und Zertifikate der Vorstufe das wir mehr und mehr verschwinden und mehr in Eigenkontrolle gehen um einfach sicher zu sein dass man konform arbeitet. Da erwarte ich einen Trend weil nur das letztendlich den Wert des eigenen Unternehmens schützt.
78. Halten sie unsere Branche für vorbereitet mit dieser Problematik umzugehen? Persönlich glaube ich das nicht.
79. Ich sehe aber mittel- und langfristig eine Besserung zugunsten von Papier weil das Thema Ökologie glaube ich wird noch sehr viel mehr in Zukunft wichtig sein und insoweit wird man sich, abgesehen von der Ressource Öl an den daraus resultierenden Herstellungen für Kunststoff, Gedanken machen müssen, ob man nicht doch wieder mehr im Papierbereich tut. Ich bin davon überzeugt das Papier auf dem Vormarsch sein wird mittel- und langfristig.
80. Heute haben wir Kunden im europäischen Ausland und insoweit wäre ich froh wenn es eine einheitliche europäische Lösung geben würde, dann hätte man länderübergreifend nicht so viel Diskussionen und Papierkrieg.

## 15.1.1 Frequency\_Long\_Term\_Relatioinship\_SRQ1\_3

Theme	Subresearch Questions
Code	Future_Success_Factors_SRQ4_1
Sub Code	Frequency_Long_Term_Relatioinship_SRQ1_3
Segments	07

1. Wenn das eine gewisse Breite in der Implementation in einer Branche gefunden hat, dann müssen auch die Restlichen natürlich nachziehen weil es irgendwann auch zum Standard seitens der Kunden, als Standard gefordert wird, denn man dann sozusagen in der Herstellung der Geschäftsbeziehungen wenn es um die Rahmendaten abhaken muss als das man es erfüllt
2. Automatischen EDV-gestützten Lieferbeziehungen, Kommunikationskanäle gewünscht sind, eingefordert werden, Stichwort SAB-Anbindung
3. Die Faltschachtelindustrie hat ja vor vielen Jahren schon Szenario-Management durchgeführt im Rahmen der Verbandstätigkeit und dort ist sehr klar herausgearbeitet worden, dass man natürlich als Unternehmen, als Unternehmer eine Strategie für sein Unternehmen haben muss. Insofern wurden da vor vielen Jahren zehn, fünfzehn, zwanzig Jahren entsprechende Entwicklungen eingeleitet
4. Es gibt ja nicht den Faltschachtelmarkt, es gibt immer nur Segmentmärkte oder seit dem nur noch Segmentmärkte. Man hat sich spezialisiert auf ein bestimmtes Segment, ob es Kosmetik ist, oder Zigarette ist, oder andere. Man hat sich aufgestellt als internationales Unternehmen oder das sich lokal fokussiert. Man hat eine Vorwärtsintegration praktiziert indem man für den Kunden bestimmte Tätigkeiten mitübernimmt, eine Rückwärtsintegration eher nicht so sehr.
5. Aktuell wird gerade sehr stark das Thema digitale Faltschachteherstellung, also sowohl digitaler Druck als auch digitale Verarbeitung, eben vor dem Hintergrund dieser Veränderung dieser Losgrößen diskutiert. Damit geht natürlich einher, das Thema Investitionskosten, damit geht einher das Thema Lebensmittelsicherheit, damit geht einher das Thema Qualität des Drucks und im Pharmabereich Wiederholbarkeit des Druckauftrags. Offset zu digital wurde sehr stark vor zehn Jahren diskutiert, dass der Digitaldruck wurde abgetan.

6. Es bedarf nicht immer nur einer gesetzlichen Regelung um aktiv zu werden und Verbrauchererwartungen zu erfüllen, sondern müssen die Unternehmen von sich aus daran arbeiten wenn potenzielle Risiken entdeckt werden, diese zu minimieren oder im Idealfall sogar abzustellen. Insofern glaube ich schon dass neben unserem Hause viele andere die direkt betroffen sind, begonnen haben das Thema zu analysieren, mögliche Ursachen herauszufiltern und auch erste korrigierende Maßnahmen eingeleitet haben.
7. Lösungen für den Markt anzubieten, auch ohne dass da schon ein konkreter rechtlicher Handlungsbedarf entstand.

#### 15.1.2 Indicators\_Success\_SRQ3\_4

Theme	Subresearch Questions
Code	Future_Success_Factors_SRQ4_1
Sub Code	
Segments	11

1. Es werden ja nicht nur Lebensmittel verpackt. Es gibt einen großen Teil der Verpackungen im Bereich der Nonfood oder eben technischen Gebrauchsgüter, das sind ja enorme Mengen, eingehen. Man muss also hier unterscheiden, sehr stark, und das machen wir auch in unserer Tätigkeit, nicht nur vom Material her, sondern eher in die Anwendung.
2. Immer dann, wenn Technologiesprünge möglich waren oder sich ergeben haben, dann hat das natürlich Auswirkungen auf die sogenannte Zulieferindustrie, z.B. den Maschinenbau, gehabt und da mussten sich die Betriebe natürlich massiv umstellen. Die guten haben es schneller geschafft, die schlechten haben es eben später geschafft und die ganz schlechten haben es nicht erkannt und letztendlich dann gar nicht geschafft.
3. Die Verpackung hat ja auch die Aufgabe, das Produkt, das in ihr liegt, zu veredeln, nicht nur zu schützen und zu transportieren und es auch höherwertig zu machen, wie man es ja bei vielen digitalen Produkten sieht.
4. Entscheidend ist, dass im Unternehmen eine ordentliche, neuzeitliche Unternehmenskultur herrscht und das beginnt bei der Führung. Das sind viele, viele Rädchen, die da ineinander greifen. Ich will es mal so sagen: Das zentrale Thema ist für uns als Berater die Frage, welche Kultur wird in einem Unternehmen gelebt? Das hängt natürlich auch von der Stellung der

Kunden im Unternehmen ab. Ist man wirklich dabei, sich um die wahren Bedürfnisse der Kunden zu kümmern, werden die Menschen ordentlich behandelt, wird auch Geld verdient. Eine Zertifizierung ist ja noch nicht die Garantie dafür, dass man Geld verdient und auch keine Garantie dafür, dass das Unternehmen im nächsten Jahr noch existent ist. Für uns gibt es eine klare Hierarchie der Managementaufgaben. Ganz oben steht die Unternehmensstrategie. Die Zertifizierungsfragen sind für uns Werkzeuge, die so ein strategischen Ansatz natürlich untermauern und auch befüllen, aber sie ersetzen unmöglich weder die Unternehmenskultur noch die Unternehmensstrategie.

5. Da haben sie Recht, aber die Erfahrung zeigt, dass sich die Unternehmen mit solchen Fragen eigentlich erst befassen, wenn es gar nicht mehr anders geht, wenn ein Zwang da ist.
6. Da brauche ich ja Stabsstellen oder müsste mein Qualitätsmanagement ausbauen. Ohne Druck und ohne direkte Notwendigkeit wird sich da im Mittelstand nichts bewegen
7. Daneben haben wir quasi als Basis die Produktivität, die Wirtschaftlichkeit der Prozesse, die Workfloworientierung und als weiteren Punkt die Mitarbeiter, die Mitarbeiterqualität und die Mitarbeiterorientierung.
8. Und das ganze bezeichnen wir dann als strategisches Dreieck: Vertrieb, Produktivität und Mitarbeiterorientierung. Dieses sog. strategische Dreieck wird dann noch überlagert von der Druckereistrategie - alles immer darauf ausgerichtet, dass man ausreichend Geld verdient, um auch in Zukunft investieren zu können.
9. Aber es ist halt nur so, durch den sehr starken Rückgang des Einsatzes von grafischem Papier für Zeitung und Zeitschriften und so weiter, verschieben sich die Mengenverhältnisse in den Altpapierkreisläufen. Und es ist durchaus schon mal ein Gedankenexperiment wert, zu sagen, der ganze Altpapierkreislauf braucht ja immer Frischfaser, weil ja die Fasern beim recyceln immer leiden und man nach fünf bis sieben Mal immer geschrieben wird dann so zu Staub zerrieben sind, dass sie weg sind. sprich, man muss immer wieder Frischfasern ersetzen. Das passiert im grafischen Bereich so, das Zeitungspapier aus Finnland oder Schweden kommt und das auf Frischfasern basiert. und aus den alten Zeitungen die man hier einsammelt, macht man in der Deinkinganlage Zeitungspapier aus hundertprozentigem Altpapier. Wenn jetzt die Menge grafische Papiere schrumpft und die Menge Verpackung steigt. dann könnte man ja überlegen, kann man nicht die Frischfasern zuerst für Lebensmittelverpackungen nehmen und dann die Kreisläufe entsprechend

umzubauen denn man wir sie eh umbauen müssen und dann erst im zweiten Schritt aus der alten Nudelschachtel Zeitungspapier machen.

10. Wichtig ist, dass eben die Informationsübermittlung vom Druckfarbenhersteller bis zum Inverkehrbringer funktioniert, so wie es der BLL, Dr. Stähle postuliert.
11. Focus on efficiency, service, innovation, a niche to attack the market

### 15.1.3 Task\_Fulfillment\_Supplier\_SRQ3\_2

Theme	Subresearch Questions
Code	Future_Success_Factors_SRQ4_1
Sub Code	Task_Fulfillment_Supplier_SRQ3_2
Segments	10

1. Konformität, Garantien, kritisch ist wenn Zusagen die Liquidität des Zulieferers übersteigen, Haftungspolizen, Kontrolle, Behörden haben keine standardisierte Messmethode, keine Durchsetzung.
2. Dass ist ein ganz wichtiger Aspekt denk ich, denn hier wird die durchgängige Kommunikation in der supply-chain angesprochen mit dieser Frage. Ich glaube das bei vielen Marktteilnehmern die man auf den verschiedenen Stufen das Bild vorherrscht und es gibt entsprechende Andeutungen immer mal wieder aufgrund der Äußerungen von Kundenseite oder Kundenverbandsseite, dass hier sozusagen die Gewährleistung der Verkehrsfähigkeit zu dokumentieren, zu beweisen ist. Seitens des Lieferanten. ich glaub aber viel mehr im Sinne der durchgängigen Kommunikation dass es nur eine gemeinsame Aufgabe sein kann, weil der Partner in das Supply-Chain ein verkehrsgerechtes Produkt am Ende herzustellen.
3. Das wird ja immer von der Einrichtung eines GMP Systems, eines Risikomanagementsysteme gesprochen, es wird davon gesprochen, dass man seine Rohmaterialien vorher definierten Spezifikationen bezieht. Das heißt: Ich muss als Kunde meines Lieferanten, das ist egal auf welcher Stufe, ich muss mein Produkt spezifizieren das ich bekommen möchte. Das ist ein ganz großes Manko was in der ganzen Supply-Chain noch vorherrscht, das haben wir noch nicht. Das ist der zweite Teil, aber der Dritte ist eben, das qualifiziert dokumentierte Risikomanagementsystem.



4. Das meine ich mit dem Agieren. Das vermisse ich gerade, große Unternehmen tun sich da natürlich schwerer, ein inhabergeführtes oder kleine mittelständige Unternehmen, die können es leichter entscheiden.
5. Solid board, the tendency is a little bit different there, because there is no direct contact with food.
6. Corrugated packaging there is in general no awareness about this ordinance.
7. Nicht alle gleichermaßen, aber diejenigen die ganz offensichtlich von Anfang an im Fokus standen haben sich doch sehr intensiv mit der Problematik auseinandergesetzt. Im Fokus standen von Anfang an die Hersteller von Verpackungen und die Zulieferer dazu die vor allem altpapierbasierte Materialien setzen. Hier gab es speziell auch in unserem Haus, direkt von Anfang an die Überlegung: Wie können wir diese Belastung in dem konkreten Fall mit Kohlenwasserstoffverbindungen reduzieren, auch wenn es dafür noch keine gesetzliche Voraussetzung gab.
8. Entsprechendes gilt auch fürs Hause Mayr-Melnhof Karton, dem Marktführer in Europa für Faltschachtelkarton, für Recyclingkarton. Nachdem man festgestellt hat dass das alleine nicht reicht, haben verschiedene Unternehmen, in dem Fall waren es ganz sicherlich die zwei genannten, versucht Barrierelösungen zu entwickeln um die Migration dieser Kohlenwasserstoffe aus der Verpackung in das Lebensmittel zu unterbinden. Da gibt aber noch darüber hinaus von anderen Unternehmen andere Ansätze. Es gibt Ansätze die sagen: Wir wollen nicht eine Barriere bilden, wir wollen die Kohlenwasserstoffverbindungen einfangen und innerhalb des Kartons binden.
9. Ich stelle mein Verpackungskonzept um. Dieser große Schritt, es gibt kleine Schritte wo verschieden kleine Hersteller in aller Stille ihre Verpackungen umgestellt haben auf Barrierekarton zum Beispiel, aber so lange eben nicht in einer offenen Kommunikation bedeutende Marktteilnehmer bereit sind, das zu kommunizieren das sie bereit sind heute eine funktionierende Lösung haben, wir das ganze weiterhin eher so dahin dümpeln.
10. Für mich sind Erfolgsfaktoren natürlich ein hohes Maß an Verlässlichkeit, an Kontinuität und vor allem an einer partnerschaftlichen Gesamtlösung weil der Kunde heute den Anspruch hat, ein sehr komplexes Objekt haben zu wollen aber nur einen kompetenten Ansprechpartner haben möchte um am Ende des Tages, wie ich immer zu sagen pflege, den Kopf schön entspannt ins Kopfkissen legen kann.

## 15.1.4 Trust\_in\_PSC\_SRQ3\_4

Theme	Subresearch Questions
Code	Trust_in_PSC_SRQ3_4
Sub Codes	
Segments	37

1. Also wichtig ist, dass solche Gespräche geführt werden, dass solch eine Spezifikation vereinbart ist auf jeder Stufe in der Kette.
2. Vertrauen ist etwas das die Gesellschaft unbedingt braucht. Und das ist natürlich gerade im Lebensmittelbereich im Food-Bereich eine Geschichte ich sage mal die Grundlage jeder Marke und jeder Branche einfach auch ist. Das die Branche vertrauen erweckt. Ich sehe Vertrauen als Grundvoraussetzung und wenn das Vertrauen nicht mehr da ist, dann sieht man letztendlich das ein Vertrauensverlust, siehe Kernenergie, das es zu einem Erdbeben führt und dass sich eine Branche innerhalb von kürzester Zeit in Schall und Rauch auflösen kann.
3. Dass das Unternehmen, mein Packmittel-Lieferant, in der Lage ist nach institutionalisierten Prozessen hier Produkte gleichbleibender Qualität zu liefern.
4. Dass ist ein ganz wichtiger Aspekt denk ich, denn hier wird die durchgängige Kommunikation in der Supply-chain angesprochen mit dieser Frage. Ich glaube das bei vielen Marktteilnehmern die man auf den verschiedenen Stufen das Bild vorherrscht und es gibt entsprechende Andeutungen immer mal wieder aufgrund der Äußerungen von Kundenseite oder Kundenverbandsseite, dass hier sozusagen die Gewährleistung der Verkehrsfähigkeit zu dokumentieren, zu beweisen ist. Seitens des Lieferanten. ich glaub aber viel mehr im Sinne der durchgängigen Kommunikation dass es nur eine gemeinsame Aufgabe sein kann, weil der Partner in das Supply-Chain ein verkehrsgerechtes Produkt am Ende herzustellen.
5. Wir müssen gemeinsam mit unseren Lieferanten eine adäquate Produktentwicklung durchführen. Und dass schließt dann auch ein, dass man sich darüber austauscht und sich abstimmt, inwiefern auch Migrationsuntersuchungen am fertigen Packmittel durchzuführen sind.

6. Das geht eben von Lieferanten des Lieferanten, also die gesamte Wertschätzungskette, wo kommt eigentlich die Pulpe her? Wie wird die Pulpe hergestellt?
7. Es muss wirklich vom Unternehmen, und da kommen wir eben auch auf den Lieferanten, der heute auch ein Image hat, das Image des Markenartikler hängt vom Image des Vorlieferanten mit ab und darauf wird man meiner Ansicht nach immer mehr Wert legen.
8. Das beginnt beim Kunden der letztendlich sagt: "Ich will nur das wissen, was ich wissen muss.". Der Kunde der sagt: "ich möchte ein bisschen mehr darüber wissen", der schafft dann Vertrauen in beide Richtungen
9. Darüber müssten sich einige Hersteller in der Lieferkette Gedanken machen. Ich muss also nicht nur wissen: was macht mein Kunde? Sondern: was macht der Kunde meines Kunden? Was macht der Lieferant meines Lieferanten? Also diese Betrachtung dieser gesamten Kette und darüber hinaus mehr als die Normen vorschreiben zu tun, das ist meiner Ansicht nach langfristig der richtige Weg um nicht nur Vertrauen zu schaffen, sondern um besonders in Westeuropa für Konsumenten insgesamt Vertrauen zu schaffen.
10. Die Kommunikation zu den Druckereien, würde eigentlich so wie gewohnt weitergehen.
11. Man kann es jetzt salopp sagen, die ganze Diskussion über Mineralöl und was noch alles durch die Presse ging, die hat dazu geführt, dass die Nachfrage nach Druckfarben die bestimmungsgemäß für Lebensmittelverpackungen geeignet sind deutlich gestiegen ist. Also es gab durchaus vor fünf Jahren noch Druckereien und Auftraggeber die dahinter standen, wo es dann noch hieß: "Kümmert euch nicht um die Farbe die ihr noch eh habt und gut ist es". Aber das hat sich geändert, weil das hat jetzt jeder begriffen, dass das ein sehr hohes Risiko ist."
12. Also ich denke wir brauchen, wenn sie Audits so definieren, dass da noch mal ein formales Zusätzliches System nötig sein wird. Das sehe ich eigentlich als unnötig.
13. Wenn man sich quasi die Lebensmittelindustrie dann ist es jetzt so geregelt das jetzt quasi die Verpackungen Sicherheit in einer guten Herstellungspraxis hergestellt worden sein kann. Wenn man jetzt speziell das Thema Safety von möglichen migrierenden Substanzen anguckt dann würde ich sagen, dann kann man diese Zertifizierungen so wie sie heute sind nicht mehr oder minder vergessen weil man da sehr ins Detail geht, denn da geht es wirklich nur darum, tragen sie Haarnetze? Und das die nicht im Betrieb rauchen und nicht essen und solche Sachen.

14. Ob bei einer Wellpappe eine Stichprobe über Mineralöl zu machen, dass halte ich für raus geschmissenes Geld.
15. Ja, die Branche hat sich sehr sensibilisieren lassen von diesen Veröffentlichungen und sie hat reagiert indem eben auch Verpackungsänderungen erfolgt sind bei den zu Rede stehenden Produkten im Fokus. In der Lieferkette entsprechende Anforderungen gestellt worden. Man kann nicht mehr behaupten dass sich die Branche heute noch auf dem Kenntnis- und Umsetzungsstatus befindet wie in 2010.
16. Innerhalb der Lieferkette müssen sich die Partner Vertrauen entgegen bringen.
17. Wenn ich meinen Abnehmer nicht nur in meinen Dokumenten oder in meinem Marketing erkläre dass das geeignete Verpackungen sind und ich durchgehende Prüfungen gemacht habe und dafür einstehe - das wird sich dann zukünftig noch konkreter und durch Dritte bestätigt. Also ob das Vertrauen dadurch größer wird, ich weiß es nicht. Es gibt da ja auch Möglichkeiten das nicht vertrauenswürdig umzusetzen. Die sind heute da und die sind zukünftig auch da.
18. In Deutschland ist das die Empfehlung 36 des Bundesinstitutes für Risikobewertung, die bestimmte Rahmenbedingungen enthält und dazu eine Positiv-Liste der Stoffe, die nach Einschätzung des BfR geeignet sind für die Herstellung von Lebensmittelverpackungspapieren. Diese Empfehlung ist quasi ein Vorweggutachten, das die Frage beantwortet, ob die Papiere den sehr allgemein formulierten Paragraphen 30 und 31 des Lebensmittelgesetzbuches gehorchen.
19. Überraschend war die Reaktion des damaligen BMELV, Bundesministerium für Ernährung und Landwirtschaft und Verbraucherschutz, das das BfR um eine Stellungnahme gebeten hat, die dann am 09. Dezember 2009 erschienen ist, auch im Internet noch einsehbar ist und die einen Handlungsbedarf vorgegeben hat.
20. Eine Verordnung, und das ist der Hauptpunkt, ist nur dann umsetzbar, wenn sie nachkontrollierbar ist. Bei der Kontrolle von Gehalten an Inhaltsstoffen spielt Vertrauen keine große Rolle. Man muss eine Möglichkeit haben, messtechnisch zu prüfen, ob die Verordnung eingehalten ist. Und eine behördliche Beanstandung muss auch vor Gericht bewiesen werden können. Da spielt Vertrauen keine große Rolle, da spielt der Analytik-Rahmen eine große Rolle. Und ich glaube, das ist einer der Gründe, warum auch die Verordnung so nicht umsetzbar ist,

21. Da spielt Vertrauen keine große Rolle, da geht es um Naturwissenschaft. Auch die NGOs werden untersuchen, Stiftung Warentest wird nachprüfen... das ist ein Arbeitsbeschaffungsprogramm für Laboratorien.
22. Man wird versuchen, das eventuelle Risiko auf den Lieferanten zu verlagern. Der Lieferant wird sich absichern durch mehr oder weniger umfassende Erklärungen. Falls sich jemand gegen einen Haftungsanspruch wehrt, müssen notfalls Gerichte entscheiden.
23. Vertrauen schaffen kann man nicht unbedingt mit irgendwelchen externen Bescheinigungen oder Zertifizierungen oder Erklärungen dass jemand besonders Vertrauenswürdig ist. Ich glaube Vertrauen stellt sich in der persönlichen Geschäftsbeziehungen schlägt sich diese nieder in dem die eben zuverlässig ist und nachhaltig funktioniert.
24. Ich höre ganz oft, dass meine Mandanten Produkte aus China beziehen, Verpackungsmaterialien zum Beispiel und dann wird von dem chinesischen Hersteller einfach Blind so eine Konformitätserklärung unterschrieben, da weiß man schon ganz genau dass da einfach keine Arbeit geleistet wurde.
25. Aber wenn eben ein Hersteller von dem man annimmt, dass er die Konformitätsarbeit geleistet hat, entsprechende Erklärungen abgibt, dann muss man eben darauf vertrauen können dass es passiert, denn sonst ist diese Konformitätsarbeit in der Lieferkette nicht leistbar wenn man sich auf die Vorgänger nicht verlassen kann. Ich sage meinen Mandanten immer, man darf sich halt nicht blind drauf verlassen, man muss Zwischenkontrollieren und man muss Stichprobenartig auch noch mal gucken und man muss sich vielleicht auch den Lieferantenbetrieb mal angucken. Aber in der Praxis ist es schon so dass hier vertraut wird und auch vertraut werden muss, sonst wäre das ganze gar nicht leistbar.
26. Aber dass in der Richtung etwas passiert ist sicherlich so und wir selber haben für uns schon die Konsequenz gezogen und setzen nur noch mineralölfreie Farben ein im Offsetdruck, im Flexodruck haben wir dieses Thema eigentlich nicht so.
27. Wie ich uns Deutsche kenne, wird man versuchen das immer auf die vorgelagerten Stufen zu verlagern und sich viele Unterschriften geben zu lassen, damit man da selber auf der sicheren Seite ist.
28. Vertrauen ist nach wie vor wichtig auf allen möglichen Kundenbeziehungen.
29. Towards mineral oil our customers who are interested in this are satisfied having a declaration of our ink suppliers, that LMQ Inks do not contain Mineral Oil.

30. Introducing mineral oil within our supply chain and to the paper that we are making, as long as we are not sure that the source of our problem is detected and under control, I cannot see that someone in the chain has trust in the things that we are doing as an industry.
31. The issue of mineral oil is very large towards the complete chain,
32. This is a dilemma, you have to look at the complete chain, finding a solution within the chain, so attacking the problem at the source means, avoiding to have mineral oils out of the beginning of the chain, meaning newspapers and magazines.
33. Die Verpackung muss unter akzeptablen sozialen Bedingungen hergestellt worden sein. Also nicht dadurch das irgendwo Kinderarbeit einer Rolle spielt, was jetzt in Europa jetzt nicht so der Fall ist, was aber in anderen Regionen der Welt durchaus ein gewisser Aspekt sein könnte.
34. Hier müssen meiner Erwartung nach die Lebensmittelhersteller neue Wege gehen, müssen alle beteiligten zusammenbringen und über das Gesamtsystem der Verpackungen eine gemeinschaftliche Vereinbarung finden, treffen die alle gemeinschaftlich tragen können und nicht wie in der Vergangenheit eine Kette abarbeiten von innen nach außen. Das wird nicht mehr funktionieren weil zwar die Kette von Innen nach Außen abdeckt, aber die Störeinflüsse von Nicht-Kettenmitgliedern gegeben sind die eben in dieser Konformitätsarbeit nicht darstellbar sind.
35. Wenn man das über die verschiedenen Stufen der Wertschöpfungskette zusammenträgt und zusammenbringt an einen großen runden Tisch, müsste man eigentlich in der Lage sein untereinander großes Vertrauen aufzubauen, so dass die einen Verstehen: Ja, die anderen arbeiten an der Lösung des Problems und die anderen verstehen: Aha, die haben ja auch ihre Themen. es bin ja nicht nur ich alleine in meiner Funktion als Wertschöpfungskettenmitglied der das Problem hat, sondern andere tragen auch ihre Probleme mit hinein.
36. Faltschachtelkartonlösungen, aber es traut sich keiner der großen Kunden so richtig aus der Deckung und sagt: Ich nutze jetzt diese Möglichkeit um mein Produkt besser zu schützen als in der Vergangenheit. Das hat verschieden Gründe, zum einen Risiko vor dem Irrtum, das es eben doch nicht funktioniert, zum zweiten dass man damit dem Verbraucher aufschreckt und der sagt: Aha, da war in die Vergangenheit ein Problem. Aber es wäre sehr hilfreich für die Weiterentwicklung insgesamt das man sagt, man kann bei konkreten Fällen nachweisen dass die Systeme funktionieren, das man mit gängige Verfahren, Prozessen und durchaus

gängigen Packstoffen, Mitteln diese gewünschte Lebensmittelsicherheit erreichen kann.

37. Aber das Lebensmittel ist einfach hinten runter gefallen und ich glaube das ist ein großes Problem und das wird uns auch zukünftig, auch wenn wir eine Regulierung haben, weiterhin das Leben schwer machen, weil im Zweifelsfall immer von der Lebensmittelindustrie der Versuch geführt werden wird nachzuweisen dass die Verpackungen trotzdem die Ursache des Problems war, was sie nicht notwendigerweise immer ist.

### 15.1.5 Contracts Design

Theme	Subresearch Questions
Code	Trust_in_PSC_SRQ3_4
Sub Codes	Contracts_Design
Segments	08

1. Substanz des Zulieferers, dann können die den Recall bezahlen.
2. Verträge Haftung wird durchgereicht, wer nicht belegen kann, das er es nicht war, hat verloren,
3. Wo ist es dazu gekommen? Ich muss dann in die die Dokumentation geben, die lass ich mir zeigen. Ob das beim Lebensmittelhersteller ist, beim Einpacker oder beim Faltschachtelhersteller ist und der muss dann die Schublade aufmachen und muss für diesen konkreten Fall, für dieses Objekt, für den Artikel die entsprechende Dokumentation rausholen.
4. Beschaffenheitszertifikate und Konformitätsarbeit von unseren Lieferanten bewerkstelligt haben, die quasi mit ihren Lieferanten auch wieder schauen was die so einsetzen und in wie weit diese Verpackung Substanzen abgibt an ein Produkt. Das ist quasi so unsere Sachlage wie wir das heute bewerkstelligen.
5. Man wird versuchen, das eventuelle Risiko auf den Lieferanten zu verlagern. Der Lieferant wird sich absichern durch mehr oder weniger umfassende Erklärungen. Falls sich jemand gegen einen Haftungsanspruch wehrt, müssen notfalls Gerichte entscheiden..
6. Wie ich uns Deutsche kenne, wird man versuchen das immer auf die vorgelagerten Stufen zu verlagern und sich viele Unterschriften geben zu lassen, damit man da selber auf der sicheren Seite ist
7. Ja, nach unserer bescheidenen Erfahrung hier im Haus ist es einfach so, dass wir Erklärungen abgeben müssen, beziehungsweise durch die

Zertifizierungen gewisse Formalien erklären müssen und dadurch sichern sich diese, unsere Vertragspartner, sprich unsere Kunde ab.

8. Ja, wir kriegen mittlerweile von unseren Kunden, insbesondere von den größere Kunden schon fast Handschellen angelegt weil die Anforderungsprofile die wir haben, ob es jetzt Zertifizierungen sind, ob es jetzt HACCP Verordnungen sind, oder ob das ganz bestimmte Forderungen sind, die in den Häusern spezifisch gefordert werden.

#### 15.1.6 Trust Label - Hallmark

Theme	Subresearch Questions
Code	Trust_in_PSC_SRQ3_4
Sub Codes	Trust_Label_Hallmark
Segments	59

1. Gütesiegel: Braucht kein Mensch, wo ist der kleinste gemeinsame Nenner?
2. Gütesiegel: Was soll gesiegelt werden, der Prozess oder die Schachtel, War alles bisher giftig? Transportverpackungen aus Wellpappe kritisch, wo ist der kleinste gemeinsame Nenner?
3. Ich könnte mir vorstellen dass das Sinn macht. Ich glaube letztendlich dass das wahrscheinlich aufgrund des Kostendrucks und aufgrund der Rahmenbedingungen natürlich nicht wirklich umsetzbar sein wird.
4. Qualitätssiegel im Prinzip erzeugt werden, aber es muss letztendlich dahinter auch substanziell etwas stehen. Das heißt man muss wirklich auch das Vertrauen mit Leben füllen.
5. Ich glaub das musste man unter kommunikativen Aspekten ganz genau sich überlegen ob man so etwas aufdrucken möchte. Insofern sehe ich da eigentlich im Hinblick auf die Kommunikation zum Verbraucher wenig Relevanz und wenig Chance.
6. Es gibt ja Verpackungen da sind fünf Siegel drauf und jetzt, nach einer Umfrage bei Konsumenten, 90% können mit keinem dieser Siegel irgendetwas anfangen.
7. Weniger, weil es eben doch einen sehr technisch geprägtes Gütesiegel ist, ich spreche von Konsumverpackungen. Interessiert nach meiner Sicht niemanden.
8. Sie müssen auch bedenken, diese ganze Zertifizierung ist ja irgendwo auch ein Geschäft. Es gibt Gesellschaften, die diese Zertifizierungen begleiten und auch abnehmen. Da muss man auch immer im Detail prüfen, wer



bestätigt jetzt diese Verlängerung der Zertifizierung und wie läuft es dann im Detail ab. Wir stellen immer wieder fest, dass da auch von den zertifizierenden Organisationen oft viele Augen zuge drückt werden, um die Zertifizierung zu verlängern. Wir als Berater wundern uns oftmals, dass Unternehmen die Zertifizierung erhalten haben, wo man doch bereits beim Durchlaufen merkt, dass es zum Teil drunter und drüber geht.

9. Es wird sich auch niemand hinstellen: "Ok, meins ist nicht migrationsarm". und wenn es dann nur drauf hinausläuft das dem, der das Gütesiegel organisiert wieder Gebühren zu zahlen, ist das eigentlich nicht einzusehen, dass wir das brauchen."
10. Jedes Unternehmen hat immer ein Interesse daran Gütesiegel zu entwickeln, daher glaube ich schon dass diese Gütesiegel kommt. Wird das Gütesiegel relevant sein? Schauen sie sich jede Verpackung an, da sind schon tausende von Symbolen drauf, das weiß der Konsument eh nicht. Das halte ich für wenig relevant.
11. Also für mich wäre das die Alternative zu der gesetzlichen drohenden Konformitätsarbeit. Wenn Gütesiegel das dann, das das auch bisher von der GMP-Verordnung eine Anforderung ist, eben erklärt und in der Lieferkette in einem angemessenen Umfang ausweist, dass diese Verpackung jetzt migrationsarm ist und für bestimmte Anwendungen geeignet ist. Das muss hier nicht alles so, wie das die Konformitätserklärung der Druckfarbenverordnung vorsieht, so detailliert ausformuliert und angegeben werden.
12. Sehen sie neben der Konformitätsarbeit auch noch andere Instrumente die Vertrauen schaffen? Sie haben ja ein Beispiel genannt. Ein Gütesiegel. Es gibt ja viele Möglichkeiten die Verpflichtungen setzt: Erklärungen die nach unserem Empfinden auch Vertrauen schaffen oder ein angemessenes Vertrauen begründen."
13. Wenn der Markt es fordert wird es das geben. Und wenn eine Mineralölverordnung eingeführt werden soll, dann wird der Markt wahrscheinlich solche Dinger einfordern, dann wird es so etwas geben.
14. Wir haben selbst schon über so etwas nachgedacht um eine Mineralölverordnung zu verhindern. Ein Zertifizierungssystem im Rahmen eines reinen Gütezeichens. Haben wir aber aus den verschiedensten Gründen wieder verworfen.
15. Wenn Zertifizierungssysteme der Signalisierung dienen um zu zeigen, dass ich ein gewisses standardisiertes Vorgehen habe in meiner Produktion, glauben sie, dass es gegebenenfalls eine Art Gütesiegel geben könnte migrationsarme Verpackungen? Kann ich mir vorstellen, ja.

16. Nein, ich glaube nicht das es ein eigenes Gütesiegel für -mineralölarne Verpackungen geben wird, aber es könnte ein Gütesiegel geben für geprüfte Sicherheit, was Lebensmittelverpackungen anbelangt, was weit mehr abdeckt als nur Mineralöl. Mineralöl ist ja nur eine von vielen Komponenten die möglicherweise in Verpackungen enthalten sind und dann in das Lebensmittel immigrieren und dieses verändern und damit eine Gefährdung für die menschliche Gesundheit darstellen können und deswegen glaube ich, eine Eingrenzung auf ein Mineralölfrei-Siegel, auch wenn es kommen würde, hätte kaum eine Überlebenschance weil morgen schon der nächste Stoff auftaucht für den man dann ein neues Siegel bräuchte.
17. Also wenn ein Siegel kommt, dann eher ein allgemeineres Siegel. Die europäische Faltschachtelindustrie hat versucht so ein Siegel zu entwickeln vor 3 Jahren, basierend auf ihrer GMP, also ihre Empfehlung für eine gute Herstellungspraxis bei der Herstellung von Faltschachtel für den Lebensmittelbedarf. Dieses Food-Seal, glaube ich ist die Bezeichnung, hat sich nicht durchgesetzt und ich glaube wird sich nicht durchsetzen, denn so ein Siegel... Es müsste so etwas sein wie ein blauer Engel der für viele Bereiche gilt und nicht nur ein Branchenspezifisches Siegel ist für Wellpappe oder Faltschachtelverpackung, sondern so ein Siegel müsste auch für Kunststoffe oder Metall, für Glasverpackungen gelten, dann würde es wahrscheinlich auch von dem Verbraucher akzeptiert werden. Ein reines Gütesiegel nur für Verpackung, da sehe ich keine Chance.
18. Für mich ist das alles Etikettenschwindel, mir wäre ein, zwei wirklich verlässliche Prüfsiegel lieber wie 20 die keiner nachvollziehen kann.
19. Dann muss ich belegen können dass ich nach GMP arbeite, während die Food-Zertifizierungen die betreffen ja wiederum nur den Hersteller und Inverkehrbringer von Lebensmitteln. Ein Verpackungslieferant der Verpackungen in die Food Industrie liefert, der muss sich damit befassen, aber die Herstellung der Verpackung an sich da ist die GMP das wichtigste. Und diese Zertifizierungen beinhaltet schon was, das ist so weit definiert und soweit detailliert dass das Bestehen eines solchen Audits durchaus was über die Abläufe bei dem jeweiligen Hersteller aussagen.
20. Gleiche gilt für den Verpackungshersteller wenn er eine bestimmte Farbe kauft. Kann er eine Farbe kaufen zu dem er sehr weitreichend Zusagen bekommt, wo er bis hin zu einer Garantie auch eine Aussage bekommen kann: Wenn sie diese Farbe einsetzen, mit einer maximalen Auftragsmenge von sowieso, vollflächig und 1 Kilogramm Farbe in 6 Quadratdezimeter

verpacken, dann können wir sicher sein dass der Übergang von Stoffen unter den Grenzwerten liegt

21. Kontrolle ist in der Regel keine vertrauensbildende Maßnahme. Kontrolle trägt dazu bei dass ich meinem Lieferanten traue wenn 10 Kontrollen ergeben haben dass die Aussagen richtig sind.
22. Vertrauensbildende Maßnahme ist natürlich auch das Know-how ausgetauscht wird. Jeder weiß etwas, was dem anderen nützt. Das gehört auch dazu. Es ist ja nicht nur der Austausch des Produkts sondern auch der Austausch des Knowhows, auch die technischen Informationen die dazugehören.
23. Eine Verpackung muss per se Migrationsarm sein sonst ist sie nicht legal zulässig. Der, der die Verpackung in Verkehr bringt ist rechtlich verantwortlich dass die Verpackung den gesetzlichen Anforderungen entspricht. Das bestätigt er, wenn er eine Kunststoffverpackung hat, mit einer Konformitätserklärung wie es in der Kunststoffverordnung steht. Wenn es eine faserbasierte Verpackung ist, ist er gut beraten das mit einer Erklärung zu bestätigen die sich an die Konformitätserklärung der Kunststoffverordnung anlehnt.
24. In gewisser Weise sind die natürlich vertrauensbildende Maßnahmen, weil hierdurch gegenüber dem Kunden dargestellt wird, beziehungsweise der Kunde erhält dadurch das Signal, als dass es hier um ein professionell geführtes Unternehmen sich handelt.
25. Der Verbraucher unterstellt dass natürlich von der Verpackung keine schädlichen Einwirkung des Packguts des Lebensmittels oder Kosmetik und so weiter, auch bei anderen Produkten, selbst bis hin zu Tiernahrung übergehen.
26. Ich glaube dass das ein Bereich ist der von großem Interesse ist für die Überwachung, der von großem Interesse sein wird zukünftig im Rahmen von Audits: Nämlich hast du hier strukturiert System deiner Dokumentation.
27. Das beginnt beim Kunden der letztendlich sagt: "Ich will nur das wissen, was ich wissen muss.". Der Kunde der sagt: "ich möchte ein bisschen mehr darüber wissen", der schafft dann Vertrauen in beide Richtungen. Er fordert auf der anderen Seite vom Lieferanten nicht nur "halte das ein, alles andere interessiert mich nicht", sondern ein Stückchen darüber hinaus. Das sind vertrauensbildende Maßnahmen.
28. Aber dieses Scheibchenweise sagen, nun gut, da wird was kommen aber wir tun immer nur das was unbedingt sein muss, weil es Geld kostet. Den Schalte mal umzulegen, es kostet ohnehin Geld, wir nehmen es also in die

Hand und machen vielleicht sogar ein Stückchen mehr für unsere Kunden, für unsere Konsumenten.

29. In letzter Konsequenz sind natürlich alle modernen Managementmethoden irgendwo vertrauensbildende Maßnahmen.
30. Uns fehlt noch, die deutsche Druckfarbenverordnung, wird ja eine Positiv-Liste beinhalten, da fehlen uns noch einige Rohstoffe. Was dann halt neu sein wird, ist, dass sie dann die Inverkehrbringen auch drauf eingestellt sein müssen diese Arbeit zur Darstellung der Eignung der Verpackung so durchzuführen und das ist aus meiner Sicht, wenn man mit großen Markenartikler redet, die haben ja zum Teil tausend verschiedene Verpackungen wo sie ihre Produkte anbieten, das wird sicher sehr aufwendig und schwer werden, hier belastbare Dokumentationen, so wie es die aktuelle Version der deutschen Druckfarbenverordnung fordert vorzuhalten.
31. Also sprich, die Druckfarbenindustrie wüsste schon, wie sie dem begegnen, müsste rein vom Ablauf her, hätte aber zum heutigen Standpunkt noch Probleme mit einigen Farbsystemen, weil einfach noch nicht alle nötigen Substanzen auf der positiv Liste stehen, aber die Kommunikation zu den Druckereien, würde eigentlich so wie gewohnt weitergehen.
32. Was dann neu dazu käme, ist dann der nächste Schritt, dass ja dann die Druckerei ihrem Auftraggeber, und wenn dann noch jemand dazwischen sitzt, vor dem Inverkehrbringer dann halt auch mit allen anderen bis zu dem Inverkehrbringer, der ja dann unter der Druckfarbenverordnung die Pflicht hätte die Dokumentation zusammenzustellen, vorzuhalten, dass das die Aufgaben zu erleichtern.
33. Das muss ja letztlich nur der Fluss der Informationen da sein und an dieser Stelle muss auf Information der Schluss gezogen werden der nötig ist und der dort an dieser Stelle erforderlich ist.
34. Ja gut, das sind ja, ich sag mal, wenn wir was schriftlich mit Stempel und Unterschrift geben, dann stehen wir dazu und dann ist das auch irgendwo rechtlich einklagbar, also wenn wir da irgendeinen Fehler machen würden, dann wäre das unser Fehler für den wir dann gerade stehen müssten oder unsere Versicherung. Also da sehe ich schon als rechtlich wasserdicht wie man es eben im Geschäftsleben, wenn man über Spezifikationen, über Vereinbarungen von Produkteigenschaften sich vereinbart arbeitet.
35. Nach wie vor haben die Faltschachteln ein recht gutes Image und die entsprechenden Industrien tun auch einiges dafür die Faltschachteln positiv darzustellen.

36. Und da kann man jetzt inzwischen schon sehen das eben nicht nur die ganzen Safety abgearbeitet werden, sondern das es ganz klar ist, das ist auch ein Punkt zu Konformitätsarbeit gemacht werden muss.
37. Diese Zertifizierungssysteme oder gerade Audit-Systeme durch dritte, durch Prüfungsgesellschaften haben auch einen Signalcharakter, es heißt sie signalisieren, dass eine Firma einen gewissen Standard erreicht hat und den auch halten kann und ihn wirklich lebt. Sehen sie diesen Aspekt als eine vertrauensbildende Maßnahme? Ja, ich sehe das als Vertrauensbildende Maßnahme.
38. Ob bei einer Wellpappe eine Stichprobe über Mineralöl zu machen, das halte ich für raus geschmissenes Geld. Bei einer recycelten Faltschachtel die nicht besonders Mineralölarum ausgelobt wurde ist es auch raus geschmissenes Geld. Ich muss nichts messen wo ich davon ausgehen muss, dass es da ist. Das ist quasi nicht notwendig.
39. Eine Stichprobe ist eigentlich zum Prüfen ob etwas in Ordnung ist und nicht um zu prüfen ob etwas nicht in Ordnung ist. Da sehe ich im Moment für recycelte faserbasierte Stoffe, abgesehen von den wenigen die da speziell ausgelobt wurden dass sie von der ursprünglichen Materialeintrag schon sehr gut sind oder eben mit besonderen Barrieren ausgelobt wurden, dann muss ich keine Stichprobe in den Materialien machen, wohl aber müsste ich eine Stichprobe oder müsste ich auch wieder überprüfen wenn ich solche Materialien einsetze mit den Barrieren, dann müsste ich quasi die Barriere-Wirkung überprüfen. Erscheint mir alles als sehr komplizierter Ansatz.
40. Auf der anderen Seite muss man natürlich das digitale Zeitalter sehen, es mag schon sein das man im Internet unter jedem Produkt eine riesen lange Liste ansehen kann, in wie weit diese Papier oder die faserbasierte Verpackung deklariert ist aber da muss man auch wieder sagen, im Grunde haben wir heute Gesetz das sagt ich darf nicht und ich sag jetzt 95% der Konsumenten gehen davon aus dass das auch tatsächlich eingehalten wird.
41. Wenn wir heute auch auf Grund der Sorgfaltspflicht Verpflichtungen einer Situation innerhalb der Lieferkette.... Innerhalb der Lieferkette müssen sich die Partner Vertrauen entgegen bringen. Also wir sind dabei Systeme zu schaffen, wie sie eben sagten in Form von Gütesiegeln oder in einer Konformitätserklärung nach Maßgabe des Gesetzgebers, hier natürlich noch mehr vertrauensbildende Instrumente zu nutzen.
42. In Deutschland ist das die Empfehlung 36 des Bundesinstitutes für Risikobewertung, die bestimmte Rahmenbedingungen enthält und dazu eine Positiv-Liste der Stoffe, die nach Einschätzung des BFR geeignet sind

für die Herstellung von Lebensmittelverpackungspapieren. Diese Empfehlung ist quasi ein Vorweggutachten, das die Frage beantwortet, ob die Papiere den sehr allgemein formulierten Paragraphen 30 und 31 des Lebensmittelgesetzbuches gehorchen.

43. Die Analytik gibt eben das nicht her, was man von ihr verlangt wird. Da spielt Vertrauen keine große Rolle, da geht es um Naturwissenschaft. Auch die NGOs werden untersucht, Stiftung Warentest wird nachprüfen... das ist ein Arbeitsbeschaffungsprogramm für Laboratorien.
44. Zum einen können die Unternehmen natürlich darauf Wert legen Barrierepapier-Lieferanten darauf hinzurücken dass nur bestimmte Mineralölkonzentrationen im Papier gemessen werden können, so dass vom Papier und der daraus entstehenden Verpackung auch nur z.B. innerhalb der Grenzwerte liegen dürfen, Migrationen auf Lebensmittel vorkommen.
45. Daraufhin muss dann eine vernünftige Abstimmung darüber erfolgen, wer was prüft. Ob jetzt der Hersteller von Kartonverpackungen schon Konformitätsarbeit leistet und prüft welche Migration möglich ist und eben übergehen könnte, oder ob das der Verpacker dann tut, das müsste eben besprochen werden. Und dann müssten entsprechende mögliche schriftliche Vereinbarungen beschlossen werden.
46. In dem Sinne, dass die Unternehmen Konformitätsarbeit leisten bzw. leisten müssen und da eine Sensibilität herrscht, sind sie schon vorbereitet auf die Verordnung. Worauf sie allerdings nicht vorbereitet sind, sind die gesamten Sekundärverpackungen, die Umkartons auch noch auszutauschen und da eben auf dem gesamten Transportweg, bei der Lagerung etc. auch drauf zu achten. Was natürlich eine weitere Schwierigkeit ist, dass es analytisch sehr schwierig ist festzustellen woher das überhaupt kommt, welche Bestandteile eigentlich drin sind, ob das MOSH oder MOAH sind, das sind ja in diesen Analysen diverse Peaks nicht richtig ausgewertet werden können, so dass es bei der Umsetzung einer konkreten Verordnung doch noch erhebliche Probleme geben dürfte.
47. Sprich, man muss auch sinnvollerweise Versicherungen abschließen wenn man in diesen Bereich neu kommt, man muss seine gesamten Vertragswerke noch einmal anschauen ob das alles prächtig ist und für den Bereich passend. Das sind aus meiner Sicht erhebliche Vorbereitungen von Nöten.
48. Es ist ein wichtiger Faktor. Diese Absicherung in der Lieferkette funktioniert natürlich nur wenn man darauf vertrauen kann dass der

Lieferant tatsächlich diese Konformitätsarbeit durchgeführt hat, die er zugesichert hat.

49. Welche Instrumente schaffen Vertrauen? Zertifizierungen haben sie schon genannt. Persönliche Bekanntschaft bzw. persönliche Besuche bei den unterschiedlichen Unternehmen, Informationen die ausgetauscht werden sind sehr wichtig und eben auch Ehrlichkeit in Bezug auf Analysen die nicht durchgeführt werden oder werden können beim Betrieb. z.B.: Ich habe geprüft für diesen oder diese Stoffe, aber wenn das jetzt anders eingesetzt wird, muss noch das und das und das gemacht werden."
50. Glauben sie, dass es eine Art Gütesiegel geben wird für migrationsarme Verpackungen? Ja, das kann ich mir sehr gut Vorstellen Es gibt ja schon entsprechende Werbung und Produkte die eben entsprechend diesen Regelungen hergestellt werden.
51. Es gibt schon lebensmittelechte Druckfarben und es gibt auch diese neuen Kartons die aus Recyclingmaterial hergestellt sind, die dann eben aber angeblich migrationsarm oder -frei sind. Gerade für kleine und Mittelständige Unternehmen ist es sicher nicht leicht sich jedes Mal eine eigene Verpackungslösung überlegen müssen und die Konformitätsarbeit selbst von A bis Z leisten müssen, so kann ich mir schon sehr gut vorstellen dass es da entsprechende zertifizierte Verpackungen, Fertigverpackungslösungen geben wird, die dann eben nicht mehr überprüft werden müssen vom Verpackungshersteller sondern wo er sich wirklich drauf vertrauen kann dass das dann wirklich einsetzbar ist.
52. Es stimmt, die Analytik ist noch nicht besonders weit. ich habe gerade gestern, ich war in einem Vortrag von Fresenius und da war der Herr Dr. Grob aus der Schweiz und er hat noch einmal sehr eindrucksvoll dargestellt, wie wenig man bisher noch weiß, wie viele Pieckser irgendwie drin sind in den verschiedenen Migrantentypen, die man noch gar nicht kennt und dass es da eine vernünftige Analytik gibt.
53. Dazu gehört sicherlich die Bereitschaft sich auditieren zu lassen, das ist auch ganz klar. Die Kunden die solche Themen richtig ernst nehmen die werden versuchen, zumindest bei wichtigen Lieferanten, sich selbst ein Bild zu verschaffen und diesen Lieferanten auch zu auditieren. Ja, das sind wahrscheinlich schon somit die wichtigsten Dinge. Ich sage mal, das Vertrauen steht letztendlich in der täglichen Zusammenarbeit. Ein Kunde weiß dass er vernünftig behandelt wird und dass man mit ihm vor allem offen agiert. Es kann ja auch immer mal etwas passieren und dass man dann bei solchen Themen eben auch offen agiert und nicht versucht

Probleme zu kaschieren - ist sicherlich auch eine Sache die Vertrauen schafft.

54. Wert seiner Marke unterstreicht oder vielleicht sogar noch mehr.
55. Die Kunden sehen es eigentlich aus Vergangenheit gewohnt, dass sie mithilfe von Konformitätsarbeit sich absichern können indem sie sich entlang der Lieferkette für Verpackungen bestätigen lassen dass die Waren, die sie einsetzen, die Rohstoffe die dafür verwendet worden sind bis zu den Grundstoffen, dass die entsprechend den gesetzlichen Bestimmungen zugelassen sind. Das ist so die gelernte Praxis aus der Vergangenheit. Das werden die Kunden, bzw. die Lebensmittelhersteller, denke ich übertragen wollen, auch auf das Thema sichere Lebensmittelverpackungen, speziell in Bezug auf Mineralölmigration
56. Denn alle Zertifizierungssiegel nützen nichts wenn der Verbraucher letztendlich kein Vertrauen mehr hat weil die Art der Verpackung dem Verbraucher dubios erscheint.
57. Vertrauen hat immer etwas mit Offenheit zu tun. Man sollte eigentlich immer versuchen offen zu erklären welche Problematiken man in seinen eigenen Prozessen hat, welche Problematik man aus den Vorstufen erwartet und Maßnahmen auch klar kommunizieren mit welchen Auswirkungen man für die nachfolgende Stufe gegebenenfalls rechnet.
58. Offenheit und offene Diskussion und Austausch von gewissen Informationen bis zum Endprodukt hin, das wäre eigentlich die richtige Methode die Vertrauen innerhalb der Branche bis zum Kunden zu erzeugen.
59. Das Wort Vertrauen ist natürlich schön, das müssen sie sich ja erarbeiten. Aber auch wir dokumentieren auch mit anderen Dingen heute die Qualitäten in Vertrauensmaßnahmen, ob das jetzt für uns Grenzwertkarten sind im Bereich, ob das für uns ganz andere Vertragsstrukturen sind die wir mit dem Kunden zu weilen schließen.



### 15.1.7 Vertical Integration

Theme	Subresearch Questions
Code	Trust_in_PSC_SRQ3_4
Sub Codes	Vertical_Integration
Segments	06

1. Vertrauen: langfristige Bindung, Schnittstellen EDV, Management by Commitment, man verhält sich nur im Sinne des Kunden,
2. Langfristige Bindung, Er hält was der Partner verspricht, Verträge, Third Party Audits, Kontinuität der ehrbare Kaufmann, persönliche Affinität.
3. Vertrauen spielt selbstverständlich eine Rolle, denn es gibt Lieferanten die ich kenne, mit denen ich schon eine Zeit lang zusammen gearbeitet habe, wo ich mir ein Bild gemacht habe in wie weit Kompetenz da ist, in wie weit die Dinge auf die es ankommt verstanden wurden. Dass sind häufig vertrauensbildende Maßnahmen. Was ein neuer Lieferant oder Quereinsteiger erst mal nicht hat. Der muss mir das dann genau belegen können.
4. Insofern wird es natürlich immer eine gewisse vertikale Integration geben, die vollzieht sich aber glaube ich sehr stark im Sinne von objektbezogenen oder zeitlich befristeten Zusammenarbeiten und wenn diese dann ausläuft, Stichwort Tender-Objekte zum Beispiel, wird wieder neu ausgeschrieben und dann werden die Karten wieder neu Gemischt
5. Automatische EDV-gestützte Lieferbeziehungen, Kommunikationskanäle gewünscht sind, eingefordert werden, Stichwort SAB-Anbindung zum Beispiel, was jetzt gerade als Welle durch die Branche geht bei uns, dann müssen sie es, wenn sie nach wie vor noch aktiv sein wollen in dem Markt, müssen sie das natürlich bieten.
6. Hier gibt es die klare Tendenz zur Konzernbildung.

## 15.1.8 Validation Authorities NGO Customer SRQ3\_1

Theme	Subresearch Questions
Code	Validation_Authorities_NGO_Customer_SRQ3_1
<b>Sub Codes</b>	
Segments	46

1. Nachweismethode unbestimmt und Grundbelastung der LM zu hoch. Das tut sich politisch niemand an.
2. Und das glaube ich führt da eigentlich Vorbereitung alles nötig. Wenn die Regulierung jetzt sofort kommen würde, würde die ersten Jahre drunter und drüber gehen weil die Analysemethoden noch nicht an dem Punkt ist, das man wirklich reproduzierbar messen kann.
3. Eines der großen Probleme ist ja die permanente Verbesserung der Analytik. Großer Teil der Gesetzgebung die derzeit existiert wo man analytisch froh war, wenn man eine Milligramm pro Kilogramm analysieren konnte. Da konnte man auch leicht ein klares überschaubares Gesetz machen. Was man nicht gefunden hat war dann unter einen PPM. Heute kann der Analytiker wenn er sich Mühe gibt und seine Methode optimiert von jedem Stoff ein 1000tel von der Menge von damals finden. Damit wird die gesetzliche Herangehensweise immer komplexer. Ein Stoff der nicht erwünscht ist, darf nicht nachweisbar sein. Das ist für den Ersteller einer Verordnung eine sehr schwierige Sache.
4. Aber ich stimme natürlich zu, wir haben in Bezug auf die für die Faltschachtelhersteller relevanten Packstoffe keine Einzelregulierung. Bislang noch nicht Einzelregulierung für den deutschen und eben zum Großteil europäischen Markt noch nicht. Das heißt, die Ziele sind gesteckt, aber die Frage, dass mehr oder weniger unbestimmte Rechtsbegriffe sind: Was ist denn jetzt hier tatsächlich im Einzelnen zu beachten? Das ist nicht spezifiziert gegenwärtig.
5. Um mal eine andere Gruppe anzusprechen, die amtliche Lebensmittelüberwachung, was die zukünftig viel mehr interessieren wird glaube ich, das ist der eine Aspekt der auch in der europäischen GMP Verordnung genannt ist, nämlich die Dokumentation.
6. Das ist der zweite Teil, aber der Dritte ist eben, das qualifiziert dokumentierte Risikomanagementsystem. Und das ist das was natürlich die amtliche Überwachung interessiert. Ob es jetzt einen konkreten Vorfall

gibt, ein Produkt ist aus dem Markt gezogen, untersucht wurde, es sind irgendwelche Werte überschritten, also gehe ich hin, in die Kette und suche genau die Stellen heraus: Wo ist es dazu gekommen? Ich muss dann in die die Dokumentation geben, die lass ich mir zeigen. Ob das beim Lebensmittelhersteller ist, beim Einpacker oder beim Faltschachtelhersteller ist und der muss dann die Schublade aufmachen und muss für diesen konkreten Fall, für dieses Objekt, für den Artikel die entsprechende Dokumentation rausholen. Und ich glaube dass das ein Bereich ist der von großem Interesse ist für die Überwachung, der von großem Interesse sein wird zukünftig im Rahmen von Audits: Nämlich hast du hier strukturiert System deiner Dokumentation. Die beide haben großes Interesse daran, dass es ein solches System der Dokumentation gibt.

7. Wir haben einen Zielkonflikt. Wir haben hier mehrere politische Zielen, der Verbraucherschutz, die Ökonomie, aber eben auch den Umweltschutz. Und wenn es die Thematik des Umweltschutzes nicht gäbe, dann hätten wir schon längst entsprechende Verordnungen die vorgibt dass eine entsprechende Barriere aufzubringen ist, oder dass eben hier die recyclingfaserbasierte Faltschachtel so nicht zum Einsatz kommen dürften aufgrund der Migration. Aber man weiß, dass man hier das Kind mit dem Bade ausschütten könnte, dass die Gefahr besteht, also kann es hier bisher nicht zu einer kurzfristigen Erlass einer Verordnung. Also wir haben hier Zielkonflikte in diesen Politikfeld, das bezieht sich auf die Politik, also die Grenzen verlaufen auf Inhalt der Bundesregierung oder Quer durch die Bundesregierung.
8. Also aktuell ist ja die Umsetzung der Druckfarbenverordnung in Deutschland bisschen ins Stocken geraten. Es gibt gerade seit den letzten Tagen entsprechende Veröffentlichungen auf der Website des Bundesministeriums Ernährung und Landwirtschaft die es quasi den Zwischenstand der Verordnungsgebung ins Internet gesetzt haben und dann zwei Tage oder drei Tage die Seite wieder gelöscht haben oder wieder offline gestellt haben, hat zu großer Verwunderung geführt. Die Umsetzbarkeit oder die Umsetzung wird natürlich schon intensiv Diskutiert bei uns in der Branche. Es gibt unterschiedliche Meinungen dazu. Interessant ist, dass große Teile der Inhalte der deutschen Druckfarbenverordnung ja bereits umgesetzt sind im Markt. Die Druckfarbverordnung schreibt im Kern, in ihrem Wesen vor, dass die sogenannten non-migration-Druckfarben einzusetzen sind. Ohne die könnte man eine spätere Verordnung nicht erfüllen. Die Farben werden angewendet und die werden schon seit 2009/2010 für Food-Verpackungen

oder vergleichbare PET-Food etc. zum Einsatz gebracht. Das heißt die Druckfarbenindustrie erfüllt die Verordnung.

9. Meine Meinung ist, dass die Verordnung insofern die Funktion erfüllt, dass die Lebensmittelüberwachung Instrumente an die Hand bekommt, dann haben sie eine Verordnung auf die sie sich stützen können in der Überwachung. Bisher haben sie die Verordnung nicht, also können sie sich nicht darauf stützen. Sie stützen sich lediglich auf Artikel 3 der 1935. Aber wie die anzuwenden ist, da fehlt ihnen das Instrumentarium. insofern würden wir uns eigentlich gar nicht so weit mehr Weiterentwickeln müssen, in der Umsetzbarkeit was unsere Branche angeht.
10. Aus Druckfarbensicht bzw. die Druckfarbenhersteller, sind zumindest von der Prozedur gut drauf eingestellt, denn das was wir bisher mit dem Statement of Composition, mit den Angaben zur Zusammensetzung machen, das wird dann in ähnlicher Weise die Druckfarbenverordnung sein. Was uns noch fehlt, die deutsche Druckfarbenverordnung wird ja eine Positiv Liste beinhalten, da fehlen uns noch einige Rohstoffe.
11. Es wurde in der Vergangenheit in Deutschland zumindest relativ viel gemacht, wir hatten ja schon vor 5 Jahren schon die Dinge die jetzt das ganze Vorhaben zum Anstoß gebracht hat. Das war die so genannte 119-Proben-Untersuchung, also da wurden die 119 Lebensmittel aus dem Supermarkt geholt und die wurden nach Druckfarbenerhaltstoffen gesucht, was man auch gefunden hat. Das lässt sich so nicht wegdiskutieren, das war halt so, man kann da immer noch sagen, die Auswahl der Lebensmittelverpackungen war ein bisschen einseitig. Es war mehr UV-Druck, als es im statistischen Durchschnitt war, aber sei es wie es ist. Und wir hatten ja, sei es über Stiftung Warentest oder auch über die Überwachungsbehörden auch die letzten Jahre immer mal wieder Untersuchungen. Es gab im vergangenen Herbst eine Untersuchung von Stiftung Warentest bei Pralinen bezüglich Druckfarbenbestandteile aus der Verpackung. Das Jahr vorher war der Adventskalender dran
12. Der Verbraucher, gut, der braucht es nicht sehen. Ob er jetzt der behördlichen Überwachung vertraut oder nicht, aber so ist halt unser Staatswesen organisiert, dass man halt manche Dinge die man nicht sieht als Verbraucher dann halt von den entsprechenden Behörden gewährleistet bekommen muss. Es gibt ja dann doch noch die NGO's und Stiftung Warentest, die dann auch mal den Behörden auf die Finger schauen.
13. Es ist ja Fakt, also gerade in diesem Entscheidungshilfeprojekt hat die Behörde damals definitiv geschrieben das Recycling-Kartonagen nicht für Lebensmittelverpackungen geeignet sind.

14. Das Umweltbundesamt ist sehr besorgt über das Image des Altpapiers und der Kreislauf Wirtschaft und hört das gar nicht gerne. Aber das ist mal Fakt. Zum anderen ist es so, es gibt ja auch den Entwurf der Mineralölverordnung und wenn man da den jetzigen Entwurf zu Grunde legt der wiederum Grenzwerte für die aromatischen Inhalten zu Grunde legt, dann ist es ein defacto Verbot von Recycling-Karton für Lebensmittelverpackungen.
15. Nicht explizit geregelt, das stimmt natürlich. aber auf der anderen Seite gibt es natürlich diesen Passus im deutschen Lebensmittelrecht 31. Das ist die menschliche Gesundheit nicht gefährden darf, darf es organoleptisch keine Beeinträchtigung geben darf und noch ein paar andere Sachen.
16. Also ich glaube momentan im Umfeld rechne ich ... Also es wird sicher.. kommt eine neue Verordnung, dann ist ein Jahr Transition je nachdem wann es eintritt, dann ist quasi mit dem gültig werden noch ein Jahr Transition und dann wird normalerweise losgemessen. Da wird es jetzt natürlich was geben, aber das sind hochkomplizierte Messungen. Weil viele Untersuchungsämter haben gar keine Gaschromatografien, die werden es nicht messen können. Also wir reden hier von ein paar Ländern in Europa die das machen können, auch nur ein paar Länder in Deutschland die das machen können. Was wollte ich sagen?
17. Wie es zuletzt kam, war der Vorschlag das man das im Material misst und nicht im Produkt weil im Produkt hat man ja noch andere Eintragsquellen, da hab ich dann auch wieder das Problem das jemand, der quasi eine Barriere-Schicht aufgebracht hat, natürlich enthält dann das Material eine gewisse Anzahl an Mineralöle, wie ich das dann wieder nachweisen muss, dass ich eine gute Barriere habe und das was außen ist, ist dann nicht relevant. Das erscheint mir alles als sehr unausgegoren wie das überprüft werden soll.
18. Sie können es ja sehen in Kunststoffen, sie haben Kunststoffe da sind 30 Substanzen geliefert, das können sie an einer Hand abzählen wie oft sie da eine Anfrage bekommen von der Food-Authority, wenn die da irgendwas Falsches gemessen hat. Wenn da was kommt, dann ist es meistens, dass man überhaupt einen Stoff nicht, der keine EFSA Bewertung hat, das muss natürlich weiter ausgeweitet werden. Aber diese Kleinteilige, 5mg hier und da, ich glaube das ist kein Konzept das wird dann doch irgendwann verschwinden. Also dass man doch letztendlich auf dieses Material dann doch irgendwann wieder, was in Amerika genommen wird wieder zurückfindet.

19. Die Analytik ist mittlerweile weiterentwickelt worden, nach wie vor ist es aber so, dass hier Summenparameter bestimmt werden, die von Dr. Grob als MOSH, aliphatische und naphthalenische Mineralöle bzw. MOAH, aromatische Mineralöle bezeichnet werden. Beide Untergruppierungen umfassen eine Unzahl von nicht identifizierten und teilweise nicht identifizierbaren Verbindungen, so dass es sowohl für Koni Grob nicht möglich ist zu zeigen, dass hier kanzerogene Verbindungen drin sind und für uns nicht möglich ist, nachzuweisen, dass keine kanzerogenen Verbindungen drin sind.
20. Denn wir wissen, es gibt eine Vielzahl von Mineralölquellen und wenn ich aus dem Karton keine Migration finde und trotzdem im Lebensmittel diese Öle nachweise, ist die Frage: Hat die Barriere nicht funktioniert, gab es Schnittkantenprobleme oder sind die Öle aus anderen Quellen ins Lebensmittel gekommen.
21. Der Markt muss zeigen und die Behörden in ihrer Kontrolle müssen zeigen, ob das Lösungen sein werden.
22. Ich rechne damit, dass zunächst mal, wenn die Lösungen auf dem Markt verfügbar sind, sie von den Behörden untersucht werden, ob sie das, was sie vorgeben zu erbringen, auch wirklich erbringen. Und das muss zunächst, so stellen es sich zumindest die Behörden vor, die Prüfung der Migration aus dem Packmaterial sein. Die Behörden sagen sich: Wenn wir einen Karton haben oder eine Wellpappe haben, aus der nichts migriert, dann gibt es einen Stempel drauf und dann kann dieses Material für die Lebensmittelverpackung eingesetzt werden. Und wir kontrollieren anschließend im Lebensmittel nicht mehr, ob da Mineralöle sind oder nicht.
23. Die Kritik der Industrie ist: Wenn das Mineralöl so ein großes Problem ist, dann muss es den Behörden doch egal sein, wo es herkommt. Sie dürften die Verordnung nicht nur auf Recyclingmaterialien konzentrieren, sie müssten das ganze Problem angreifen. Ansonsten wäre es eine Verordnung zur Verhinderung von Papierrecycling und das kann nicht im Sinne der Behörden sein. Sie wissen sicherlich, dass der Konsens unter den Ministerien bezüglich der Verordnung noch nicht hergestellt ist, dass besonders das Wirtschaftsministerium Handelshemmnisse befürchtet, und das Umweltministerium einen Rückgang des Recycling befürchtet. Das ist bislang noch ein Hinderungsgrund dafür, dass die Diskussion über die Verordnung noch nicht abgeschlossen ist.
24. Das ist eine Sache der Unternehmen. Für ein Gütezeichen müssen sich gleichgesinnte Unternehmen zusammenfinden und sich auf Qualitätsmerkmale für solch ein Gütezeichen einigen. Ich sehe das

- zunächst mal nicht, ich sehe, dass die Firmen, die Barrieren anbieten, das bewerben werden und der Kunde dann schauen kann, ob er die behördlichen- und die Eigenkontrollen damit übersteht. Also: die Behörden machen insofern den Stempel drauf, als dass sie sagen: Wenn das Material aus der Fläche hinaus keine Migration zeigt, dann prüfen wir nicht weiter.
25. Ich glaube auch, dass die NGOs ihre Rolle spielen werden und sagen werden: Jetzt haben die Unternehmen das teurere Material eingesetzt und trotzdem finden wir noch diese Öle, die wir nicht haben wollen. Die finden wir in Spuren im Lebensmittel vielleicht, in etwas größeren Spuren im Lebensmittelpapier, aber in noch größeren Mengen in den Tageszeitungen, die uns täglich ins Haus gebracht werden. Es ist für die Öffentlichkeit schwer verständlich, dass man das hinnimmt und Spuren der Mengen, die in der Zeitung gefunden werden, im Papier kritisiert und im Lebensmittel ebenfalls kritisiert - aus rein formalen Gründen. Das muss man erst mal in der Öffentlichkeit verkaufen. Sie wissen, es sind ja auch auf Zeitungen keine Hinweise drauf: Darf nicht in die Hände von Kindern gelangen. Und die Kinder nehmen das Papier in den Mund, formen kleine Bällchen und werfen damit. Wenn die Situation mit den Ölspuren so kritisch ist, müsste man doch eigentlich die Verbraucher umfassender informieren.
  26. Es ist nach wie vor eine große Frage, wie diese sogenannte Cross-Kontamination beurteilt wird. Es gibt Unternehmen, die sagen: Das gibt es und andere sagen: Das gibt es nicht. Cross-Kontamination ist der Effekt, dass aus einer Recycling-Außenverpackung durch eine Frischfaser-Innenverpackung Stoffe hindurch auf das verpackte Lebensmittel wandern. Die Frischfaserhersteller sagen: So etwas gibt es nicht, andere sagen: Wir haben den Effekt messtechnisch nachgewiesen.
  27. Die Verordnung bisher nur daran gescheitert ist, dass wir noch keine validierten Analysemethoden haben.
  28. Den sehe ich gegeben, weniger durch NGOs. Ich denke schon dass dort die jeweiligen, für Hygiene zuständigen Landesuntersuchungsämter, entsprechend beauftragt werden Kontrollen durchzuführen.
  29. Als wir zu Beginn über die Mineralölverordnung diskutiert haben, hätte ich das nicht für ausreichend gehalten, habe dort auch in Anhörungen für eine längere Transmissionszeiten plädiert. Da wir aber jetzt schon seit vier oder fünf Jahren über die Verordnung sprechen und die Unternehmen schon entsprechende Vorbereitungen getroffen haben, bin ich der Auffassung dass zwei Jahren genügend sein müssten. Ich würde den Behörden gegenüber aber immer noch für eine längere Frist eintreten.

30. Natürlich ist der Food-Bereich doch sehr viel mehr Konformitätsarbeit notwendig als im Non-Food-Bereich und das kann natürlich auch erhebliche Kosten verursachen. Zudem muss man ganz erhebliche Systeme aufbauen, Kontrollen und Dokumentationsgeflechte, andere Verfolgbarkeit sind geben usw. so dass es doch eine erhebliche Umstellung im Unternehmensablauf erforderlich sind. Aber auch einige finanzielle Mittel vorhanden sein müssen um das vernünftig machen zu können. Ansonsten läuft man doch als Hersteller von Kartonverpackungen erheblich Gefahr Haftungsrisiken ausgesetzt zu sein. Und dann eben in die Haftung zu rennen wenn etwas schief läuft.
31. Die NGOs auf jeden Fall. Die werden sich mit Wonne darauf stürzen wenn es eine Mineralölverordnung gibt, dann zu gucken ob das auch alles eingehalten wird. Aber ich denke auch dass es bei den Überwachungsbehörden da die entsprechende Kontrolldichte noch erhöht wird. Ich kann im Moment schlecht einschätzen, ob die das in der Praxis lange durchhalten und durchbringen. Es ist ja schon natürlich mit erheblichen Problemen verbunden, wo und wann man denn Testet. Also ich denke mal, die Überwachungsbehörden werden wie immer versuchen, einen praxistauglichen weg zu finden,
32. Es wird schon sehr schwierig sein, da den richtigen Ton zu finden und Ich hoffe dass die Überwachungsbehörden zumindest nur die Leerverpackungen prüfen werden nach entsprechenden Materialien und gucken ob die in Ordnung sind und es dabei bewenden lassen. Aber das ist schwer einzuschätzen wie dann damit umzugehen sein wird.
33. Denn die Überwachungsbehörden kommen zum Teil schon nicht hinterher die Unternehmen zu kontrollieren,
34. Insofern wird das sicherlich für die Lebensmittelbranche ein Erfolg, entsprechende Verpackungslösungen zu finden die dann auch einsetzbar sind, ohne dieses Risiko und die ewigen Grauzonen, die man da hat rechtlich und diese Risiken denen man da ausgesetzt ist.
35. Zwar wird das ganze ausgelöst von einer Analyse der NGOs oder der Überwachungsbehörde, aber dann ist man eben auch selber am Zug nachzuweisen dass das Ganze in Ordnung ist. Und wenn eine Analysemethode nicht ausgereift ist, dann kann man sich vielleicht aus der Strafbarkeit und der Ordnungswidrigkeit Schlinge zu ziehen, zu sagen: Das ist eben nicht mein Verschulden, hier gibt's gar keine vernünftig Analyse. Aber viele andere Haftungsfaktoren, z.B. Das Verbot der Verpackung und der Rückruf, der Schaden und die Gewährleistung vor allen Dingen, die wird dadurch nicht beeinflusst. Also alles was vom Verschulden abhängt,



ja da kann man vielleicht sagen, da hat man etwas bessere Chancen wenn die Analytik nicht ausgereift ist. Aber alles was eben verschuldensunabhängiger Ansprüche ist, dem ist man natürlich trotzdem ausgesetzt.

36. Aus rechtlicher Sicht ist das ganze Thema geprägt bisher von einem gewissen Wegschauen in der Branche einerseits. Und von etwas Hilflosigkeit auf allen Seiten, weil man auf der einen Seite feststellt, dass die Analytik noch nicht so weit ist und auch viele Stoffe noch nicht identifizieren können, schon gar nicht deren Gefährlichkeit.
37. Auf der anderen Seite hat man den Verbraucher dem sehr daran gelegen ist, dass gar nichts migriert und der auch ganz wenig Kenntnis über diesen ganzen Bereich hat.
38. Nur da ist eben eine ziemlich große Diskrepanz zu dem was analytisch im Moment jetzt immer weiter herauskommt, dass man eben da noch im Prinzip jede Woche einen neuen Skandal verursachen könnte. Das ist sehr spannend was da die neuen Entwicklungen bringen werden. Ich denk mal, das wird in den nächsten Jahren noch sehr viel passieren.
39. Das kommt auf das System an. Wenn man Zertifizierungen einführen würde, dann bräuchte man alleine dafür schon mehr Kontrolleure. Ob es darüber hinaus dann noch von staatlicher Seite viele Kontrolleure geben wird, oder man das nicht im Rahmen der normalen behördlichen Stellen die heute schon da sind, die sich mit dem Thema Lebensmittel und Gesundheit auseinandersetzen, nicht dann auch da Stichpunkte macht, das ist schwierig.
40. Personally I am not convinced that we will have a regulation at short time, but if we would have one it will depend on the possibility to have reasonable testing methods.
41. It is difficult to proof, when we have a reel of raw paper we can have a segment that is ok, but later within the same reel, there might have a bale of paper that could have a another result in testing at the corrugated board plant.
42. Die Bundesregierung, hier eben das Ministerium für Landwirtschaft und Ernährung, der Verbraucherschutz ist ja nicht mehr dabei, aber die Verantwortung für die Themen Mineralölmigration ist beim Wirtschaftsministerium geblieben, hat sich selber in eine schwierige Situation manövriert indem man gesagt hat: Man muss den Verbraucher schützen und man muss gegebenenfalls, wenn die EU nicht reagiert, eine nationale Verordnung machen. Wenn die EU Signale geben würde, dann könnte die Bundesregierung ihr Vorhaben zurückstellen mit der

Begründung: Jetzt befasst sich ja die europäische Union damit und dann müssen wir uns sowieso in einem späteren Verfahren dieser Regelung unterordnen.

43. Ein Beispiel dafür ist auch Druckfarbenverordnung nachdem wir jetzt glaube ich den fünften Entwurf hatten nach einer Druckfarbenverordnung hat das Ministerium gesagt: Jetzt ist sie fertig, ich setze sie aber nicht um. Ich bitte jetzt doch noch mal die europäischen Behörden zu überlegen ob es nicht sinnvoll ist eine europäische Druckfarbenverordnung zu machen, so dass ich als deutsche Behörde mich nicht gezwungen sehe hier eine Einzelaktion, dem Beispiel der Schweiz folgend durchziehen zu müssen. also ja, ich glaube in der Summe dass eine europäische Regelung heute mehr Chancen hat als zuvor.
44. Wichtig ist genau so, dass die Lebensmittel selbst und die Prozesse in der Lebensmittelindustrie zu analysieren und zu regeln wohl wesentlich dass diese Bereiche in ganz unterschiedliche rechtliche Themen fallen, also kann nicht alles in einer gemeinsamen Verordnung geregelt werden, das ist mir schon klar, aber die Frage ist: Was bedeutet denn eine Verordnung, eine Regelung die die Verpackung absolut sicher macht wenn das Verpackte Gut von sich aus schon belastet ist und dadurch möglicherweise Trugschlüsse auf die Verpackung abgeleitet werden. Ich erwähne gerne das Beispiel des Adventskalender aus dem Jahr 2012 wo man eben in der Schokolade von 24 Adventskalender, einer war sauber und 23 hatten Rückstände von Mineralölkohlenwasserstoffen gefunden und sofort hat man auf die böartigen Recyclingkartonverpackungen der Adventskalender geschlossen die ja gar keine Recyclingkartonverpackungen waren und wo sich herausgestellt hat das das Lebensmittel schon selbst Belastungen mitgebracht hat, aber auch andere Verpackungsmaterialien wie Einwickelpapier belastet waren, die dann zur Migration von Kohlenwasserstoffen in die Schokolade geführt haben. Diese alleinige Fokussierung auf Kartonverpackung, Faltschachtelverpackungen, Wellpappenverpackungen und zu sagen: Wenn wir das regeln, dann haben wir alles erschlagen, das ist sicher in großes Problem und die Frage wäre: Inwieweit man das verpackte Gut, das Lebensmittel auch mitberücksichtigen muss wenn man von solchen Verordnungsvorhaben spricht. Ein Interessanter Ansatz war zu sagen: Wir betrachten den Inhalt im Lebensmittel, aber davon ist man in der Praxis abgewichen und hat gesagt: Das ist viel zu komplex weil jedes Lebensmittel ist anders in der Analytik, das kann niemand leisten.

45. Aber Tatsache in meinem Blickfeld ist, das die, sage ich mal, Kenntnisse, die Vorbereitung auf einheitliche Standards und ein gewisses Niveau einfach nicht gegeben ist. Viel zu viele Unklarheiten.
46. Also mit Behörden habe ich im Augenblick keine Erfahrung, kann ich nichts zu sagen.

## 15.2 EU\_SPILL\_OVER\_SRQ4\_4

Theme	Subresearch Questions
<b>Code</b>	EU_SPILL_OVER_SRQ4_4
<b>Sub Code</b>	
<b>Segments</b>	42

1. EU Ebene: Ja möglich, da sinnvoll, ansonsten Wettbewerbsverzerrung, Gleichbehandlung keine Handelshemmnisse, wünschenswert gemeinsamer Geltungsbereich. Es gibt für LM Hersteller keine nationalen Märkte mehr, man kauft und designt immer auf EU Level.
2. EU Ebene: Ja möglich, da sinnvoll, ansonsten Wettbewerbsverzerrung, Gleichbehandlung keine Handelshemmnisse, wünschenswert gemeinsamer Geltungsbereich.
3. Eine Verordnung, die so komplex ist, dass einer, der sich bisher nicht damit befassen musste, versucht ist, die zu umgehen oder aus dem Geschäft ganz raus zu gehen - das kann nicht der Sinn sein. Sie muss irgendwie pragmatisch und verständlich sein. Es muss unmittelbar einleuchten dass alle davon einen Nutzen haben.
4. Oder das Lieferanten die ihre Verpackungen in Deutschland herstellen alleine durch ihren Standort einen nach teilhaben, weil sie sich an Vorgaben hatten müssen an die sich ihr polnischer oder französischer Nachbar nicht halten muss.
5. Dazu kommt, wenn eine solche Regelung national gilt, dann werden die meisten Markenartikler die Regelung halt vorschreiben und dann stellen sich die Leute vor, dass es dann damit sowieso europaweit gültig ist und europaweit angewendet wird, aber das ist halt leider nicht so.

6. Ich kann es dann zwar bestätigen aber eine Behörde, die ein Produkt aus dem Regal nehmen kann oder eine Verpackung als nicht konform zurückziehen kann, das kann die dann nur in Deutschland und nicht anderswo.
7. Rechtlich bin ich nur in Deutschland dran, überall sonst ist es freiwillig.
8. Das ist unfair den deutschen Herstellern gegenüber, das entspricht nicht dem, wie die europäische Union mal angetreten ist, dass sie ein gleiches Spielfeld für alle bieten möchte und den freien Warenverkehr innerhalb der EU befördern möchte. Das wäre ein übles Handelshemmnis.
9. Ich glaube letztendlich in Europa ist eine staatliche Lösung grundsätzlich nicht mehr zielführend. Wenn wir über eine Verordnung oder eine Lösung sprechen, dann würde es wenig Sinn machen in einem zusammenwachsenden Europa über eine deutsche Lösung nachzudenken, dafür ist Deutschland einfach zu groß mit seinen Handelskonzernen, Deutschland dominiert den europäischen Handel mit Metro, mit LIDL, mit ALDI, mit Kaufland mit Rewe, - also mit den großen Handelskonzernen. Das heißt, eine deutsche Lösung, eine deutsche Verpackungslösung wäre quasi eine europäische Lösung. Niemand betrachtet heute von den großen Handelskonzernen ausschließlich den deutschen Markt, sondern immer den europäischen Markt. Ich glaube eine deutsche Lösung kann es nicht geben und macht keinen Sinn.
10. Und wenn es die Thematik des Umweltschutzes nicht gäbe, dann hätten wir schon längst entsprechende Verordnungen die vorgibt dass eine entsprechende Barriere aufzubringen ist, oder dass eben hier die recycling basierten Faltschachtel so nicht zum Einsatz kommen dürften aufgrund der Migration. Aber man weiß, dass man hier das Kind mit dem Bade ausschütten könnte, dass die Gefahr besteht, also kann es hier bisher nicht zu einer kurzfristigen Erlass einer Verordnung. Also wir haben hier Zielkonflikte in diesen Politikfeld, das bezieht sich auf die Politik, also die Grenzen verlaufen auf Inhalt der Bundesregierung oder Quer durch die Bundesregierung. Das haben wir auch auf verschiedensten Anhörungen und bei verschiedensten Diskussionssituationen auch mit Vertretern der Bundesregierung erlebt. So erlebt dass es hier keinen Konsens gab in diesem Punkt. Auch wenn da natürlich der Dissens nicht offen ausgetragen worden ist.
11. Daher spielt es in meinen Augen, das habe ich schon immer gesagt, gar keine große Rolle ob es eine deutsche Druckfarbenverordnung ist oder eine europäische Druckfarbenverordnung ist. Deutschland ist der größte Faltschachtelmarkt in Europa. 25% der Faltschachteln in Europa werden in

Deutschland produziert, davon viele für den deutschen Markt. Kein großer Brand ohne in Europa den der deutsche Markt liefert wird glaube ich es sich erlauben auch unter Glaubwürdigkeitsaspekten zwei verschiedene Verpackungen zu machen. Eine für den deutschen Markt entsprechend der Druckfarbenverordnung und eine für andere Länder in Europa.

12. Wir haben ja schon seit 2010 die Schweizer Druckfarbenverordnung die im Grunde genommen mit paar Abweichungen aber im Wesen gleiche Aussagen, gleich Regelungskonzepte hat wie die deutsche Verordnung. Abgesehen davon, das nicht vollzogen wird, aber hier wird auch immer gefragt nach der Konformität mit der Schweizer Verordnung. Und wenn ich die erfülle und hab non-migration-Druckfarben im Einsatz dann habe ich sie sozusagen, dann muss ich sie für Deutschland auch erfüllen. Und insofern hat es für mich wenig Relevanz ob es eine deutsche oder eine europäische Druckfarbenverordnung ist.
13. Jetzt gerade hat ja der deutsche Minister für Ernährung und für Landwirtschaft, der Herr Schmidt, an die Kommission adressiert einen Brief geschrieben, sie möge doch bitte die deutsche Druckfarbenverordnung an sich ziehen und zu einer europäischen Verordnung machen und man würde seitens der Bundesregierung mit den Entsprechenden nachgeordneten Behörden, dem BFR, hier unterstützen die Kommission, bei der Erarbeitung unterstützen das zu tun. Ich glaube nur dass die EU-Kommission im Bereich Lebensmittelbedarfsgegenständerecht, das ist ja eine one-man-show, es gibt eine Person die sich europaweit in der Kommission mit Lebensmittelbedarfsgegenständen, mit den ganze Materialien und Gegenständen die dafür erforderlich sind oder im Regelungsbereich stehen, wird kaum die Kapazitäten haben. Es sei denn es wird zur einzigen Aufgabe jetzt erklärt, dies zu machen. Aber es gibt nach wie vor noch Bedarf im Bereich Kunststoff, es gibt bedarf im Bereich aktive und intelligente Materialien ungeregelt ist, beziehungsweise ist geregelt aber gibt es noch einiges zu tun.
14. Insofern glaube ich nicht dass eine europäische Druckfarbenverordnung auf der Prioritätenliste ganz oben steht, auch wenn die Kommission selber gefragt hat: Was sollen wir regeln? Hat eine Umfrage vor zwei, drei Jahren gemacht, das Ergebnis war klar: Druckfarben und Papier, Karton, Pappe an den ersten beiden Positionen, aber scheint es dass sie sich aus diesem Ergebnis nichts ins eigene Hausaufgabenheft reinschreiben. Ich bezweifle das die Kommission diese Sache an sich ziehen wird.
15. Andererseits hatten wir gerade erst die letzten Wochen hier eine gewisse Bewegung verspürt, das ist jetzt noch nicht schriftlich, offiziell verkündet,

aber es sieht so aus als ob der Minister Schmitt einen Brief an den EU-Kommissar, der zuständig ist geschrieben hat, mit der Anregung den Themenkreis Druckfarben in der Lebensmittelverpackung doch EU-weit zu regeln. Das ist, Ich sag mal das Resultat der vielen und mühsamen Kommentare die die ganze Industrie, also nicht nur die Farbenindustrie sondern auch die Markenartikler, und die Lebensmittelindustrie die letztendlich in dem BLL, dem Bund für Lebensmittelrecht und Lebensmittelkunde organisiert sind, über die Jahre gemacht haben. Und offensichtlich hat das jetzt erst aktuell zu dem Effekt geführt, dass also versucht wird den Ball nach Europa zu spielen was dann hieße , dass die deutschen Aktivitäten zunächst auf Eis liegen würden. Auch das haben wir noch nicht offiziell bestätigt bekommen, es ist nur ein bisschen eine seltsame Prozedur aufgetreten.

16. Und die EU hat eine Kunststoffverordnung gemacht und sieht auch vor das es etwas äquivalentes für Paper und Karton geben sollte. Bislang war halt immer die Aussage brauchen wir eigentlich nicht so dringend und Zeit haben wir auch nicht. Aber ich sag mal, der rechtliche Rahmen der hat da schon dran gedacht und sieht das auch vor.
17. Die haben ja alle gesagt, jetzt warten wir mal was in Deutschland passiert und wenn das gut wird dann übernehmen wir das eins zu eins.
18. Genau. Und das ist ja auch nicht verwerflich, man kann sich ja Arbeit ersparen wenn es irgendwo schon was Vernünftiges gibt, dann kann man sich das so übernehmen. Und es gab ja zumindest bei dem Europarat schon vor über zehn Jahren schon ein Anlauf etwas für Druckfarben in Lebensmittelverpackungen zu machen, was dann halt im Sande verlaufen ist. Das ist jetzt was die Kommission draus machen werden, ist sehr schwer einzuschätzen. Da gab's auch personelle Änderungen im letzten Jahr. man muss es abwarten.
19. Also wir reden hier von ein paar Ländern in Europa die das machen können, auch nur ein paar Länder in Deutschland die das machen können. Was wollte ich sagen? Wenn sie jetzt quasi in Europa sich angucken, dann sieht die Lage noch schlechter aus und dann hab ich da einen Wert, ok.
20. Der Konsument ist ja im Grunde völlig verwirrt was er da letztendlich auswählen soll. Da bin ich der Meinung das der Konsument doch auf die europäische Gesetzgebung stützt dass das Produkt an sich in Ordnung sein muss.
21. Es wäre natürlich wünschenswert eine EU weite Regelung zu haben.
22. Auf der anderen Seite sehe ich auch, käme die Deutsche Verordnung, bin ich nicht sicher ob sie es über das Prüfverfahren hinausschafft weil es wird

dann alle andere europäische und einige stehen ja schon in den Startlöchern, werden da sehr hohe Einwände haben dass sie nach Deutschland nicht mehr liefern können weil sie die Vereinbarung nicht einhalten können/würden. Und da sehe ich nicht als... um ehrlich zu sein, ich sehe die nationale Verordnung noch nicht für dieses Recycling/Mineralölproblematische, die Druckfarben könnte ich mir eher vorstellen, dass das relevant sein könnte.

23. Und dadurch passen die zwei Gesetzgebungen ohnehin nicht so wahnsinnig zusammen. Wird man sich auch auf einen Kompromiss einigen müssen. Es wird aber nicht draufstehen: Verpackung ist nicht in Europa zulässig.
24. Das sehe ich das eine, und dann sehe ich auch die Initiative der EU an sich, das Programm Re-fit, keine kleinteiligen Regulierungen mehr auszuarbeiten sondern quasi halt Regulierungen, Fit-for-Purpose, zusammenzutragen und da ist quasi diese Mineralölverordnung und selbst auch die Druckfarbenregulierung,
25. Ich glaube nicht das die Problematik national ist. Sie wird nur national im besonderen Maß wahrgenommen, also in Deutschland - und diskutiert. Weil hier der Verbraucherschutz in der Politik eine andere Bedeutung hat und weil das eben ein bisschen populistisch alle behandelt wird von Seiten der Politik. Ich glaube das es in anderen Ländern, zumindest nicht wenn ich Europa sehe, wenn dort Recyclingfasern eingesetzt werden, dann muss es dort auch eine Problematik geben. Die Prüft nur keiner, da diskutiert keiner und die sieht keiner. Das passiert nur in Deutschland.
26. Wir sehen hier in Deutschland das Problem, also müssen wir in Deutschland auch handeln.
27. Wir denken das ist ein europäisches Problem und man muss in diesem Fall europäisch handeln weil es keine nationalen Märkte mehr gibt, das ist ja das weshalb wir uns so für die europäische Lösung streiten, weil es gibt keine nationalen organisierten Lebensmittelhändler mehr, sondern die kaufen europäisch ein und die denken europäisch. Und deshalb stört ein solcher nationaler Alleingang besonders.
28. Das heißt, es ist aus Sicht des Lebensmittelherstellers nicht mit einer Verknappung von Ressourcen zu rechnen, wenn denn so eine Verordnung kommen sollte? Das ist richtig.
29. Die Schwierigkeit der Diskussion in Deutschland hat, glaube ich, klugen europäischen Beamten gezeigt, dass man dieses Thema besser nicht anfasst, ohne vorher eine Lösung zu haben. Ich bin mir auch nicht ganz sicher, ob die Deutschen das Fass nochmal aufmachen würden. Es ist immer relativ

unklug, ein Problem in die öffentliche Diskussion zu bringen, für das man keine Lösungsmöglichkeit hat.

30. Da muss ich jetzt persönlich abwägen zwischen für und wieder. Ich sah es auf europäischer Ebene zunächst mal nicht, zumal es in England ein solches Ansehen ja schon abgelehnt worden ist. Es müsste jetzt mit dem europäischen Zertifizierungsprozess kommen, der hat meines Wissens einstimmig zu erfolgen, wenn einer Nein sagt ist die Sache sogar für Deutschland schon gestorben.
31. Da gibt es ja im Moment, bei der Druckfarbenverordnung zumindest Vorschläge oder einen Ansatz, dass man versucht den europäischen Gesetzgeber dahin zu bringen eine Regelung zu treffen. Da könnte ich mir tatsächlich vorstellen dass da tatsächlich etwas angestoßen wird, immerhin gibt es ja eine Roadmap usw. gewisse Überlegungen in diese Richtung. Es ist natürlich schwierig sich zu einigen bei so umfangreichen Geschichten und es wird noch einige Zeit dauern, aber ich denk mal, gerade wenn Deutschland den Anfang gemacht hat und entsprechende Verordnungsentwürfe vorlegt, kann ich mir zumindest bei den Druckfarben gut vorstellen, dass es da bald auf längere Sicht eine europäische Regelung geben wird. Und beim Mineralöl ist es eigentlich ähnlich.
32. Da stellt sich zunächst mal die Frage, ob ein nationaler Alleingang da überhaupt sinnvoll wäre. Wenn ich selbst ein uns sehe, wie stark wir auch in das benachbarte Ausland liefern, macht das eigentlich relativ wenig Sinn. Schön wäre es schon, wenn man auf EU-Ebene zumindest sich Gedanken machen würde und dann auch EU-Einheitliche Regeln treffen würde. Das gleiche gilt ja auch letztlich für unsere Kunden, die ja selber dann eben nicht nur nach Deutschland ihre Produkte liefern, sondern auch selbst sehr stark exportieren.
33. Für wie wahrscheinlich halten sie eine europäische Gesetzgebung? Also ich persönlich glaube, dass die kommt.
34. Also der wichtigste Punkt für mich ist, dass man versucht EU-weit eine Norm zu schaffen, sonst macht das alles keinen Sinn, weil dafür ist Deutschland viel zu stark vernetzt mit den anderen Ländern was Lieferung angeht, sowohl Import als auch Export. Da macht ein nationaler Alleingang wenig Sinn.
35. In some issues, yes, we are really unhappy with same issues: Deinking, plastic recycling, which could contaminate food, proofed by studies from the USA and Canada, especially to fruits, we are aware of this and that is



- focused by our marketing companies on industry level, but the awareness of mineral oil is very low at local level.
36. Biphenyl-A for example, the new regulation in France, but it is not in force for transport packaging only for food contact layers, as far as I know.
  37. Durchaus. Die EU hat ja, glaube ich 2012 gesagt: Ja, durchaus, wir sehen auch dass hier ein Problem existieren könnte, aber uns fehlt im Moment auch noch ein bisschen die wissenschaftliche Evidenz. Die FSA, die beratende Behörde der Kommission oder der EU-Behörde hat im Moment ganz andere Sorgen, kann sich nicht drum kümmern, hat vielleicht nicht die personelle oder finanzielle Ausstattung, wir stellen das Thema zurück.
  38. Wenn die EU Signale geben würde, dann könnte die Bundesregierung ihr Vorhaben zurückstellen mit der Begründung: Jetzt befasst sich ja die europäische Union damit und dann müssen wir uns sowieso in einem späteren Verfahren dieser Regelung unterordnen. Die Österreicher haben es ein bisschen anders gelöst, die haben schon ihre eigene kleine Mineralölverordnung auf den Weg gebracht, so eine Art Empfehlung die aber doch relativ wenig juristische Bedeutung hat meiner laienhaften Einschätzung nach. Die Engländer haben es ganz anders gemacht. Die haben gesagt: There is no need to change your behaviour and packaging. Die sehen das alles ganz gelassen und man hat den Eindruck das in den Südeuropäischen Regionen das Wort Mineralölmigration nicht wirklich existent ist. Das ist also von gar keinem Interesse ist. Das ist aber wirklich nur ein Eindruck.
  39. Es gibt ja auch ganz neu eine Initiative des Verbandes der europäischen Papier- und Kartonindustrie CP der gesagt hat: Jetzt sollten wir doch noch mal die EU darauf stoßen und sagen: Passt mal auf, nationale Regelungen sind sowieso ein großer Krampf, das kann gar nicht funktionieren. Jetzt kümmert euch doch mal darum. Diese Initiative ist jetzt ganz neu, mag vielleicht dazu helfen, dass die EU das Thema neu aufgreift und wenn sie das signalisiert dann glaube ich, haben wir eine gute Chance und dann haben wir auch eine Chance für eine praktikable Lösung im Gegensatz zur nationalen Einzelgängen die sehr unterschiedlich aussehen werden wie gerade eben schon versucht darzustellen. Ja, eigentlich ist es eine Notwendigkeit dass wir eine europäische Regelung bekommen und die Chance sehe ich inzwischen als nicht mehr so schlecht an.
  40. Ein Beispiel dafür ist auch Druckfarbenverordnung nachdem wir jetzt glaube ich den fünften Entwurf hatten nach einer Druckfarbenverordnung hat das Ministerium gesagt: Jetzt ist sie fertig, ich setze sie aber nicht um. Ich bitte jetzt doch noch mal die europäischen Behörden zu überlegen ob es

nicht sinnvoll ist eine europäische Druckfarbenverordnung zu machen, so dass ich als deutsche Behörde mich nicht gezwungen sehe hier eine Einzelaktion, dem Beispiel der Schweiz folgend durchziehen zu müssen. also ja, ich glaube in der Summe dass eine europäische Regelung heute mehr Chancen hat als zuvor.

41. Ich würde sie gerne sehen, weil die Tatsache wäre im Falle von Globalisierung und als ich vor 13 Jahren dieses Unternehmen gekauft habe, hatten wir keine Kunden im so genannten europäischen Ausland, nur die Kunden im europäischen Ausland haben uns in Deutschland die Aufträge weggenommen. Heute haben wir Kunden im europäischen Ausland und insoweit wäre ich froh wenn es eine einheitliche europäische Lösung geben würde, dann hätte man länderübergreifend nicht so viel Diskussionen und Papierkrieg
42. Also der Schwerpunkt aus unserer Sicht wäre ganz klar der, dass man ein einheitliches Regulierungssystem hat, das beispielsweise die Farbe, wir nicht mehr drüber Diskutieren was für Standard Farben, migrationsarme, migrationsfreie Farben haben, das wir für gewisse Bereiche klare Vorschriften haben. Dann gibt's die Diskussion nicht ob die Vergleichbarkeit ist dann mehr gegeben. Und das gleiche würde ich auch bei dem Papier sehen, denn wir reden immer von Primär und Sekundär Fasern, man muss leider mal klar festlegen: Wo ist was zum Einsatz zu bringen? Mit welchem Restrisiko und da sehe ich die Ansatzpunkte für die Zukunft und da wäre auch Klarheit angesagt.

## 15.3 ASSET\_SPECIFICITY\_SRQ4\_2

Theme	Subresearch Questions
Code	Asset_Specificity_SRQ4_2
Sub Code	
Segments	32

1. Die Branche ist vorbereitet bei den Big Playern, als Prozesssicherheit, der Mittelstand lässt es drauf ankommen, wird erst im letzten Moment sich bewegen mit minimaler Anpassung.
2. POS, Print on Demand, Mikro Markets.
3. Da gibt es die Möglichkeit 1. Dass ich den Karton oder den Mineralöl oder sonst wie unerwünscht stoffhaltigen Karton gleich bei der Herstellung mit einer Barriere-Schicht versehe, die muss dann recyclierbar sein und darf dass weiter Schicksal der Verpackung nicht stören.
4. Ich glaube das die ersten in der Branche die ein neues System adaptieren, einführen natürlich einen gewissen Vorteil am Markt haben, indem sie hier im Sinne des Marketings, der Vermarktung des eigenen Unternehmen ein Signal an Kunden aussenden können.
5. Ich glaube dass letzteres der Fall ein wird. Kunden scheuen dass singlessourcing und scheuen es auch, denke ich, wenn es Große Marken sind die europaweit ihre Packmittel beziehen, scheuen es auch nur mit zwei, drei, vieren oder fünfen zusammen zu arbeiten. Wir haben leider die Situation in Bezug auf unser Produkt, dass hier keine großen Abschottungen aufgrund technologischer Fortschritte vorhanden sind.
6. Sie müssen sie bieten wenn sie mitmachen wollen. wenn natürlich von Kundenseite, beispielsweise irgendwelche automatischen EDV-gestützten Lieferbeziehungen, Kommunikationskanäle gewünscht sind, eingefordert werden, Stichwort SAB-Anbindung zum Beispiel, was jetzt gerade als Welle durch die Branche geht bei uns, dann müssen sie es, wenn sie nach wie vor noch aktiv sein wollen in dem Markt, müssen sie das natürlich bieten. Das gibt gerade für den general-packaging Bereich, gar keine Frage.
7. Um mich abzugrenzen gegenüber meinem Wettbewerb auf dem Markt.
8. Es gibt ja nicht den Faltschachtelmarkt, es gibt immer nur Segmentmärkte oder seit dem nur noch Segmentmärkte. Man hat sich spezialisiert auf ein bestimmtes Segment, ob es Kosmetik ist, oder Zigarette ist, oder andere.

Man hat sich aufgestellt als internationales Unternehmen oder das sich lokal fokussiert. Man hat eine Vorwärtsintegration praktiziert indem man für den Kunden bestimmte Tätigkeiten mitübernimmt, eine Rückwärtsintegration eher nicht so sehr.

9. Ist eben die große Wettbewerbsintensität und die geringe zu erwartende Margen in der Faltschachtelindustrie haben dazu gesorgt das praktisch die Faltschachtelindustrie in einem permanenten Fitnessprogramm ist was die eigene Effizienz angeht, der rationalen Faltschachtelfertigung. Insofern hab ich im Moment den Eindruck dass man da gut aufgestellt ist in dem Bereich.
10. gibt einzelne Maschinen am Markt, Druck, Offsetdruckmaschinen am Markt die mir schon bekannt sind, die, ich will nicht sage explizit darauf ausgerichtet sind. das ist ja immer eine Frage der Kosten, das Ganze muss ja unter ökonomischen Aspekten zu produzieren sein
11. Der Kunde hat Abpacklinien und diese Abpacklinien sind, wenn wir den Status Quo betrachten für bestimmte Produkte entweder Kartontaufrichter oder er hat eben Maschinen zum Schlauchbeutelabfüllen. Aber der Kunde kann nicht von jetzt auf gleich entscheiden, ich switche mit einem Produkt jetzt auf einen Schlauchbeutel, auf eine flexible Verpackung. Dieser Switch kann nur im Rahmen einer umfassenden Investitionsentscheidung stattfinden, denn eine Abpacklinie bedeutet eine gewisse Investition mit der sich der Kunde dann auch über einen gewissen Zeitraum festlegt.
12. Es gab solche Situationen in der Vergangenheit unabhängig von dieser Migrationsthematik, dass ein Kunde aus, welchen Überlegungen auch immer, gewechselt ist, vom Schlauchbeutel in die Verpackung oder von einem Beutel in die Flatschachtelverpackung oder auch umgekehrt. Aber diese Wechsel finden erstaunlicherweise sehr sehr selten statt.
13. Die unternehmen die das antizipiert haben, die sind vielleicht auch im Wettbewerber und in der Vertrauensbildung ein Stückchen weiter schon.
14. Papier ist Papier, Kunststoff ist noch lange nicht Kunststoff. Dort haben wir ganz andere Möglichkeiten im Bereich der flexiblen oder starren, in der Verarbeitung, Blasen, Spritzen und so weiter. Es sind ganz andere Anwendungsmöglichkeiten und durch diese Anwendungsmöglichkeiten, beispielsweise nehmen wir mal eine PET-beschichtete, mit SIO<sub>2</sub>, also mit Siliciumdioxid beschichtete Folie, die, müsste jetzt lügen wie dünn die ist, ich darf nicht sagen wie dick die ist, hat aber eine Sperreigenschaft wie Glas.
15. Gut, die gesamte Verpackungsindustrie, einschließlich des Maschinenbaus, wird über die demografische Entwicklung getrieben, so, wenn wir jetzt die

demografische Entwicklung nur in Deutschland betrachten, oder nur in Europa oder weltweit, da sind es also schon große Unterschiede.

16. Der Verpackungsmarkt wächst nach wie vor, was vor allem am allgemeinen Bevölkerungswachstum liegt, aber auch an der Tendenz zu kleineren Haushalten. Und die Verpackungen werden in der Tendenz auch kleiner, es gibt also mehr Verpackungen. Das ist auch der Grund, warum sich sowohl die Druckereien als auch der Maschinenbau in diese Richtung bewegen.
17. Ich sehe da - wie bereits erwähnt - schon die Gefahr einer Oligopol- oder gar Monopolisierung der gesamten Druckzulieferindustrie auf uns zukommen und zwar über die gesamte Wertschöpfungskette hinweg. Davon ist der Maschinenbau betroffen, die Papierindustrie und auch die Farbindustrie.
18. Würde ich eigentlich nicht sehen, denn Lebensmittelverpackungen sollten eigentlich alle migrationsarm sein, dann ist es kein Alleinstellungsmerkmal mehr.
19. Es wird sich auch niemand hinstellen: "Ok, meins ist nicht migrationsarm". und wenn es dann nur drauf hinausläuft das dem, der das Gütesiegel organisiert wieder Gebühren zu zahlen, ist das eigentlich nicht einzusehen, dass wir das brauchen."
20. Ich sehe dass sich die Industrien vorbereiten. Mayr-Melnhof hat ja da ziemlich schnell ein Patent angemeldet, man hat in der Zwischenzeit auf von SAPI gehört, dass die entsprechende Vorbereitungen betreiben.
21. Sprich, man wird, wenn man weiterhin recycling-Kartonage verwenden will, entweder Barrierelacke oder Innenverpackung in einem Beutel oder was auch immer machen müssen.
22. Zunächst wird sich... Sie haben es selber genannt, es gibt nur wenige Anbieter. Das sind wahnsinnige Investitionen. Wenn sich da jeder eine Maschine hinstellt dann kann man schon glücklich sein, aber die eine Maschine deckt vielleicht 10 oder 20%, je nach Anbieter von seinem gesamten Marktvolumen ab.
23. Sie stellen ja nicht nur den Beutel um, sondern die Technologie. Man muss ja auch die entsprechende Abfüllanlage haben und so weiter. Wenn das mal passiert ist, dann geht man nicht mehr zurück auf den Papierbeutel.
24. Jeder muss eben seine Kunden überzeugen. Der Frischfaserhersteller wird sagen: Mein Material hat keine migrierenden Inhaltsstoffe, da geht auch nichts durch. Und der andere wird sagen: Ich habe zwar Recyclingpapier oder -karton, aber ich habe eine Barriere drauf, da geht nichts durch. Und wer dann beim Kunden am besten ankommt, ist eine auch Frage von Euro

und Cent und der Erfahrung auf dem Markt, das ist ganz schwer vorherzusagen.

25. Und Mayr-Melnhof zitiert auch die Behörden die sagen: Es geht ja nicht nur um Mineralöl, es geht um ca. 250 Stoffe, die in einem Behörden-Entscheidungshilfeprojekt, das vom BMEL finanziert wurde, gefunden wurden. Diese sind auch unerwünscht, auch toxikologisch nicht bis ins letzte untersucht.
26. Das sind übrigens Stoffe, mit denen wir auch sonst in Berührung kommen, denn die ganzen Druckprodukte, die wir als Informationsmedien oder Verpackungen kaufen, sind irgendwann im Haushalt. Anders als eine Wandfarbe, die ich aufbringe und 10 Jahre an der Wand habe, bekomme ich Druckprodukte ständig neu mit diesen Stoffen beladen ins Haus geliefert. Tageszeitungen, Fernsehverpackungen, Mehlerpackungen - was auch immer. Das sind Stoffe, mit denen ich in meiner näheren Umwelt umgehe, und es ist doch schon erstaunlich, dass dann auf einmal nur in einem Bereich als sehr kritisch angesehen werden, wenn sie wissentlich auch in anderen Bereichen eingebracht werden."
27. Ich sehe darin sowohl Konzerne als auch Mittelständler bzw. kleine Mittelständler werden die Möglichkeiten haben entsprechende Materialien bei anderen Zulieferern zu besorgen. Dass das dadurch nicht preiswerter wird, das steht auf einem anderen Blatt.
28. Das hat leider nur bei einer Druckerei funktioniert, da halte ich halt die Zeitungslobby noch für zu stark. Aber es hat in dieser Woche zum ersten Mal die BILD-"Zeitung" das Thema aufgegriffen und in ihrer Printausgabe sogar veröffentlicht. Das hat uns veranlasst mal den Test des Institutes ISEGA die Zeitungen geprüft haben auf die Höhe der Mineralölanteile in diesen jeweiligen Zeitungsprodukten. Der Bildzeitung diesen Test zukommen zu lassen aus dem hervorgeht dass die Bildzeitung den höchsten Mineralölanteil hat."
29. Hier gibt es immer noch die Möglichkeit, sich vom Wettbewerb zu differenzieren und gerade bei uns ist es so, dass wir in der Lage sind, doch einiges heute im Flexodirektdruck zu drucken was früher noch im Offsetdruck gängig war. Das ist dann unter Umständen schon eine sehr interessante Geschichte für die Kunden in entsprechenden Stückzahlen dann eben, wird hier nur noch einstufig nach der Wellpappenanlage produziert wo man indem Offsetdruck in der Regeln noch drei oder vier Wertschöpfungsstufen hat.
30. First of all to be cheap.

31. The proof is in the pudding. Man muss einfach mal unter Beweis stellen, dass gewisse Entwicklungen der Industrie funktionieren.
32. Die Kunst liegt eigentlich weniger in der Chemie, die Chemie ist relativ einfach. Man weiß sehr lange schon welche Verbindungen mit Barrierewirkungen darstellen, die Kunst liegt eher in der Auftragstechnologie, dass die Verbindung dann auch hält auf dem Material auf dem es aufgetragen wird.

#### 15.4 MARKET\_ENTRY\_BARRIERS\_SRQ2\_1

Theme	Subresearch Questions
Code	Market_Entry_Barriers_SRQ2_1
Sub Code	
Segments	14

1. Investitionssumme Fertigungslinien.
2. Also es sind drei verschiedene Zertifizierungen die sie da genannt haben. ISO9001 ist etwas, was sie von jeder Druckerei fordern kann, das würde ich durchaus als Markteintrittsbarriere ansehen. Wer nicht ISO-Zertifiziert ist, wird generell Schwierigkeiten haben inzwischen, wenn es um Lebensmittelverpackungen geht ist die ISO-Zertifizierung schon mal das mindeste.
3. In diesen Markt lässt sich gut Geld verdienen - dann sehe ich die Eintrittsbarriere extrem hoch weil das Knowhow nicht da ist, weil man in der Regel die Volumina am Anfang nicht hat und weil wenn du die Volumina nicht hast, dann hast du so gut wie keine Chance in diesen Markt einzusteigen.
4. Und das hat mit Knowhow in der Weiterverarbeitung zu tun. Drucken kann jeder, aber die Weiterverarbeitung ob ich nur hefte oder falze oder ob ich die ganze Veredelung im Bereich der Verpackung realisiere, das ist etwas ganz anderes.
5. Automatische EDV-gestützten Lieferbeziehungen, Kommunikations-kanäle gewünscht sind, eingefordert werden, Stichwort SAB-Anbindung zum Beispiel, was jetzt gerade als Welle durch die Branche geht bei uns, dann müssen sie es, wenn sie nach wie vor noch aktiv sein wollen in dem Markt,

müssen sie das natürlich bieten. Das gibt gerade für den General-Packaging Bereich, gar keine Frage.

6. Im Bereich Konsumverpackung habe ich es mit anderen Restriktionen zu tun.
7. Das vermisse ich gerade, große Unternehmen tun sich da natürlich schwerer, ein inhabergeführtes oder kleine mittelständige Unternehmen, die können es leichter entscheiden.
8. Der Verpackungsmarkt ist ein Wachstumsmarkt, einer der wenigen Wachstumsmärkte, die es überhaupt im Druckbereich gibt. Folglich stützen sich sowohl die Maschinenhersteller als auch die Druckereien auf dieses Marktsegment.
9. Die angesprochenen Verordnungen sind für Kleinbetriebe oder Kleinstunternehmen aus diesem Segment schwer umsetzbar. Mit Sicherheit wird eine solche Verordnung, die ja Komplexität bedeutet und für die Unternehmen natürlich eine starke dispositive Management- und Projektqualität erfordert, alles parallel zum klassischen Alltagsgeschäft, schwer zu stemmen sein.
10. Das muss ja gar nicht die Lebensmittelindustrie sein, es gibt ja auch Non-Food-Verpackungen mit ebenfalls guten Wachstumsraten.
11. Aber ich sehe das natürlich auch, jetzt kann sich nicht jeder kleine Mittelständler kann sich da in der Tiefe mit auseinandersetzen, kann nicht eigene Messungen grundsätzlich durchführen und da ist es sicher noch ein weiter Weg um das quasi wirklich mit Leben zu füllen in dieser supply chain.
12. Wenn die Firma ihre Produkte entsprechend kennt, spezifizieren kann, als geeignete Lebensmittelverpackungen, das ist die einzige Hürde die ich sehe.
13. Natürlich ist der Food-Bereich doch sehr viel mehr Konformitätsarbeit notwendig als im Non-Food-Bereich und das kann natürlich auch erhebliche Kosten verursachen. Zudem muss man ganz erhebliche Systeme aufbauen, Kontrollen und Dokumentationsgeflechte, andere Verfolgbarkeit sind geben usw. so dass es doch eine erhebliche Umstellung im Unternehmensablauf erforderlich sind. Aber auch einige finanzielle Mittel vorhanden sein müssen um das vernünftig machen zu können. Ansonsten läuft man doch als Hersteller von Kartonverpackungen erheblich Gefahr Haftungsrisiken ausgesetzt zu sein. Und dann eben in die Haftung zu rennen wenn etwas schief läuft. Im Lebensmittelbereich kommt es doch relativ häufig vor, dass Dinge beanstandet werden und rückverfolgt



werden und dann Ersatzansprüche in der Lieferkette weitergereicht werden.

## 15.5 PRIVATE STANDARDS

### 15.5.1 Meaning\_of\_Cert.Sys\_SRQ3\_3

Theme	Subresearch Questions
Code	Meaning_of_Cert.Sys_SRQ3_3
Sub Code	
Segments	33

1. Third Party Audits!
2. Zertifizierung ist ein Erfolgsfaktor, Kunden würden sonst nicht bei uns kaufen, ohne Prozesssicherheit und Hygiene keine Verkauf sind so wichtige Herstellungsfaktoren wie ein fehlerfreies Produkt.
3. Wenn ich keine GMP nachweisen kann, dann denke ich, kann ich an keiner Lebensmittelhertseller eine Lebensmittelverpackung verkaufen. Also das ist würde ich für eine Voraussetzung ansehen.
4. Ich bin der Meinung oder meine persönlich Meinung ist, dass diese Zertifizierungssysteme nicht wirklich aussagekräftig sind. Weil in der Praxis... weil sie nicht wirklich eine Praxisrelevanz haben. Und wir sind selber ISO-Zertifiziert, die ISO-Zertifizierung oder Hygienestandards oder eine Umweltstandard und Pharmastandards. Also ich messe denen keinen wirklich hohe Bedeutung bei.
5. Das ist letztendlich eine Grundlage und vertrauen muss durch Regeln, durch Vorgaben, durch Zertifizierungen.
6. Kontinuierlicher Prozess der Verbesserung im Sinne der Guten Herstellungspraxis.
7. Es gibt heute noch einzelne Unternehmen von uns die zum Beispiel die keine ISO9000 haben und die sagen: Ich bin immer noch am Markt. Mich gibt's noch immer. ich produziere nach wie vor, aber ohne ISO9000.
8. Sofern sie solche Schnittstellen bieten können.
9. Und ein Wettbewerbsvorteil ist dann natürlich an der Stelle, dass man hier entsprechend mit den Prozessen, mit den Audits und so weiter, mit den Zertifizierungen ausgestattet ist, dass man zumindest mal von der

Kundenseite, die dann immer noch flankiert werden durch Kunden-Audits, dass hier entsprechende Signale aussendet, dass man ein professionell Arbeitendes Unternehmen ist, dass man GMP im Griff hat und dass die Packmittel in einer gleichbleibenden Qualität sind.

10. Offengestanden, wenn es um Konsumverpackungen geht, welcher Verbraucher steigt denn heutzutage noch durch was es für Zertifizierungen gibt
11. Also das ist eher für den internen Gebrauch im Bereich Business-to-Business, also wenn wir in den Bereich Transportverpackungen gehen.
12. Ich kenne Unternehmen im Bereich der Zertifizierung ISO sagen, klar haben wir schon lange, das interessiert unsere Kunden aber nicht. Wir müssen besser sein in bestimmten Dingen. Also, das ist meine persönliche Meinung: mehr agieren, weniger reagieren.
13. Die Zertifizierungssysteme in der Druckindustrie - und die Druckindustrie ist ja weitestgehend mittelständisch geprägt. Die Verpackungsindustrie ist da eher eine Ausnahme, weil die Konzentration hier schon wesentlich weiter fortgeschritten ist - werden wohl mehrheitlich aus Zwang heraus gemacht, vor allem aus Zwang der Kunden. Es gibt natürlich schon einige Betriebe, die das aus Überzeugung heraus machen, aber es ist schon so, dass der Druck von Kundenseite kommt. Es gibt ohne Frage auch Unternehmen, die darin eine Chance sehen, ihre Prozesse zu standardisieren und zu verbessern und vor allem durch die standardisierten Abläufe die Produkt-Qualität zu steigern und die Fehlerkosten zu reduzieren. Aber so richtig begeistert ist der Mittelstand von solchen neuen Verordnungen eigentlich nicht.
14. Wenn das Zertifizierungssystem auch inhaltlich gelebt wird, dann sage ich: "Ja".
15. Sie müssen auch bedenken, diese ganze Zertifizierung ist ja irgendwo auch ein Geschäft.
16. Wir stellen immer wieder fest, dass da auch von den zertifizierenden Organisationen oft viele Augen zuge drückt werden, um die Zertifizierung zu verlängern. Wir als Berater wundern uns oftmals, dass Unternehmen die Zertifizierung erhalten haben, wo man doch bereits beim Durchlaufen merkt, dass es zum Teil drunter und drüber geht.
17. Eine Zertifizierung ist ja noch nicht die Garantie dafür, dass man Geld verdient und auch keine Garantie dafür, dass das Unternehmen im nächsten Jahr noch existent ist.
18. Es wird zwar solche Dinge sicher geben, denn auch damit kann man Geld verdienen, aber erforderlich ist es eigentlich nicht.

19. Zum einen dieses prerequisite Programm für Lebensmittelverpackungen im Food Bereich was da beim britisch Institute of Standardisation gemacht wurde und was ich auch immer als wichtigen Punkt anführe ist dieses GFSI Grundlagen wo wir quasi auch so einen Mindeststandard definiert haben und der wurde quasi jetzt von den verschiedenen Food-Packaging-Auditprogrammen übernommen und quasi mit Leben gefüllt.
20. Ich muss natürlich gleich einwenden, wenn ich heute ein recyciertes Material habe, ein faserresigniertes Material habe mag ich noch so perfekt zertifiziert sein, es wird auch so sein das ich keine Zigaretten in den Kartons vorfinde aber ich hab dann schon das Problem das ich mit einem Stoff arbeite der in meinen Augen per se nicht für längeren Lebensmittelkontakt vorgesehen ist. Muss die Wellpappe zertifiziert sein sage ich ja, aber ich erwarte jetzt nicht von der Wellpappe, da ist 0,5mg pro Kilogramm MOSH drin und deswegen ist es perfekt bewertet.
21. Gerade IFS ist ja enorm bedeutend geworden, also ganz heimlich und wenig wirklich diskutiert sondern einfach einseitig unterstellt, vom letzten Glied in der Kette, von den Handelsunternehmen. Und die IFS hat eine vorschlagende Bedeutung als Privatstandard und erhebt Forderungen, Bedingungswirkungen die weit über die Rechte und ihren Charakter hinweg... Jetzt der Charakter, die rechtliche Verpflichtungen schlagen und auch was die Inhaltlich die Anforderung angeht, die gehen ja weit über ihre legitimen rechtlichen Anforderungen hinaus. Das ist einfach so. Das ist Fakt.
22. Was verlangt der Gesetzgeber? Was ist die Pflicht die ein Unternehmer hat? Aber die Kür, also das was in der Lieferkette eben zusätzlich gefordert wird das verlieren wir manchmal ein bisschen aus den Augen. Aber sie haben recht, dadurch das von den Handelsunternehmen klare Vorgaben gemacht werden, die nicht nur die Zulieferer, also direkt als Lieferant auftreten organisiert und ausgestattet sein sollen und das nicht nur diese Stufe hat, die IFS zu erfüllen. Sondern auch die weit hinten in der Kette sich befindlichen also auch deren Zulieferer, da sind dann Anforderungen die erst mal zu schaffen sind.
23. Also die Privatstandards, das hat aber auch seine Grenzen und es kann auch eine vermeidbare Belastung der Lieferkette sein.
24. Es sind ja dann auch immer mehrfach Audits, immer mehrfach Zertifizierungen notwendig weil eben jeder Kunde dann ein eigenes Audit verlangt weil der IFS sich auch herausnimmt mehrfach zu auditieren. Ich weiß nicht ob das alles wirklich von Nöten ist um erfolgreich und sichere Lebensmittelverpackungen zu liefern.

25. Aufgrund der Mineralölverordnung werden die Systeme nicht an Bedeutung gewinnen. Die Anforderungen der Verordnung werden mit eingearbeitet in dieses System. ISO 9000 ist ein Qualitätssicherungssystem, die Bedingungen der Verordnung lassen sich einarbeiten - wobei das keine bestimmte Qualität, sondern nur eine gleichbleibende, nachkontrollierbare Qualität, garantiert. IFS hat, glaube ich, nicht so sehr die Inhaltsstoffe zum Thema.
26. Die Zertifizierungssysteme führen schon dazu, dass die Compliance bei den Unternehmen sehr groß geschrieben wird und dass die Konformitätsarbeit qualitativ doch besser wird, das stelle ich doch fest
27. Von daher sehe ich das doch als Qualitätsverbesserung an wenn man solch einer Auditierung unterläuft und da das ja heutzutage fast Standard ist, dass man entsprechend Auditiert ist, weil man ansonsten überhaupt keine Abnehmer mehr findet, hat das doch schon zu einem erheblichen ansteigen der Sensibilität geführt auf diesem Bereich und sicherlich auch zu einigen Verbesserungen.
28. Sie haben Zertifizierungssysteme angesprochen. Halten sie Zertifizierungssysteme für Erfolgsfaktoren in unserer Branche? Also Grundsätzlich schon!
29. But we fell whatever we put on this paper, they are happy with it, they are not really specialist in these items, and they feel just good to having a paper that we declare, we do not do things that they don't like, just having an umbrella about their business.
30. Zertifizierungssysteme können eigentlich nur auf der rechtlichen Seite eine gewisse Absicherung für den Lebensmittelhersteller bringen. Ja, das wird zunehmen, man wird sich auf Brief und Siegel in der Zukunft auch versuchen zu verlassen. Insbesondere wenn die Siegel von akkreditierten Laboren und Instituten gegeben werden
31. Die Zertifizierungssysteme sind auch auf ihrer Fülle in der es sie inzwischen gibt, so ein bisschen inflationär, so ein bisschen, nicht bedeutungslos geworden, aber sie haben... Man verlässt sich einfach zu leicht darauf, dass man schon irgendwo einen Stempel für irgendetwas bekommt was rechtliche Sicherheit anbelangt.
32. Wir merken selber auch in der eigenen Zertifizierungspraxis das aber auch die Zertifizierer vorsichtiger werden, nachdem es in der Vergangenheit ganz einfach was eine Bestätigung oder Konformität nach der 36 Empfehlung des BFR zu bekommen, fing es plötzlich an das irgendwelche Zusätze in der Empfehlung aufgeführt wurden, dass dann innerhalb der Textes Einschränkungen gemacht wurden die immer noch verschärfter

wurden. Also auch die Zertifizierer werden vorsichtiger um nicht nachher an den Pranger gestellt werden zu können, so dass das ganze System zur Zertifizierung nicht nur komplexer und weniger Hilfreich für die Vermarktung des Produktes wird, sondern, um das noch mal zusagen das der Lebensmittelhersteller eigentlich dringend daran arbeiten muss, neben den klassischen Zertifizierung nach Managementsystemen oder nach Erfüllung von rechtlichen Bedingungen auch das Vertrauen der Konsumenten zertifiziert zu bekommen, wie immer diese Art der Zertifizierung gestaltet sein kann.

33. Ich glaube an den Etikettenschwindel zwischenzeitlich denn, lassen sie mich ein anderes Beispiel nehmen: So viel Bio, wie sie heute im Einzelhandel kaufen können wir gar nicht produziert, kann gar nicht produziert werden. Aus Erfahrung weiß ich das, weil wir Kunden haben in diesem Bereich die sich selbst wundern wo so viel Bio herkommt. Für mich ist das alles Etikettenschwindel, mir wäre ein, zwei wirklich verlässliche Prüfsiegel lieber wie 20 die keiner nachvollziehen kann.

#### 15.5.2 Cert.System\_Barriers

Theme	Subresearch Questions
Code	Meaning_of_Cert.Sys_SRQ3_3
Sub Code	Cert.System_Barriers
Segments	09

1. Markteintrittsbarrieren: QS System und Track and Trace, Zugang zum Kunden ohne Cert.Systems nicht möglich,
2. Zertifizierungssysteme sind Markteintrittsbarrieren, nicht jeder kann sich die Stabsstellen leisten, QS Aufbau, Wissen kann man sich zukaufen
3. Zertifizierungssysteme sind keine Markteintrittbarrieren, jeder kann sich das leisten, QS Aufbau, Wissen kann man sich zukaufen, CERT Dienstleitungen einkaufen
4. Also es sind drei verschiedene Zertifizierungen die sie da genannt haben. ISO9001 ist etwas, was sie von jeder Druckerei fordern kann, das würde ich durchaus als Markteintrittsbarriere ansehen. Wer nicht ISO-Zertifiziert ist, wird generell Schwierigkeiten haben inzwischen, wenn es um Lebensmittelverpackungen geht ist die ISO-Zertifizierung schon mal das mindeste.

5. Das kommt auf die Gestaltung der Kosten für die Zertifizierung an. Wenn sich die Zertifizierung in der Kostenstruktur nach der Unternehmensgröße richtet, sollte es keine Markteintrittsbarriere sein, wenn es so eine pauschale Beträge sind, die dort zu entrichten sind, ist es natürlich für ein großes Unternehmen viel einfacher 10.00 Euro für eine Zertifizierung auf den Tisch zu legen als für ein kleines Unternehmen.
6. Heute mit Sicherheit, so wie ich es eben schon sagte. Wenn sie heute nicht nach GMP oder ähnlichem zertifiziert sind, werden sie bei einem größeren Lebensmittelhersteller gar nicht erst zugelassen als möglicher Lieferant.
7. Wir sehen sie heute als Klein- und Mittelständler, Ja, weil, um ein Beispiel zu nennen: wenn wir heute für Konzerne, ohne einen Namen zu nennen, Arbeiten wollen, dann werden wir mit HACCP Verordnungen und mit anderen Dingen konfrontiert die wir als Mittelständler so in ihrer umfänglichen Art nicht abbilden können. Weder von der Manpower noch von der Finanz Seite aus.
8. Ich erachte sie durchaus als wichtig, aber nicht in der umfänglichen bürokratischen Art wie sie heute von uns abverlangt wird und vor allem für den Mittelstand, um wieder auf unser Unternehmen zu sprechen zu kommen, wäre es schon schön, man würde mal europäisch einheitlich sich auf bestimmte Systeme konzentrieren, denn man kann nicht als Mittelständler, das ist meine persönliche Meinung, sechs oder sieben Systeme zertifiziert sein, pflegen, verwalten. Das Geld haben wir nicht, die Manpower haben wir nicht, das funktioniert so nicht.
9. Unter diesem Aspekt will ich beilegen, dann ist es eine Markteintrittsbarriere. In dem Moment wenn wir diese Erfordernisse nicht abbilden können, wie jetzt jüngst in einem großen Konzernfall wo es eine HACCP gibt, da steigen wir dann aus und dann ist es für uns durchaus eine Einstiegsbarriere.

## 15.6 OLIGOPOL\_SRQ4\_3

Theme	Subresearch Questions
Code	Oligopol_SRQ4_3
Sub Code	
Segments	23

1. Monopol Oligopol: Nein, es wird ausreiche Alternativen geben, jedoch zeitverzögert aufgrund der 2 jährigen Transmissionszeit.
2. Monopol Oligopol: Nein, es wird ausreiche Alternativen geben
3. Die Gefahr ist immer da. Wenn ich eine Hohe neue Anforderung an eine Produktgruppe stelle, dass dann nur noch wenige das schaffen. Ich gehe durchaus davon aus, dass wenn eine solche Verordnung kommt, das dann von 500 Verpackungsdruckern nur noch 250 auf dem Gebiet tätig sein werden.
4. Zu einer Konzentration wird's kommen. Wenn die Konzentration bedeutet, dass nur noch zwei übrig bleiben, dann wird es natürlich knapp. Wenn das aber ein interessantes Konzept ist mit den Barrieren dann sehe ich nicht, warum nicht irgendwelche Quereinsteiger erfolgreiche Barrieren liefern können die dann jeder auf seine Kartonverpackung beschichten kann.
5. Kunden scheuen dass singlessourcing und scheuen es auch, denke ich, wenn es Große Marken sind die europaweit ihre Packmittel beziehen, scheuen es auch nur mit zwei, drei, vieren oder fünfen zusammen zu arbeiten.
6. Also im Moment sieht es nicht danach aus.
7. Wenn wir uns den Kunden vorstellen und wie er eben alternative Packstoffauswahl betrachtet, dann gibt es natürlich eins, was glaube ich nach wie vor ein ganz wichtiges Argument ist. Der Kunde scheut neben Singlesourcing nur Maschinenstopper.
8. Die Gefahr besteht. Das ist ja heute bereits ziemlich realistisch, weil wir Verpackungskonzerne haben, die nicht nur Faltschachteln herstellen, sondern auch gleichzeitig den Rohkarton dafür produzieren. Schon heute müssen Unternehmen bei diesen Herstellern einkaufen, die im Druckbereich ihre direkten Konkurrenten sind. Da sehe ich doch wirklich eine große Gefahr einer Monopolbildung. Wie sich überhaupt im gesamten Umfeld der Druckindustrie mehr und mehr monopolartige oder zumindest

oligopolartige Strukturen sowohl im klassischen Papierbereich als auch in der Maschinenindustrie irgendwann wohl einstellen könnten.

9. Ich sehe da - wie bereits erwähnt - schon die Gefahr einer Oligopol- oder gar Monopolisierung der gesamten Druckzulieferindustrie auf uns zukommen und zwar über die gesamte Wertschöpfungskette hinweg. Davon ist der Maschinenbau betroffen, die Papierindustrie und auch die Farbindustrie.
10. Aber wenn es dann am Ende ein Monopol entstehen sollte, dann ist das natürlich schlecht.
11. Also ich glaube diese Idee, dass wenige Faltschachtelhersteller monopolisieren für eine kurze Zeit, aber ich ... monopolisieren heißt, einen hohen Preis unter Umständen zu verlangen, wird ziemlich gebremst durch die Möglichkeit andere Konzepte zu fahren, sprich: Plastiktrays mit flowpack.
12. Also den Eindruck habe ich nicht. Ich sehe da einen großen Wettbewerb, ich sehe das verschiedene Anbieter mit Konzepten auf den Markt kommen. Ich weiß dass die migrationshemmende Materialien unterschiedlich sind. Der eine macht einen Papierstrich, der andere mit Aktivkohle und der dritte mit Kunststoff-Beschichtungen. Aber ich sehe da schon einen Wettbewerb und keine Monopolisierung. "
13. Es gibt zwei große Maschinenkartonfabriken, die Barrieren gegen Migration von Mineralölen entwickelt haben, diese Barrieren werden teilweise online aufgebracht in einem Unternehmen, teilweise hat man die Möglichkeit, diese extern aufzubringen. Ein weiteres Unternehmen hat Aktivkohle in den Karton eingearbeitet, was ebenfalls erfolgreich wirkt. Ein anderes Unternehmen hat eine Variante entwickelt, die auf hochausgemahlenem, reinen Zellstoffpapier basiert, das ebenfalls eine Barriere darstellt. Wir haben uns also vorbereitet, der Markt wird in wenigen Wochen so weit sein, dass sowohl Frischfaserkarton, Recyclingkarton mit Barriere und Recyclingkarton ohne Barriere angeboten werden kann, so dass der Kunde die Möglichkeit hat, das ihm am geeignetsten erscheinende Material auszusuchen.
14. Es ist sicher so, dass diejenigen, die die Nase vorne haben, am Anfang Vorteile haben werden. Ich meine, sie kennen den Markt, da sind Patente, und da sind die Firmen Mayr-Melnhof und Weig, die Barrieren entwickelt haben, die aufgebracht werden können.. Die werden sicherlich zunächst einen Vorteil haben, wenn sich das Material auf dem Markt durchsetzt. Es gibt die Möglichkeit, auch von der BASF oder anderen, Materialien zuzukaufen die entweder aufkaschiert werden oder wie Strich aufgebracht



werden. Der Markt muss zeigen und die Behörden in ihrer Kontrolle müssen zeigen, ob das Lösungen sein werden.

15. Diejenige die diese Beschichtungsmaschinen haben, die ihre Materialien verkaufen können, werden da sicherlich einen Nutzen draus ziehen können.
16. Jeder muss eben seine Kunden überzeugen. Der Frischfaserhersteller wird sagen: Mein Material hat keine migrierenden Inhaltsstoffe, da geht auch nichts durch. Und der andere wird sagen: Ich habe zwar Recyclingpapier oder -karton, aber ich habe eine Barriere drauf, da geht nichts durch. Und wer dann beim Kunden am besten ankommt, ist eine auch Frage von Euro und Cent und der Erfahrung auf dem Markt, das ist ganz schwer vorherzusagen.
17. Ich sehe darin sowohl Konzerne als auch Mittelständler bzw. kleine Mittelständler werden die Möglichkeiten haben entsprechende Materialien bei anderen Zulieferern zu besorgen. Dass das dadurch nicht preiswerter wird, das steht auf einem anderen Blatt.
18. Das habe ich am Anfang gesehen, ja. aber im Moment scheint das mindestens schon in Richtung Oligopol zu gehen. Und irgendwann werden wir in der Beziehung auf Wettbewerb haben.
19. Das könnte sein, dass da einige Hersteller doch auf den Markt gedrängt werden wenn man immer wieder feststellt dass Migrationen nicht zuverlässig ausgeschlossen werden können. Andererseits gibt es so viele verschiedene Anbieter auf dem Markt. Eigentlich halte ich das nicht für realistisch dass es echte Monopole in dem Bereich geben wird, denn es gibt doch dafür auch zu viele Möglichkeiten.
20. Beides sehe ich eigentlich nicht, weil es ja a) Unterschiedliche Möglichkeiten gibt und b) auch selbst, wenn es auf der Papierseite gelöst werden würde, es doch mittlerweile eine ausreichende Anzahl von Papierherstellern gibt. Und, wie gesagt, da es mehrere Systeme gibt, man muss es ja nicht nur aus Papier machen, sondern es gibt ja auch eine Primärverpackung, hab ich da keine Angst vor einer Oligopolisierung.
21. No, of course they have a certain advance in development compared with others, but the demand in the market at the packaging supply side triggered by our customers is still so low that main players in the market did not even start to develop barrier coatings, this will be a cost element, the customers are not willing to pay for it, and in some instance the recycle ability some papers with barrier coatings will not be possible within the chain.

22. Das glaube ich nicht. Also das was heute inzwischen bekannt ist an Lösungen, an Ansätzen. Wir beteiligen uns auch zum Beispiel an Vergleichsmessungen wo verschiedene Packungssysteme parallel untersucht werden von der Lebensmittelindustrie.
23. Das Wissen was möglich oder was gemacht wird, das ist inzwischen breit und das Angebot an Rohstoffen für diese Lösungen ist breit verfügbar. Also man braucht nicht zu glaube das zum Beispiel ein großer Chemiekonzern mit weniger einer Hand voll Buchstaben plötzlich ein Monopol auf irgendwelche Polymere hätte.

#### 15.7 SUBSTITUTION PLASTICS VS. FIBRES\_SRQ4\_5

Theme	Subresearch Questions
Code	Substitution Plastics vs. Fibres_SRQ4_5
Sub Codes	
Segments	44

1. Frage ist nach der Präsentation am POS, Geschmack des Marketing, Verbraucherakzeptanz, CO2 Footprint, Durchsetzbarkeit am POS, der Markt entscheidet, Image von Plastik ist schlecht.
2. Substitution Plastik: Pizza in Beutel mit Luftkammern zur Stapelung, Frage ist nach der Präsentation am POS, Geschmack des Marketing, Verbraucherakzeptanz, Durchsetzbarkeit am POS, der Markt entscheidet.
3. Oder das ich hier die Barrierschicht als separate Komponente der Verpackung beibehalte. Dass ich dann halt eine Faltschachtel nur noch als stabile Außenverpackung nehme und die tatsächlich lebensmittelberührende Verpackung ist dann ein Kunststoff mit einer entsprechenden Barriere.
4. Sehen sie eine Substitutionsgefahr, Kunststoff gegen faserbasierte Verpackungen? Das sehe ich, das wird auch stattfinden. Aber das wird nicht nur in eine Richtung stattfinden. Da werden sich wahrscheinlich mehrere Verpackungen in bestimmte Richtungen ändern. Es kann sehr wohl sein dass es letztendlich auf Kosten der faserbasierten Verpackung ablaufen wird."
5. Aber einzelne Verpackungen werden direkt in den Kunststoff übergehen. Wobei, eine Kunststoffverpackung ist ja so einfach auch nicht. Wenn ich

den Kunststoff direkt bedrucke, dann mach ich ja zuerst eine Kunststoffbahn die wiederum aufgewickelt wird, ich kann ja auch unsichtbar Abklatsch bekommen, so dass unerwünschte Stoffe auch wiederum auf der lebensmittelberührenden Innenseite der Verpackung sind.

6. Ich finde dass es überhaupt nicht anders geht. Es darf nur eine europäische Regulierung sein. Solange es eine deutsche Regulierung ist, stellt es die ganzen deutschen Hersteller in den Senkel. Die ganze Verpackungsherstellung wird ins Ausland wandern.
7. Die Gefahr besteht dass Lieferanten den deutschen Markt aussparen.
8. Naja, im Endeffekt ist die Folie natürlich sauber, rein, also eine hervorragende Barriere, hat nur ein katastrophales Image. Im Gegenzug hat der faserbasierte Bedruckstoff oder Verpackungstoff ein sehr gutes Image aber katastrophale reale Daten. Weder Barrierefunktion noch schützt er vor Feuchtigkeit und nebenbei ist es noch eine Mischung aus einem Giftcocktail der völlig unkontrolliert ist. Er hat aber ein sehr gutes Image. Hier liegt einfach die Realität und die gefühlte Geschichte völlig diametral auseinander.
9. Wenn man Papier oder Zellstoff mit einer Barrierschicht versieht, dann frage ich mich: Wieso brauche ich dann überhaupt Papier? Ich kann ja auch gleich Kunststoff nehmen.
10. Der Kunde scheut neben Singlesourcing nur Maschinenstopper. Der Kunde hat Abpacklinien und diese Abpacklinien sind, wenn wir den Status Quo betrachten für bestimmte Produkte entweder Kartontaufrichter oder er hat eben Maschinen zum Schlauchbeutelabfüllen. Aber der Kunde kann nicht von jetzt auf gleich entscheiden, ich switche mit einem Produkt jetzt auf einen Schlauchbeutel, auf eine flexible Verpackung. Dieser Switch kann nur im Rahmen einer umfassenden Investitionsentscheidung stattfinden, denn eine Abpacklinie bedeutet eine gewisse Investition mit der sich der Kunde dann auch über einen gewissen Zeitraum festlegt.
11. Wir haben deswegen bis zum aufkommend er Mineralöldiskussion eigentlich von relativ statischen Märkten, was die Packstoffauswahl angeht. Es gab bis dato im Grunde keinen richtigen Wettkampf der Packstoffe zwischen Plastik und Karton.
12. Und da spielt natürlich die Faltschachtel aufgrund ihrer hohen Bedruckbarkeit, aufgrund ihrer klaren Oberfläche sehr große Vorteile auf, in der Wertigkeit, in der Vermittlung von Marke und Artikel, als andere Verpackungen. insofern gibt es da gewisse Vorteile und das ist eben auch ein Punkt, denn der Markenartikler abwägt. Er entscheidet hier nicht nur

unter dem Aspekt der Migration, sondern eben auch shelf appearance, Wertigkeit der Zentrale, das ist eine große Mengenlage von unterschiedlichen Faktoren die bisher und, vielleicht hat das eben auch mit dem, noch nicht Vorhandensein, weder der Druckfarben noch der Mineralölverordnung zu tun, die dazu führen das da eine relative Stagnation ist was den Wechsel angeht von Packstoffen.

13. Also eine Hektik ist dort im Markt nicht zu verspüren.
14. Was wir allerdings eben auch sehen, es gibt die Untersuchung von Professor Simat TU Dresden, dass innerhalb bestehender Systeme, also ein Produkt war bereits in einer Faltschachtel, ist auch immer noch in einer Faltschachtel. es sind ja oftmals nicht nur reine Faltschachtel-verpackungen, es gibt ja Inbeutel aus Papier oder PE, dass es innerhalb dieser Systeme, wenn man vergleicht 2009 zu 2012/2013, schon Verpackungssystemweiterentwicklungen gab, indem ein Inbeutel vorher aus Papier was heutzutage eben aus PET Inbeutel ist. Aber grundsätzlich besteht natürlich die Gefahr der Substitution, dass man sozusagen, wie es in der Frage angedeutet wurde, dass wir zukünftig eventuell hochwertig bedruckte Barriereverpackungen gibt und diese substituieren dann eine Kartongverpackung.
15. Gut Barriere ist immer Kunststoffbasiert. Punkt. Daher haben wir wieder das Beispiel BASF und da komme ich wieder zum Anfang. In dem Moment in dem ich Faserstoffe als Primärpackmittel einsetzen will, komme ich mit den reinen Primärfasern nicht mehr aus.
16. Sehr große Gefahr sehe ich auch und die Substitution sieht man ja im Regal. Da muss man ja jetzt nicht nur durch die Regale in Deutschlands Supermärkten gehen, sondern wir sind hier in der näher von Karlsruhe, geht man jetzt rüber nach Frankreich, rüber in das Elsass, dort sehen die Verpackungen schon ganz anders aus. Es gibt eben Trends, Produkte in anderen Verpackungen zu verpacken die teilweise teurer sind, aber trotzdem eine höhere Marge erzielen.
17. Beispiel: Das Rotkraut was wir früher so, ich kennst, meine Oma hat es in Dosen gekauft und in den Keller gestellt. Lange Haltbarkeit, erhöht die Qualität des Produktes. Jetzt gibt es Rotkohl schon lange im Tiefkühlregal. Die Tiefkühlphase ist gekommen, was der Weißblechdose oder Konserve sehr zu schaffen gemacht hat. Es also Substitution Weißblech durch beschichtete Faserstoffe in Richtung Tiefkühl. Und jetzt kommen die Frischen Produkte. Das heißt nicht mal tiefgekühlt. Sie haben zwar nicht mehr diese lange Haltbarkeit, aber Menschen wie meine Oma gibt es heute auch nicht mehr, die etwas 12 Monate oder länger lagern wollen. Sie kaufen

ihr Rotkraut im Kunststoff-Standard-Pouch der schön im Regal steht und wenn der vier Monate hält reicht das aus. Aber er ist nicht so behandelt, weder tiefgekühlt, noch hitzebehandelt, das er auch wirklich lecker schmeckt. Also durch diese Packungsform, besteht meiner Ansicht nach, eine große Gefahr für die klassischen Faserstoffe.

18. Im Premiumbereich nimmt man die Faltschachtel wieder. Aber nur eben im Premiumbereich.
19. Dann gibt es aber Marken, die etwas Besseres suggerieren wollen, die auch etwas teurer sind, teilweise drei Mal so teuer, da haben sie aber auch Faltschachteln mit Heißprägung und wirklich aufwändigen Umverpackungen, also Sekundärverpackungen, die weniger dem Schutz des Produktes nutzen als dem Verkauf. Die stehen dann auch nicht als Bückware unten, sondern die stehen dann auch in Augenhöhe.
20. Dort haben wir ganz andere Möglichkeiten im Bereich der flexiblen oder starren, in der Verarbeitung, Blasen, Spritzen und so weiter. Es sind ganz andere Anwendungsmöglichkeiten und durch diese Anwendungsmöglichkeiten, beispielsweise nehmen wir mal eine PET-beschichtete, mit  $\text{SiO}_2$ , also mit Siliciumdioxid beschichtete Folie, die, müsste jetzt lügen wie dünn die ist, ich darf nicht sagen wie dick die ist, hat aber eine Sperreigenschaft wie Glas. Das sind Dinge die im Kunststoff möglich sind, die aufgrund der Grundstruktur des Faserstoffes Grenzen gesetzt sind. Ähnliches haben wir beispielsweise im Verpackungsglas. Verpackungsglas können sie nicht unendlich in der Größe vergrößern, da haben sie ein Gewichtsproblem, sie haben das Bruchproblem. Das war ja auch der Grund warum Coca Cola das Thema PET-Getränkeflasche aus Atlanta mit Milliarden gepusht hat.
21. Man möchte dünner werden, geht aber nicht, Kunststoff könnte das. Noch lange nicht ausgestanden ist das ganze Thema. Da steckt noch viel Entwicklung drin.
22. Diese Tendenz ist ja schon seit vielen Jahren vorhanden. Nicht umsonst hat der Flexodruck sehr hohe Zuwachsraten. Gerade zum Beispiel im Tiefkühlbereich ist die flexible Verpackung stark im Kommen. Unsere Kunden aus diesem Segment haben eine gute Marktentwicklung. So gesehen kann man sagen, dass die flexible Verpackung die Kartonagenverpackung angreift. Das wird in Zukunft mit Sicherheit auch so weitergehen.
23. Ich sehe da - wie bereits erwähnt - schon die Gefahr einer Oligopol- oder gar Monopolisierung der gesamten Druckzulieferindustrie auf uns zukommen und zwar über die gesamte Wertschöpfungskette hinweg.

Davon ist der Maschinenbau betroffen, die Papierindustrie und auch die Farbindustrie.

24. Auch wenn die Markenartikler rechnen, sagen: Ok, wenn ich jetzt für meine Nudeln einen Innenbeutel brauche dann kann ich den gleich bedrucken und die Schachtel außen rum gleich weglassen. Solche Überlegungen wird es sicher geben. Als Farbhersteller kann ich es etwas gelassener sehen, denn wir haben Farben für alle Arten von Verpackungen."
25. Ein großes Thema ist, wenn man sich das Produktportfolio im Lebensmittelbereich anguckt, dann hat man halt Produkte die nass sind, da wird es immer schwierig sein es in reinen faserbasierten Verbund zu bringen. Und dann hat man Produkte die in erster Linie gegen Fremdgerüche geschützt werden müssen und dann gibt es Produkte die Sauerstoff, vielleicht noch eine Sauerstoffbarriere brauchen. Wenn man da sich im Markt reines Papier anschaut, oder faserbasierten Stoff dann hat man quasi keine Barrierefunktion gegen Sauerstoff und Wasserdampf und auch keine Barrierefunktion gegen Fremdgerüche, mehr noch, gerade wenn man sich den Recyclingbereich anschaut, dann hat man quasi noch nicht mal einen sensorisch neutrales Material sondern ein sensorisch auffälliges Material was man ohnehin mit vielen Produkte nicht in direkt Kontakt bringen kann, weil das Produkt damit organoleptische Verfälschung aufweisen würde.
26. Also für die faserbasierten Faltschachtel-Papiere, wobei ich glaube Recyclingpapiere habe ich im Lebensmittelbereich noch selten gesehen aber wird es auch geben. Ich glaube die müssen entweder auf Frischfaser ausweichen oder Barrierschichten auftragen sonst werden die keinen Fuß da mehr reinkriegen. Also das wäre quasi das Aus für die Recyclingindustrie im Lebensmittelbereich.
27. Bei der Wellpappe sehe ich das anders weil ich...das ist das logistische Transportmittel, dass jetzt alles Barrierschichten aufzubringen hat, in meinen Augen glaube ich... Natürlich bekommt man das weg, aber das Recycling wäre dann glaube ich nicht mehr so interessant wenn ich erst mal überall Polymere drauf tun muss und dann ultimativ ist dann immer die Frage, das hatte ich auch früher schon gesagt: Warum soll ich dann noch Papierverbunde einsetzen wenn ich ohnehin eine Wahnsinns Barriere direkt am Lebensmittel brauche. Bei der Wellpappe da hab ich mein, das ist für Weichverpackungen, mein logistisches Konzept.
28. Man sieht es ja auch, die Faltschachtel hat in gewisser Weise in den letzten Jahren für uns zumindest sehr zurückgegangen sind, weil wir quasi Konzepte mit flexiblen Verpackungen da einsetzen.

29. Ja, also da sehe ich schon ein Verdrängungsmechanismus. Ich mein, wenn man jetzt viel länger denkt, was man im Augenblick ja nicht feststellen kann, ist die rohölbasierten Kunststoffe fallen ja auch irgendwann weg, wenn wir jetzt an 20 Jahre denken, muss entweder der Technologiesprung irgendwo herkommen oder ich bin dann wieder zurück bei rezipierten Papierverpackungen.
30. Sie sehen hier alle Produkte waren früher mal im Papiereinschlag und heute sehen wir überall einen Kunststoffeinschlag, der Trend wird sich so vorläufig fortsetzen und damit wird es weniger wichtig auf der Faser und Stabilitätsbasierten Umverpackung ja Kartons einzusetzen und dann hab ich nur noch die Wellpappe als Handelsverpackung aus Stabilitätsgründen.
31. Klar, wenn eine Regulierung kommt, dann werden dann mehr Investitionen notwendig sein, aber das würde die Kosten sehr in die Höhe treiben und ich meine auch: Unser Unternehmen wägt dann auch ab, ich meine heute kann ich sehr günstige Faltschachteln und Recyclingkartons kaufen und dann ist die Frage: Kaufe ich lieber Frischfaser, mit dem Problem dass ich dann immer noch die Wellpappe außen hab wo ich keine Barriere habe oder mache ich gleich meine Kunststoffstandbeutel mit Barriere, dann ist mir das außen alles nicht mehr Interessant.
32. Ziemlich gebremst durch die Möglichkeit andere Konzepte zu fahren, sprich: Plastik-Trays mit Flowpack.
33. Das wird sich dann aber auch auf das Lebensmittel aussetzen und heute in Amerika habe ich quasi nicht diese Hazards, sehr starke Gefahr, auf Einzelstoff ausgerichtete Regulierung sonder mehr auf ein Expose.
34. Sie können es ja sehen in Kunststoffen, sie haben Kunststoffe da sind 30 Substanzen geliefert, das können sie an einer Hand abzählen wie oft sie da eine Anfrage bekommen von der Food-Authority, wenn die da irgendwas Falsches gemessen hat. Wenn da was kommt, dann ist es meistens, dass man überhaupt einen Stoff nicht, der keine EFSA Bewertung hat, das muss natürlich weiter ausgeweitet werden. Aber diese Kleinteilige, 5mg hier und da, ich glaube das ist kein Konzept das wird dann doch irgendwann verschwinden. Also dass man doch letztendlich auf dieses Zeug dann doch irgendwann wieder zurückkommen, was in Amerika genommen wird..
35. Wie schätzen sie die Gefahr der Substitution ein, das faserbasierte Packmittel durch Kunststoff ersetzt werden zukünftig? Von Gefahr möchte ich jetzt nicht sprechen, weil das ist wertend. Aber das passiert und das wird. Es ist schon in erkennbarem Umfang passiert. Also wenn man nur von hinten guckt als Verbraucher die Verpackungswelt anguckt. Und es wird weiter, wird die papierbasierte Verpackung substituiert werden wo es

auch immer geht und wo es sich immer anbietet. Das ist eine Einbahnstraße, das ist leider so denke ich."

36. Auf der anderen Seite gewinnt das Papiermaterial für Transportzwecke ja immer mehr an Bedeutung.
37. Zumal der Kunde auch die Möglichkeit hat, auf andere Materialien auszuweichen - was wir nicht schätzen, was auch nach Ansicht von Dr. Grob keine Lösung ist. Denn aus Kunststoffen und aus anderen Materialien migrieren ebenfalls Stoffe, unter anderen auch Mineralöl.
38. Ich sehe durchaus eine gewisse Substitutionsgefahr genau aus dem einfachen Grund. Wenn ich schon in einen Beutel verpacken muss, dann kann ich den Beutel auch gleich als Verkaufsverpackung verwenden, lässt sich aber durchaus nicht bei allen Verpackungsgütern darstellen.
39. Die sehe ich als hoch an. Ich wundere mich sowieso dass die heute immer noch so viel in Faltschachteln verpacken. ich kann mir sehr gut vorstellen, dass wenn die Regelungen da strenger werden, dass dann viele umsteigen auf einfache, händelbare Kunststoffverpackungen die einfach schon besser untersucht wurden, wo die Analyse besser ist, wo es eben schon länger die Verordnung gibt und bei denen man eben etwas sicherer sein kann als bei den Faltschachteln und vor allen Dingen bei den Recyclingpapier, da sehe ich wirklich schwarz was die Lebensmittelbranche angeht.
40. Wenn die Mineralölverordnung so kommt, wie es der letzte Entwurf vorsieht, dann halte ich das für sehr schwierig die überhaupt noch einzusetzen.
41. Also es gibt sicherlich Bereiche wo wir das schon gesehen haben, wo eine Verpackung ersetzt worden ist durch einer bedruckte Folie. Aber ich denke mal, da gibt es schon deutliche Grenzen was Stapelfähigkeit usw. angeht. Und auch in der ganzen Logistik wird es auch Schwierigkeiten geben bei den meisten Produkten, wenn die nur folienumwickelt sind. Also insofern haben wir persönlich da eigentlich überhaupt keine Angst vor. Das sind eher ergänzende Systeme und ich denke, das wird für uns kein Problem sein.
42. For that reason: No. At this moment certainly not, because the contamination of plastic may even be bigger than paper, so at the moment there is no fear in this direction.
43. Wir erleben gerade die Diskussion, dass die Verbraucher realisieren welche Umweltbelastung durch Plastikverpackungen entstehen. Insofern hat die Faltschachtelverpackung, Wellpappenverpackung da natürlich ein Bonus.
44. Ja, die sehe ich sehr wohl und das sehe ich auch sehr gespalten weil, um wieder auf unser Basisgeschäft zurück zu kommen, Etiketten - wir haben in



den zurückliegenden Jahren sehr viel in den Etiketten im Papierbereiche verloren, sowohl in dem No-Label Bereich als auch in Schrumpffolien. Ich sehe aber mittel- und langfristig eine Besserung zugunsten von Papier weil das Thema Ökologie glaube ich wird noch sehr viel mehr in Zukunft wichtig sein und insoweit wird man sich, abgesehen von der Ressource Öl an den daraus resultierenden Herstellungen für Kunststoff, Gedanken machen müssen, ob man nicht doch wieder mehr im Papierbereich tut. Ich bin davon überzeugt das Papier auf dem Vormarsch sein wird mittel- und langfristig.

## 15.8 PRINCIPAL AGENT THEORY

### 15.8.1 Agency Cost

Theme	P-A Theory
Code	Agency Cost
Sub Code	
Segments	03

1. Die Verpackungsindustrie ist da eher eine Ausnahme, weil die Konzentration hier schon wesentlich weiter fortgeschritten ist - werden wohl mehrheitlich aus Zwang heraus gemacht, vor allem aus Zwang der Kunden.
2. Es gibt ohne Frage auch Unternehmen, die darin eine Chance sehen, ihre Prozesse zu standardisieren und zu verbessern und vor allem durch die standardisierten Abläufe die Produkt-Qualität zu steigern und die Fehlerkosten zu reduzieren. Aber so richtig begeistert ist der Mittelstand von solchen neuen Verordnungen eigentlich nicht.
3. Ich will es mal so sagen: Das zentrale Thema ist für uns als Berater die Frage, welche Kultur wird in einem Unternehmen gelebt?

### 15.8.2 Bounding

<b>Theme</b>	<b>P-A Theory</b>
<b>Code</b>	<b>Agency Cost</b>
<b>Sub Code</b>	<b>Bounding</b>
<b>Segments</b>	<b>14</b>

1. Kann ich aber haben, dann ist Leuten, je kleiner die Unternehmen werden desto schwieriger ist das für sie oft. Wenn ich eine gesetzliche Konformitätserklärung habe, weiß ich genau was ich tun muss hintereinander.
2. Die anderen werden sich entscheiden: Ich beschränke mich auf Non-Food-Packaging oder ich steige gleich richtig ein. Beides machen und schauen wie ich meine Maschinen auslaste wird dann ja nicht mehr gehen. Zu eine Konzentration wird's kommen.
3. Für Unternehmen die bislang, man hat ja oft die Diskussion über die Akzidenzdrucker, ob Akzidenzdrucker zur Erweiterung ihres Geschäftsportfolios einsteigen in die Faltschachtelindustrie. Marktzugangsbeschränkungen sehe ich dadurch absolut gar nicht, Nein. Das sind andere Gründe die dagegen sprechen, dass ein Unternehmen eintritt in die Faltschachtelindustrie. Die Gefahr wird immer gesehen, von Seiten unsere Mitglieder, aber wirklich realisiert im nennenswerten Umfang hat es das bislang nicht gegeben, das Akzidenzdruckereien im Faltschachtelbereich eingestiegen sind. Und das hat mit Knowhow in der Weiterverarbeitung zu tun. Drucken kann jeder, aber die Weiterverarbeitung ob ich nur hefte oder falze oder ob ich die ganze Veredelung im Bereich der Verpackung realisiere, das ist etwas ganz anderes.
4. Um mich abzugrenzen gegenüber meinem Wettbewerb auf dem Markt.
5. Das heißt die Druckfarbenindustrie erfüllt die Verordnung. In der Verordnung, in der möglichen oder zukünftigen Verordnung wird, wenn es dabei bleibt, beim bisherigen Entwurfsstand auch beinhaltet sein, dass eine Konformitätserklärung abzugeben sein wird, die haben wir natürlich noch nicht, weil die Verordnung noch nicht in Kraft ist. Die Farben haben wir schon, aber die entsprechende Konformitätserklärung noch nicht.

6. Aus der Sicht der Druckfarbenindustrie geht es schon seit 10 Jahren dahin, dass wir auch ohne offizielle Regulierung in der Prozesskette entsprechende Informationen weitergeben müssen um einfach das Ziel "Lebensmittelverpackungen herzustellen, die gesundheitlich unbedenklich sind" zu erreichen
7. Wir sind da als Druckfarbenindustrie eigentlich ganz zufrieden damit, dass uns das so geglückt ist, denn wir konnten die ganzen Anforderungen die uns von Behörden, von der Lebensmittelüberwachung immer wieder gefordert werden, auf die Art und Weise ganz gut begegnen.
8. Das ist, Ich sag mal das Resultat der vielen und mühsamen Kommentare die die ganze Industrie, also nicht nur die Farbenindustrie sondern auch die Markenartikler, und die Lebensmittelindustrie die letztendlich in dem BLL, dem Bund für Lebensmittelrecht und Lebensmittelkunde organisiert sind, über die Jahre gemacht haben.
9. Ja gut, das sind ja, ich sag mal, wenn wir was schriftlich mit Stempel und Unterschrift geben, dann stehen wir dazu und dann ist das auch irgendwo rechtlich einklagbar, also wenn wir da irgendeinen Fehler machen würden, dann wäre das unser Fehler für den wir dann gerade stehen müssten oder unsere Versicherung. Also da sehe ich schon als rechtlich wasserdicht wie man es eben im Geschäftsleben, wenn man über Spezifikationen, über Vereinbarungen von Produkteigenschaften sich vereinbart arbeitet.
10. Ich glaube Vertrauen stellt sich in der persönlichen Geschäftsbeziehungen schlägt sich diese nieder in dem die eben zuverlässig ist und nachhaltig funktioniert.
11. Ja, was immer wichtig war und weiterhin wichtig ist, ist der Lieferservice, das heißt dass der Kunde sich drauf verlassen kann, dass er die gewünschten oder vereinbarten Termine wirklich gehalten bekommt und er seine Ware bekommt. Das zweite, die grundsätzliche Geschwindigkeit. Dass die Lieferzeiten heute doch wesentlich kürzer sind als früher. Aber auch die Genauigkeit der Termine ganz anders sind als früher als ich angefangen hab vor 30 oder 25 Jahren war es dann so, dass es viele KW-Termine gab, die gibt es heute überhaupt nicht mehr, sondern man muss auf den Tag genau liefern und in der Regel sogar mit relativ festen Uhrzeiten.
12. Ansonsten ist natürlich die Entwicklungsgeschwindigkeit nach wie vor ein Thema, das heißt: Wie schnell kann ich dem Kunden umsetzbare Vorschläge machen für sein Produkt.
13. Wenn Zertifizierungssysteme der Signalisierung dienen um zu zeigen, dass ich ein gewisses standardisiertes Vorgehen habe in meiner Produktion,

glauben sie, dass es gegebenenfalls eine Art Gütesiegel geben könnte migrationsarme Verpackungen?

14. Kann ich mir vorstellen, ja."

### 15.8.3 Monitoring and Control\_Principal

Theme	P-A Theory
Code	Agency Cost
Sub Code	Monitoring and Control_Principal
Segments	21

1. Behörden haben keine standardisierte Messmethode, keine Durchsetzung
2. Ja, die Faltschachtelindustrie, insbesondere die FFI-Mitglieder, vermutlich auch die Nicht-Mitglieder über die Lieferanten sind informiert über diese Regelungsvorhaben.
3. Dass das Unternehmen, mein Packmittel-Lieferant, in der Lage ist nach institutionalisierten Prozessen hier Produkte gleichbleibender Qualität zu liefern.
4. Seitens des Lieferanten. ich glaub aber viel mehr im Sinne der durchgängigen Kommunikation dass es nur eine gemeinsame Aufgabe sein kann, weil der Partner in das Supply-Chain ein verkehrsgerechtes Produkt am Ende herzustellen.
5. Und dass haben eben viele Kunden verstanden, diese Thematik, dass es ihnen gar nichts bringt, wenn die eine Unterschrift haben auf einer Konformitätserklärung sondern man muss hier gemeinsam eine Verpackung entwickeln und muss sich darüber abstimmen ob sie Verkehrsgerecht ist, ob sie im Rahmen des Lebensmittelbedarfsgegenständerecht ist. Das ist die richtige Herangehensweise an dieser Stelle. Und da muss man natürlich sagen, es kann schon sein, dass der ein oder andere das in der Branche noch nicht verstanden hat. Ich will jetzt gar nicht von kleinen und großen Unternehmen reden, aber die großen sind auf jeden Fall mit ihren großen Kunden so weit, dass sie diesen Weg gemeinsam bestreiten.
6. Von außen zu disziplinieren ist glaube ich immer sehr schwierig
7. Der aktuelle Stand der Druckfarbenverordnung plus der aktuelle Stand der positiv Listen war, für (ich denk) zwei Wochen im Internet zu sehen, wurde jetzt aber aus der Webseite des Ministeriums wieder entfernt.

8. Es wurde in der Vergangenheit in Deutschland zumindest relativ viel gemacht, wir hatten ja schon vor 5 Jahren schon die Dinge die jetzt das ganze Vorhaben zum Anstoß gebracht hat. Das war die so genannte 119-Proben-Untersuchung, also da wurden die 119 Lebensmittel aus dem Supermarkt geholt und die wurden nach Druckfarbeninhaltsstoffen gesucht, was man auch gefunden hat. Das lässt sich so nicht wegdiskutieren, das war halt so, man kann da immer noch sagen, die Auswahl der Lebensmittelverpackungen war ein bisschen einseitig. Es war mehr UV-Druck, als es im statistischen Durchschnitt war, aber sei es wie es ist. Und wir hatten ja, sei es über Stiftung Warentest oder auch über die Überwachungsbehörden auch die letzten Jahre immer mal wieder Untersuchungen. Es gab im vergangenen Herbst eine Untersuchung von Stiftung Warentest bei Pralinen bezüglich Druckfarbenbestandteile aus der Verpackung. Das Jahr vorher war der Adventskalender dran.
9. Wichtig ist, dass eben die Informationsübermittlung vom Druckfarbenhersteller bis zum Inverkehrbringer funktioniert, so wie es der BLL kontrolliert. Das ist sicher noch nicht bei jedem angekommen, da muss noch ran arbeiten.
10. Das ist die menschliche Gesundheit nicht gefährden darf, darf es organoleptisch keine Beeinträchtigung geben darf und noch ein paar andere Sachen. Und das muss man so oder so einhalten, insofern Papier und Karton einsetzt, dann hat man in erster Linie keine Barrierewirkung.
11. Und da kann man jetzt inzwischen schon sehen das eben nicht nur die ganzen safety abgearbeitet werden, sondern das es ganz klar ist, das ist auch ein Punkt zu Konformitätsarbeit gemacht werden muss. Es wurde sehr ins Detail auf mögliche additive Zusatzstoffe und die ganzen chemischen Bereich mit abdeckt
12. Meine Stichproben werden ja auch gemacht. Wir haben eigene Stichprobenprogramme, die Lebensmitteluntersuchungsämter in den einzelnen Ländern machen Stichproben, nur muss ich eine Stichprobe unter sehr kostengetriebenen Aspekten angucken.
13. Aber sie haben recht, dadurch das von den Handelsunternehmen klare Vorgaben gemacht werden, die nicht nur die Zulieferer, also direkt als Lieferant auftreten organisiert und ausgestattet sein sollen und das nicht nur diese Stufe hat, die IFS zu erfüllen.
14. Den sehe ich gegeben, weniger durch NGOs. Ich denke schon dass dort die jeweiligen, für Hygiene zuständigen Landesuntersuchungsämter, entsprechend beauftragt werden Kontrollen durchzuführen.

15. Ich glaube Vertrauen stellt sich in der persönlichen Geschäftsbeziehungen schlägt sich diese nieder in dem die eben zuverlässig ist und nachhaltig funktioniert.
16. Das heißt, es muss eine vernünftige Abstimmung erfolgen in ersten Stufe, mit dem jeweiligen Kunden: Für was wird Karton/Pappe verwendet? Für was die Faltschachtel? Daraufhin muss dann eine vernünftige Abstimmung darüber erfolgen, wer was prüft.
17. Aber wenn man den Auditor im Haus hat, der fragt schon ganz genau nach ob dass denn auch alles richtig ist was auf den Verpackungen draufsteht. Wie denn kontrolliert wird, wann analysiert wird usw.
18. Aber wenn eben ein Hersteller von dem man annimmt, dass er die Konformitätsarbeit geleistet hat, entsprechende Erklärungen abgibt, dann muss man eben darauf vertrauen können dass es passiert, denn sonst ist diese Konformitätsarbeit in der Lieferkette nicht leistbar wenn man sich auf die Vorgänger nicht verlassen kann. Ich sage meinen Mandanten immer, man darf sich halt nicht blind drauf verlassen, man muss Zwischenkontrollieren und man muss Stichprobenartig auch noch mal gucken und man muss sich vielleicht auch den Lieferantenbetrieb mal angucken. Aber in der Praxis ist es schon so dass hier vertraut wird und auch vertraut werden muss, sonst wäre das ganze gar nicht leistbar.
19. Dazu gehört sicherlich die Bereitschaft sich auditieren zu lassen, das ist auch ganz klar. Die Kunden die solche Themen richtig ernst nehmen die werden versuchen, zumindest bei wichtigen Lieferanten, sich selbst ein Bild zu verschaffen und diesen Lieferanten auch zu auditieren. Ja, das sind wahrscheinlich schon somit die wichtigsten Dinge. Ich sage mal, das Vertrauen steht letztendlich in der täglichen Zusammenarbeit. Ein Kunde weiß dass er vernünftig behandelt wird und dass man mit ihm vor allem offen agiert. Es kann ja auch immer mal etwas passieren und dass man dann bei solchen Themen eben auch offen agiert und nicht versucht Probleme zu kaschieren - ist sicherlich auch eine Sache die Vertrauen schafft.
20. Das kommt auf das System an. Wenn man Zertifizierungen einführen würde, dann bräuchte man alleine dafür schon mehr Kontrolleure. Ob es darüber hinaus dann noch von staatlicher Seite viele Kontrolleure geben wird, oder man das nicht im Rahmen der normalen behördlichen Stellen die heute schon da sind, die sich mit dem Thema Lebensmittel und Gesundheit auseinandersetzen, nicht dann auch da Stichpunkte macht, das ist schwierig.

21. Bei Kunden kann ich sagen, wir haben ein verstärktes Aufkommen, wir werden von all unseren Kunden jedes Jahr zwischenzeitlich auditiert und das ist unabhängig davon ob wir eine Zertifizierung haben die gefordert oder ob wir mit den eigenen Zertifizierungen zurechtkommen oder mit den eigenen Wertmaßstäben die wir, wie erwähnt mit Grenzwertkarten oder ähnlichen zu Grunde gelegt haben.

#### 15.8.4 Screening\_Principal

<b>Theme</b>	<b>P-A Theory</b>
<b>Code</b>	<b>Agency Cost</b>
<b>Sub Code</b>	<b>Screening_Principal</b>
<b>Segments</b>	<b>09</b>

1. Wenn das eine gewisse Breite in der Implementation in einer Branche gefunden hat, dann müssen auch die Restlichen natürlich nachziehen weil es irgendwann auch zum Standard seitens der Kunden, als Standard gefordert wird, denn man dann sozusagen in der Herstellung der Geschäftsbeziehungen wenn es um die Rahmendaten abhaken muss als das man es erfüllt.
2. Das ist der zweite Teil, aber der Dritte ist eben, das qualifiziert dokumentierte Risikomanagementsystem. Und das ist das was natürlich die amtliche Überwachung interessiert. Ob es jetzt einen konkreten Vorfall gibt, ein Produkt ist aus dem Markt gezogen, untersucht wurde, es sind irgendwelche Werte überschritten, also gehe ich hin, in die Kette und suche genau die Stellen heraus: Wo ist es dazu gekommen? Ich muss dann in die die Dokumentation geben, die lass ich mir zeigen. Ob das beim Lebensmittelhersteller ist, beim Einpacker oder beim Faltschachtelhersteller ist und der muss dann die Schublade aufmachen und muss für diesen konkreten Fall, für dieses Objekt, für den Artikel die entsprechende Dokumentation rausholen. Und ich glaube dass das ein Bereich ist der von großem Interesse ist für die Überwachung, der von großem Interesse sein wird zukünftig im Rahmen von Audits: Nämlich hast du hier strukturiert System deiner Dokumentation. Die beide haben großes Interesse daran, dass es ein solches System der Dokumentation gibt.
3. Es gibt ja dann doch noch die NGO's und Stiftung Warentest, die dann auch mal den Behörden auf die Finger schauen.

4. Also die Privatstandards, das hat aber auch seine Grenzen und es kann auch eine vermeidbare Belastung der Lieferkette sein. Also es dürfte nicht in der Form praktiziert werden. Es sind ja dann auch immer mehrfach Audits, immer mehrfach Zertifizierungen notwendig weil eben jeder Kunde dann ein eigenes Audit verlangt weil der IFS sich auch herausnimmt mehrfach zu auditieren. Ich weiß nicht ob das alles wirklich von Nöten ist um erfolgreiche und sichere Lebensmittelverpackungen zu liefern.
5. Denn wir wissen, es gibt eine Vielzahl von Mineralölquellen und wenn ich aus dem Karton keine Migration finde und trotzdem im Lebensmittel diese Öle nachweise, ist die Frage: Hat die Barriere nicht funktioniert, gab es Schnittkantenprobleme oder sind die Öle aus anderen Quellen ins Lebensmittel gekommen.
6. :Aufgrund der Mineralölverordnung werden die Systeme nicht an Bedeutung gewinnen. . Die Anforderungen der Verordnung werden mit eingearbeitet in dieses System. ISO 9000 ist ein Qualitätssicherungssystem, die Bedingungen der Verordnung lassen sich einarbeiten - wobei das keine bestimmte Qualität, sondern nur eine gleichbleibende, nachkontrollierbare Qualität, garantiert. IFS hat, glaube ich, nicht so sehr die Inhaltsstoffe zum Thema.
7. Eventuell kann man sich auch vorstellen, dass entsprechende Zertifizierungen mal wieder ins Leben gerufen werden, wie FSC oder sonstige Dinge. Aber da sind wir mal gespannt was da letztlich kommen wird.
8. Die Druckereien haben es wohl erkannt und hätten zumindest, zumindest die großen Verpackungshersteller sehen was da auf sie zukommen würde, die Markenartikler oder Handelshäuser noch weniger, also hier wäre es sicher nötig noch ein bisschen mehr Aufklärungsarbeit zu machen. Was ich gar nicht einschätzen kann ist was denn der arme Edeka oder REWE macht, der Reispackungen in Vietnam bestellt und die dann gefüllt und bedruckt aus Vietnam kommen.
9. Dazu gehört sicherlich die Bereitschaft sich auditieren zu lassen, das ist auch ganz klar. Die Kunden die solche Themen richtig ernst nehmen die werden versuchen, zumindest bei wichtigen Lieferanten, sich selbst ein Bild zu verschaffen und diesen Lieferanten auch zu auditieren.



### 15.8.5 Signaling Agent & Signalisation

Theme	P-A Theory
Code	Agency Cost
Sub Codes	Signaling_Agent & Signalisation
Segments	45

1. Recycling-Image, der Markt wird entscheiden
2. Zugang zum Kunden ohne Zertifizierungssysteme nicht möglich,
3. Zertifizierung ist ein Erfolgsfaktor, Kunden würden sonst nicht bei uns kaufen, ohne Prozesssicherheit und Hygiene keine Verkauf sind so wichtige Herstellungsfaktoren wie ein fehlerfreies Produkt.
4. Ein Verpackungslieferant der Verpackungen in die Food Industrie liefert, der muss sich damit befassen, aber die Herstellung der Verpackung an sich da ist die GMP das wichtigste. Und diese Zertifizierungen beinhaltet schon was, das ist so weit definiert und soweit detailliert dass das Bestehen eines solchen Audits durchaus was über die Abläufe bei dem jeweiligen Hersteller aussagen.
5. Ansonsten die Kontrolle ist ja Teil der GMP jedes Glieds in der Kette. Jemand der Druckfarbe herstellt, stellt die nach GMP her. Jemand er damit eine faserbasierte Verpackung bedruckt, macht das nach GMP. Und die GMP auf jeder einzelnen Stufe beinhaltet ja, dass ich kontrolliere, dass ich entsprechende Kontrollpunkte aufstelle und mir überlege: Will ich einen 100% Eingangskontrolle machen? Wie genau schaue ich welchen Rohstoff an? Wie oft und unter welchen Umständen mache ich Migrationstests? Welche Sorte meiner Verpackungen kann ich zusammenfassen und nur den Worst-Case untersuchen? Solche Überlegungen gehören ja mit zur GMP, so dass die Kontrolle nicht fakultativ ist sondern: Eine Kontrolle muss im Rahmen der GMP stattfinden.
6. Vielleicht in der Größenordnung, das ist ja ein sukzessiver Prozess. Zunächst mal angefangen mit Hygienemanagementsystemen, wenn wir den Fokus richten auf Bedarfsgegenstände.
7. Aber es war ein schrittweiser Prozess hier zu einer Professionalisierung zu kommen, bis hin dann zu den absoluten Top-Zertifizierungen in dem Bereich BRC, IUP oder ISO etc. PackSecure also den IFS-Standard.

8. Ich glaube das die ersten in der Branche die ein neues System adaptieren, einführen natürlich einen gewissen Vorteil am Markt haben, indem sie hier im Sinne des Marketings, der Vermarktung des eigenen Unternehmen ein Signal an Kunden aussenden können.
9. Beziehungsweise der Kunde erhält dadurch das Signal, als dass es hier um ein professionell geführtes Unternehmen sich handelt.
10. Und ein Wettbewerbsvorteil ist dann natürlich an der Stelle, dass man hier entsprechend mit den Prozessen, mit den Audits und so weiter, mit den Zertifizierungen ausgestattet ist, dass man zumindest mal von der Kundenseite, die dann immer noch flankiert werden durch Kunden-Audits, dass hier entsprechende Signale aussendet, dass man ein professionell Arbeitendes Unternehmen ist, dass man GMP im Griff hat und dass die Packmittel in einer gleichbleibenden Qualität sind. was, um mal eine andere Gruppe anzusprechen, die amtliche Lebensmittelüberwachung, was die zukünftig viel mehr interessieren wird glaube ich, das ist der eine Aspekt der auch in der europäischen GMP Verordnung genannt ist, nämlich die Dokumentation
11. Nicht nur akzeptieren, sondern antizipieren. Immer einen Schritt voraus zu sein. Nicht erst warten bis es passiert und zu sagen: "Wenn die kommt, dann reagieren wir!". Das ist das was ich bei vielen Unternehmen, ob es nun kleinere oder größere sind, vermisse. Es wird zu viel reagiert und zu wenig agiert. Wieso soll ich nicht etwas vorwegnehmen was ohnehin, nicht nur kommt, sondern mit einem gesunden Menschenverstand ist, das es kommt und dann habe ich vielleicht weiter vor. Viele Unternehmen und Unternehmensführer wollen es auch einfach nicht wahrhaben und sagen: "Gut, wenn es kommt, dann kommt es.". Zu wenige Unternehmen, es gibt sie aber, die es antizipieren, die sagen, wir sind schon zwei oder drei Schritte voraus
12. Aus der Sicht der Druckfarbenindustrie geht es schon seit 10 Jahren dahin, dass wir auch ohne offizielle Regulierung in der Prozesskette entsprechende Informationen weitergeben müssen um einfach das Ziel "Lebensmittelverpackungen herzustellen, die gesundheitlich unbedenklich sind" zu erreichen.
13. Druckfarben für Lebensmittelverpackungen nachfragen, Angaben zur Zusammensetzung zu machen
14. Unsere Prozedur, Offenlegung der dementsprechenden Daten an die Druckerei, das ist eigentlich ausreichen. Da brauchen wir niemand er uns vorschreibt, dass müsste ihr aber auf so einem Formular machen oder auf dieser Art und Weise und so und so oft. Das ist eigentlich nicht nötig.

15. Entsprechenden Industrien tun auch einiges dafür die Faltschachteln positiv darzustellen
16. Wenn man jetzt speziell das Thema Safety von möglichen migrierenden Substanzen anguckt dann würde ich sagen, dann kann man diese Zertifizierungen so wie sie heute sind nicht mehr oder minder vergessen weil man da sehr ins Detail geht, denn da geht es wirklich nur darum, tragen sie Haarnetze? Und das die nicht im Betrieb rauchen und nicht essen und solche Sachen.
17. Also ich sehe natürlich.. Jedes Unternehmen hat immer ein Interesse daran Gütesiegel zu entwickeln, daher glaube ich schon dass diese Gütesiegel kommen. Wird das Gütesiegel relevant sein? Schauen sie sich jede Verpackung an, da sind schon tausende von Symbolen drauf, das weiß der Konsument eh nicht. Das halte ich für wenig relevant.
18. Wir werden noch ein System an Zertifikaten, an Konformitätserklärungen hinzu bekommen. Es wird, zudem was bisher schon kommuniziert wird und was ja auch von dem Hintergrund der GMP Verordnung schon dokumentiert und bestätigt sein muss, wird es jetzt noch nach der konkreten Vorgabe der Druckfarbenverordnung inhaltlich ausgefüllt noch zusätzliche Dokumente geben die dann in der Lieferkette weitergegeben werden müssen, modifiziert werden müssen. Das ist ja alles ein Aufwand der nicht mehr ohne Kosten und Lasten bleibt
19. Also für mich wäre das die Alternative zu der gesetzlichen drohenden Konformitätsarbeit. Wenn Gütesiegel das dann, das das auch bisher von der GMP-Verordnung eine Anforderung ist, eben erklärt und in der Lieferkette in einem angemessenen Umfang ausweist, dass diese Verpackung jetzt migrationsarm ist und für bestimmte Anwendungen geeignet ist. Das muss hier nicht alles so, wie das die Konformitätserklärung der Druckfarbenverordnung vorsieht, so detailliert ausformuliert und angegeben werden.
20. Haben wir uns vorbereitet? Ja, ich glaube wir haben uns vorbereitet.
21. Es gibt zwei große Maschinenkartonfabriken, die Barrieren gegen Migration von Mineralölen entwickelt haben, diese Barrieren werden teilweise online aufgebracht in einem Unternehmen, teilweise hat man die Möglichkeit, diese extern aufzubringen. Ein weiteres Unternehmen hat Aktivkohle in den Karton eingearbeitet, was ebenfalls erfolgreich wirkt. Ein anderes Unternehmen hat eine Variante entwickelt, die auf hochausgemahlenem, reinen Zellstoffpapier basiert, das ebenfalls eine Barriere darstellt. Wir haben uns also vorbereitet, der Markt wird in wenigen Wochen so weit sein, dass sowohl Frischfaserkarton,

Recyclingkarton mit Barriere und Recyclingkarton ohne Barriere angeboten werden kann, so dass der Kunde die Möglichkeit hat, das ihm am geeignetsten erscheinende Material auszusuchen."

22. Das ist eine Sache der Unternehmen. Für ein Gütezeichen müssen sich gleichgesinnte Unternehmen zusammenfinden und sich auf Qualitätsmerkmale für solch ein Gütezeichen einigen. Ich sehe das zunächst mal nicht,
23. Wichtig aus meiner Sicht ist, dass die Verpackungen die Qualitäten die dem Kunden versprochen wurden auch standhalten damit er sie für die Anwendung für die er sie braucht auch sicher verwenden kann und die Produkte die darin verpackt werden, sicher beim Verbraucher oder Handel, also dahin wo sie gehen sollten, ankommen.
24. Aber ich weiß dass in der Branche vielfältig entsprechende Vorbereitungen getroffen wurden, mit Barrierschichten, Barrierematerialien zu arbeiten, so dass, sollte es zu einer gesetzlichen Anforderung kommen, aus meiner Sicht die Unternehmen relativ schnell sich entsprechend umstellen dürften.
25. Zudem muss man ganz erhebliche Systeme aufbauen, Kontrollen und Dokumentationsgeflechte, andere Verfolgbarkeit sind geben usw. so dass es doch eine erhebliche Umstellung im Unternehmensablauf erforderlich sind. Aber auch einige finanzielle Mittel vorhanden sein müssen um das vernünftig machen zu können.
26. Die Zertifizierungssysteme führen schon dazu, dass die Compliance bei den Unternehmen sehr groß geschrieben wird und dass die Konformitätsarbeit qualitativ doch besser wird, das stelle ich doch fest.
27. Von daher sehe ich das doch als Qualitätsverbesserung an wenn man solch einer Auditierung unterläuft und da das ja heutzutage fast Standard ist, dass man entsprechend Auditiert ist, weil man ansonsten überhaupt keine Abnehmer mehr findet, hat das doch schon zu einem erheblichen ansteigen der Sensibilität geführt auf diesem Bereich und sicherlich auch zu einigen Verbesserungen.
28. Es ist ein wichtiger Faktor. Diese Absicherung in der Lieferkette funktioniert natürlich nur wenn man darauf vertrauen kann dass der Lieferant tatsächlich diese Konformitätsarbeit durchgeführt hat, die er zugesichert hat.
29. Glauben sie, dass es eine Art Gütesiegel geben wird für migrationsarme Verpackungen? Ja, das kann ich mir sehr gut vorstellen Es gibt ja schon entsprechende Werbung und Produkte die eben entsprechend diesen Regelungen hergestellt werden."

30. Aber dass in der Richtung etwas passiert ist sicherlich so und wir selber haben für uns schon die Konsequenz gezogen und setzen nur noch mineralölfreie Farben ein im Offsetdruck, im Flexodruck haben wir dieses Thema eigentlich nicht so.
31. Eventuell kann man sich auch vorstellen, dass entsprechende Zertifizierungen mal wieder ins Leben gerufen werden, wie FSC oder sonstige Dinge. Aber da sind wir mal gespannt was da letztlich kommen wird.
32. Also Grundsätzlich schon. Ich denke mal, wenn man heute nicht 9001 Zertifiziert ist, wird man bei vielen Kunden überhaupt nicht die Möglichkeit haben etwas anzubieten, das war sicherlich vor 20 Jahren noch anders. Deswegen haben wir da sehr offensiv da betrieben und sind sehr früh zertifiziert worden in den 90er Jahren. Das gleiche sehe ich bei dem GMP, auch da ist es heute wahrscheinlich so, dass man einen Lebensmittelkunden nicht mehr beliefern kann wenn man nicht nach GMP oder ähnlichen Kriterien zertifiziert ist. Es ist sicherlich immer eine Zeit lang, etwas womit man sich differenzieren kann und irgendwann kommt dann der Punkt wo man es haben muss weil man ansonsten einfach durch das Raster fällt.
33. Wenn Zertifizierungssysteme der Signalisierung dienen um zu zeigen, dass ich ein gewisses standardisiertes Vorgehen habe in meiner Produktion, glauben sie, dass es gegebenenfalls eine Art Gütesiegel geben könnte migrationsarme Verpackungen? Kann ich mir vorstellen: Ja."
34. But we fell whatever we put on this paper, they are happy with it, they are not really specialist in these items, and they feel just good to having a paper that we declare, we do not do things that they don't like, just having an umbrella about their business.
35. Er muss dem Markenartikler das Vertrauen geben das die Verpackung nicht nur die gesetzlichen Anforderungen erfüllt, sondern darüber hinaus noch die Verbrauchererwartungen abdeckt, die ja zum Teil übergesetzliche Bedingungen hinausgehen können.
36. Denn alle Zertifizierungssiegel nützen nichts wenn der Verbraucher letztendlich kein Vertrauen mehr hat weil die Art der Verpackung dem Verbraucher dubios erscheint.
37. Also blindes Vertrauen auf Bestätigungen und Zertifikate der Vorstufe das wir mehr und mehr verschwinden und mehr in Eigenkontrolle gehen um einfach sicher zu sein dass man konform arbeitet. Da erwarte ich einen Trend weil nur das letztendlich den Wert des eigenen Unternehmens schützt.

38. The proof is in the pudding. Man muss einfach mal unter Beweis stellen, dass gewisse Entwicklungen der Industrie funktionieren.
39. Ich erachte sie durchaus als wichtig, aber nicht in der umfänglichen bürokratischen Art wie sie heute von uns abverlangt wird und vor allem für den Mittelstand, um wieder auf unser Unternehmen zu sprechen zu kommen, wäre es schon schön, man würde mal europäisch einheitlich sich auf bestimmte Systeme konzentrieren, denn man kann nicht als Mittelständler, das ist meine persönliche Meinung, sechs oder sieben Systeme zertifiziert sein, pflegen, verwalten.
40. Unter diesem Aspekt will ich beilegen, dann ist es eine Markteintrittsbarriere. In dem Moment wenn wir diese Erfordernisse nicht abbilden können, wie jetzt jüngst in einem großen Konzernfall wo es eine HACCP gibt, da steigen wir dann aus und dann ist es für uns durchaus eine Einstiegsbarriere.
41. . Ich denke dass diese großen Konzerne eher das treiben, als die kleineren. Unter anderem um etwas zu antizipieren, unter anderen aber auch um den kleinen Wettbewerber das Leben etwas schwerer zu machen.
42. Kommunikation zu den Druckereien, würde eigentlich so wie gewohnt weitergehen.
43. Wenn der Markt es fordert wird es das geben. Und wenn eine Mineralölverordnung eingeführt werden soll, dann wird der Markt wahrscheinlich solche Dinger einfordern, dann wird es so etwas geben.
44. Ja. Wir haben selbst schon über so etwas nachgedacht um eine Mineralölverordnung zu verhindern. Ein Zertifizierungssystem im Rahmen eines reinen Gütezeichens. Haben wir aber aus den verschiedensten Gründen wieder verworfen.
45. Als eine Art Prozesszertifizierung? Genau, wir hätten dann selbst Grenzwerte setzen müssen, das geht bei der Wahl nicht anders, weil man ganz konkrete Werte, die messbar sein müssen, als Kriterium vorweisen muss, das wäre eben auch in Bezug auf die nicht vorhanden patentierte Analytik zu komplex geworden."

### 15.8.6 Agent Motivation

<b>Theme</b>	<b>P-A Theory</b>
<b>Code</b>	<b>Agency Cost</b>
<b>Sub Codes</b>	<b>Agent_Motivation</b>
<b>Segments</b>	<b>23</b>

1. Was steckt für eine Philosophie in dem Unternehmen dahinter? Das heißt, was ich eben sagte: Wie geht man a) mit den Zulieferern um? Also auch ein Hersteller von Packmitteln hat Zulieferer. Wo kommen die Rohstoffe her? Sind die Rohstoffe nachverfolgbar. Wo man früher gesagt hat: Das ist mein Lieferant, der muss nach HACCP Produzieren, alles andere interessiert mich nicht, so was geht heute tatsächlich deutlich weiter. Das geht eben von Lieferanten des Lieferanten, also die gesamte Wertschätzungskette, wo kommt eigentlich die Pulpe her? Wie wird die Pulpe hergestellt? Das wir hier sauber produzieren heißt ja nicht dass wir irgendwo in Südamerika irgendwelche Flüsse versauen.
2. Es gibt natürlich schon einige Betriebe, die das aus Überzeugung heraus machen, aber es ist schon so, dass der Druck von Kundenseite kommt.
3. Wir haben in der Druckindustrie drei bis vier strategische Erfolgsbereiche, die natürlich wiederum über viele Unterpunkte verfügen. Für uns steht ganz oben, die Marktausrichtung, die Kundenorientierung."
4. . Vielleicht verdienen dann die, die übrig bleiben, zumindest so viel Geld, dass sie ordentlich leben und investieren können
5. Aber sie können sicher sein, dass der Wettbewerber, der keine Barrieren oder andere Barrieren hat, nachprüfen wird, ob in dem vom Wettbewerb verpackten Lebensmittel nicht auch Öle zu finden sind, und wenn der dann seinem Kunden sagt: Ihr könnt das Material zwar kaufen, aber ihr seid damit nicht am Ziel, dann ist das eine schwierige Situation.
6. Die finden wir in Spuren im Lebensmittel vielleicht, in etwas größeren Spuren im Lebensmittelkarton, aber in noch größeren Mengen in den Tageszeitungen, die uns täglich ins Haus gebracht werden. Es ist für die Öffentlichkeit schwer verständlich, dass man das hinnimmt und Spuren der Mengen, die in der Zeitung gefunden werden, im Karton kritisiert und im Lebensmittel ebenfalls kritisiert - aus rein formalen Gründen. Das muss man erst mal in der Öffentlichkeit verkaufen. Sie wissen, es sind ja auch auf

Zeitungen keine Hinweise drauf: Darf nicht in die Hände von Kindern gelangen. Und die Kinder nehmen das Papier in den Mund, formen kleine Bällchen und werfen damit. Wenn die Situation mit den Ölsuren so kritisch ist, müsste man doch eigentlich die Verbraucher umfassender informieren.

7. jedoch Nachweismethode unbestimmt
8. Ja, allerdings. Man bewegt sich dann in einen sehr detailliert geregelten Bereich und kann nicht mehr so arbeiten wie es einem gerade in den Kram passt, sondern muss auf viele gesetzliche Vorgaben und Grenzwerte und Konformitätsprüfungen sich einrichten, die man, wenn es nicht um Lebensmittelverpackungen geht nicht hat. Da gibt es reguläre Produktsicherheitsgesetze, die regulären Anforderungen...
9. Das ist jetzt natürlich der Punkt wo der Satz fallen muss dass die Kontrolle besser ist und das trifft hier auch exakt zu
10. Dass sie größere Sicherheit haben von einer Rückrufaktion verschont zu bleiben. Das ist ja ein sehr angenehmer Gedanke, dass ich etwas in der Hand habe mit dem ich mich sicherer fühle als bisher. Das ich keinen Rückruf aushalten muss.
11. Ja, die Faltschachtelindustrie, insbesondere die FFI-Mitglieder, vermutlich auch die Nicht-Mitglieder über die Lieferanten sind informiert über diese Regelungsvorhaben.
12. Wir müssen gemeinsam mit unseren Lieferanten eine adäquate Produktentwicklung durchführen.
13. Sehen sie das zum Beispiel die Nestle Guidelines die schon längere Geschichte haben, die ihre Lieferanten diszipliniert haben? Richtig, genau das, sehr gutes Beispiel.
14. Ja, wie mit allen Aufwendungen, Kunden-Lieferanten Beziehungen sind immer schwierig, "in wie weit kann ich Rohstoffkosten weitergeben?", "in wie weit kann ich Energiekosten weitergeben?", "in wie weit kann ich Aufwendungen in der Qualitätssicherung weitergeben?"
15. Diese Informationen bekommen die Druckereien unter einer Geheimhaltungserklärung offengelegt und werden dadurch in den Stand versetzt, für die konkrete Verpackung, die gerade geplant wird, ein Worst-Case-Szenario abzuschätzen.
16. Aber das hat sich geändert, weil das hat jetzt jeder begriffen, dass das ein sehr hohes Risiko ist. Denn wenn so Dinge passieren, wie das was damals in Italien passiert sind, dass diese Kindermilchprodukte. Das bringt eine Druckerei wohl in den Bankrott.



17. Wichtig ist, dass eben die Informationsübermittlung vom Druckfarbenhersteller bis zum Inverkehrbringer funktioniert, so wie es der BLL kontrolliert. Das ist sicher noch nicht bei jedem angekommen, da muss noch ran arbeiten.
18. Also ich glaube momentan im Umfeld rechne ich ... Also es wird sicher.. kommt eine neues Verordnung, dann ist ein Jahr Transmission je nachdem wann es eintrifft, dann ist quasi mit dem gültig werden noch ein Jahr Transmission und dann wird normalerweise losgemessen. Da wird es jetzt natürlich was geben, aber das sind hochkomplizierte Messungen.
19. Man wird versuchen, das eventuelle Risiko auf den Lieferanten zu verlagern. Der Lieferant wird sich absichern durch mehr oder weniger umfassende Erklärungen. Falls sich jemand gegen einen Haftungsanspruch wehrt, müssen notfalls Gerichte entscheiden
20. Es ist nach wie vor eine große Frage, wie diese sogenannte Cross-Kontamination beurteilt wird. Es gibt Unternehmen, die sagen: Das gibt es und andere sagen: Das gibt es nicht. Cross-Kontamination ist der Effekt, dass aus einer Recycling-Außenverpackung durch eine Frischfaser-Innenverpackung Stoffe hindurch auf das verpackte Lebensmittel wandern. Die Frischfaserhersteller sagen: So etwas gibt es nicht, andere sagen: Wir haben den Effekt messtechnisch nachgewiesen.
21. Also es gibt sicherlich Bereiche wo wir das schon gesehen haben, wo eine Verpackung ersetzt worden ist durch einer bedruckte Folie. Aber ich denke mal, da gibt es schon deutliche Grenzen was Stapelfähigkeit usw. angeht. Und auch in der ganzen Logistik wird es auch Schwierigkeiten geben bei den meisten Produkten, wenn die nur folienumwickelt sind. Also insofern haben wir persönlich da eigentlich überhaupt keine Angst vor. Das sind eher ergänzende Systeme und ich denke, das wird für uns kein Problem sein.
22. Personally I am not convinced that we will have a regulation at short time, but if we would have one it will depend on the possibility to have reasonable testing methods.
23. Da glaube ich, hat jeder zwei Seelen in der Brust, sowohl die Lebensmittelindustrie als auch die Verpackungsindustrie, unsere Branche, weil jeder weiß: die perfekte Lösung werden wir nie finden, aber wir können versuchen eine optimierte Lösung gemeinsam zu finden. Aber wie gesagt, keine traut sich so richtig aus der Deckung an dieser Stelle.

## 15.8.7 Risk\_Allocation

Theme	P-A Theory
Code	Agency Cost
Sub Codes	
Segments	18

1. jedoch Nachweismethode unbestimmt
2. Ja, allerdings. Man bewegt sich dann in einen sehr detailliert geregelten Bereich und kann nicht mehr so arbeiten wie es einem gerade in den Kram passt, sondern muss auf viele gesetzliche Vorgaben und Grenzwerte und Konformitätsprüfungen sich einrichten, die man, wenn es nicht um Lebensmittelverpackungen geht nicht hat. Da gibt es reguläre Produktsicherheitsgesetze, die regulären Anforderungen...
3. Das ist jetzt natürlich der Punkt wo der Satz fallen muss dass die Kontrolle besser ist und das trifft hier auch exakt zu
4. Dass sie größere Sicherheit haben von einer Rückrufaktion verschont zu bleiben. Das Ist ja ein sehr angenehmer Gedanke, dass ich etwas in der Hand habe mit dem ich mich sicherer fühle als bisher. Das ich keinen Rückruf aushalten muss.
5. Ja, die Faltschachtelindustrie, insbesondere die FFI-Mitglieder, vermutlich auch die Nicht-Mitglieder über die Lieferanten sind informiert über diese Regelungsvorhaben.
6. Wir müssen gemeinsam mit unseren Lieferanten eine adäquate Produktentwicklung durchführen.
7. Sehen sie das zum Beispiel die Nestle Guidelines die schon längere Geschichte haben, die ihre Lieferanten diszipliniert haben? Richtig, genau das. sehr gutes Beispiel.
8. Ja, wie mit allen Aufwendungen, Kunden-Lieferanten Beziehungen sind immer schwierig, "in wie weit kann ich Rohstoffkosten weitergeben?", "in wie weit kann ich Energiekosten weitergeben?", "in wie weit kann ich Aufwendungen in der Qualitätssicherung weitergeben?"
9. Diese Informationen bekommen die Druckereien unter einer Geheimhaltungserklärung offengelegt und werden dadurch in den Stand versetzt, für die konkrete Verpackung, die gerade geplant wird, ein Worst-Case-Szenario abzuschätzen.

10. Aber das hat sich geändert, weil das hat jetzt jeder begriffen, dass das ein sehr hohes Risiko ist. Denn wenn so Dinge passieren, wie das was damals in Italien passiert sind, dass diese Kindermilchprodukte. Das bringt eine Druckerei wohl in den Bankrott."
11. Wichtig ist, dass eben die Informationsübermittlung vom Druckfarbenhersteller bis zum Inverkehrbringer funktioniert, so wie es der BLL, Dr. Stähle kontrolliert. Das ist sicher noch nicht bei jedem angekommen, da muss noch ran arbeiten.
12. Also ich glaube momentan im Umfeld rechne ich ... Also es wird sicher.. kommt eine neues Verordnung, dann ist ein Jahr Transmission je nachdem wann es eintrifft, dann ist quasi mit dem gültig werden noch ein Jahr Transmission und dann wird normalerweise losgemessen. Da wird es jetzt natürlich was geben, aber das sind hochkomplizierte Messungen.
13. Man wird versuchen, das eventuelle Risiko auf den Lieferanten zu verlagern. Der Lieferant wird sich absichern durch mehr oder weniger umfassende Erklärungen. Falls sich jemand gegen einen Haftungsanspruch wehrt, müssen notfalls Gerichte entscheiden
14. Es ist nach wie vor eine große Frage, wie diese sogenannte Cross-Kontamination beurteilt wird. Es gibt Unternehmen, die sagen: Das gibt es und andere sagen: Das gibt es nicht. Cross-Kontamination ist der Effekt, dass aus einer Recycling-Außenverpackung durch eine Frischfaser-Innenverpackung Stoffe hindurch auf das verpackte Lebensmittel wandern. Die Frischfaserhersteller sagen: So etwas gibt es nicht, andere sagen: Wir haben den Effekt messtechnisch nachgewiesen.
15. Also es gibt sicherlich Bereiche wo wir das schon gesehen haben, wo eine Verpackung ersetzt worden ist durch einer bedruckte Folie. Aber ich denke mal, da gibt es schon deutliche Grenzen was Stapelfähigkeit usw. angeht. Und auch in der ganzen Logistik wird es auch Schwierigkeiten geben bei den meisten Produkten, wenn die nur folienumwickelt sind. Also insofern haben wir persönlich da eigentlich überhaupt keine Angst vor. Das sind eher ergänzende Systeme und ich denke, das wird für uns kein Problem sein.
16. Personally I am not convinced that we will have a regulation at short time, but if we would have one it will depend on the possibility to have reasonable testing methods.
17. Da glaube ich, hat jeder zwei Seelen in der Brust, sowohl die Lebensmittelindustrie als auch die Verpackungsindustrie, unsere Branche, weil jeder weiß: die perfekte Lösung werden wir nie finden, aber wir

können versuchen eine optimierte Lösung gemeinsam zu finden. Aber wie gesagt, keine traut sich so richtig aus der Deckung an dieser Stelle.

### 15.8.8 Additional Mitigate Measures

<b>Theme</b>	<b>Principal Agent Theory</b>
<b>Code</b>	<b>Agency Cost</b>
<b>Sub Code</b>	Additional Mitigate Measures
<b>Segments</b>	20

1. Die Verpackungsindustrie ist da eher eine Ausnahme, weil die Konzentration hier schon wesentlich weiter fortgeschritten ist - werden wohl mehrheitlich aus Zwang heraus gemacht, vor allem aus Zwang der Kunden.
2. Es gibt ohne Frage auch Unternehmen, die darin eine Chance sehen, ihre Prozesse zu standardisieren und zu verbessern und vor allem durch die standardisierten Abläufe die Produkt-Qualität zu steigern und die Fehlerkosten zu reduzieren. Aber so richtig begeistert ist der Mittelstand von solchen neuen Verordnungen eigentlich nicht.
3. Ich will es mal so sagen: Das zentrale Thema ist für uns als Berater die Frage, welche Kultur wird in einem Unternehmen gelebt?
4. Konformität, Garantien , kritisch ist wenn Zusagen die Liquidität des Zulieferers übersteigen, Haftungspolizen, Kontrolle,
5. Konformität, Garantien Downstream nach Upstream, aus Sicht der Zulieferer Upstream nach Downstream
6. Unsere Rohstoffe haben wir dementsprechend ausgewählt, wir haben es nach GMP hergestellt und unsere eigenen Untersuchungen haben ergeben, dass die Werte eingehalten werden. Dass muss der Hersteller der Schachtel dann selber für sein Objekt nachvollziehen weil es dann keine Garantie in der Form.
7. Ansonsten, wie das genau zu erfolgen hat, in dem Entwurf der deutschen Druckfarbenverordnung ist auch der Entwurf einer Konformitätserklärung

drin, wo dann drin steht, die schriftlichen Erklärungen die ausgetauscht werden, die müssen dann diese Exakten Angaben enthalten.

8. Dass ist ein ganz wichtiger Aspekt denk ich, denn hier wird die durchgängige Kommunikation in der supply-chain angesprochen mit dieser Frage. Ich glaube das bei vielen Marktteilnehmern die man auf den verschiedenen Stufen das Bild vorherrscht und es gibt entsprechende Andeutungen immer mal wieder aufgrund der Äußerungen von Kundenseite oder Kundenverbandsseite, dass hier sozusagen die Gewährleistung der Verkehrsfähigkeit zu dokumentieren, zu beweisen ist.
9. Das heißt der Schaden wird nicht ersetzt, aber der Image-Schaden ist noch viel Größer für den Markenartikler. Und dass haben eben viele Kunden verstanden, diese Thematik, dass es ihnen gar nichts bringt, wenn die eine Unterschrift haben auf einer Konformitätserklärung sondern man muss hier gemeinsam eine Verpackung entwickeln und muss sich darüber abstimmen ob sie Verkehrsgerecht ist, ob sie im Rahmen des Lebensmittelbedarfsgegenständerecht ist. Das ist die richtige Herangehensweise an dieser Stelle. Und da muss man natürlich sagen, es kann schon sein, dass der ein oder andere das in der Branche noch nicht verstanden hat. Ich will jetzt gar nicht von kleinen und großen Unternehmen reden, aber die großen sind auf jeden Fall mit ihren großen Kunden so weit, dass sie diesen Weg gemeinsam bestreiten.
10. Was wichtig ist, ist das Vertrauen in die Marke an sich.
11. Das heißt, dieses Branding einer Marke, unabhängig von den ganzen technischen Siegeln die darauf stehen, die ohnehin niemand nachvollziehen kann, ist es meiner Ansicht nach wesentlich wichtiger das die Marke an sich Vertrauen schafft.
12. der heute auch ein Image hat, das Image des Markenartikler hängt vom Image des Vorlieferanten mit ab und darauf wird man meiner Ansicht nach immer mehr Wert legen.
13. Meine Überlegung war eben die, mehr als das zu tun, was man auch tun muss.
14. Die Unternehmen die das antizipiert haben, die sind vielleicht auch im Wettbewerber und in der Vertrauensbildung ein Stückchen weiter schon.

15. Das Material an sich schon nicht und das Material selber enthält natürlich auch viele Inhaltsstoffe die gegebenenfalls einen safety-Problem auf dem Produkt auslösen können - das heißt, heute wollen wir quasi Beschaffenheitszertifikate und Konformitätsarbeit von unseren Lieferanten bewerkstelligt haben, die quasi mit ihren Lieferanten auch wieder schauen was die so einsetzen und in wie weit diese Verpackung Substanzen abgibt an ein Produkt. Das ist quasi so unsere Sachlage wie wir das heute bewerkstelligen.
16. Aber die Kür, also das was in der Lieferkette eben zusätzlich gefordert wird das verlieren wir manchmal ein bisschen aus den Augen.
17. Sie müssen den Wert ihrer Marke schützen, dementsprechend muss ein Hersteller von Verpackungen dem Markeninhaber das Gefühl vermitteln, dass er durch seine Verpackung nicht nur seine Marke schützt sondern den Wert seiner Marke unterstreicht oder vielleicht sogar noch mehr.
18. Die Kunden sehen es eigentlich aus Vergangenheit gewohnt dass sie mit Hilfe von Konformitätsarbeit sich absichern können indem sie sich entlang der Lieferkette für Verpackungen bestätigen lassen dass die Waren, die sie einsetzen, die Rohstoffe die dafür verwendet worden sind bis zu den Grundstoffen, dass die entsprechend den gesetzlichen Bestimmungen zugelassen sind. Das ist so die gelernte Praxis aus der Vergangenheit. Das werden die Kunden, bzw. die Lebensmittelhersteller, denke ich übertragen wollen, auch auf das Thema sichere Lebensmittelverpackungen, speziell in Bezug auf Mineralölmigration.
19. Ja, nach unserer bescheidenen Erfahrung hier im Haus ist es einfach so, dass wir Erklärungen abgeben müssen, beziehungsweise durch die Zertifizierungen gewisse Formalien erklären müssen und dadurch sichern sich diese, unsere Vertragspartner, sprich unsere Kunde ab.
20. Das Wort Vertrauen ist natürlich schön, das müssen sie sich ja erarbeiten.

## 15.9 PROPERTY RIGHTS THEORY

Theme	Property-Rights_Theorie
Code	
Sub Codes	
Segments	06

1. Hier gibt es die klare Tendenz zur Konzernbildung.
2. Konzentration ist auch eine Folge der Globalisierung, das muss nicht negativ sein, aber ich brauche für solche Vorschriften eine gewisse Unternehmensgröße.
3. Also da sehe ich schon als rechtlich wasserdicht wie man es eben im Geschäftsleben, wenn man über Spezifikationen, über Vereinbarungen von Produkteigenschaften sich vereinbart arbeitet.
4. Ob jetzt der Hersteller von Kartonverpackungen schon Konformitätsarbeit leistet und prüft welche Migration möglich ist und eben übergehen könnte, oder ob das der Verpacker dann tut, das müsste eben besprochen werden. Und dann müssten entsprechende mögliche schriftliche Vereinbarungen beschlossen werden.
5. Und dann eben in die Haftung zu rennen wenn etwas schief läuft. Im Lebensmittelbereich kommt es doch relativ häufig vor, dass Dinge beanstandet werden und rückverfolgt werden und dann Ersatzansprüche in der Lieferkette weitergereicht werden. und genau das kann im Food-Bereich sehr erheblich sein weil dann meistens Verpackungen betroffen sind in denen Lebensmittel eingepackt waren und die dann entsprechend vernichtet werden müssen. Sprich, man muss auch sinnvollerweise Versicherungen abschließen wenn man in diesen Bereich neu kommt, man muss seine gesamten Vertragswerke noch einmal anschauen ob das alles prächtig ist und für den Bereich passend. Das sind aus meiner Sicht erhebliche Vorbereitungen von Nöten.
6. Und wenn eine Analysemethode nicht ausgereift ist, dann kann man sich vielleicht aus der Strafbarkeit und der Ordnungswidrigkeit Schlinge ziehen, zu sagen: Das ist eben nicht mein Verschulden, hier gibt's gar keine vernünftig Analyse. Aber viele andere Haftungsfaktoren, z.B. Das Verbot der Verpackung und der Rückruf, der Schaden und die Gewährleistung vor allen Dingen, die wird dadurch nicht beeinflusst. Also alles was vom

Verschulden abhängt, ja da kann man vielleicht sagen, da hat man etwas bessere Chancen wenn die Analytik nicht ausgereift ist. Aber alles was eben verschuldensunabhängiger Ansprüche ist, dem ist man natürlich trotzdem ausgesetzt.

### 15.9.1 Externalities

Theme	Property-Rights_Theorie
Code	Externalities
<b>Sub Codes</b>	
Segments	39

1. Hier gibt es die klare Tendenz zur Konzernbildung.
2. Konzentration ist auch eine Folge der Globalisierung, das muss nicht negativ sein, aber ich brauche für solche Vorschriften eine gewisse Unternehmensgröße.
3. Also da sehe ich schon als rechtlich wasserdicht wie man es eben im Geschäftsleben, wenn man über Spezifikationen, über Vereinbarungen von Produkteigenschaften sich vereinbart arbeitet.
4. Ob jetzt der Hersteller von Kartonverpackungen schon Konformitätsarbeit leistet und prüft welche Migration möglich ist und eben übergehen könnte, oder ob das der Verpacker dann tut, das müsste eben besprochen werden. Und dann müssten entsprechende mögliche schriftliche Vereinbarungen beschlossen werden.
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6. Und wenn eine Analyseverfahren nicht ausgereift ist, dann kann man sich vielleicht aus der Strafbarkeit und der Ordnungswidrigkeit Schlinge



ziehen, zu sagen: Das ist eben nicht mein Verschulden, hier gibts gar keine vernünftig Analyse. Aber viele andere Haftungsfaktoren, z.B. Das Verbot der Verpackung und der Rückruf, der Schaden und die Gewährleistung vor allen Dingen, die wird dadurch nicht beeinflusst. Also alles was vom Verschulden abhängt, ja da kann man vielleicht sagen, da hat man etwas bessere Chancen wenn die Analytik nicht ausgereift ist. Aber alles was eben verschuldensunabhängiger Ansprüche ist, dem ist man natürlich trotzdem ausgesetzt.

7. Ich glaube das Entscheidendste ist am Ende des Tages das Altpapier. Ich glaube dass es eine wirkliche Kontrolle, eine wirkliche Zertifizierung nur möglich ist wenn man Altpapier weitestgehend ausschaltet. Also die große Variable ist aus meiner Sicht das Altpapier weil keiner sagen kann welcher Giftcocktail befindet sich im Altpapier. Wenn wir über Qualität sprechen, dann muss ich den Rohstoff kontrollieren und den Rohstoff kann ich nur kontrollieren wenn ich aus einem reinen Rohstoff generiere und wenn die Frage richtig verstanden habe, dann glaube ich nicht daran das man mit einem geschlossenen Kreislauf da wirklich weiterkommt.
8. Da Papier und Karton beziehungsweise Druckfarben/Klebstoffe nicht reguliert sind, wir haben natürlich eine Regulierung. Wir haben die 1935-Rahmenverordnung der EU, die ja grundsätzlich regelt dass kein Übergang stattfinden darf, aus dem Lebensmittelbedarfsgegenstand an Stoffe in Mengen die die Gesundheit gefährden oder die Zusammensetzung des Lebensmittels beeinträchtigen. Insofern haben wir hier allgemeine Zielvorgaben des europäischen Gesetzgebers, vorher auch schon des deutschen Gesetzgebers. Aber ich stimme natürlich zu, wir haben in Bezug auf die für die Faltschachtelhersteller relevanten Packstoffe keine Einzelregulierung. Bislang noch nicht Einzelregulierung für den deutschen und eben zum Großteil europäischen Markt noch nicht. Das heißt, die Ziele sind gesteckt, aber die Frage, dass mehr oder weniger unbestimmte Rechtsbegriffe sind: Was ist denn jetzt hier tatsächlich im Einzelnen zu beachten? Das ist nicht spezifiziert gegenwärtig.
9. Wir haben ja zwei Regulierungen die angestrebt werden von Seiten des deutschen, nicht Gesetzgebers sondern Ordnungsgebers, wir sprechen hier von Aktivitäten der Exekutive und nicht der Eigentlichen Legislative. Die Druckfarbenverordnung und die Mineralölverordnung als Änderung zur Bedarfsgegenständeverordnung.
10. Wo wird es hergestellt? Mit wem wird es hergestellt? Sind da Kinderhände beispielsweise im Spiel oder nicht? Das sind alles Dinge, die meiner

Ansicht nach einen deutlich höheren Ausschlag geben als irgendein FSC Siegel oder wie die alle heißen.

11. Welches Produkt liefert mir mein Lieferant sondern: a) wie stellt er es her? Also nicht nur unter hygienischen und rein normierten Verfahren sondern: Was steckt für eine Philosophie in dem Unternehmen dahinter? Das heißt, was ich eben sagte: Wie geht man a) mit den Zulieferern um? Also auch ein Hersteller von Packmitteln hat Zulieferer. Wo kommen die Rohstoffe her? Sind die Rohstoffe nachverfolgbar. Wo man früher gesagt hat: Das ist mein Lieferant, der muss nach HACCP Produzieren, alles andere interessiert mich nicht, so was geht heute tatsächlich deutlich weiter. Das geht eben von Lieferanten des Lieferanten, also die gesamte Wertschätzungskette, wo kommt eigentlich die Pulpe her? Wie wird die Pulpe hergestellt
12. Das ist ein Teil der Kosten die auf das Produkt zukommen, die aber meiner Ansicht nach nicht so gravierend sind wie vielleicht aktuell mal Energiekosten die aktuell in den Keller rauschen, aber nicht lange sind. Rohstoffpreise schwanken meiner Ansicht nach mehr. Auf Themen wie Qualität kann man sich langfristig einrichten, das ist auch kalkulierbarer als Energie- oder Rohstoffkosten, gerade im Papierbereich.
13. Wie geht es wieder in den Kreislauf hinein? Wir haben ja den Punkt, den grünen Punkt, Anteil Kunststoff im Verhältnis zum Faserstoff. Und wenn ich den Anteil rechnerisch verkleinern möchte, mache ich den Anteil des Faserstoffes größer. Ich packe also mehr drauf, dann habe ich ja wieder Relation geschafft. Ist eigentlich nicht gerade vertrauensbildend, wenn man das mal nachvollzieht.
14. Gut, die gesamte Verpackungsindustrie, einschließlich des Maschinenbaus, wird über die demografische Entwicklung getrieben, so, wenn wir jetzt die demografische Entwicklung nur in Deutschland betrachten, oder nur in Europa oder weltweit, da sind es also schon große Unterschiede. Also betrachten wir sie einfach nur hier in Westeuropa, mit 1,8 Kindern, Singlehaushalten, das ist da eine, kleinere Verpackungen. Was noch viel wichtiger ist, ist die Individualisierung.
15. Immer dann, wenn Technologiesprünge möglich waren oder sich ergeben haben, dann hat das natürlich Auswirkungen auf die sogenannte Zulieferindustrie, z.B. den Maschinenbau, gehabt und da mussten sich die Betriebe natürlich massiv umstellen. Die guten haben es schneller geschafft, die schlechten haben es eben später geschafft und die ganz schlechten haben es nicht erkannt und letztendlich dann gar nicht geschafft.
16. Der Verpackungsbereich ist in der Tat ein wichtiger Teil der Druckindustrie. Der Verpackungsmarkt wächst nach wie vor, was vor

allem am allgemeinen Bevölkerungswachstum liegt, aber auch an der Tendenz zu kleineren Haushalten.

17. Das ist ja heute bereits ziemlich realistisch, weil wir Verpackungskonzerne haben, die nicht nur Faltschachteln herstellen, sondern auch gleichzeitig den Rohkarton dafür produzieren. Schon heute müssen Unternehmen bei diesen Herstellern einkaufen, die im Druckbereich ihre direkten Konkurrenten sind. Da sehe ich doch wirklich eine große Gefahr einer Monopolbildung. Wie sich überhaupt im gesamten Umfeld der Druckindustrie mehr und mehr monopolartige oder zumindest oligopolartige Strukturen sowohl im klassischen Papierbereich als auch in der Maschinenindustrie irgendwann wohl einstellen könnten.
18. Diese Tendenz ist ja schon seit vielen Jahren vorhanden. Nicht umsonst hat der Flexodruck sehr hohe Zuwachsraten. Gerade zum Beispiel im Tiefkühlbereich ist die flexible Verpackung stark im Kommen. Unsere Kunden aus diesem Segment haben eine gute Marktentwicklung. So gesehen kann man sagen, dass die flexible Verpackung die Kartonagenverpackung angreift. Das wird in Zukunft mit Sicherheit auch so weitergehen.
19. Was uns noch fehlt, die deutsche Druckfarbenverordnung wird ja eine positiv Liste beinhalten, da fehlen uns noch einige Rohstoffe. Was dann halt neu sein wird, ist, dass sie dann die Inverkehrbringen auch drauf eingestellt sein müssen diese Arbeit zur Darstellung der Eignung der Verpackung so durchzuführen und das ist aus meiner Sicht, wenn man mit großen Markenartikler redet, die haben ja zum Teil tausend verschiedene Verpackungen wo sie ihre Produkte anbieten, das wird sicher sehr aufwendig und schwer werden, hier belastbare Dokumentationen, so wie es die aktuelle Version der deutschen Druckfarbenverordnung fordert vorzuhalten.
20. Also das ist entsprechen auch ein gewisser Druck da und der hat auch dazu geführt, dass die Wahrnehmung in den Druckereien doch deutlich verstärkt wurde in den letzten fünf Jahren.
21. Sprich, wenn man weiterhin recycling-Kartonage verwenden will, entweder Barrierelacke oder Innenverpackung in einem Beutel oder was auch immer machen müssen.
22. Aber es ist halt nur so, durch den sehr starken Rückgang des Einsatzes von grafischem Papier für Zeitung und Zeitschriften und so weiter, verschieben sich die Mengenverhältnisse in den Altpapierkreisläufen. Und es ist durchaus schon mal ein Gedankenexperiment wert, zu sagen, der ganze Altpapierkreislauf braucht ja immer Frischfaser, weil ja die Fasern beim

Recyclen immer leiden und man nach fünf bis sieben Mal wie immer geschrieben wird, dann so zu Staub zerrieben sind, dass sie weg sind. sprich, man muss immer wieder Frischfasern ersetzen. Das passiert im grafischen Bereich so, das Zeitungspapier aus Finnland oder Schweden kommt und das auf Frischfasern basiert. und aus den alten Zeitungen die man hier einsammelt, macht man in der Deinking Anlagen Zeitungspapier aus hundertprozentig Altpapier. Wenn jetzt die Menge grafische Papiere schrumpft und die Menge Verpackung steigt. dann könnte man ja überlegen, kann man nicht die Frischfasern zuerst für Lebensmittelverpackungen nehmen und dann die Kreisläufe entsprechend umzubauen denn man wir sie eh umbauen müssen und dann erst im zweiten Schritt aus der alten Nudelschachtel Zeitungspapier machen.

23. Die 1935 hat ja im Prinzip schon vor gedacht was denn alles schön wäre. Und die EU hat eine Kunststoffverordnung gemacht und sieht auch vor das es etwas äquivalentes für Papier und Karton geben sollte. Bislang war halt immer die Aussage brauchen wir eigentlich nicht so dringend und Zeit haben wir auch nicht. Aber ich sag mal, der rechtliche Rahmen der hat da schon dran gedacht und sieht das auch vor.
24. Wenn das Mineralöl so ein großes Problem ist, dann muss es den Behörden doch egal sein, wo es herkommt. Sie dürften die Verordnung nicht nur auf Recyclingmaterialien konzentrieren, sie müssten das ganze Problem angreifen.
25. Es ist nach wie vor eine große Frage, wie diese sogenannte Cross-Kontamination beurteilt wird. Es gibt Unternehmen, die sagen: Das gibt es und andere sagen: Das gibt es nicht. Cross-Kontamination ist der Effekt, dass aus einer Recycling-Außenverpackung durch eine Frischfaser-Innenverpackung Stoffe hindurch auf das verpackte Lebensmittel wandern. Die Frischfaserhersteller sagen: So etwas gibt es nicht, andere sagen: Wir haben den Effekt messtechnisch nachgewiesen.
26. Und Mayr-Melnhof zitiert auch die Behörden die sagen: Es geht ja nicht nur um Mineralöl, es geht um ca. 250 Stoffe, die in einem Behörden-Entscheidungshilfeprojekt, das vom BMEL finanziert wurde, gefunden wurden. Diese sind auch unerwünscht, auch toxikologisch nicht bis ins letzte untersucht.
27. Die Barriere würde auch diese Stoffe zurückhalten.
28. Das sind übrigens Stoffe , mit denen wir auch sonst in Berührung kommen, denn die ganzen Druckprodukte, die wir als Informationsmedien oder Verpackungen kaufen, sind irgendwann im Haushalt. Anders als eine Wandfarbe, die ich aufbringe und 10 Jahre an der Wand habe, bekomme

ich Druckprodukte ständig neu mit diesen Stoffen beladen ins Haus geliefert. Tageszeitungen, Fernseher-verpackungen, Mehlverpackungen - was auch immer. Das sind Stoffe, mit denen ich in meiner näheren Umwelt umgehe, und es ist doch schon erstaunlich, dass dann auf einmal nur in einem Bereich als sehr kritisch angesehen werden, wenn sie wissentlich auch in anderen Bereichen eingebracht werden."

29. Ich glaube dass unsere Branche vorbereitet ist, weil wir schon so lange darüber diskutieren das Risiko einer entsprechenden Verordnung bekannt ist,
30. Als wir zu Beginn über die Mineralölverordnung diskutiert haben, hätte ich das nicht für ausreichend gehalten, habe dort auch in Anhörungen für eine längere Transmissionszeiten plädiert. Da wir aber jetzt schon seit vier oder fünf Jahren über die Verordnung sprechen und die Unternehmen schon entsprechende Vorbereitungen getroffen haben, bin ich der Auffassung dass zwei Jahren genügend sein müssten. Ich würde den Behörden gegenüber aber immer noch für eine längere Frist eintreten.
31. Da kann ich nur noch mal auf das vorhin schon kurz angedeutete Reflektieren: Besonderes Augenmerk ist zu richten auf die Druckereilobby und die Verwendung Mineralöhlhaltiger Druckfarben im Zeitungsdruckprozess.
32. Es ist ja schon natürlich mit erheblichen Problemen verbunden, wo und wann man denn Testet. Also ich denke mal, die Überwachungsbehörden werden wie immer versuchen, einen praxistauglichen weg zu finden, denn z.B. wenn man erst im Markt die Kartonverpackung prüft, dann sind die schon so einen weiten Weg gegangen und gelagert worden, vielleicht in Sekundärverpackungen, die wiederum Stoffe abgegeben haben, stehen vielleicht im Supermarkt neben Waschmittelverpackungen usw. so dass man dann am Ende vielleicht gar nicht mehr den Verantwortlichen ausmachen kann.
33. Insofern wird das sicherlich für die Lebensmittelbranche ein Erfolg, entsprechende Verpackungslösungen zu finden die dann auch einsetzbar sind, ohne dieses Risiko und die ewigen Grauzonen, die man da hat rechtlich und diese Risiken denen man da ausgesetzt ist.
34. Wie ich uns Deutsche kenne, wird man versuchen das immer auf die vorgelagerten Stufen zu verlagern und sich viele Unterschriften geben zu lassen, damit man da selber auf der sicheren Seite ist.
35. Tendencias towards innovation for example towards sustainability

36. Personally I am not convinced that we will have a regulation at short time, but if we would have one it will depend on the possibility to have reasonable testing methods.
37. In some instance the recycle ability some papers with barrier coatings will not be possible within the chain.
38. Biphenyl-A for example, the new regulation in France, but it is not in force for transport packaging only for food contact layers, as far as I know. Towards plastics there is no worry from our sites.
39. Das sind heutzutage hauptsächlich Nachhaltigkeitserwartungen. Die Verpackung muss aus einem ökologischen sinnvollen Material gemacht werden. Wir erleben gerade die Diskussion, dass die Verbraucher realisieren welche Umweltbelastung durch Plastikverpackungen entstehen. Insofern hat die Faltschachtelverpackung, Wellpappen-verpackung da natürlich ein Bonus. Die Verpackung muss unter akzeptablen sozialen Bedingungen hergestellt worden sein.

### 15.9.2 Individual Utility

Theme	Property-Rights_Theory
Code	Individual Utility
<b>Sub Codes</b>	
Segments	03

1. Die muss nachvollziehbar und verständlich sein. Das ist schon mal gar nicht so leicht weil die oft von guten meinenden von politischen Beamten geschrieben werden die die Feinheiten in der Industrie, in den Lieferketten erst mal nicht kennen. Das verbessert sich dann im Lauf der Jahre mit den zunehmenden Entwürfen. Also sie muss verständlich und nachvollziehbar sein. Eine Verordnung, die so komplex ist, dass einer, der sich bisher nicht damit befassen musste, versucht ist, die zu umgehen oder aus dem Geschäft ganz raus zu gehen - das kann nicht der Sinn sein. Sie muss irgendwie pragmatisch und verständlich sein. Es muss unmittelbar einleuchten dass alle davon einen Nutzen haben.
2. Vielleicht verdienen dann die, die übrig bleiben, zumindest so viel Geld, dass sie ordentlich leben und investieren können.
3. Ich höre ganz oft, dass meine Mandanten Produkte aus China beziehen, Verpackungsmaterialien zum Beispiel und dann wird von dem

chinesischen Hersteller einfach Blind so eine Konformitätserklärung unterschrieben, da weiß man schon ganz genau dass da einfach keine Arbeit geleistet wurde.

### 15.9.3 Bounded Rationality

<b>Theme</b>	<b>Property-Rights_Theory</b>
<b>Code</b>	Influencing_Factors
<b>Sub Codes</b>	Bounded Rationality
<b>Segments</b>	16

1. Da durchgereichte Haftung.
2. Da geht es immer nur um Positiv-Listen, kann ich es nachweisen oder nicht? Und Positiv-Listen ist etwas sehr komplexes da ich jeden Stoff lebensmittelrechtlich bewertet haben muss. Das ist ein großer Aufwand, das kostet viel Geld, ich verbrauche Tiere in Tierversuchen und um sinnvolle Grenzwerte zu bekommen ist ein großer Aufwand nötig.
3. Und in einem solchen Fall bleibt es dem Packmittellieferanten nur übrig zum Amtsgericht zu gehen und die Drei Finger zu heben: Das heißt der Schaden wird nicht ersetzt, aber der Image-Schaden ist noch viel Größer für den Markenartikler. Und dass haben eben viele Kunden verstanden, diese Thematik, dass es ihnen gar nichts bringt, wenn die eine Unterschrift haben auf einer Konformitätserklärung sondern man muss hier gemeinsam eine Verpackung entwickeln und muss sich darüber abstimmen ob sie Verkehrsgerecht ist, ob sie im Rahmen des Lebensmittelbedarfsgegenständerecht ist. Das ist die richtige Herangehensweise an dieser Stelle. Und da muss man natürlich sagen, es kann schon sein, dass der ein oder andere das in der Branche noch nicht verstanden hat. Ich will jetzt gar nicht von kleinen und großen Unternehmen reden, aber die großen sind auf jeden Fall mit ihren großen Kunden so weit, dass sie diesen Weg gemeinsam bestreiten.
4. Wir haben die Diskussion um die Mineralölverordnung, die nicht richtig zum Tragen kommt. Wieso? Wir haben hier einen Zielkonflikt. Wir haben hier mehrere politische Zielen, der Verbraucherschutz, die Ökonomie, aber eben auch den Umweltschutz. Und wenn es die Thematik des Umweltschutzes nicht gäbe, dann hätten wir schon längst entsprechende Verordnungen die vorgibt dass eine entsprechende Barriere aufzubringen

ist, oder dass eben hier die auf Recycling-Fasern basierten Faltschachtel so nicht zum Einsatz kommen dürften aufgrund der Migration. Aber man weiß, dass man hier das Kind mit dem Bade ausschütten könnte, dass die Gefahr besteht, also kann es hier bisher nicht zu einer kurzfristigen Erlass einer Verordnung. Also wir haben hier Zielkonflikte in diesen Politikfeld, das bezieht sich auf die Politik, also die Grenzen verlaufen auf Inhalt der Bundesregierung oder Quer durch die Bundesregierung. Das haben wir auch auf verschiedensten Anhörungen und bei verschiedensten Diskussionssituationen auch mit Vertretern der Bundesregierung erlebt. So erlebt dass es hier keinen Konsens gab in diesem Punkt.

5. Davon ist mir nichts bekannt.
6. Warum? Das ist relativ einfach: Im klassischen Mittelstand unserer Branche, sagen wir bei Betrieben mit 50 Beschäftigten, da sind alle Mitarbeiter in den Tagesablauf eingebunden, da gibt es wenig freie Kapazitäten, die sich mit solchen dispositiv-planerischen Fragen befassen können und meistens gibt es auch kein Geld für so etwas. Das können sich in der Regel nur die großen Player leisten.
7. Da haben sie Recht, aber die Erfahrung zeigt, dass sich die Unternehmen mit solchen Fragen eigentlich erst befassen, wenn es gar nicht mehr anders geht, wenn ein Zwang da ist. Freiwillig, von sich heraus sozusagen, kann ich mir nicht vorstellen, dass ein mittelständisches, auch ein großes mittelständisches Unternehmen mit mehreren hundert oder auch tausend Mitarbeitern solche Signale aufnimmt und sich frühzeitig damit befasst. Dafür ist der Alltagskampf einfach zu groß und es gibt zu wenige interne Kapazitäten, die hier greifen könnten. Da brauche ich ja Stabsstellen oder müsste mein Qualitätsmanagement ausbauen. Ohne Druck und ohne direkte Notwendigkeit wird sich da im Mittelstand nichts bewegen.
8. Sie wissen sicherlich, dass der Konsens unter den Ministerien bezüglich der Verordnung noch nicht hergestellt ist, dass besonders das Wirtschaftsministerium Handelshemmnisse befürchtet, und das Umweltministerium einen Rückgang des Recycling befürchtet. Das ist bislang noch ein Hinderungsgrund dafür, dass die Diskussion über die Verordnung noch nicht abgeschlossen ist.
9. Wenn das Material aus der Fläche hinaus keine Migration zeigt, dann prüfen wir nicht weiter.
10. Es ist nach wie vor eine große Frage, wie diese sogenannte Cross-Kontamination beurteilt wird. Es gibt Unternehmen, die sagen: Das gibt es und andere sagen: Das gibt es nicht. Cross-Kontamination ist der Effekt, dass aus einer Recycling-Außenverpackung durch eine Frischfaser-



Innenverpackung Stoffe hindurch auf das verpackte Lebensmittel wandern. Die Frischfaserhersteller sagen: So etwas gibt es nicht, andere sagen: Wir haben den Effekt messtechnisch nachgewiesen.

11. die Verordnung bisher nur daran gescheitert ist, dass wir noch keine validierten Analysemethoden haben.
12. Es stimmt, die Analytik ist noch nicht besonders weit. ich habe gerade gestern, ich war in einem Vortrag von Fresenius und da war der Herr Dr. Grob aus der Schweiz und er hat noch einmal sehr eindrucksvoll dargestellt, wie wenig man bisher noch weiß, wie viele Pieckser irgendwie drin sind in den verschiedenen Migraten, die man noch gar nicht kennt und dass es da eine vernünftige Analytik gibt.
13. Corrugated packaging there is in general no awareness about this ordinance.
14. Just having an umbrella about their business.
15. Also nicht dadurch das irgendwo Kinderarbeit einer Rolle spielt, was jetzt in Europa jetzt nicht so der Fall ist, was aber in anderen Regionen der Welt durchaus ein gewisser Aspekt sein könnte. ich erinnere mich an letztes Jahr als xxxx (Hinweis: Datenschutz) in gewisse Bredouille als aufgetaucht ist das auf einer Sammeldeponie in Pakistan, Kinder Altpapier eingesammelt haben, was nicht durchgängig durch die Kette kommuniziert und abgesichert was, das hat sogar Vorstandsmitglieder den Kopf gekostet.
16. Mittelständiges Unternehmen haben diesen Erfahrungsschatz nicht.

#### 15.9.4 Imperfect Information

Theme	Property-Rights_Theory
Code	Influencing_Factors
Sub Codes	Imperfect Information
Segments	19

1. Die Verpackungsbranche schaut sich das natürlich genau an was passiert. Noch ist es ja unklar wie die Regulierung tatsächlich aussehen soll
2. Wenn ein beispielsweise Druckfarbendhersteller Rohstoffe einkauft aus denen er dann eine Druckfarbe herstellt aus der dann wiederum ein Verpackungshersteller eine Verpackung herstellt die dann in Kontakt mit Lebensmittel soll. Jedes Glied in der Kette muss seinen Vorlieferanten selbstverständlich mit entsprechenden Spezifikationen versorgen damit klar ist, welche Anforderungen das Produkt hat.
3. Das sind die guten, das sind die Bösen. Dass man neue Konzepte der Risikobewertung ernster nehmen muss. Die gibts nämlich all, die sind alle entwickelt worden. Man kann Substanzen anhand ihrer Chemischen funktionellen Gruppen die dran sind, schon mal in drei Gruppen unterteilen und sagen: Dieses Molekül zeigt Hinweise darauf, dass man es besser untersuchen sollte. Während ein anderes, da gibt es keinen Hinweis dass es irgendwie gefährlich sein sollte. Dafür kann ich großzügigere Spuren erlauben als für die die Merkmale zeigen wo man besser vorsichtig ist. Das sind moderne Methoden der Risikobewertung die aber unter den Toxikologen diskutiert werden, die aber bislang keinen Eingang in der Gesetzgebung gefunden haben.
4. Bislang noch nicht Einzelregulierung für den deutschen und eben zum Großteil europäischen Markt noch nicht. Das heißt, die Ziele sind gesteckt, aber die Frage, dass mehr oder weniger unbestimmte Rechtsbegriffe sind: Was ist denn jetzt hier tatsächlich im Einzelnen zu beachten? Das ist nicht spezifiziert gegenwärtig.
5. Gemeinsam mit unseren Lieferanten eine adäquate Produktentwicklung durchführen. Und dass schließt dann auch ein, dass man sich darüber austauscht und sich abstimmt, inwiefern auch Migrationsuntersuchungen am fertigen Packmittel durchzuführen sind. Es kann hier nicht zu Ziel führen, dass ich die Packmittel geliefert bekomme, begleitet durch eine

Erklärung ob das eine Beschaffenheitsbeschreibung oder eine Konformitätserklärung, Ich das so entgegennehme und für den Fall einer Störung am Markt, eines Rückrufs eines Inzidenz halt dann hingehe und die Schublade aufmache und nachgucke, welche Erklärung habe ich in meiner Schublade liegen? Bis wohin reicht die Haftung meines Lieferanten? Das funktioniert so nicht, dass ist auch nicht so angelegt im Lebensmittelbedarfsgegenständerecht, dass ist immer von einer gemeinsamen Verantwortung hier die Rede. Man muss sich hier darüber abstimmen was man gemeinsam erreichen will mit den Mitteln Erklärungen. Ich glaube auch viele sind mittlerweile, viele Kunden haben darüber eben die Kenntnis erlangt dass eben eine solche Erklärung vielleicht Haftungsrechtlich belastbar ist, in dem da eine Erklärung abgegeben wird seitens des Lieferanten, aber wir hatten den Fall noch nicht, aber die Juristen bestätigen das.

6. Und wir hatten ja, sei es über Stiftung Warentest oder auch über die Überwachungsbehörden auch die letzten Jahre immer mal wieder Untersuchungen.
7. Das muss ja letztlich nur der Fluss der Informationen da sein und an dieser Stelle muss auf Information der Schluss gezogen werden der nötig ist und der dort an dieser Stelle erforderlich ist.
8. Da bin ich der Meinung das der Konsument doch auf die europäische Gesetzgebung stützt dass das Produkt an sich in Ordnung sein muss. Und wenn ich dann irgendeine Lösung brauche, dann müsste ich das eigentlich im Produkt anbieten und nicht in irgendwelchen Verpackungen zu gucken ob die bestimmte Werte erreichen oder nicht.
9. Die Verordnung bisher nur daran gescheitert ist, dass wir noch keine validierten Analysemethoden haben.
10. Es ist richtig dass Papier und Verpackungen nicht im Rahmen einer Einzelmaßnahme geregelt sind und deshalb auch noch keine Konformitätserklärung offiziell abgegeben werden muss, gleichwohl muss für Papier und Pappe schon jetzt Konformitätsarbeit geleistet werden und es muss darauf geachtet werden, dass keine unvertretbare Veränderung in der Zusammensetzung des Lebensmittels erfolgen kann, wenn denn in Papier und Pappe verpackt werden soll
11. Das gilt sowohl für Primär- also auch für Sekundärverpackungen.
12. Die Signale haben natürlich dazu geführt dass mittlerweile sehr intensiv untersucht wird und schon untersucht werden muss.
13. Ich höre ganz oft, dass meine Mandanten Produkte aus China beziehen, Verpackungsmaterialien zum Beispiel und dann wird von dem

chinesischen Hersteller einfach Blind so eine Konformitätserklärung unterschrieben, da weiß man schon ganz genau dass da einfach keine Arbeit geleistet wurde.

14. Deinking, plastic recycling, which could contaminate food, proofed by studies from the USA and Canada, especially to fruits, we are aware of this and that is focused by our marketing companies on industry level, but the awareness of mineral oil is very low at local level.
15. Towards mineral oil our customers who are interested in this are satisfied having a declaration of our ink suppliers, that LMQ Inks do not contain Mineral Oil.
16. Wie können wir diese Belastung in dem konkreten Fall mit Mineralölkohlenwasserstoffverbindungen reduzieren, auch wenn es dafür noch keine gesetzliche Voraussetzung gab.
17. Wo man noch am wenigsten nachweislich weiß, ist tatsächlich die Auswirkung dieser Mineralölkohlenwasserstoffe, da gibt es noch keine eindeutige wissenschaftliche Evidenz. Es gibt große Vermutungen, die möglicherweise durchaus ihre Berechtigung haben, aber an der Stelle sind wir noch nicht wirklich viel weiter also vor 5 oder 6 Jahren.
18. Nehmen wir das Beispiel: Eine Lebensmittelverpackung ist aus einem Frischfaserkarton hergestellt der per se sauber ist, mineralölfrei ist. Er ist dann mit einer Mineralölfreien oder Migrationsarmen Druckfarbe bedruckt worden, insofern ist die Primärverpackung unabhängig davon, ob sie von einer späteren Verordnung betroffen ist oder nicht, die Primärverpackung, die Produktverpackung ist sauber. Jetzt kommt die Umverpackung, die Transportverpackungen, möglicherweise dazwischen sogar noch eine Regalverpackung die aus altpapierhaltigem Material hergestellt worden ist, Wellpappe die wiederum aus Testliner hergestellt worden ist. Es ist inzwischen Vielfach nachgewiesen worden, dass eine Migration aus Umwelteinflüssen, Lagerbedingung, Regalbedingungen, durch eine saubere Verpackung hindurch in das Lebensmittel hinein geben kann. So eine Situation ist durch eine reine Konformitätsarbeit nicht mehr regelbar, handelbar
19. Persönlich glaube ich das Nein. Wir müssen zwar hier in unserem Hause, durch die Tatsache dass wir direkten und indirekten Lebensmittelkontakt haben und natürlich auch für Bio-Mitglieder arbeiten heute, was die Farben angeht mit durchaus anderen Farben arbeiten als wir das noch in der Vergangenheit hatte. Aber Tatsache in meinem Blickfeld ist, das die, sage ich mal, Kenntnisse, die Vorbereitung auf einheitliche Standards und ein gewisses Niveau einfach nicht gegeben ist. Viel zu viele Unklarheiten.

### 15.9.5 Individual Maximisation of Utility

Theme	Property-Rights_Theory
Code	Influencing_Factors
Sub Codes	Individual Maximisation. of Utility
Segments	02

1. Das habe ich am Anfang gesehen, ja. aber im Moment scheint das mindestens schon in Richtung Oligopol zu gehen. Und irgendwann werden wir in der Beziehung auf Wettbewerb haben.
2. Ja, durch NGOs auf jeden Fall. Die werden sich mit Wonne darauf stürzen wenn es eine Mineralölverordnung gibt, dann zu gucken ob das auch alles eingehalten wird.

### 15.9.6 Indivisible Production Processes

Theme	Property-Rights_Theory
Code	Influencing_Factors
Sub Codes	Indivisible Production Processes
Segments	10

1. Heute haben sie 10 Meter, Joghurt in allen Fettstufen, in allen Geschmacksrichtungen, da ist die Individualität. Das heißt: "wie bringe ich Individualität über die Verpackung?". Stichwort Digitaldruck. Das ist der Trend, was uns in den nächsten Jahren enorm bewegen wird. Alle großen Druckmaschinenhersteller sind in dieser Entwicklung dabei, nicht im Akzidenzdruck um Fachzeitschriften zu individualisieren, unterschiedliche, individuelle Deckblätter, erste Seite zu drucken, nein. Nehmen sie Nutella, da können sie also Vorname Peter Nutella drauf tun. Das sind diese Dinge die uns treiben werden. Das ist die demografische Entwicklung und das haben viele Maschinenhersteller auch zu spät erkannt. Wo sie sagen: "Wieso soll der Maschinenhersteller sich um die demografische Entwicklung kümmern?" Warum,? Er hat immer nur sein Kunden und nicht den Kunden des Kunden, bis ins Regal. Wenn die heute Druckmaschinenhersteller sind müssen sie wissen, was im Regal

übermorgen passiert. Und da gibt es jährlich die eine oder andere Versäumnisse aber Tatsache ist: Individualisierung, demografische Entwicklung, wird die Vielfalt der Verpackung potenzieren würde ich fast sagen. Also diese Entwicklung ist noch lange nicht abgeschlossen.

2. Das ist auch der Grund, warum sich sowohl die Druckereien als auch der Maschinenbau in diese Richtung bewegen. Der Verpackungsmarkt ist ein Wachstumsmarkt, einer der wenigen Wachstumsmärkte, die es überhaupt im Druckbereich gibt. Folglich stützen sich sowohl die Maschinenhersteller als auch die Druckereien auf dieses Marktsegment. Die Verpackungsindustrie ist aber seit längerer Zeit schon sehr konzentriert aktiv, das heißt, der Konzentrationsprozess der Unternehmen ist da sehr weit fortgeschritten, was vor allem wiederum am Konzentrationsverhalten innerhalb der Nahrungs- und Genussmittel-industrie liegt.
3. Ich sehe da - wie bereits erwähnt - schon die Gefahr einer Oligopol- oder gar Monopolisierung der gesamten Druckzulieferindustrie auf uns zukommen und zwar über die gesamte Wertschöpfungskette hinweg. Davon ist der Maschinenbau betroffen, die Papierindustrie und auch die Farbindustrie. Ob das in seiner Auswirkung dann zwingend negativ sein muss, weiß ich heute nicht abzuschätzen.
4. Würde ich eigentlich nicht sehen, denn Lebensmittelverpackungen sollten eigentlich alle Migrationsarm sein, dann ist es kein Alleinstellungsmerkmal mehr.
5. Ich sehe dass sich die Industrien vorbereiten. Mayr-Melnhof hat ja da ziemlich schnell ein Patent angemeldet, man hat in der Zwischenzeit auf von SAPI gehört, dass die entsprechende Vorbereitungen betreiben.
6. Sie stellen ja nicht nur den Beutel um, sondern die Technologie. Man muss ja auch die entsprechende Abfüllanlage haben und so weiter. Wenn das mal passiert ist, dann geht man nicht mehr zurück auf den Papierbeutel.
7. Das hat leider nur bei einer Druckerei funktioniert, da halte ich halt die Zeitungslobby noch für zu stark.
8. Das könnte sein, dass da einige Hersteller doch aus den Markt gedrängt werden wenn man immer wieder feststellt dass Migrationen nicht zuverlässig ausgeschlossen werden können. Andererseits gibt es so viele verschiedene Anbieter auf dem Markt. Eigentlich halte ich das nicht für realistisch dass es echte Monopole in dem Bereich geben wird, denn es gibt doch dafür auch zu viele Möglichkeiten.
9. Und was natürlich wichtig ist, was zum Glück aber nicht alle Wettbewerber so beherrschen, das ist die Möglichkeit, auch im Flexodirektdruck sehr hochwertig zu drucken. Hier gibt es immer noch die Möglichkeit, sich vom

Wettbewerb zu differenzieren und gerade bei uns ist es so, dass wir in der Lage sind, doch einiges heute im Flexodirektdruck zu drucken was früher noch im Offsetdruck gängig war. Das ist dann unter Umständen schon eine sehr interessante Geschichte für die Kunden in entsprechenden Stückzahlen dann eben, wird hier nur noch einstufig nach der Wellpappenanlage produziert wo man indem Offsetdruck in der Regeln noch drei oder vier Wertschöpfungsstufen hat

10. Beides sehe ich eigentlich nicht, weil es ja a) Unterschiedliche Möglichkeiten gibt und b) auch selbst, wenn es auf der Papierseite gelöst werden würde, es doch mittlerweile eine ausreichende Anzahl von Papierherstellern gibt. Und, wie gesagt, da es mehrere Systeme gibt, man muss es ja nicht nur aus Papier machen, sondern es gibt ja auch eine Primärverpackung, hab ich da keine Angst vor einer Oligopolisierung

#### 15.9.7 Institutional Boundaries

Theme	Property-Rights_Theory
Code	Influencing_Factors
Sub Codes	Institutional Boundaries
Segments	26

1. Wenn die Regulierung jetzt sofort kommen würde, würde die ersten Jahre drunter und drüber gehen weil die Analysemethoden noch nicht an dem Punkt ist, das man wirklich reproduzierbar messen kann.
2. Wenn der Gesetzgeber das so vorsieht, dann ist das gesetzliche Pflicht, dann braucht man sich selber nichts mehr ausmachen.
3. Ein Stoff der nicht erwünscht ist, darf nicht nachweisbar sein. Das ist für den Ersteller einer Verordnung eine sehr schwierige Sache.
4. Also die große Variable ist aus meiner Sicht das Altpapier weil keiner sagen kann welcher Giftcocktail befindet sich im Altpapier. Wenn wir über Qualität sprechen, dann muss ich den Rohstoff kontrollieren und den Rohstoff kann ich nur kontrollieren wenn ich aus einem reinen Rohstoff generiere und wenn die Frage richtig verstanden habe, dann glaube ich nicht daran das man mit einem geschlossenen Kreislauf da wirklich weiterkommt
5. Das heißt die Frage stellt sich: "Gehen meine Verpackungen, die ich herstelle oder herstellen möchte, in den Bereich Konsumverpackungen oder

gehen sie in den Bereich Transport- und Schutzverpackungen?“. Das sind tatsächlich zwei Welten. Im Bereich Konsumverpackung habe ich es mit anderen Restriktionen, anderen Dingen zu tun als im Bereich Transportverpackungen wo konstruktive Dinge gehören, Wert haben als beispielsweise Druck, weil diese Dinge sich nicht im Regal verkaufen müssen. Also grundsätzlich zwar in der Anwendung sollte man unterscheiden.

6. Und wie soll ich das denn noch nachher recyceln. Letztendlich ist es nur die Frage: Wie geht es wieder in den Kreislauf hinein?
7. Und das ist ja auch nicht verwerflich, man kann sich ja Arbeit ersparen wenn es irgendwo schon was vernünftiges gibt, dann kann man sich das so übernehmen. Und es gab ja zumindest bei dem Europarat schon vor über zehn Jahren schon ein Anlauf etwas für Druckfarben in Lebensmittelverpackungen zu machen, was dann halt im Sande verlaufen ist.
8. Und wo dann halt auch diese WTO noch ein Wörtchen mitzureden hat, das wäre dann ein Handelshemmnis. Nur weil ich in Vietnam Probleme habe in Vietnam herauszufinden welche Druckfarbe auf diese Reisschachtel gedruckt wird, wäre dann defacto der Import nach Deutschland verboten.
9. Und dadurch passen die zwei Gesetzgebungen ohnehin nicht so wahnsinnig zusammen. Wird man sich auch auf einen Kompromiss einigen müssen. Es wird aber nicht draufstehen: Verpackung ist nicht in Europa zulässig.
10. Also wir haben ja eine Rahmenregelung, das ist die Verordnung 1935 aus 2004 und eine allgemeine Anforderung die dort niedergelegt ist an alle Arten von Lebensmittelkontaktmaterial und Verpackungsmaterial Artikel 3, eine Beschaffenheitsanforderung die eben verlangt das keine Migration, kein stofflicher Übergang stattfindet. Der zu vermeiden, soweit technisch möglich und nicht akzeptabel wenn sensorische oder Gesundheitsbeeinträchtigungen daraus folgen. Und das gilt auch für Papier und Kartonverpackungen und das ist quasi das Grundgebot. Es gibt keine Konkretisierungen dann im europäischen Recht, das ist richtig.
11. Von allen anderen Dingen die jetzt auszuhandeln sind zwischen Hersteller und Kunde möchte ich jetzt nicht sprechen. Es gibt keine Zulassungen oder Anerkennungen für Betriebe die jetzt Verpackungen herstellen. Anders ist das bei Lebensmittelherstellern.
12. Die Schwierigkeit der Diskussion in Deutschland hat, glaube ich, klugen europäischen Beamten gezeigt, dass man dieses Thema besser nicht anfasst, ohne vorher eine Lösung zu haben. Ich bin mir auch nicht ganz sicher, ob



die Deutschen das Fass nochmal aufmachen würden. Es ist immer relativ unklug, ein Problem in die öffentliche Diskussion zu bringen, für das man keine Lösungsmöglichkeit hat.

13. Rein grundsätzlich ist die Haltung, die wir im Verband im Vorstand abgestimmt haben, dass Stoffe, die das Recycling behindern, nicht in den Papierkreislauf eingebracht werden sollten.
14. Ich sehe darin sowohl Konzerne als auch Mittelständler bzw. kleine Mittelständler werden die Möglichkeiten haben entsprechende Materialien bei anderen Zulieferern zu besorgen.
15. Den sehe ich gegeben, weniger durch NGOs. Ich denke schon dass dort die jeweiligen, für Hygiene zuständigen Landesuntersuchungsämter, entsprechend beauftragt werden Kontrollen durchzuführen.
16. Da muss ich jetzt persönlich abwägen zwischen für und wieder. Ich sah es auf europäischer Ebene zunächst mal nicht, zumal es in England ein solches Ansehen ja schon abgelehnt worden ist. Es müsste jetzt mit dem europäischen Zertifizierungsprozess kommen, der hat meines Wissens einstimmig zu erfolgen, wenn einer Nein sagt ist die Sache sogar für Deutschland schon gestorben.
17. Ich stelle immer wieder fest dass die Leute sagen: Wieso ist das noch gar nicht in Kraft die Mineralölverordnung, jetzt muss ich mich doch noch gar nicht um MOSH und MOAH kümmern. So ist es natürlich nicht, sondern es ist so, dass die Verpackungsbranche sich im Prinzip jetzt schon daran halten muss, dass keine unvertretbare Veränderung der Zusammensetzung nach der 1935 auftritt und dass diese Mineralölbestandteile nicht in einem unvertretbaren Maße übergehen und wird auch durchaus heute schon diese Grenzl意思ien des letzten Entwurfes der Mineralölverordnung herangezogen als Maßstab. In dem Sinne, dass die Unternehmen Konformitätsarbeit leisten bzw. leisten müssen und da eine Sensibilität herrscht, sind sie schon vorbereitet auf die Verordnung.
18. Aber ich denke auch dass es bei den Überwachungsbehörden da die entsprechende Kontrolldichte noch erhöht wird. Ich kann im Moment schlecht einschätzen, ob die das in der Praxis lange durchhalten und durchbringen.
19. Es wird schon sehr schwierig sein, da den richtigen Ton zu finden und Ich hoffe dass die Überwachungsbehörden zumindest nur die Leerverpackungen prüfen werden nach entsprechenden Materialien und gucken ob die in Ordnung sind und es dabei bewenden lassen. Aber das ist schwer einzuschätzen wie dann damit umzugehen sein wird.

20. Denn die Überwachungsbehörden kommen zum Teil schon nicht hinterher die Unternehmen zu kontrollieren,
21. Heute mit Sicherheit, so wie ich es eben schon sagte. Wenn sie heute nicht nach GMP oder ähnlichem zertifiziert sind, werden sie bei einem größeren Lebensmittelhersteller gar nicht erst zugelassen als möglicher Lieferant.
22. Personally I have the feeling that trust is limited to our side, that we declare that we are not doing wrong things and that our customers have an umbrella that if something may occur in the supply chain.
23. You have to look at the complete chain, finding a solution within the chain, so attacking the problem at the source means, avoiding to have mineral oils out of the beginning of the chain, meaning newspapers and magazines.
24. Ja, davon bin ich fest überzeugt. Nicht alle gleichermaßen, aber diejenigen die ganz offensichtlich von Anfang an im Fokus standen haben sich doch sehr intensiv mit der Problematik auseinandergesetzt. Im Fokus standen von Anfang an die Hersteller von Verpackungen und die Zulieferer dazu die vor allem altpapierbasierte Materialien setzen.
25. Wir sehen sie heute als Klein- und Mittelständler, Ja, weil, um ein Beispiel zu nennen: wenn wir heute für Konzerne, ohne einen Namen zu nennen, Arbeiten wollen, dann werden wir mit HACCP Verordnungen und mit anderen Dingen konfrontiert die wir als Mittelständler so in ihrer umfänglichen Art nicht abbilden können. Weder von der Manpower noch von der Finanzseite.
26. Das Geld haben wir nicht, die Manpower haben wir nicht, das funktioniert so nicht.

**15.9.8 Concentration - Dilution**

<b>Theme</b>	<b>Property-Rights_Theory</b>
<b>Code</b>	Influencing_Factors
<b>Sub Codes</b>	Concentration_Dilution
<b>Segments</b>	13

1. Langfristige Bindung.
2. Es gilt die EU-Verordnung 1935, nach dem eine Lebensmittelverpackung keine Bestandteile auf das Lebensmittel übergehen dürfen, die das Lebensmittel in seiner Zusammensetzung verändern, in seinen sensorischen Eigenschaften verändern oder zu einer Gesundheitsgefährdung des Verbrauchers führen könnten. Das gilt generell, das gilt für jede Sorte von Verpackungsmaterial, also auch für faserbasierte Materialien.
3. Der Verpackungsmarkt ist ein Wachstumsmarkt, einer der wenigen Wachstumsmärkte, die es überhaupt im Druckbereich gibt. Folglich stützen sich sowohl die Maschinenhersteller als auch die Druckereien auf dieses Marktsegment. Die Verpackungsindustrie ist aber seit längerer Zeit schon sehr konzentriert aktiv, das heißt, der Konzentrationsprozess der Unternehmen ist da sehr weit fortgeschritten, was vor allem wiederum am Konzentrationsverhalten innerhalb der Nahrungs- und Genussmittelindustrie liegt. Hier gibt es die klare Tendenz zur Konzernbildung.
4. Das würde den Konzentrationsprozess der Branche mit Sicherheit anstoßen und zwar hin zu den Großbetrieben, zu Konzernen und der Mittelstand, der Kleinbetrieb wird dadurch massiv negativ beeinflusst.
5. Gerade IFS ist ja enorm bedeutend geworden, also ganz heimlich und wenig wirklich Diskutiert sondern einfach einseitig unterstellt, vom letzten Glied in der Kette, von den Handelsunternehmen.
6. Und die IFS hat eine vorschlagende Bedeutung als Privatstandard und erhebt Forderungen, Bedingungswirkungen die weit über die Rechte und ihren Charakter hinweg... Jetzt der Charakter, die rechtliche Verpflichtungen schlagen und auch was die Inhaltlich die Anforderung angeht, die gehen ja weit über ihre legitimen rechtlichen Anforderungen hinaus. Das ist einfach so. Das ist Fakt.

7. Wir kommen immer vom Lebensmittelrecht her und als Verband ist unsere Aufgabe zu sagen: Was verlangt der Gesetzgeber? Was ist die Pflicht die ein Unternehmer hat? Aber die Kür, also das was in der Lieferkette eben zusätzlich gefordert wird das verlieren wir manchmal ein bisschen aus den Augen. Aber sie haben recht, dadurch das von den Handelsunternehmen klare Vorgaben gemacht werden, die nicht nur die Zulieferer, also direkt als Lieferant auftreten organisiert und ausgestattet sein sollen und das nicht nur diese Stufe hat, die IFS zu erfüllen. Sondern auch die weit hinten in der Kette sich befindlichen also auch deren Zulieferer, da sind dann Anforderungen die erst mal zu schaffen sind.
8. Sie wissen sicherlich, dass der Konsens unter den Ministerien bezüglich der Verordnung noch nicht hergestellt ist, dass besonders das Wirtschaftsministerium Handelshemmnisse befürchtet, und das Umweltministerium einen Rückgang des Recycling befürchtet. Das ist bislang noch ein Hinderungsgrund dafür, dass die Diskussion über die Verordnung noch nicht abgeschlossen ist.
9. Da gibt es ja im Moment, bei der Druckfarbenverordnung zumindest Vorschläge oder einen Ansatz, dass man versucht den europäischen Gesetzgeber dahin zu bringen eine Regelung zu treffen. Da könnte ich mir tatsächlich vorstellen dass da tatsächlich etwas angestoßen wird, immerhin gibt es ja eine Roadmap usw. gewisse Überlegungen in diese Richtung. Es ist natürlich schwierig sich zu einigen bei so umfangreichen Geschichten und es wird noch einige Zeit dauern, aber ich denk mal, gerade wenn Deutschland den Anfang gemacht hat und entsprechende Verordnungsentwürfe vorlegt, kann ich mir zumindest bei den Druckfarben gut vorstellen, dass es da bald auf längere Sicht eine europäische Regelung geben wird. Und beim Mineralöl ist es eigentlich ähnlich.
10. Hier gab es speziell auch in unserem Haus, direkt von Anfang an die Überlegung: Wie können wir diese Belastung in dem konkreten Fall mit Mineralölkohlenwasserstoffverbindungen reduzieren, auch wenn es dafür noch keine gesetzliche Voraussetzung gab.
11. Es gab mehrere Verschiedene Ansätze der betroffenen Unternehmen. Lösungen für den Markt anzubieten, auch ohne dass da schon ein konkreter rechtlicher Handlungsbedarf entstand.
12. : Die Kunden sehen es eigentlich aus Vergangenheit gewohnt das sie mithilfe von Konformitätsarbeit sich absichern können indem sie sich entlang der Lieferkette für Verpackungen bestätigen lassen dass die Waren, die sie einsetzen, die Rohstoffe die dafür verwendet worden sind bis zu den

Grundstoffen, dass die entsprechend den gesetzlichen Bestimmungen zugelassen sind. Das ist so die gelernte Praxis aus der Vergangenheit.

13. Ich bring jetzt ein hinkendes Beispiel, wir sind ja auch zertifiziert was die DPG Wellen angeht und da müssen sie z.B. die DPG Farbe bei einer bestimmten Fabrik kaufen, bei einem bestimmten vor-nominierten Preis und das alles dank, das sage ich laut und deutlich, Roland Berger, das ist Wettbewerbsverzerrung, das ist Blödsinn.

## 15.10. TRANSACTION COSTS THEORY

### 15.10.1 Individual Max. of Utility

Theme	Transaction Theory
Code	Influencing_Factors
Sub Codes	Individual Max. of Utility
Segments	24

1. Aus meiner Sicht gibt es für den Markenartikler zwei wichtige Aspekte: einmal ist es Papierweißgrad, also Qualität der Verpackung, wo sehr häufig der Weißgrad der Verpackung angesprochen wird. Und die Druckqualität die gefordert ist. Beides hängt natürlich stark voneinander ab. Stimmt der Weißgrad, stimmt der Qualität des Bedruckstoff, dann lässt sich in der Regel auch sehr gut drucken und dann führt es letztendlich zu einer hohen Zufriedenheit beim Kunden
2. Konzentration ist auch eine Folge der Globalisierung, das muss nicht negativ sein, aber ich brauche für solche Vorschriften eine gewisse Unternehmensgröße. Warum? Das ist relativ einfach: Im klassischen Mittelstand unserer Branche, sagen wir bei Betrieben mit 50 Beschäftigten, da sind alle Mitarbeiter in den Tagesablauf eingebunden, da gibt es wenig freie Kapazitäten, die sich mit solchen dispositiv-planerischen Fragen befassen können und meistens gibt es auch kein Geld für so etwas. Das können sich in der Regel nur die großen Player leisten.
3. Da haben sie Recht, aber die Erfahrung zeigt, dass sich die Unternehmen mit solchen Fragen eigentlich erst befassen, wenn es gar nicht mehr anders geht, wenn ein Zwang da ist. Freiwillig, von sich heraus sozusagen, kann ich mir nicht vorstellen, dass ein mittelständisches, auch ein großes mittelständisches Unternehmen mit mehreren hundert oder auch tausend

Mitarbeitern solche Signale aufnimmt und sich frühzeitig damit befasst. Dafür ist der Alltagskampf einfach zu groß und es gibt zu wenige interne Kapazitäten, die hier greifen könnten. Da brauche ich ja Stabsstellen oder müsste mein Qualitätsmanagement ausbauen. Ohne Druck und ohne direkte Notwendigkeit wird sich da im Mittelstand nichts bewegen.

4. Inverkehrbringen auch drauf eingestellt sein müssen diese Arbeit zur Darstellung der Eignung der Verpackung so durchzuführen und das ist aus meiner Sicht, wenn man mit großen Markenartikler redet, die haben ja zum Teil tausend verschiedene Verpackungen wo sie ihre Produkte anbieten, das wird sicher sehr aufwendig und schwer werden,
5. Aufgabe der Druckerei zu sagen, die Schachtel wird so groß, hat diese Fläche, da kommt so viel Farbe drauf und da kommt dann 50gr. Tee oder Popcorn oder zwei Kilo Nudeln hinein, das sind ja alles Dinge die wir nicht wissen.
6. Das war von Anfang an eine heftige Diskussion. Und weil man auch von Behördenseite das Vorhandensein der Ölsuren nicht gutheißen konnte, ist man dort weitergegangen und hat einen Verordnungsentwurf herausgebracht, der ordentlich kritisiert und diskutiert wurde, und dann noch einen Entwurf. Mittlerweile sind wir beim dritten und warten auf den vierten Verordnungsentwurf.
7. Wenn das Mineralöl so ein großes Problem ist, dann muss es den Behörden doch egal sein, wo es herkommt. Sie dürften die Verordnung nicht nur auf Recyclingmaterialien konzentrieren, sie müssten das ganze Problem angreifen. Ansonsten wäre es eine Verordnung zur Verhinderung von Papierrecycling und das kann nicht im Sinne der Behörden sein.
8. Wenn das Material aus der Fläche hinaus keine Migration zeigt, dann prüfen wir nicht weiter.
9. Worauf sie allerdings nicht vorbereitet sind, sind die gesamten Sekundärverpackungen, die Umkartons auch noch auszutauschen und da eben auf dem gesamten Transportweg, bei der Lagerung etc. auch drauf zu achten. Was natürlich eine weitere Schwierigkeit ist, dass es analytisch sehr schwierig ist festzustellen woher das überhaupt kommt, welche Bestandteile eigentlich drin sind, ob das MOSH oder MOAH sind, das sind ja in diesen Analysen diverse Peaks nicht richtig ausgewertet werden können, so dass es bei der Umsetzung einer konkreten Verordnung doch noch erhebliche Probleme geben dürfte.
10. Aus rechtlicher Sicht ist das ganze Thema geprägt bisher von einem gewissen Wegschauen in der Branche einerseits. Und von etwas Hilflosigkeit auf allen Seiten, weil man auf der einen Seite feststellt, dass

die Analytik noch nicht so weit ist und auch viele Stoffe noch nicht identifizieren können, schon gar nicht deren Gefährlichkeit. Auf der anderen Seite hat man den Verbraucher dem sehr daran gelegen ist, dass gar nichts migriert und der auch ganz wenig Kenntnis über diesen ganzen Bereich hat. Er denkt, es migriert eigentlich nie irgendwas und die Wirklichkeit sieht dann doch sehr viel anders aus. Im Moment ist das ganze noch von der Verordnung 1935 eben nur sehr schwammig geregelt und man versucht da eben einen Weg zu finden, diese ganzen modernen Verpackungen aufrecht zu halten und weiter im Markt zu halten. Man kann eben nicht zurück zur Milchkanne und zu den alten traditionellen Verpackungen von denen man wusste, dass sie unschädlich sind. Und es muss ja auch alles billig sein und umweltschonend usw. Nur da ist eben eine ziemlich große Diskrepanz zu dem was analytisch im Moment jetzt immer weiter herauskommt, dass man eben da noch im Prinzip jede Woche einen neuen Skandal verursachen könnte. Das ist sehr spannend was da die neuen Entwicklungen bringen werden. Ich denk mal, das wird in den nächsten Jahren noch sehr viel passieren.

11. Corrugated packaging there is in general no awareness about this ordinance.
12. Ging man zunächst davon aus, dass die Kohlenwasserstoffbelastung , die so genannte Mineralölbelastung im Recyclingpapier eigentlich ausschließlich aus Druckfarben aus Zeitungen die im so genannten Cold-Set Verfahren gedruckt worden stammen, so musste man doch erkennen, dass auch zum Teil im Verpackungsdruck Farben verwendet wurde, die Bestandteile beinhalteten die letztendlich als so genanntes Mineralöl nachher im Recyclingprozess im Recyclingkarton wiedergefunden wurden.
13. Es gibt ein paar bekannte Namen die dem Konsumenten sofort Qualität suggerieren, Fresenius ist so etwas, also etwas als Konsument ins Lebensmittelsicherheit beschäftigt und irgendwo liest Fresenius dann glaubt er wahrscheinlich schon dass er ein sicheres Lebensmittel bekommt.
14. Heute hat das Ganze noch ein bisschen Schuldzuweisungscharakter. Schuldzuweisung ist immer Kontraproduktiv für Vertrauensbildung. Offenheit und offene Diskussion und Austausch von gewissen Informationen bis zum Endprodukt hin, das wäre eigentlich die richtige Methode wo Vertrauen innerhalb der Branche bis zum Kunden zu erzeugen.
15. Das eine ist, wir wären sehr froh wenn wir innerhalb der europäischen Seite einheitliche Regelungen hätten zu den Vorschriften was Papier angeht. Sie kennen die Verordnung ob jetzt FSC oder ähnliches mehr. Das

andere ist, dass wir natürlich auch mit Materialien konfrontiert werden wo wir im Augenblick als rein mittelständiges Unternehmen nicht diesen Erfahrungsschatz haben um über die Qualität oder die Inhaltsstoffe oder die Auswirkung des Materials Auskunft zu bekommen.

16. Was ich persönlich glaube, da ist die Frage vielleicht falsch formuliert, Glaube fängt bei mir da an, wo Wissen aufhört. Ich persönlich glaube nicht daran, weil für mich sind die ganzen Siegel scheinheilig und ich bin wirklich schon mehr als 40 Jahre dabei. Ich habe den weißen Schwan, den blauen Tauben alles mitgemacht was Papier anging. Ich glaube an den Etikettenschwindel zwischenzeitlich denn, lassen sie mich ein anderes Beispiel nehmen: So viel Bio, wie sie heute im Einzelhandel kaufen können wir gar nicht produziert, kann gar nicht produziert werden. Aus Erfahrung weiß ich das, weil wir Kunden haben in diesem Bereich die sich selbst wundern wo so viel Bio herkommt. Für mich ist das alles Etikettenschwindel, mir wäre ein, zwei wirklich verlässliche Prüfsiegel lieber wie 20 die keiner nachvollziehen kann. Die Branche ist vorbereitet, Foodboard ist verfügbar.
17. Was gegenüber dem Verbraucher kommuniziert? Der Verbraucher unterstellt dass natürlich von der Verpackung keine schädlichen Einwirkung des Packguts des Lebensmittels oder Kosmetik und so weiter, auch bei anderen Produkten, selbst bis hin zu Tiernahrung übergehen. Insofern würde man jetzt nachdem der Verbrauch 50, 60 Jahre lang mit vorverpackten Lebensmitteln seinen Bedarf gedeckt hat, eher Fragen provozieren, als, ja was ist denn vorher die 50, 60 Jahre passiert wenn jetzt plötzlich ausgelobt wird, dass es sich hier um eine Verpackung handelt, die keinen Einfluss aufs Lebensmittel hat.
18. Sehr große Gefahr sehe ich auch und die Substitution sieht man ja im Regal. Da muss man ja jetzt nicht nur durch die Regale in Deutschlands Supermärkten gehen, sondern wir sind hier in der näher von Karlsruhe, geht man jetzt rüber nach Frankreich, rüber in das Elsass, dort sehen die Verpackungen schon ganz anders aus. Es gibt eben Trends, Produkte in anderen Verpackungen zu verpacken die teilweise teurer sind, aber trotzdem eine höhere Marge erzielen. Beispiel: Das Rotkraut was wir früher so, ich kennst, meine Oma hat es in Dosen gekauft und in den Keller gestellt. Lange Haltbarkeit, erhöht die Qualität des Produktes. Jetzt gibt es Rotkohl schon lange im Tiefkühlregal. Die Tiefkühlphase ist gekommen, was der Weißblechdose oder Konserve sehr zu schaffen gemacht hat. Es also Substitution Weißblech durch beschichtete Faserstoffe in Richtung Tiefkühl. Und jetzt kommen die Frischen Produkte. Das heißt nicht mals



tiefgekühlt. Sie haben zwar nicht mehr diese lange Haltbarkeit, aber Menschen wie meine Oma gibt es heute auch nicht mehr, die etwas 12 Monate oder länger lagern wollen. Sie kaufen ihr Rotkraut im Kunststoff-Standard-Pouch der schön im Regal steht und wenn der vier Monate hält reicht das aus. Aber er ist nicht so behandelt, weder tiefgekühlt, noch hitzebehandelt, das er auch wirklich lecker schmeckt. Also durch diese Packungsform, besteht meiner Ansicht nach, eine große Gefahr für die klassischen Faserstoffe.

19. Die Anwendung im Bereich Pharmazie, aber im Bereich der Mengen, der Massen, sprich Zahncreme, man soll sich ja zwei Mal am Tag die Zähne putzen, sind das schon riesige Mengen. Hat sich etwas getan, man brauchte die Faltschachtel von der Technik her nicht mehr. Heute sehen sie auch, ein Großteil der Zahncreme, die Preiswerten, die legen einfach im Karton, im Umkarton, nicht einzeln verpackt und werden auch gekauft, ist auch alles in Ordnung. Dann gibt es aber Marken, die etwas Besseres suggerieren wollen, die auch etwas teurer sind, teilweise drei Mal so teuer, da haben sie aber auch Faltschachteln mit Heißprägung und wirklich aufwändigen Umverpackungen, also Sekundärverpackungen, die weniger dem Schutz des Produktes nutzen als dem Verkauf.
20. Ob es ein Vorteil sein wird, weiß ich nicht. Es gibt natürlich in zahlreichen Industriezweigen Konzentrationsprozesse, wie zum Beispiel in der Automobilindustrie. Wir haben ja in Deutschland nach wie vor noch knapp neuntausend Druckunternehmen. Wie groß da die Anzahl der Verpackungsunternehmen ist, weiß ich nicht, da es auch immer wieder Neueinsteiger gibt, die in das wachstumsstarke Verpackungsgeschäft wechseln.
21. Vielleicht verdienen dann die, die übrig bleiben, zumindest so viel Geld, dass sie ordentlich leben und investieren können.
22. Es wird zwar solche Dinge sicher geben, denn auch damit kann man Geld verdienen, aber erforderlich ist es eigentlich nicht.
23. Diejenige die diese Beschichtungsmaschinen haben, die ihre Materialien verkaufen können, werden da sicherlich einen Nutzen draus ziehen können.
24. Jeder muss eben seine Kunden überzeugen. Der Frischfaserhersteller wird sagen: Mein Material hat keine migrierenden Inhaltsstoffe, da geht auch nichts durch. Und der andere wird sagen: Ich habe zwar Recyclingpapier oder -karton, aber ich habe eine Barriere drauf, da geht nichts durch. Und wer dann beim Kunden am besten ankommt, ist eine auch Frage von Euro

und Cent und der Erfahrung auf dem Markt, das ist ganz schwer vorherzusagen.

### 15.10.2 Opportunism

Theme	Transaction Theory
Code	Influencing_Factors
Sub Codes	Opportunism
Segments	5

1. Kontrolle, Behörden haben keine standardisierte Meßmethode, keine Durchsetzung.
2. Die muss nachvollziehbar und verständlich sein. Das ist schon mal gar nicht so leicht weil die oft von guten meinenden von politischen Beamten geschrieben werden die die Feinheiten in der Industrie, in den Lieferketten erst mal nicht kennen. Das verbessert sich dann im Lauf der Jahre mit den zunehmenden Entwürfen. Also sie muss verständlich und nachvollziehbar sein. Eine Verordnung, die so komplex ist, dass einer, der sich bisher nicht damit befassen musste, versucht ist, die zu umgehen oder aus dem Geschäft ganz raus zu gehen - das kann nicht der Sinn sein. Sie muss irgendwie pragmatisch und verständlich sein. Es muss unmittelbar einleuchten dass alle davon einen Nutzen haben.
3. Wir stellen immer wieder fest, dass da auch von den zertifizierenden Organisationen oft viele Augen zgedrückt werden, um die Zertifizierung zu verlängern. Wir als Berater wundern uns oftmals, dass Unternehmen die Zertifizierung erhalten haben, wo man doch bereits beim Durchlaufen merkt, dass es zum Teil drunter und drüber geht.
4. Ich höre ganz oft, dass meine Mandanten Produkte aus China beziehen, Verpackungsmaterialien zum Beispiel und dann wird von dem chinesischen Hersteller einfach Blind so eine Konformitätserklärung unterschrieben, da weiß man schon ganz genau dass da einfach keine Arbeit geleistet wurde.
5. Eigentlich sollte das selbstverständlich sein in der Konformitätsarbeit, aber ich stelle immer wieder fest, dass das gerade nicht der Fall ist, sondern viele versuchen den Kopf aus der Schlinge zu ziehen und eine Erklärung abzugeben die eben den Kunden zufrieden stellt ohne drauf zu schauen ob es vielleicht für ihn auch eine sinnvolle Hilfe ist bei seiner eigenen Konformitätsarbeit.

### 15.10.3 Small Numbers / Strategic Impotence

<b>Theme</b>	<b>Transaction Theory</b>
<b>Code</b>	Influencing_Factors
<b>Sub Codes</b>	Small Numbers / Strategic Impotence
<b>Segments</b>	8

1. Seitens des Lieferanten. ich glaub aber viel mehr im Sinne der durchgängigen Kommunikation dass es nur eine gemeinsame Aufgabe sein kann, weil der Partner in das Supply-Chain ein verkehrsgerechtes Produkt am Ende herzustellen.
2. Kunden scheuen dass Singlessourcing und scheuen es auch, denke ich, wenn es Große Marken sind die europaweit ihre Packmittel beziehen, scheuen es auch nur mit zwei, drei, vieren oder fünf Zusammenarbeiten. Wir haben leider die Situation in Bezug auf unser Produkt, dass hier keine großen Abschottungen aufgrund technologischer Fortschritte vorhanden sind.
3. Und wenn man sozusagen sich zukünftig Abgrenzen will, muss man natürlich so globale Veränderungen, die feststellbar sind, wie zum Beispiel Wirtschaftskrise 2009, internationale Finanz und Wirtschaftskrisen hatte zur Folge, dass die Kunden ihr Work-in-care-Battle abgebaut haben, Lagerbestände, die Sicherheitsabstände oder die Sicherheitsbestände wurden drastisch heruntergefahren, mit dem Effekt, dass heute Faltschachtelhersteller viel kurzfristiger, viel flexibler liefern müssen, dass sie kleinere Mengen in einem Kürzeren Zeitpunkt zur Verfügung stellen müssen, dass sie zu festen Terminen liefern müssen. Alleine im Pharmabereich hat sich die durchschnittliche Auflagenhöhe von 35000 auf 17000 Stück reduziert.
4. Also im Moment sieht es nicht danach aus. Die zwei genannten, die Kartonhersteller die Karton anbieten mit der Barriere ausgestattet ist, dass ist die eine Möglichkeit, es gibt auch noch den dritten, der mit der Aktivkohlefunktion. Das sind die, die sie ab Werk schon kaufen können. es gibt natürlich noch die Möglichkeit dass man extrudierten Karton, nachbehandelten Karton, auch dafür gibt es mehre Anbieter und es wird zukünftig verstärkt auch die Möglichkeit geben, dass der Faltschachtelhersteller selbst in der Lage sein wird, eine Barriere aufzutragen, im Rahmen der Produktion des Druckens, des Lackierens. Das

heißt individuell auf den Kunden zugeschnitten, auf ein Produkt zugeschnitten, eine Faltschachtel mit einer Barriere auszustatten. Diese Möglichkeit wird es geben, das ist gut so dass es hier verschiedene Möglichkeiten gibt und man als Faltschachtelhersteller natürlich nicht davon abhängig ist hier von der Lieferantenseite bedient zu werden. Also da gibt es durchaus verschiedene Angebote.

5. Aber der Lebensmittelverpacker hat eine größere Auswahl. Er kann, wenn er eine Barriere haben möchte, die Barriere auch erhalten, er kann auch Frischfaserkarton mit Barriere ausrüsten lassen und die Kontamination durch den Frischfaserkarton verhindern. Er hat eine breite Palette an Möglichkeiten
6. Es gibt schon Lebensmittelechte Druckfarben und es gibt auch diese neuen Kartons die aus Recyclingmaterial hergestellt sind, die dann eben aber angeblich migrationsarm oder -frei sind. Gerade für kleine und Mittelständige Unternehmen ist es sicher nicht leicht sich jedes Mal eine eigene Verpackungslösung überlegen müssen und die Konformitätsarbeit selbst von A bis Z leisten müssen, so kann ich mir schon sehr gut vorstellen dass es da entsprechende zertifizierte Verpackungen, Fertigverpackungslösungen geben wird, die dann eben nicht mehr überprüft werden müssen vom Verpackungshersteller sondern wo er sich wirklich drauf vertrauen kann dass das dann wirklich einsetzbar ist.
7. No, of course they have a certain advance in development compared with others, but the demand in the market at the packaging supply side triggered by our customers is still so low that main players in the market did not even start to develop barrier coatings, this will be a cost element, the customers are not willing to pay for it, and in some instance the recycle ability some papers with barrier coatings will not be possible within the chain.
8. Für mich sind Erfolgsfaktoren natürlich ein hohes Maß an Verlässlichkeit, an Kontinuität und vor allem an einer partnerschaftlichen Gesamtlösung weil der Kunde heute den Anspruch hat, ein sehr komplexes Objekt haben zu wollen aber nur einen kompetenten Ansprechpartner haben möchte um am Ende des Tages, wie ich immer zu sagen pflege, den Kopf schön entspannt ins Kopfkissen legen kann.

#### 15.10.4 Transaction Atmosphere

<b>Theme</b>	<b>Transaction Theory</b>
<b>Code</b>	Influencing_Factors
<b>Sub Codes</b>	Transaction Atmosphere
<b>Segments</b>	26

1. Es gibt für LM Hersteller keine nationalen Märkte mehr, man kauft und designt immer auf EU Level.
2. Das sollte eigentlich das letzte sein. Wichtig ist ja das eine Lieferkette in der Industrie, dass die selber in der Lage ist, sich sinnvoll zu organisieren und das ... da kann der Gesetzgeber nachhelfen indem er eine Gesetzgebung macht, indem klar ist da kommt keiner mehr aus, jede muss das einhalten.
3. Wenn ich mir in Europa heute den Markt anschau, dann haben wir eigentlich eine Überkapazität, wir haben einen extremen Preiskampf
4. Wir haben die 1935-Rahmenverordnung der EU, die ja grundsätzlich regelt dass kein Übergang stattfinden darf, aus dem Lebensmittelbedarfsgegenstand an Stoffe in Mengen die die Gesundheit gefährden oder die Zusammensetzung des Lebensmittels beeinträchtigen. Insofern haben wir hier allgemeine Zielvorgaben des europäischen Gesetzgebers, vorher auch schon des deutschen Gesetzgebers. Aber ich stimme natürlich zu, wir haben in Bezug auf die für die Faltschachtelhersteller relevanten Packstoffe keine Einzelregulierung. Bisher noch keine Einzelregulierung für den deutschen und eben zum Großteil europäischen Markt noch nicht. Das heißt, die Ziele sind gesteckt, aber die Frage, dass mehr oder weniger unbestimmte Rechtsbegriffe sind: Was ist denn jetzt hier tatsächlich im Einzelnen zu beachten? Das ist nicht spezifiziert gegenwärtig.
5. Wir haben sehr viele Artikel, so genannte Me-too-Artikel, das heißt, der Lieferant ist hier durchaus in gewissem grade austauschbar.
6. Da haben faserstoffbasierte Verpackungen einen Vorteil in der Akzeptanz der Verbraucher und das fließt natürlich in die Entwicklung auch ein. Inwieweit das fachtechnisch immer richtig ist, da machen wir ein großes Fragezeichen dahinter, aber man muss Verbraucherströmungen nachgehen um seine Produkte entsprechen zu positionieren. Das sehe ich als ein großen Trend für die Faserstoffe.

7. Heute haben sie 10 Meter, Joghurt in allen Fettstufen, in allen Geschmacksrichtungen, da ist die Individualität. Das heißt: "wie bringe ich Individualität über die Verpackung?". Stichwort Digitaldruck. Das ist der Trend, was uns in den nächsten Jahren enorm bewegen wird. Alle großen Druckmaschinenhersteller sind in dieser Entwicklung dabei, nicht im Akzidenzdruck um Fachzeitschriften zu individualisieren, unterschiedliche, individuelle Deckblätter, erste Seite zu drucken, nein. Nehmen sie Nutella, da können sie also Vorname Peter Nutella drauf tun. Das sind diese Dinge die uns treiben werden. Das ist die demografische Entwicklung und das haben viele Maschinenhersteller auch zu spät erkannt. Wo sie sagen: "Wieso soll der Maschinenhersteller sich um die demografische Entwicklung kümmern?" Warum,? Er hat immer nur sein Kunden und nicht den Kunden des Kunden, bis ins Regal. Wenn die heute Druckmaschinenhersteller sind müssen sie wissen, was im Regal übermorgen passiert. Und da gibt es jährlich die eine oder andere Versäumnisse aber Tatsache ist: Individualisierung, demografische Entwicklung, wird die Vielfalt der Verpackung potenzieren würde ich fast sagen. Also diese Entwicklung ist noch lange nicht abgeschlossen.
8. Wenn das Zertifizierungssystem auch inhaltlich gelebt wird, dann sage ich ja.
9. Wie groß sind denn dann die Mengen die migrieren können? Und für die Migrationsgrenzwerte, die es ja für die Druckfarben nicht gibt, da halten wir uns eben an die Dinge die vorhanden sind, das ist zunächst mal die Kunststoffverordnung mit den Listen der SML-Werte, da ist schon einiges drin.
10. Belastbare Dokumentationen, so wie es die aktuelle Version der deutschen Druckfarbenverordnung fordert vorzuhalten.
11. Man kann es jetzt salopp sagen, die ganze Diskussion über Mineralöl und was noch alles durch die Presse ging, die hat dazu geführt, dass die Nachfrage nach Druckfarben die bestimmungsgemäß für Lebensmittelverpackungen geeignet sind deutlich gestiegen ist.
12. Das muss ja letztlich nur der Fluss der Informationen da sein und an dieser Stelle muss auf Information der Schluss gezogen werden der nötig ist und der dort an dieser Stelle erforderlich ist.
13. Das Nordatlantische Handelsabkommen, Chlorhänchen, das sehe ich dann auch als Auswirkung auf die Lebensmittelindustrie. Ich sehe schon, durch die Standardisierung für die deutsche Wirtschaft an sich, vor allem für Maschinenbau und Automobilbranche sehr große Vorteile, da ist kein Zweifel. Das wird sich dann aber auch auf das Lebensmittel aussetzen und

heute in Amerika habe ich quasi nicht diese Hazard, sehr starke Gefahr, auf Einzelstoff ausgerichtete Regulierung sondern mehr auf eine Expose.

14. Das sehe ich das eine, und dann sehe ich auch die Initiative der EU an sich, das Programm Re-fit, keine kleinteiligen Regulierungen mehr auszuarbeiten sondern quasi halt Regulierungen, Fit-for-purpose, zusammenzutragen und da ist quasi diese Mineralölverordnung und selbst auch die Druckfarbenregulierung, Konzepte die man in den 70ern mit den Kunststoffen angefangen hat und wo auch heute kennt die kein Mensch mehr das so machen würde weil das... Sie können es ja sehen in Kunststoffen, sie haben Kunststoffe da sind 30 Substanzen geliefert, das können sie an einer Hand abzählen wie oft sie da eine Anfrage bekommen von der Food-Authority, wenn die da irgendwas Falsches gemessen hat. Wenn da was kommt, dann ist es meistens, dass man überhaupt einen Stoff nicht, der keine EFSA Bewertung hat, das muss natürlich weiter ausgeweitet werden.
15. Der Markt muss zeigen und die Behörden in ihrer Kontrolle müssen zeigen, ob das Lösungen sein werden.
16. Ich rechne damit, dass zunächst mal, wenn die Lösungen auf dem Markt verfügbar sind, sie von den Behörden untersucht werden, ob sie das, was sie vorgeben zu erbringen, auch wirklich erbringen. Und das muss zunächst, so stellen es sich zumindest die Behörden vor, die Prüfung der Migration aus dem Packmaterial sein. Die Behörden sagen sich: Wenn wir einen Karton haben oder eine Wellpappe haben, aus der nichts migriert, dann gibt es einen Stempel drauf und dann kann dieses Material für die Lebensmittelverpackung eingesetzt werden. Und wir kontrollieren anschließend im Lebensmittel nicht mehr, ob da Mineralöle sind oder nicht.
17. Ich glaube auch, dass die NGOs ihre Rolle spielen werden und sagen werden: Jetzt haben die Unternehmen das teurere Material eingesetzt und trotzdem finden wir noch diese Öle, die wir nicht haben wollen.
18. Das kommt auf die Gestaltung der Kosten für die Zertifizierung an. Wenn sich die Zertifizierung in der Kostenstruktur nach der Unternehmensgröße richtet, sollte es keine Markteintrittsbarriere sein, wenn es so eine pauschale Beträge sind, die dort zu entrichten sind, ist es natürlich für ein großes Unternehmen viel einfacher 10.00 Euro für eine Zertifizierung auf den Tisch zu legen als für ein kleines Unternehmen.
19. Der Preis! Die Verfügbarkeit.
20. Können sie garantieren dass keine Mineralölmigration usw. Aber ich glaube nach wie vor Verfügbarkeit und Preis sind für unsere Kunden die Hauptentscheidungskriterien.

21. Welche Instrumente schaffen Vertrauen? Zertifizierungen haben sie schon genannt.
22. Die sehe ich als hoch an. Ich wundere mich sowieso dass die heute immer noch so viel in Faltschachteln verpacken. Ich kann mir sehr gut vorstellen, dass wenn die Regelungen da strenger werden, dass dann viele umsteigen auf einfache, händelbare Kunststoffverpackungen die einfach schon besser untersucht wurden, wo die Analyse besser ist, wo es eben schon länger die Verordnung gibt und bei denen man eben etwas sicherer sein kann als bei den Faltschachteln und vor allen Dingen bei den Recyclingpapier, da sehe ich wirklich schwarz was die Lebensmittelbranche angeht. Wenn die Mineralölverordnung so kommt, wie es der letzte Entwurf vorsieht, dann halte ich das für sehr schwierig die überhaupt noch einzusetzen.
23. First of all to be cheap.
24. I cannot see that someone in the chain has trust in the things that we are doing as an industry.
25. Das andere ist, dass wir natürlich auch mit Materialien konfrontiert werden wo wir im Augenblick als rein mittelständiges Unternehmen nicht diesen Erfahrungsschatz haben um über die Qualität oder die Inhaltsstoffe oder die Auswirkung des Materials Auskunft zu bekommen.
26. Für mich sind Erfolgsfaktoren aus der Sicht von Lohmann natürlich ein hohes Maß an Verlässlichkeit,

#### 15.10.5 Uncertainty and Complexity

<b>Theme</b>	<b>Transaction Theory</b>
<b>Code</b>	Influencing_Factors
<b>Sub Codes</b>	Uncertainty and Complexity
<b>Segments</b>	22

1. Cert.Sys ist ein Erfolgsfaktor, Prozesssicherheit und Hygiene.
2. Ink Ordinance hat keine Top Priorität, steht jedoch auf dem Radar, auf der To Do Liste
3. Ja, allerdings. Man bewegt sich dann in einen sehr detailliert geregelten Bereich und kann nicht mehr so arbeiten wie es einem gerade in den Kram passt, sondern muss auf viele gesetzliche Vorgaben und Grenzwerte und Konformitätsprüfungen sich einrichten, die man, wenn es nicht um Lebensmittelverpackungen geht nicht hat. Da gibt es reguläre Produktsicherheitsgesetze, die regulären Anforderungen...



4. Es ist ja nicht nur der Austausch des Produkts sondern auch der Austausch des Knowhows, auch die technischen Informationen die dazugehören.
5. Bis wohin reicht die Haftung meines Lieferanten? Das funktioniert so nicht, dass ist auch nicht so angelegt im Lebensmittelbedarfsgegenständerecht, dass ist immer von einer gemeinsamen Verantwortung hier die Rede. Man muss sich hier darüber abstimmen was man gemeinsam erreichen will mit den Mitteln Erklärungen. Ich glaube auch viele sind mittlerweile, viele Kunden haben darüber eben die Kenntnis erlangt dass eben eine solche Erklärung vielleicht Haftungsrechtlich belastbar ist, in dem da eine Erklärung abgegeben wird seitens des Lieferanten, aber wir hatten den Fall noch nicht, aber die Juristen bestätigen das. Im theoretischen Falls das es zu einem Rückruf kommt, oder zu einer Verbraucherschädigung, also strafrechtlich oder eben Ordnungswidrigkeiten, dass in diesem Fall, wenn dann natürlich aufgrund des Schadens Kosten entstanden sind, die dann der Lieferant für die Verpackungen zu tragen hat, sich dann die entsprechende Versicherung einschreitet des Packmittelherstellers. Und die fragt dann: Entsprech das denn eine solche Erklärung wissentlich abzugeben? Entsprech dass denn dem Standard? Ist das richtige kaufmännische Verhalten an der Stelle gewesen? Und wenn die Kaufmann gegen sein Wissen einfach ein Erklärung unterzeichnet hat, die verlangt war vom Kunden, ist die gegebenenfalls durch die Haftpflichtversicherung die der Versicherer abgibt, für den Schaden einzutreten nicht abgedeckt.
6. Aber ich glaube eben dass hier der Kunde natürlich sehr stark, weil er weiß 80% der in Faltschachtel verpackten Güter sind Schnelldreher, FMCGs, fast moving consumer goods, die aufgrund der Unentschlossenheit des Kunden, sehr stark aufgrund der Verpackungsgestaltung entschieden werden solche Entscheidungen. 70% der Kaufentscheidungen fallen erst am Point-of-Sale. Und da spielt natürlich die Faltschachtel aufgrund ihrer hohen Bedruckbarkeit, aufgrund ihrer klaren Oberfläche sehr große Vorteile auf, in der Wertigkeit, in der Vermittlung von Marke und Artikel, als andere Verpackungen. insofern gibt es da gewisse Vorteile und das ist eben auch ein Punkt, denn der Markenartikler abwägt.
7. Offengestanden, wenn es um Konsumverpackungen geht, welcher Verbraucher steigt denn heutzutage noch durch was es für Zertifizierungen gibt? Bewerten kann er sie ohnehin nicht.
8. Es gibt ja Verpackungen da sind fünf Siegel drauf und jetzt, nach einer Umfrage bei Konsumenten, 90% können mit keinem dieser Siegel irgendetwas anfangen

9. Welches Produkt liefert mir mein Lieferant sondern: a) wie stellt er es her? Also nicht nur unter hygienischen und rein normierten Verfahren sondern: Was steckt für eine Philosophie in dem Unternehmen dahinter? Das heißt, was ich eben sagte: Wie geht man a) mit den Zulieferern um? Also auch ein Hersteller von Packmitteln hat Zulieferer. Wo kommen die Rohstoffe her? Sind die Rohstoffe nachverfolgbar. Wo man früher gesagt hat: Das ist mein Lieferant, der muss nach HACCP Produzieren, alles andere interessiert mich nicht, so was geht heute tatsächlich deutlich weiter. Das geht eben von Lieferanten des Lieferanten, also die gesamte Wertschätzungskette, wo kommt eigentlich die Pulpe her? Wie wird die Pulpe hergestellt? Dass wir hier sauber produzieren heißt ja nicht dass wir irgendwo in Südamerika irgendwelche Flüsse versauen.
10. Also sprich, die Druckfarbenindustrie wüsste schon, wie sie dem begegnen, müsste rein vom Ablauf her, hätte aber zum heutigen Standpunkt noch Probleme mit einigen Farbsystemen, weil einfach noch nicht alle nötigen Substanzen auf der positiv Liste stehen,
11. Die nächste Stufe, die Abschätzung: kann es in der Einzelverpackung zu Überschreitungen der SML Werte kommen oder nicht, dass können wir ja nicht tun. Das heißt, es ist dann die Aufgabe der Druckerei quasi deren Wissen über Geometrie der Schachteln, über Farbbelegung der Schachtel und die Menge an Lebensmittel die dann drin sein wird quasi abzuschätzen: Kann da etwas passieren oder nicht? Und dann gibts da natürlich wie immer verschiedene Möglichkeiten, wenn man rein nach Aktenlage, weit entfernt von den SML-Werten liegt, dann kann man auch sagen, da kann nichts passieren, da brauchen wir nichts machen, wenn es irgendwo grenzwertig ist, dann muss man mit dem entsprechenden Auftraggebern über Migrationstests reden.
12. Es ist ja Fakt, also gerade in diesem Entscheidungshilfeprojekt hat die Behörde damals definitiv geschrieben das Recycling-Kartonagen nicht für Lebensmittelverpackungen geeignet sind. Das hören andere Behörden nicht so gerne.
13. Wie es zuletzt kam, war der Vorschlag das man das im Material misst und nicht im Produkt weil im Produkt hat man ja noch andere Eintragsquellen, da hab ich dann auch wieder das Problem das jemand, der quasi einen Barrierschicht aufgebracht hat, natürlich enthält dann das Material eine gewisse Anzahl an Mineralöle, wie ich das dann wieder nachweisen muss, dass ich eine gute Barriere habe und das was außen ist, ist dann nicht relevant. Das erscheint mir alles als sehr unausgegoren wie das überprüft werden soll.

14. Wir hätten auch als Verbände auch nicht korrekt gearbeitet wenn das jetzt nicht so wäre. Ja, die Branche hat sich sehr sensibilisieren lassen von diesen Veröffentlichungen und sie hat reagiert indem eben auch Verpackungsänderungen erfolgt sind bei den zu Rede stehenden Produkten im Fokus. In der Lieferkette entsprechende Anforderungen gestellt worden. Man kann nicht mehr behaupten dass sich die Branche heute noch auf dem Kenntnis- und Umsetzungsstatus befindet wie in 2010. Was allerdings ärgerlich ist, dass die Begründung für plötzliche Maßnahmen immer noch darauf Bezug nehmen auf diese Studien von Koni Grob damals.
15. Wenn die Firma ihre Produkte entsprechend kennt, spezifizieren kann, als geeignete Lebensmittelverpackungen, das ist die einzige Hürde die ich sehe. Von allen anderen Dingen die jetzt auszuhandeln sind zwischen Hersteller und Kunde möchte ich jetzt nicht sprechen. Es gibt keine Zulassungen oder Anerkennungen für Betriebe die jetzt Verpackungen herstellen. Anders ist das bei Lebensmittelherstellern.
16. Es ist nach wie vor eine große Frage, wie diese sogenannte Cross-Kontamination beurteilt wird.
17. Unsere grundsätzliche Haltung gilt natürlich auch in Richtung solcher Öle, die zwar in Zeitungen rechtmäßig auf Basis von bestehenden Gesetzen eingebracht werden, die aber, weil im Lebensmittelverpackungsbereich andere Gesetze gelten, in Verpackungen aus Recyclingpapier stören
18. Ich glaube dass unsere Branche vorbereitet ist, weil wir schon so lange darüber diskutieren das Risiko einer entsprechenden Verordnung bekannt ist,
19. Ansonsten läuft man doch als Hersteller von Kartonverpackungen erheblich Gefahr Haftungsrisiken ausgesetzt zu sein.
20. Andererseits ist man als Verpackungshersteller und als Inverkehrbringer von Lebensmitteln in Verpackungen und als Lebensmittelverpacker ist man Inverkehrbringer und Störer dadurch, man muss es also selber nachweisen ob die Dinge die da migriert sind, ungefährlich sind und vertretbar sind oder ob es eben eine unververtretbare Zusammensetzung ist. Zwar wird das ganze ausgelöst von einer Analyse der NGOs oder der Überwachungsbehörde, aber dann ist man eben auch selber am Zug nachzuweisen dass das ganze in Ordnung ist.
21. Wie ich uns Deutsche kenne, wird man versuchen das immer auf die vorgelagerten Stufen zu verlagern und sich viele Unterschriften geben zu lassen, damit man da selber auf der sicheren Seite ist.

22. They must demonstrate that they have everything done, because I addressed that question towards my supplier, my packaging producer, he declared that he is not doing something wrong. That is not really specific.

#### 15.10.6 MIN\_TA\_Cost

Theme	Transaction Theory
Code	MIN_TA_Cost
Sub Codes	
Segments	04

1. Entscheidend ist der Preis.
2. First of all to be cheap.
3. Everybody has to deliver a good product at the best price.
4. This will be a cost element, the customers are not willing to pay for it

#### 15.10.7 Bonds Market\_Hierarchy

Theme	Transaction Theory
Code	Bonds Market_Hierarchy
Sub Codes	
Segments	05

1. Und wenn man sozusagen sich zukünftig Abgrenzen will, muss man natürlich so globale Veränderungen, die feststellbar sind, wie zum Beispiel Wirtschaftskrise 2009, internationale Finanz und Wirtschaftskrisen hatte zur Folge, dass die Kunden ihr Work-in-care-Battle abgebaut haben, Lagerbestände, die Sicherheitsabstände oder die Sicherheitsbestände wurden drastisch heruntergefahren, mit dem Effekt, dass heute Faltschachtelhersteller viel kurzfristiger, viel flexibler liefern müssen, dass sie kleinere Mengen in einem Kürzeren Zeitpunkt zur Verfügung stellen müssen, dass sie zu festen Terminen liefern müssen. Alleine im Pharmabereich hat sich die durchschnittliche Auflagenhöhe von 35000 auf 17000 Stück reduziert. Dass muss man natürlich adaptieren wenn man nach wie vor in so einem Bereich erfolgreich sein will.
2. Also im Moment sieht es nicht danach aus. Die zwei genannten, die Kartonhersteller die Karton anbieten mit der Barriere ausgestattet ist, dass

ist die eine Möglichkeit, es gibt auch noch den dritten, der mit der Aktivkohlefunktion. Das sind die, die sie ab Werk schon kaufen können. es gibt natürlich noch die Möglichkeit dass man extrudierten Karton, nachbehandelten Karton, auch dafür gibt es mehrere Anbieter und es wird zukünftig verstärkt auch die Möglichkeit geben, dass der Faltschachtelhersteller selbst in der Lage sein wird, eine Barriere aufzutragen, im Rahmen der Produktion des Druckens, des Lackierens. Das heißt individuell auf den Kunden zugeschnitten, auf ein Produkt zugeschnitten, eine Faltschachtel mit einer Barriere auszustatten. Diese Möglichkeit wird es geben, das ist gut so dass es hier verschiedene Möglichkeiten gibt und man als Faltschachtelhersteller natürlich nicht davon abhängig ist hier von der Lieferantenseite bedient zu werden. Also da gibt es durchaus verschiedene Angebote.

3. Those who will be successful will focus on efficiency
4. Service and Innovation
5. You must find a niche to attack the market.

15.11 RESPONDENT'S LETTER OF AGREEMENT

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**PhD-Project:**

The contribution of the New Institutional Economics in order to avoid opportunistic behaviour in the Packaging Supply Chain. A business process oriented analysis of the forthcoming German Ink Ordinance to avoid food safety scares.

**Supervisors:**

Catholic University San Antonio (UCAM), Murcia (Spain), Prof. Dr. Torrejón, (ftorrejon@ucam.edu)  
 FOM, University of Applied Sciences, Essen (Germany), Prof. Dr. Heupel, (thomas.heupel@fom.de)

**Researcher:** Dipl.-Ing. (FH) Matthias von Juterzenka, MBA

**You are invited to participate in this research study.**

The purpose of this study is to examine the impact of the future German Ink Ordinance in 2017/18 and the contribution of economic theories.

You have been asked to contribute toward this study by reflecting on your professional experiences and personal professional development in a face to face interview with the researcher. The interview should take between 30-45 minutes and strict ethical guidelines will be adhered to. If you agree, the interview will be audio-recorded to facilitate accurate record keeping; otherwise the interviewer will take field notes. The digital recorded files will be labelled with a pseudonym to ensure confidentiality and erased following the transcription, verification of the transcript and submission of the researcher's thesis. You will be asked later to review the summarized transcript of your interview to verify the accuracy and authenticity of its content and given the opportunity to make further comments and amendments, as and where, appropriate. Depending on your preferences you may stay absolute anonymous, any information obtained during this study, which could identify you, will be treated confidentially and your anonymity assured. The information will be used for the purpose of the researcher's thesis and may at some time in the future, be used for publication. You are free to decide whether or not to participate in this research study and to withdraw at any time.

The results of this study will be made available to you on request.

- Interview accepted:**
- |                          |                       |                          |                                    |
|--------------------------|-----------------------|--------------------------|------------------------------------|
| <input type="checkbox"/> | Anonymous             | <input type="checkbox"/> | Mentioned by name, voice recording |
| <input type="checkbox"/> | Anonymous & recording | <input type="checkbox"/> | Anonymous, field notes only        |
| <input type="checkbox"/> | Other: _____          |                          |                                    |

Name of respondent, signature: \_\_\_\_\_

Tel: \_\_\_\_\_, Email: \_\_\_\_\_

Place: \_\_\_\_\_, Date: \_\_\_\_\_

**Figure 30:** Letter of agreement (English version)

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**Thesis:**

Der Beitrag der Neuen Institutionen Ökonomie zur Vermeidung von opportunistischem Verhalten in der Zulieferkette für Verpackungen. Eine Geschäftsprozess Analyse der zukünftigen Deutschen Druckfarbenverordnung zur Vermeidung von Lebensmittel Krisen.

**Mentoren:**

Catholic University San Antonio (UCAM), Murcia (Spain), Prof. Dr. Torrejón, (ftorrejon@ucam.edu)  
FOM, University of Applied Sciences, Essen (Germany), Prof. Dr. Heupel, (thomas.heupel@fom.de)

**Forscher:** Dipl.-Ing. (FH) Matthias von Juterzenka, MBA

**Sie sind eingeladen an dieser Studie teilzunehmen!**

Der wissenschaftliche Hintergrund der Studie ist es, die Wirkung der zukünftigen Deutschen Druckfarben Verordnung in 2017/18 zu erfassen und den Beitrag ökonomischer Theorien zu bewerten.

Sie sind gebeten zu dieser Studie beizutragen aufgrund ihrer Lebens- und Berufserfahrung in einem persönlichen Interview mit dem Forscher. Das strukturierte Interview wird etwa 30-45 Minuten dauern und befolgt strikte ethische Rahmenrichtlinien. Wenn sie zustimmen, wird das Interview digital aufgezeichnet und anonymisiert um Vertraulichkeit zuzusichern. Nach der Transkription, Kontrolle des Transskriptes und Eingang in die Thesis werden die Daten gelöscht. Zu einem späteren Zeitpunkt werden sie gebeten werden, die Zusammenfassung des Transskriptes von unserem Interview zu begutachten, die Authentizität des Inhalts zu bestätigen und ggf. Kommentare und Ergänzungen hinzuzufügen. Auf ihren Wunsch können sie völlig anonym bleiben, ohne dass irgendeine Information zu ihnen zurückführt. Die Informationen aus dem Interview werden im Sinne der Thesis verarbeitet und veröffentlicht. Sie entscheiden, ob sie an der Studie teilhaben möchten und können jederzeit ihre Teilnahme in jeder Form widerrufen.

Die Ergebnisse der Studie werden nach der Verteidigung der Thesis auf Wunsch zugesandt.

**Interview akzeptiert:**  Anonym, ohne Notizen  Namentlich, Sprachaufzeichnung  
 Anonym & Sprachaufzeichnung  Anonym mit Notizen  
 Andere: \_\_\_\_\_

Name des Teilnehmers, Unterschrift: \_\_\_\_\_, \_\_\_\_\_

Tel: \_\_\_\_\_, Email: \_\_\_\_\_

Ort: \_\_\_\_\_, Datum: \_\_\_\_\_

**Figure 31:** Letter of agreement (German Version)

## 15.12 CODESYSTEMS AND ALGORITHM

● ☰ <b>Codesystem</b>	
● ☰ Substitution Plastics vs. Fibres_SRQ4_5	44
● ☰ EU_Spill_Over_SRQ4_4	42
● ☰ Oligopol_SRQ4_3	23
● ☰ Asset_Specificity_SRQ4_2_	32
● ☰ Future_Success_Factors_SRQ4_1	81
● ☰ Frequency_Long_Term_Relationship_SRQ1_3	7
● ☰ Task_Fulfillment_Supplier_SRQ3_2	10
● ☰ Indicators_Success	14
● ☰ Trust_Instruments_SRQ3_5	42
● ☰ Vertical_Integration	6
● ☰ Trust_in_PSC_SRQ3_4	37
● ☰ Trust_Label_Hallmark	18
● ☰ Contracts_Design	8
● ☰ Meaning_of_Cert.Sys_SRQ3_3	33
● ☰ Cert.System_Barriers	9
● ☰ Validation_Authorities_NGO_Customer_SRQ3_1	46
● ☰ Market_Entry_Barriers_SRQ2_1	14

**Figure 32:** Codesystem of subcodes



●☰ P-A Theory		0
☰● Agency Cost		3
●☰ Additional Mitigate Measures	☰	17
●☰ Self_Secting_Agent		3
●☰ Screening_Principal		7
☰● Signaling_Agent		39
●☰ Signalisation		5
●☰ Bounding	☰	13
●☰ Monitoring and Control_Principal		21
●☰ Risk_Allocation		17
●☰ Agent_Motivation		6
●☰ T_A_C_Theory		0
●☰ Tool_Bonds Market_Hierarchy		5
☰● Influencing_Factors		0
●☰ Bounded Rationality		17
●☰ Individual Max. of Utility		10
●☰ Opportunism		5
●☰ Uncertainty and Complexity		23
●☰ Small Numbers / Strategic Impotance		8
●☰ Transaction Atmosphere		26
●☰ MIN_TA_Cost		4
●☰ Property-Rights_Theorie		0
●☰ Tool_Concentration_Dilution		13
☰● Influencing_Factors	☰	0
●☰ Institutional Boundaries		27
●☰ Imperfect Information		19
●☰ Indivisible Production Processes	☰	10
●☰ Individual Max. of Utility		2
●☰ Bounded Rationality		16
●☰ Individual Utility		3
●☰ Externalities		31
●☰ Concentration_PR	☰	6

Figure 33: Codesystem of NIE-Codes

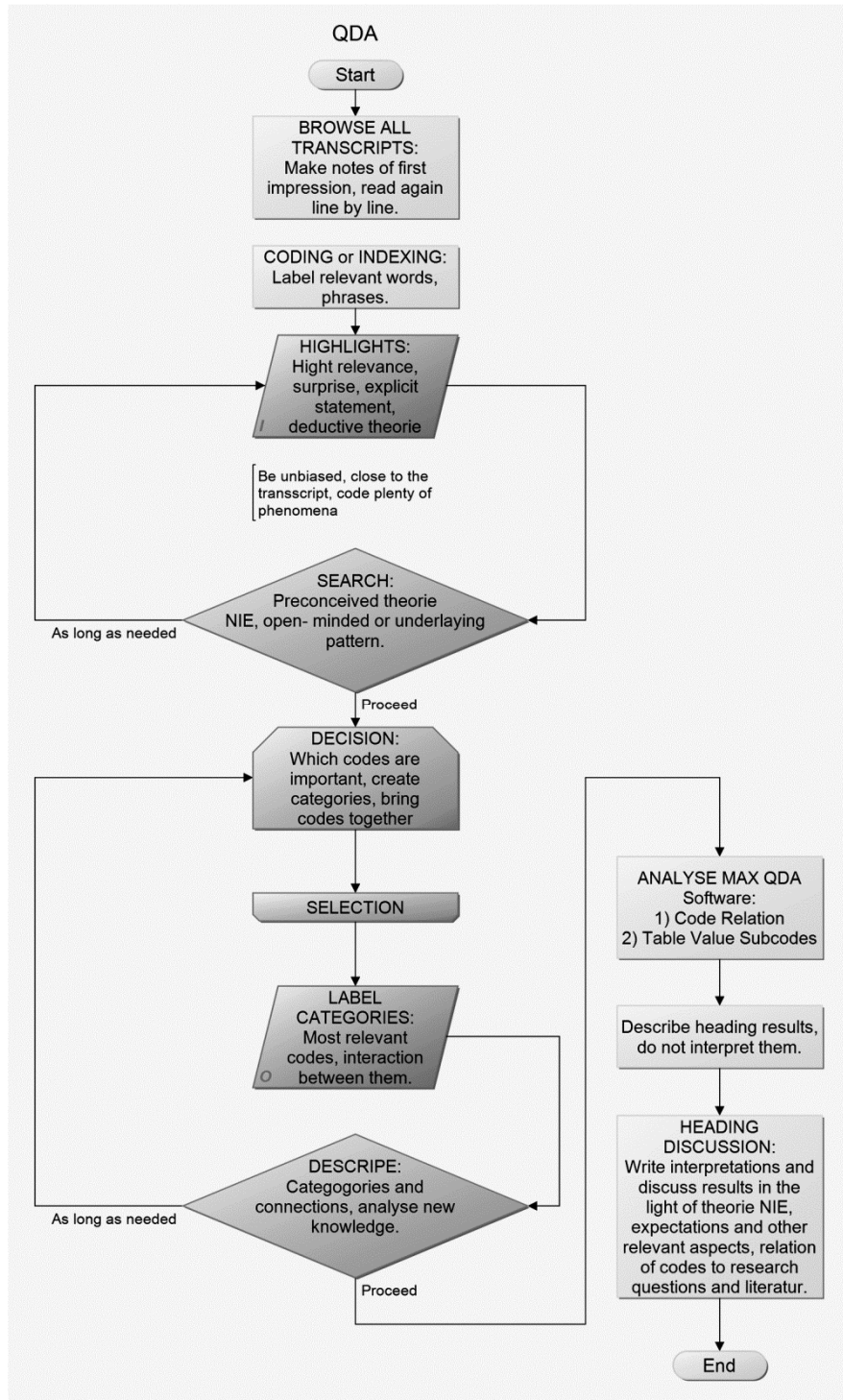
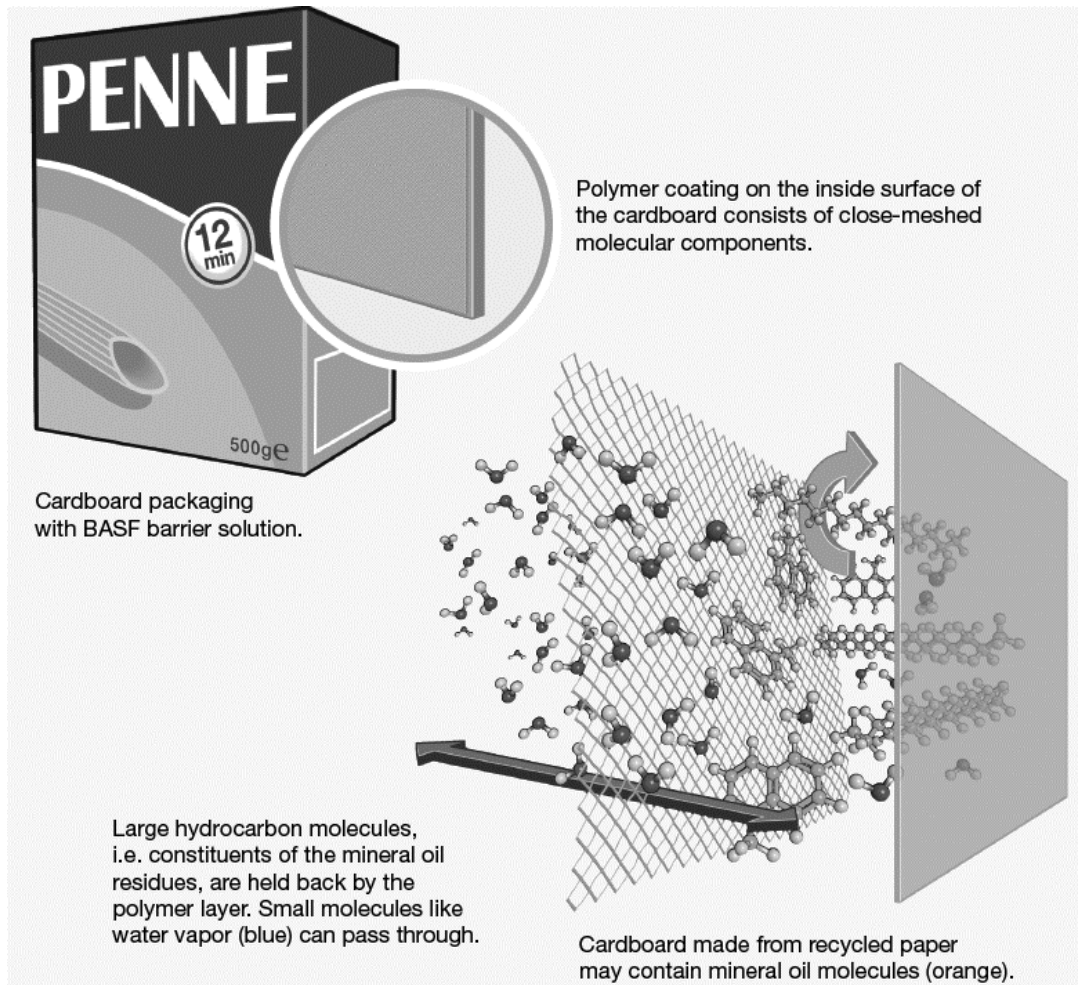


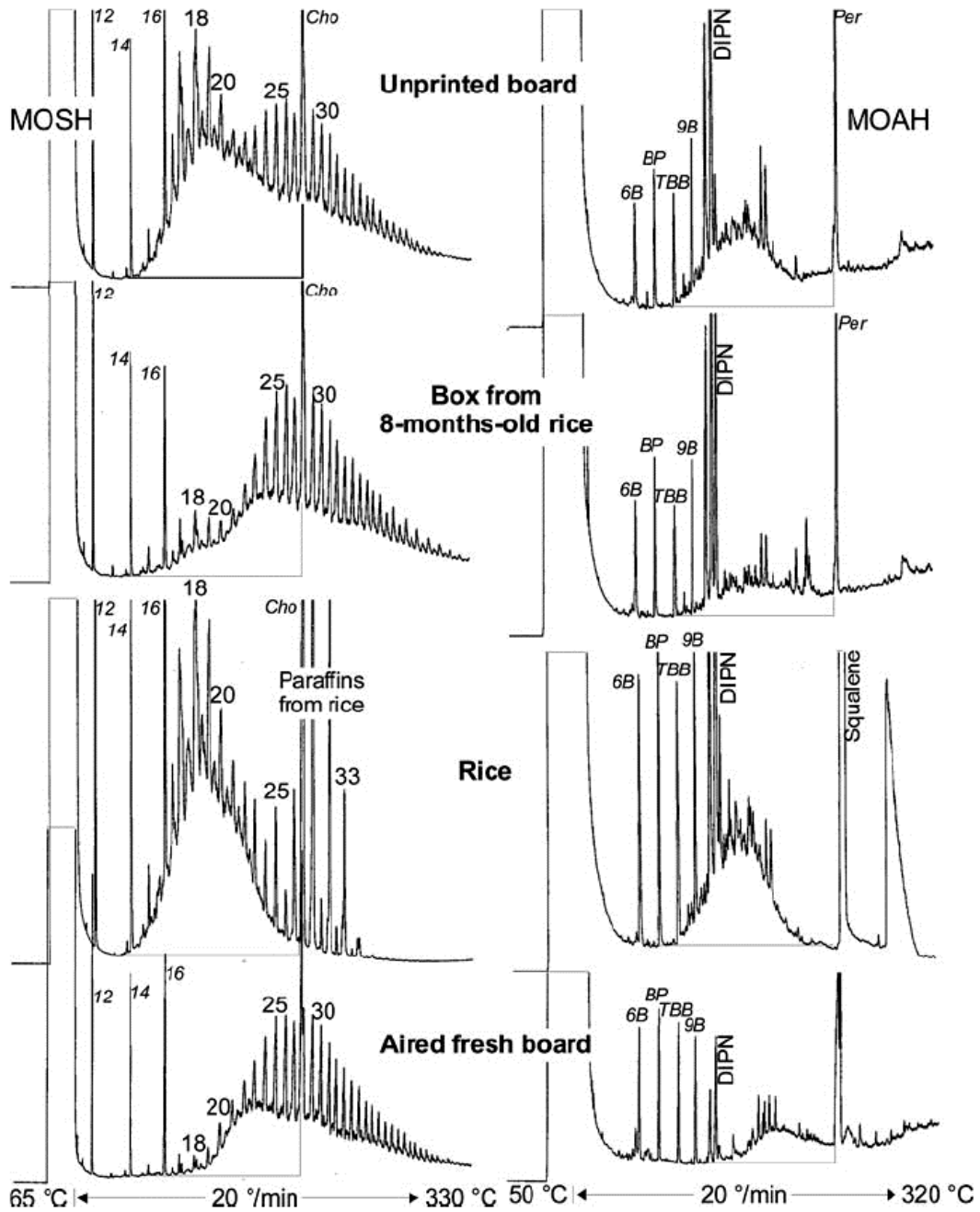
Figure 34: Authors algorithm for coding

## 15.13 PRINCIPEL OF BARRIER COATINGS



**Figure 35:** Principle of Barrier Coating, source BASF (n.n.)

15.14 MIGRATION MOSH / MOAH INTO RICE



**Figure 36:** HPLC-GC-FID, chromatograms of MOSH, (left) and MOAH (right) of samples related to rice packed into a cardboard box during 8 months. Areas integrated up to n-C28. Source: Biedermann & Grob (2010, p.794)