

# WAGENINGEN UNIVERSITY AND RESEARCH CENTRE

Department of Management Studies



# Rheinische Friedrich-Wilhelms-Universität Bonn

Faculty of Agriculture



## Final Research Report

# Impact of the consolidation process on innovations in the German compound feed industry

Submitted in partial fulfilment of the requirement for the degree of "Master of Science" by:

**Henning Köster**

Reg.Nr. Wageningen University 900706493050

Reg.Nr. Bonn University 2371787

November 2015

Author: Henning Köster  
Hauptstraße 27  
49846 Hoogstede, Germany

Study Program at Wageningen University: Management, Economics and Consumer Studies

Study Program at Bonn University: Agricultural and Food Economics

Supervisors: Dr. Emiel FM Wubben (Wageningen University)  
Prof. Dr. Stefanie Bröring (Bonn University)

Co-supervisor: Dr. Jos Bijman (Wageningen University)

Course Code of Master Thesis at Wageningen University: MST – 80430 (30 ECTS)

Course Code of Master Thesis at Bonn University: M – 401 (30 ECTS)

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## Abstract

The compound feed industry can be regarded as a crucial segment of the supply chain for animal derived food, as it produces feed for animals like cattle, pigs, poultry and fish. Due to global trends like a rising demand for food or an increasing competition for arable land and new societal demands for animal welfare and food security, the German compound feed industry is facing some challenges, most of which are related to aspects like sustainability, food security, food safety, environment and efficiency. In this research it is assumed that innovations are needed in order to overcome these challenges. Besides that, the German compound feed industry is passing through a consolidation process, meaning that it is very common that companies from that industry acquire or merge with each other. The objective of this research is to contribute to the clarification of the impact of the consolidation process in the German compound feed industry on company-level innovation in that industry. In order to reach the objective, 17 possible effects of M&A's on innovation have been identified during a literature review, whose existence in four examined cases has been analyzed through in-depth interviews with managers from German compound feed companies. Besides that, the main reasons for the M&A's in the examined companies have been identified through the interviews. Altogether, this research found that the impact of the consolidation process in the German compound feed industry on company-level innovation is limited and that market related motives are decisive for M&A's in that industry.

**Keywords:** compound feed industry, consolidation, innovation, M&A's

## Management Summary

The objective of this research is to contribute to the clarification of the impact of the consolidation process in the German compound feed industry on innovations of companies in that industry. In order to reach this objective, different methods are used. A literature review is conducted to find common ground in terms of the possible effects of M&A's on innovation and to summarize these possible effects. Besides that, the literature review aims at identifying tools and methods for the measurement and assessment of industry consolidation. To describe the consolidation process in the German compound feed industry, the tools and methods for the assessment of industry consolidation are applied to data from the German Federal Office for Agriculture and Food. To check whether the identified possible effects of M&A's on innovation are recognizable in real cases, in-depth interviews are conducted with managers from German compound feed companies which were involved in M&A's since the change of the century are held. Moreover, the interviews are intended to uncover the main reasons for the M&A's in the examined companies.

In the literature review, 17 direct and indirect possible effects of M&A's on innovation have been found. However, the research finds that both the presence of these effects in the examined cases and the actual impact of these effects on innovation in the examined cases are limited. In accordance to that finding, the identified main reasons for M&A's in the German compound feed industry reveal that R&D and innovation do not have top priority in the examined cases. Furthermore, the research findings clearly confirm the presence of a consolidation process in the German compound feed industry, which emerges through M&A's on company-level.

Altogether, this research concludes that the impact of the consolidation process in the German compound feed industry on company-level innovation is limited and that market related motives are decisive for M&A's in that industry. However, it has to be noted that the external validity of this research is restricted, as the sample size of four cases is rather small, what restricts the generalizability of the findings.

According to the findings and considering the limitations of this research, some recommendations to managers from German compound feed companies are formulated. When deciding on and implementing a M&A, managers should become more aware of the possible effects of M&A's on innovation, as this might influence the choice of a M&A or steer the related effects. Furthermore, managers should check the so called market and technology relatedness between the involved parties, as relatedness can significantly influence the impact of a M&A on innovation. Moreover, managers should observe the reactions of outsiders to a M&A (competitors) in order to be prepared for possible re-actions or retaliations, such as, for instance, the introduction of an innovative product. Finally, managers of German compound feed companies should not have high expectations related to the beneficial impact of M&A's on innovation, as this impact was found to be limited in the examined cases.

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## **1 Introduction**

The compound feed industry can be regarded as a crucial segment of the supply chain for animal derived foodstuffs, as it produces and delivers feed for animals like cattle, pigs, poultry and fish. The production of feed is carried out by commercial companies, which either produce the feed and sell it to livestock producers, or produce the feed for their own livestock production (Verheijen, Rommens, 1995).

Considering the global trends like a rising global demand for food from animal origin and an increasing competition for arable land, the feed industry is facing some challenges (FEFAC, 2009). Most of these challenges are related to aspects like sustainability, food security, food safety, environment and efficiency. According to Flachowsky (2015), who states that meat consumption will increase by 70% until 2050, part of the solution to produce "more for more with less" is an improved feed efficiency in the animals. Besides this challenge for increasing resource efficiency, the feed industry has to cope with "societal demands like animal health and welfare, food safety, sustainability of animal production and environmental aspects of animal keeping, including carbon footprints" (Flachowsky, 2011). In this research, it is assumed that the current state of the art processes and products of the compound feed industry are not capable to completely overcome the above mentioned challenges. Therefore, innovations in the sense of innovative processes and products are necessary to overcome these challenges.

The compound feed industry is passing through a consolidation process, meaning that it is common practice that companies from the compound feed industry acquire or merge with other companies in that industry. The German association of the feed industry refers in its annual report 2013/14 to a changing structure of the German feed industry, which results in fewer but larger production units (DVT, 2014). The number of feed production units in the European Union (EU) decreased from approximately 4,500 in 2004 to approximately 3,800 in 2013, while the average production volume per unit increased from approximately 32,000 tons in 2004 to approximately 40,000 tons in 2013 (FEFAC, 2013). In the period from 2004 to 2013, the overall compound feed production in the EU increased by approximately 5% (FEFAC, 2013).

In this research, it is assumed that there is a direct relationship between the innovations of the compound feed industry and the above mentioned consolidation process of that industry. It is also assumed that there is an indirect relationship between the consolidation process and overcoming the stated challenges. The relationship between the consolidation process and the innovations of the compound feed sector is the object to be examined in this research. Therefore, the main concepts of this research are the concept of mergers and acquisitions (M&A's), the concept of industry consolidation and the concept of innovation. The link between the innovations and the overcoming of the challenges is not further examined in this study, because this link is assumed to be very technical and therefore not appropriate to be examined in a management related research study.

## **1.1 Conceptual Research Design**

In the following five sections, the research objective, the research framework, the research questions, the outline of the chapters in this report and a definition of the key concepts are described. After reading these sections, the reader should have a good idea on the main objective of this research, the related research questions, the strategy to answer the research questions and the structure and main concepts of this research.

### **1.1.1 Research Objective**

The objective of this research is to contribute to the clarification of the impact of the consolidation process in the German compound feed industry on innovations of companies in that industry by providing an overview of the literature on possible effects of mergers and acquisitions (M&A's) on innovation and by analyzing whether these effects are recognizable in German compound feed companies.

The examination of the German compound feed industry in terms of industry structure and innovation is interesting as there are no other studies that examine the impact of the consolidation process in the compound feed industry on company-level innovations. Most studies on feed and the feed sector are very technical, meaning that they are related to nutritional or other technical issues. On the other hand, studies on the structure or dynamics of the compound feed industry are very scarce and often not public.

This research project is intended to provide recommendations which are valuable for managers of compound feed companies. Information about the impact of the consolidation process on the innovations of the compound feed industries can help these managers in strategic decisions which are related to possible M&A's, because one goal of an imminent M&A might be to foster innovation and thereby to solve the above mentioned challenges. This research aims at determining whether an increase of innovation can be realized through M&A's.

This research is limited to companies which are engaged in the production of compound feed for farm animals. Compound feed is defined as "a mixture of at least two feed materials, whether or not containing feed additives, for oral animal-feeding in the form of complete or complementary feed" (FEFAC, 2014). Companies which are engaged in the production and marketing of premixes, vitamins or other ingredients of compound feed are not taken into consideration in this research, as these companies differ from compound feed companies in terms of margins and R&D activities and a comparison would be misleading. However, it is possible that one and same company produces both premixes or other feed ingredients and compound feed, for example as a result of a merger between a compound feed company and a feed ingredients company. These companies might also be considered in this research study, but with special attention on the origin of their innovations and on the intention of compound feed companies merging with feed ingredient companies.

Regarding the source of innovation, one might argue that many feed related innovations do not originate from the compound feed companies itself, but from upstream segments of the

supply chain like producers of feed ingredients or manufacturers of machinery. Nevertheless, in this research it is assumed that also compound feed companies are capable to come up with innovations. This assumption can be substantiated by the fact that many compound feed companies have own R&D departments and employ scientists. The impact of the consolidation process on the innovations which originate from the compound feed companies itself is the object to be examined in this research.

Moreover, this research is limited to compound feed companies which are located in Germany. In the case of multinational compound feed companies, only the compound feed businesses in Germany are object of this research. Germany has several regions with intensive animal husbandry. The annual consumption of feed of the German agricultural animal husbandry is approximately 80 mln. tons grain equivalent units, whereby one grain equivalent unit is equivalent to the nutritional value of barley (DVT, 2015). Approximately 89 per cent of the German annual feed consumption is produced in Germany (DVT, 2015). Therefore, the German compound feed industry is crucial for the production and supply of animal derived foodstuffs in Germany. Another reason why this research is limited to Germany is the availability of the required data and the fact that the researcher is a German citizen with previous knowledge of and interest in the German compound feed industry.

Furthermore, this research is limited to compound feed companies which were involved as acquirer or target in at least one M&A since the turn of the century. It is assumed that only managers whose companies have been involved in M&A's can make valuable statements in relation to the research questions. Moreover, for the mentioned period relevant data are available.

Regarding the type of research, this research includes elements of two different research types, which are classified in the book of Verschuren and Doorewaard (2010). First, it includes elements of a theory-testing research, which is related to a theory-oriented research. This type of research aims at testing whether "[...] existing theories hold[s] when tested against the latest developments [...]" (Verschuren, Doorewaard, 2010). In this study, it is tested whether theories on the relationship between M&A and innovation hold true in the German compound feed industry. These tests are considered to be the scientific added value of this research, as scientific theories are either confirmed or rejected in relation to a specific industry. If applicable, suggestions for changes of the theories can be made based on the tests. Second, this research also includes elements of a problem-analyzing research, which is regarded as a practice-oriented research (Verschuren, Doorewaard, 2010). In general, the problem is that there is a knowledge gap of the relationship between the consolidation process and innovation of the German compound feed industry. This is a problem for managers of German compound feed companies, as they might not know whether and to what extent innovations can be realized through M&A's. This study primarily aims at contributing to the closure of the knowledge gap. But to do so, the researcher needs to be aware of what exactly the knowledge gap is, because only then he will be able to find relevant data and literature which are appropriate for closing the knowledge gap.

In this study, different levels of investigation are conceivable. First, one could investigate the consolidation process at industry level and its impact on innovations at industry level. Second, one could investigate the consolidation process at industry level and its impact on innovation at company level, i.e. on innovation in particular companies. Third, one could investigate the consolidation process at company level, i.e. a M&A in a particular company, and its impact on innovation at company level, i.e. innovation in that company. Fourth, instead of investigating the impact of the consolidation process on innovation, one could decide to investigate the effects in the opposite direction, i.e. the impact of innovation on consolidation. Among these possible variations, in this research study it is decided to investigate the consolidation process at industry level and its impact on innovation at company level, i.e. on innovation in particular companies which were involved in at least one M&A since the turn of the century. This decision is based on the fact that the consolidation process affects and changes the whole industry, while innovation is assumed to take place within the companies and not at a more aggregate level. To summarize, this research study uses an outside-in perspective. The consolidation process is analyzed at industry level, while the impact of this consolidation process on innovation is analyzed at company level. Therefore, the consequences of dynamics outside the company (consolidation process) on activities, decisions and outcomes inside the company (innovations) are analyzed.

### 1.1.2 Research Framework

According to Verschuren and Doorewaard (2010), a research framework provides an overview of the consecutive steps to be taken during the research project. Figure 1 represents the research framework for this project which can be formulated as follows:

A literature review about theories on innovation, M&A's and the relationship between M&A's and innovation (a) results in the identification of possible effects of M&A's on innovation, which serve as a theoretical framework (b) and in a set of questions to be asked in the interviews, which help to compare the possible effects to the cases (b) in a comparative analysis (c). Besides that, based on different industry consolidation measurement tools (a) and the data from the German Federal Office for Agriculture and Food (a), the industry consolidation process is described (b) and through the interviews with the examined cases (b), it is tried to find reasons of the consolidation process (c). A final confrontation of the results of the comparative analysis (c) with the reasons of the consolidation process (c) results in a conclusion on the impact of M&A's on the innovations of German compound feed companies (d).

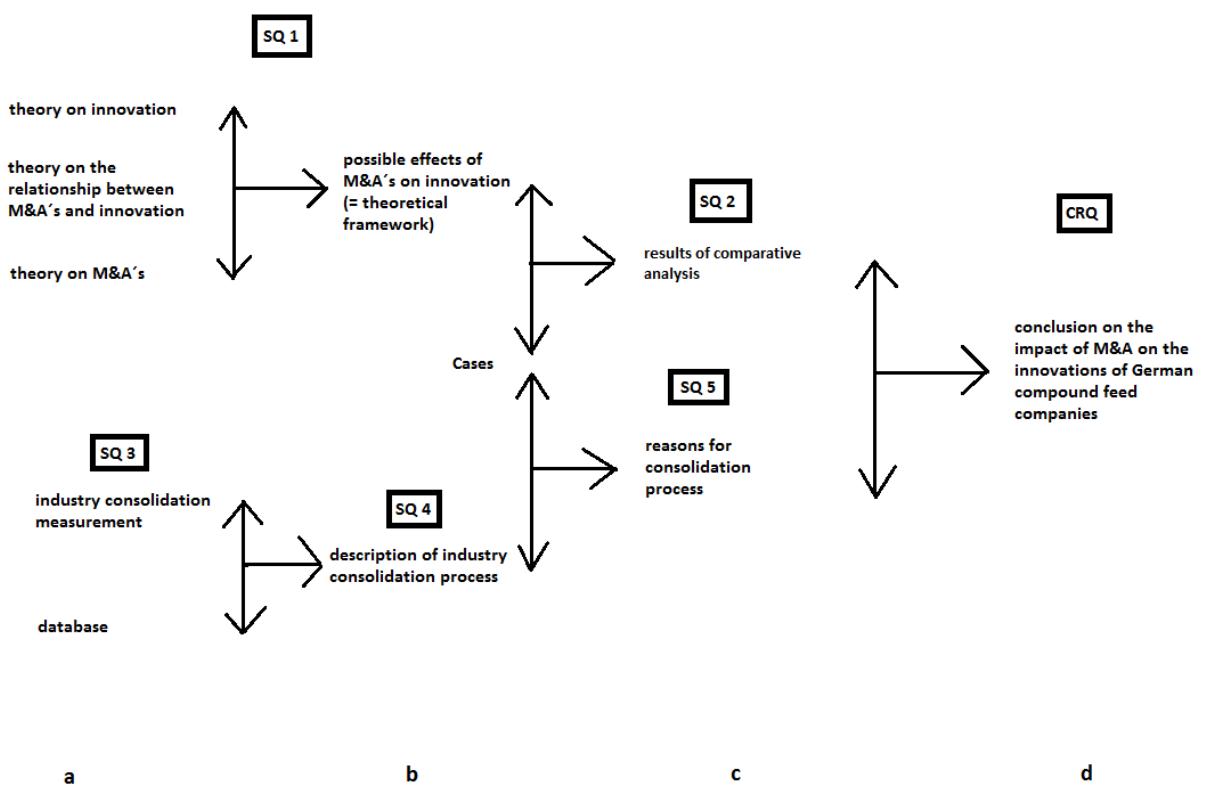


Figure 1 Research Framework

### **1.1.3 Research Questions**

This section presents the central research question and the related sub questions to be answered in this research. It is indicated in brackets in which chapter the answer to the respective research question can be found.

Central Research Question:

CRQ What is the impact of the consolidation process in the German compound feed industry on innovation in companies in that industry? (Chapter 8)

Sub questions:

SQ 1 Which possible effects of M&A's on innovation can be extracted from scientific literature? (Chapter 2)

SQ 2 Which of the possible effects can be recognized in the examined cases? (Chapter 6.1)

SQ 3 Which measurement tools for industry consolidation can be found in scientific literature? (Chapter 3)

SQ 4 Based on the identified measurement tools and the data from the German Federal Office for Agriculture and Food, how can the consolidation process in the German compound feed industry be described? (Chapter 5)

SQ 5 Which reasons for the consolidation process in the German compound feed industry can be extracted from the examined cases? (Chapter 6.2)

Verschuren and Doorewaard (2010) mention two important function requirements of research questions, namely efficiency and a steering function. Efficiency refers to the degree to which the knowledge which results from answering the research questions contributes to achieving the research objective (Verschuren, Dooreward, 2010). The above mentioned research questions fulfill this requirement, because the required knowledge for their answering highly contributes to the achievement of the research objective. The steering function requires a research question to indicate which types of knowledge and material needs to be gathered in order to answer the question (Verschuren, Doorewaard, 2010). This requirement is fulfilled by the above mentioned research questions, as they clearly indicate which type of scientific literature and empirical data is needed in order to answer them.

### **1.1.4 Definition of Concepts**

- Compound feed: "a mixture of at least two feed materials, whether or not containing feed additives, for oral animal-feeding in the form of complete or complementary feed" (FEFAC, 2014)
- Compound feed industry: Aggregation of companies and businesses that are engaged in the production of compound feed; not included are firms that produce feed additives, vitamins, mineral feed or other feed ingredients

- Merger: “An amalgamation or joining of two or more firms into an existing firm or to a new firm” (OECD, 2015).
- Acquisition: “[...] obtaining ownership and control by one firm, in whole or in part, of another firm or business entity” (OECD, 2015).
- Concentration: “[...] extent to which a small number of firms or enterprises account for a large proportion of economic activity such as total sales, assets or employment” (OECD, 2015)
- Consolidation: “[...] combination or amalgamation of two or more firms into one new through the transfer of net assets [...]” (OECD, 2015)
- Innovation: “[...] implementation of a new or significantly improved product (good or service), or process [...] (OECD, 2015), which can be regarded as a new solution to a problem.

The concepts of mergers and acquisitions (M&A's), concentration, consolidation and innovation are object of this research. Determining how these concepts can be operationalized and measured is part of the research objective. For that reason, these concepts are not specified any further at this point.

To summarize the conceptual research design, this research is intended to clarify the impact of the consolidation process in the German compound feed industry on company-level innovations in that industry. To do so, the central research question and the related sub questions need to be answered. To do so, it is analyzed whether possible effects of M&A's on innovation, which are identified in a literature review, can be recognized in German compound feed companies. Besides that, the main reasons for the M&A's in the examined cases are identified.

## **1.2 Technical Research Design**

The following three sections describe the research strategy, the methodology and the research material. These sections outline how the research objective is achieved and which methods and materials are used.

### **1.2.1 Research Strategy**

To achieve the research objective, a suitable research strategy is chosen for this study. This strategy contains elements from three different research strategies which Verschuren and Doorewaard (2010) distinguish, namely case study, grounded theory approach and desk research.

The overall strategy to be followed in this research is the case study. According to Verschuren and Doorewaard (2010), the goal of a case study is “[...] to gain a profound and full insight into one or several objects or processes that are confined in time and space”. It uses a qualitative research method with an emphasis on a comparison and interpretation of the results. The way of data gathering is regarded as qualitative (Verschuren, Doorewaard, 2010). Verschuren and Doorewaard (2010) hint at the importance of the selection of cases.

In this research, the cases to be examined are compound feed companies which are located in Germany and which have been involved in at least one M&A since the change of the century. This selection is made because for the mentioned period data from the German Federal Office for Agriculture and Food are available and it is assumed that only managers whose companies have been involved in M&A's can make valuable statements regarding the research questions. In terms of the different variants of case studies which Verschuren and Doorewaard (2010) distinguish, in this research a comparative case study is used with a separate examination of each case in a first stage and a comparison in a second stage. What is special about this case study is that in the second stage the cases are not compared with each other, but with the possible effects of M&A's on innovation. This is why this research strategy also contains elements of a grounded theory approach. Within the grounded theory approach, Verschuren and Doorewaard (2010) distinguish several ways of making comparisons. One way is the secondary theoretical comparison, in which a phenomenon is compared to theories which were formulated by others (Verschuren, Doorewaard, 2010). This is also part of this research project: phenomena (i.e. M&A and innovation of cases) are compared to scientific theories (i.e. theories on the relationship between M&A's and innovation). In order to find these relevant theories to which the phenomena are compared, elements of a third research strategy are needed, namely desk research. From the different variants of desk research which Verschuren and Doorewaard (2010) distinguish, a literature review is part of this research project with the goal "[...] to map out the latest theories pertaining to a certain subject".

### **1.2.2 Methodology**

This research starts with a literature review. The scientific databases "Scopus", "Web of Science", the online Wageningen University Library and the online Bonn University Library are used to find relevant scientific articles and books. If an article contains relevant information, the references of this article are screened to find further articles and sources in the respective field. The goal of the literature review is to find common ground in terms of the possible effects of M&A's on innovation and to summarize these possible effects. Furthermore, the literature review aims at identifying tools and methods for the measurement and assessment for the concepts of industry consolidation.

To describe the consolidation process in the German compound feed industry, it was planned to apply the tools and methods for the assessment of industry consolidation to the data from the German Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung, BLE). However, due to the limited availability of relevant data, only the k-firm concentration ratios CR<sub>4</sub> and CR<sub>8</sub> are calculated. Because of §15 Abs. 4 Gesetz über Meldungen über Marktordnungswaren, a German law that governs the reporting about goods that are subject to EU market regulations, and because of statistical nondisclosure reasons, the BLE is not allowed to publish firm specific data like the market shares of single firms. However, the BLE suggested an alternative strategy and accordingly executed the necessary calculations for the k-firm concentration ratios CR<sub>4</sub> and CR<sub>8</sub>. As the

CR<sub>4</sub> and CR<sub>8</sub> do not enable to draw any inferences about single companies, the provision of the CR<sub>4</sub> and CR<sub>8</sub> is in line with §15 Abs. 4 Gesetz über Meldungen über Marktordnungswaren. Besides that, data from the BLE are aggregated and transformed into figures which illustrate the change of important variables of the German compound feed industry like total production volume, number of companies or average production volume per company.

To gather relevant information from the managers of compound feed companies, in-depth interviews are conducted, which is a type of semi-structured interviews (Kumar, 2005). According to Boyce and Neale (2006), in-depth interviewing is a qualitative research technique, which is characterized by intensive individual interviews and a rather small number of interviewees. They are therefore useful to explore a person's perspective or opinion on a particular topic or issue. Taylor and Bogdan (1998) describe in-depth interviews as "[...] face-to-face encounters between the researcher and informants directed towards understanding informants' perspectives on their lives, experiences or situations". The purpose of the interviews is to find out whether the possible effects of M&A's on innovation, which are indicated during the literature review, can be recognized in the examined cases. These cases are compound feed companies which are located in Germany and which have been involved in at least one M&A since the change of the century. The possible effects of M&A's on innovation are implicitly named in the interview questions, so that the answers provide a clear indication whether these effects were at hand or not. However, pre-structured interview questions are used in order to obtain comparable results on the one hand and in-depth information on the other hand.

To summarize the technical research design, the research strategy contains elements of a case study, a grounded theory approach and a desk research. The used methods are a literature review and in-depth interviews with managers from German compound feed companies.

## 2 Possible Effects of M&A's on Innovation

This chapter answers the first sub question, which is “Which possible effects of M&A’s on innovation can be extracted from scientific literature?” For that reason, the possible effects of M&A’s on company-level innovation that were found during the four weeks of literature review are described. To do so, some specifications regarding the term “effect” need to be made. These specifications help to keep this section clear and comprehensible. In this research study, an effect is regarded as a concretely specified impact that a cause has on a certain object (the how of the effect). For example, scarce financial resources might cause a cut back of R&D expenditures in a company. Second, in this study there is a distinction between direct and indirect effects that M&A’s can have on innovation. Direct effects are directly, i.e. without an interstage, influencing the innovation, whereas indirect effects are influencing the innovation via an interstage.

Furthermore, it should be noticed that in the following mainly the effects of M&A’s on R&D instead of the effects of a concentration process on innovation are described. There is strong evidence for a positive impact of investments in R&D on product innovation (Deng et al., 2012). Therefore, R&D is regarded as a good indication for innovation. Furthermore, M&A’s increase concentration (Schulz, 2007). Therefore, a sequence of M&A’s can be regarded as a concentration process.

Moreover, it should be mentioned that in the following it is assumed that companies are profit maximizers, meaning that they aim to reach the highest outcome with given resources or a given outcome with minimum resources. This aim can be reached through sales maximization and/or cost minimization.

### 2.1 Direct Effects of M&A’s on Innovation

In the following sections, possible direct effects of M&A’s on innovation are described and summarized afterwards. A M&A provides the acquirer with permanent access to and full hierarchical control over innovative products, technologies, capabilities and assets (Chakrabarti et al., 1994), including licenses and patents (Schulz, 2007). This access and control might be the base for the effects described in the following sections.

#### 2.1.1 Economies of Scale in R&D

A company can realize economies of scale if it “[...] can double its output for less than twice the cost” (Pindyck, Rubinfeld, 2004). Two merging companies who both conduct R&D can realize economies of scale in R&D by spreading the costs of R&D over a larger R&D output (Cockburn, Henderson, 2001). Either R&D related measures like number of projects or market related measures like sales of new products can be regarded as output (Cassiman, Ueda, 2006). Furthermore, merging companies can realize economies of scale through the elimination of duplicate R&D inputs while keeping the R&D output at a constant level (Schulz, 2007; Röller et al., 2006). Altogether, economies of scale result in lower cost per R&D outcome and therefore in a more efficient R&D process. Several scholars consider a

reduction of innovation costs as a benefit (Batterink, 2009). Moreover, a reduction of innovation costs contributes to the aim of profit maximization of the merged company.

### **2.1.2 Economies of Scope in R&D**

Economies of scope arise whenever the total cost of producing two goods jointly is lower than producing each of the goods separately (Marques, De Witte, 2011). Two merging companies who both conduct R&D can realize economies of scope in R&D by allocating existing R&D resources to a larger range of innovation projects at little or no additional costs (Henderson, Cockburn, 1996). Besides that, a possible internalization of external effects can be the basis for economies of scope. A larger range of innovation projects enables the internalization of external effects, i.e. the internalization of knowledge spillovers (Schulz, 2007). Knowledge spillovers can be regarded as an outflow of information to external parties, who benefit from this information. If the benefiting external parties can be integrated in the company due to a M&A, the knowledge remains within the company and there are no spillovers or externalities anymore. The internalization of knowledge spillovers increases the level of R&D (Schulz, 2007). Furthermore, the elimination of duplicate R&D inputs can be the basis for economies of scope (Cassiman, Ueda, 2006). The overall effect of economies of scope in R&D is an increased efficiency of the R&D process, as the costs per innovation outcome decrease.

### **2.1.3 Synergies in R&D**

Synergies in R&D can be defined as “innovation outcomes that can only be realized when two firms are combined” (Batterink, 2009). M&A’s enable the combination of different R&D inputs. This may result in new products which can be introduced to the market earlier, in improvements of existing products (Griffin, 1997) or in efficiencies that were not achievable before (Cassiman, Ueda, 2006). One can differentiate between different R&D inputs. The combination of different knowledge resources or capabilities might result in knowledge and capabilities that did not exist before and therefore in new solutions to given problems (Cassiman, Ueda, 2006). The combination of diverse state-of-the-art technologies is likely to result in new operations and solutions that were not feasible before (Cassiman, Ueda, 2006), which is perceivable in both incremental innovations and shorter innovation lead times (Harrison et al., 1991). The sharing of complementary competences and best practices brings the innovation process to a higher level, resulting in increased productivity (De Man, Duysters, 2005). Altogether, synergies in R&D, which are realized by the combination of diverse R&D inputs broaden the scope of the R&D process, thereby increasing the R&D output and improving the R&D performance (Cassiman, Ueda, 2006).

### **2.1.4 Creation of a New Growth Platform**

The possibility to create a new growth platform is a kind of synergy. A new growth platform can be defined “[...] as a new technology development trajectory oriented at creating new products and /or markets. Such a growth platform enables the realization of breakthrough innovation, followed by a continuous flow of new products within the same product family” (Batterink, 2009). One way to create a new growth platform is the combination and

integration of complementary knowledge resources and capabilities, as this facilitates the development of new knowledge that would not have been developed otherwise (Ranft, Lord, 2002). Another way to create a new growth platform is to overcome a certain threshold level in terms of scale and scope. For example, a merged company might afford to conduct more specific, more costly or more risky innovation projects, which were not affordable in the pre-merger situation (Henderson, Cockburn, 1996). Altogether, a new growth platform is likely to result in radical or breakthrough innovations and subsequent incremental innovations (Batterink, 2009).

### **2.1.5 Innovation Lead Time Reduction**

The effect of a reduced innovation lead time is a kind of synergy. Innovation lead time can be defined as the time period “[...] between the emergence of new knowledge and its distillation into usable technology [...] [and its introduction to] the market place” (Drucker, 1985). It has been recognized that the combination of state-of-the-art technologies allows a reduction of innovation lead times (Harrison et al., 1991). Furthermore, innovation lead times can be reduced by parallel development trajectories and an improved allocation of R&D specialists across projects due to combined innovation resources (Omta, 1995). Altogether, a shorter innovation lead time might help companies to win the innovation race and to be first at market, thereby enabling a sooner recovery of innovation costs.

### **2.1.6 Risk Management in R&D**

The effect of risk spreading is a kind of synergy, as the combination of different R&D inputs enables the execution of several research projects at the same time. This more diversified portfolio of R&D projects enables the merged companies to spread the risk of R&D across more projects (Schulz, 2007). This leads to a reduction of the variance in return and therefore to a reduction of R&D costs (Cassiman, Ueda, 2006). Moreover, the effect of risk spreading is relevant in the case of debt financed R&D projects, despite the fact that most R&D projects are internally financed (Schulz, 2007). If the risks of a project are considered to be low, external financiers are more willing to grant a loan and the costs of a loan, i.e. interest rates are usually lower because of lower probability of default (Schulz, 2007). The overall result of risk spreading in R&D are lower R&D costs because of a lower chance of failure.

### **2.1.7 Market Power and Appropriation in the Technology Market**

M&A's can substantially affect market power and competition in the technology market. An increased market power in the technology market of the merged company might create an entry barrier for potential entrants (Cassiman, Ueda, 2006). If potential new entrants recognize the large market power in the technology market of the merged company, they consider their own chances to be successful in that market as very low and not even try to enter. If the merged company faces only very low competition in the technology market due to the entry barriers, it might consider it as not necessary to invest in R&D and to be innovative on the one hand. On the other hand, the merged company might be more willing to invest in longer term R&D projects, which contribute to the long term success of a

company but which are usually more risky (Cassiman, Ueda, 2006). For that reasons, the overall effects of an increased market power in the technology market due to an M&A on innovation are not unambiguous (Cassiman, Ueda, 2006).

### **2.1.8 Diseconomies in R&D due to Bureaucracy and Internal Organization**

Diseconomies in R&D arise from costs which are related to the joining of two companies. The joining of two distinct companies in an M&A usually requires the alignment of corporate structures and cultures and a drastic change of routines (Schulz, 2007). Difficulties like resistance against M&A's, not-invented-here syndrome or slower decision making result in high costs and bureaucracy and in a less efficient R&D process. Furthermore, managers might focus on the joining of the two companies, thereby ignoring R&D projects and innovation efforts. Altogether, the joining of two companies results in costs which cancel out the realized economies of scale and scope, resulting in net diseconomies.

### **2.1.9 Agency Problems in R&D**

Agency costs are a result of conflicts between the principal and the agent (i.e. between the owners and the managers; Agency Problem I) and between the principal and the principal (i.e. between the different owners of a firm; Agency Problem II) (Deng et al., 2012). In single-owner companies, conflicts between the principal (i.e. owner) and the agent (i.e. manager) are mitigated through a close alignment of interests between the owners and the managers (Anderson, Reeb, 2003). In many single-owner companies the owner and the CEO is the same person and conflicts of interests do not occur at all (Deng et al., 2012). Also Agency Problem II usually does not occur in single-owned companies, as there is only one owner and therefore no potential for conflict (Deng et al., 2012). The absence of Agency Problem I and II minimizes the agency costs in single-owner companies. Altogether, single-owner companies tend to convert R&D inputs into innovation outputs in a very efficient and effective way (Deng et al., 2012). However, single-owner companies often face problems related to the cooperation with external parties due to asymmetric information and a lack of transparency and trust to outsiders. Single-owner companies are often not willing to share information with external knowledge resources and can therefore not utilize them in their innovation process (Deng et al., 2012). On the other hand, multi-owner companies are more prone to Agency Problem I and II. As the owners typically nominate a CEO who does not come from within their own ranks, a conflict between the owners and the CEO is possible because of opportunistic behavior (Agency Problem I). Besides that, a conflict between the different owners is possible (Agency Problem II). For example, one owner might evince opportunistic behavior and try to appropriate the R&D outcome for his own advantage instead of using it for the benefit of the company (Deng et al., 2012). Moreover, the different owners might not be willing to cooperate and to share tacit knowledge, what makes the innovation process inefficient and ineffective (Su, Carney, 2011). However, multi-owner companies typically face the problems related to cooperation with external parties to a lesser extend compared to single-owner companies and are therefore better able to leverage the knowledge and expertise of company outsiders (Deng et al., 2012). According to

Deng et al., "this may result from the fact that [...] [companies] with multiple-owners are less averse to external control and more information transparent, resulting in a greater willingness and ability to utilize [...] [external] sources of product innovation".

What is relevant in this research study is the fact that a company might convert from a single-owner company to a multi-owner company as a result of a M&A. This might entail a change from a more inward directed, autonomous and very efficient and effective innovation approach towards a more outward directed, collaborative and less efficient and effective innovation approach. Whether this change is positively or negatively influencing the innovation process is not clear, as both innovation approaches have advantages and disadvantages and a general weighting is not possible.

### **2.1.10 Motivation Problems in R&D**

M&A's usually imply the need to change corporate structures, cultures and routines or to redeploy resources (Schulz, 2007). According to Schulz (2007), these restructuring processes need to be managed properly, because otherwise they might have a detrimental effect on the motivation and attitude of key inventors and researchers, who might leave in the worst case. If so, this would have bad consequences on the innovation process on the one hand, as crucial sources of (tacit) knowledge and R&D experience would lack. This might disrupt the innovation process and prevent the company to bring new products to the market, resulting in a bad economic performance. On the other hand, the lost key inventors and researchers might be hired by competitors of the company, thereby strengthening the competitors and weakening the primal company. In a nutshell, M&A's might result in motivation problems of important employees because of the need of restructuring. These motivation problems are detrimental for the innovation process and the economic performance of the company.

### **2.1.11 Summary of the Direct Effects of M&A's on Innovation**

To end this section on the direct effects of M&A's on innovation, a brief summary is given in the following. The identified direct effects might influence the innovation process positively or negatively. Economies of scale and scope result in lower costs per R&D input and influence the innovation process in a positive way. Synergies in R&D improve the R&D output and performance and have a positive impact on the innovation process. A new growth platform results in radical innovations which are followed by incremental innovations and thereby positively influences the innovation process. Shorter innovation lead times enable companies to win the innovation race and to recover innovation costs earlier, what is positive for innovation. Another positive effect is the possibility of risk spreading, as it results in lower R&D costs. It is not clear whether an increased market power in the technology market is positively or negatively influencing the innovation process, as an increased market power entails different ways of action that are reasonable for companies. Diseconomies are affecting the innovation process in a negative way, as they entail costs which cancel out possible economies of scale or scope. In terms of agency problems, it is not clear whether the change from a more inward directed, autonomous and very efficient and effective innovation approach towards a more outward directed, collaborative and less

efficient and effective innovation approach is positively or negatively affecting the innovation process, as both innovation approaches have advantages and disadvantages and a weighting has to be conducted for every single case. Finally, motivation problems might result in the loss of key inventors and are therefore detrimental for the innovation process.

## **2.2 Indirect Effects of M&A's on Innovation**

Next to the direct effects of M&A's on innovation, there are indirect effects, which affect the innovation process indirectly, i.e. via an interstage. These indirect effects are described in the following sections and summarized afterwards.

### **2.2.1 Economies of Scale in Production**

A company can realize economies of scale if it can double the output for less than twice the costs (Pyndick, Rubinfeld, 2004). Economies of scale in the product market can be realized through the spreading of production- or R&D- costs and inputs across more output or through the elimination of duplicate production inputs while keeping the output level constant (Cassiman, Ueda, 2006). On the one hand, economies of scale in the sense of spreading production inputs across more production output or eliminating duplicate production inputs can free up scarce resources like financial or human resources, which in turn could be spent on R&D and innovation (Henderson, Cockburn, 1996). On the other hand, economies of scale in the sense of spreading R&D costs across more market output leads to lower R&D costs per production unit. Altogether, economies of scale in production increase the R&D efficiency, i.e. the output per R&D unit and can free up resources for the innovation process.

### **2.2.2 More Efficient Internal Capital Markets**

M&A's can result in more efficient capital markets of the merged company compared to the pre-merger situation (Cassiman, Ueda, 2006). This effect is akin to economies of scale. The combination of the financial resources of two companies within the scope of a M&A can partly or fully make debt financing obsolete or alleviate the financial constraints of the merged companies. This makes the internal capital markets more efficient by reducing the unit costs of financing (Cassiman, Ueda, 2006). This is likely to change the organization of R&D financing, the level of R&D financing and the evaluation procedures for R&D financing (Cassiman, Ueda, 2006). Altogether, more efficient internal capital markets can change the organization and structure of the financing of R&D and thereby lower the costs of R&D.

### **2.2.3 Economies of Scope in Production**

Economies of scope arise whenever the total cost of producing two goods jointly is lower than producing each of the goods separately (Marques, De Witte, 2011). In the production process, economies of scope can be realized by spreading the costs of production across a larger portfolio of different products or by eliminating duplicate inputs. The overall effect of economies of scope in production is the cross-fertilization of R&D outputs, meaning that the R&D outputs are valuable for the production of a larger range of different products. The result is a more efficient R&D process (Cassiman, Ueda, 2006).

#### **2.2.4 Synergies in Production**

A synergy can be defined as “[...] a situation where the final outcome of a system is greater than the sum of its parts” (Batterink, 2009). Synergies in the production process can be a result of a M&A and occur if different production inputs, technologies, manufacturing and market knowledge or other functional activities are combined or integrated (Cassiman, Ueda, 2006). The results are new products or efficiencies that were not achievable in the pre-merger situation. Therefore, the effect of synergies on the R&D process might be direct, e.g. through the integration of functional activities into the R&D process, or indirect, e.g. through the combination of manufacturing and market knowledge through synergies (Cassiman, Ueda, 2006).

#### **2.2.5 Market Power and Appropriation in the Product Market**

The market power of two merged companies can be substantially larger compared to the market power of the single companies in the pre-merger situation. This increased market power helps the merged companies to appropriate the outputs which originate from the knowledge inputs which were invested into the production process (Cassiman, Ueda, 2006). The impact of this improved appropriation on the R&D process is ambiguous. On the one hand, the improved appropriation increases the incentive of the merged company to invest in R&D, as it recognizes the possibility to appropriate a substantial share of the R&D outputs. On the other hand, the larger the market power is, the lower is the potential for a further expansion of market power and therefore the lower is the potential to realize further economies of scale and scope (Cassiman, Ueda, 2006). Altogether, the effects of an increased market power in the technology market due to an M&A on innovation are not unambiguous.

#### **2.2.6 Diseconomies in Production due to Bureaucracy, Internal Organization, Agency and Motivation Problems**

After a M&A, diseconomies might occur in the production process because of an increased bureaucracy or a misfit of the involved companies due to clashing corporate structures, cultures and routines (Schulz, 2007). For example, managers might solely focus on the joining of the two companies during and shortly after the M&A, thereby ignoring the production and marketing activities of the company. Besides that, many M&A's imply agency problems and cause considerable transaction costs, which are related to joining two companies (Schulz, 2007). These transaction costs decrease the profits significantly and thereby shorten the financial resources for R&D. Furthermore, M&A might negatively affect the motivation of employees, what might lead to efficiency losses in the production process, an increase in overall production costs and therefore fewer resources for R&D. Altogether, diseconomies in production increase the unit cost of production and decrease the sales, resulting in less profit and less financial resources for R&D.

### **2.2.7 Financial Discipline**

M&A's can lead to an increased financial leverage of the acquiring company compared to the pre-merger situation. Financial leverage is the degree to which a company is financed by debt. As an acquiring company is likely to take a loan in order to acquire another company, a M&A is likely to result in a higher financial leverage of the acquiring company. A high degree of financial leverage implies a high degree of debt and therefore high interest payments (Strahan, 1999), what in turn results in high opportunity costs of funds allocated to R&D (Cassiman, Ueda, 2006). The high opportunity costs might result in the elimination of R&D projects or in a change towards more short term R&D projects, as short term projects are less risky and pay off sooner (Schulz, 2007). In a nutshell, a high financial leverage increases the chance of bankruptcy and therefore forces managers to strictly control expenditures and cancel R&D projects which are considered as unnecessary (so-called pet projects) (Cassiman, Ueda, 2006).

### **2.2.8 Summary of the Indirect Effects of M&A's on Innovation**

To end this section on the indirect effects of M&A's on innovation, a brief summary is given in the following. The identified indirect effects can foster or disturb the innovation process. Economies of scale and scope in production, more efficient internal capital markets and synergies in production lead to a more efficient innovation process and are therefore fostering innovation. The effects of an increased market power on innovation are ambiguous, i.e. an increased market power can be fostering or disturbing for innovation. Diseconomies in production are clearly detrimental for the innovation process, as they lead to a decrease of resources spent on R&D and to a lower R&D level. Finally, an increased financial discipline is detrimental for innovation, as managers strictly control expenditures and cancel out a part of the R&D projects. This decreases the level of R&D.

## **2.3 Summary of the Possible Effects of M&A's on Innovation**

In this chapter, 17 direct and indirect effects that M&A's can have on innovation are introduced and outlined, and hence the first sub question is answered, which is formulated as "Which possible effects of M&A's on innovation can be extracted from scientific literature?" The identified direct effects of M&A's on innovation are economies of scale in R&D, economies of scope in R&D, synergies in R&D, creation of a new growth platform, innovation lead time reduction, risk management in R&D, market power and appropriation in the technology market, diseconomies in R&D due to bureaucracy and internal organization, agency problems in R&D and motivation problems in R&D. The identified indirect effects of M&A's on innovation are economies of scale in production, more efficient internal capital markets, economies of scope in production, synergies in production, market power and appropriation in the product market, diseconomies in production due to bureaucracy, internal organization agency and motivation problems and financial discipline. Many of the identified effects foster the innovation process, but there are also some effects which are detrimental for the innovation process. Moreover, from some effects it is not clear whether they are positive or negative for the innovation process.

### **3 Measurement Tools for Industry Consolidation**

The aim of this chapter is to answer the third sub question, namely “Which measurement tools for industry consolidation can be found in scientific literature?” To answer this sub question, some common measurement tools for industry concentration are outlined in this chapter. Some of these tools are used in the next chapter to describe the consolidation process which is ongoing in the German compound feed industry.

The widely recognized authority in this field, the OECD (2015), defines concentration as “[...] extent to which a small number of firms or enterprises account for a large proportion of economic activity such as total sales, assets or employment”. Concentration depends on several variables. One of these variables is the consolidation of companies, which may be defined as “[...] combination or amalgamation of two or more firms into one new through the transfer of net assets [...]” (OECD, 2015). Consolidation is usually realized through M&A’s. In this chapter measurement tools for concentration are described, which help to reflect the ongoing concentration process and thereby the ongoing consolidation process and M&A’s in the German compound feed industry.

In the following sections, three different measurement tools for industrial concentration are described, namely the k-firm concentration ratio, the Herfindahl-Hirschmann Index and the Lorenz Curve and the Gini Coefficient. In general terms, industrial concentration is “[...] a function of the number of firms and their respective shares of the total production or sales [in the respective industry or market]” (Kanyenga, Mangisoni, 2007). Alternative terms for industrial concentration are industry concentration, market concentration or seller concentration, with the difference that industrial concentration refers to a whole industry while market concentration refers to a certain market (Kanyenga, Mangisoni, 2007). An industry is considered as aggregation of several markets in the same product field.

The purpose of a measurement tool for industrial concentration, a so called concentration index, is to quantify the degree of industrial concentration (Alvarado et al., 1999). In other words, a concentration index uses numbers to describe industrial concentration. There are several concentration indices known, each with its own advantages and disadvantages (Alvarado et al., 1999). In the following sections, three different concentration indices are described, namely the k-firm concentration ratio ( $CR_k$ ), the Herfindahl-Hirschman Index (HHI), and the Lorenz curve and Gini coefficient.

#### **3.1 k-firm concentration ratio ( $CR_k$ )**

In this section, the calculation of the k-firm concentration ratio is outlined and some advantages and drawbacks are outlined. In the OECD glossary of industrial organization economics and competition law, the k-firm concentration ratio is defined as “the percentage of total industry output (or other such measure of economic activity, e.g. sales revenue, employment) which a given number of large firms account for” (Khemani, Shapiro, 1993). For example, the 4-firm concentration ratio ( $CR_4$ ) is calculated by summing up the market

shares of the four largest firms in terms of market share (Ali et al., 2014), as the following formula illustrates:

$$CR4 = \frac{\sum_{i=1}^4 Si}{\sum_{i=1}^n Si} \times 100$$

*n* is the total number of firms in the industry, *Si* is the percent market share or proportion of sales of the *i*th firm to the industry (Kanyenga, Mangisoni, 2007).

Accordingly, CR<sub>5</sub>, CR<sub>6</sub>, CR<sub>7</sub> etc. are calculated. The more an industry is dominated by a few large firms, the larger is the k-firm concentration ratio. It has an upper limit of 100%, which would be obtained in a situation where the k largest firms account for all the sales in the industry (Kanyenga, Mangisoni, 2007).

An advantage of the k-firm concentration ratio is the fact that it can be calculated with very limited data and that the calculation is quite simple. As a disadvantage it can be expounded that “[...] there is no justification for focusing on the market shares of the top 4-firms rather than three or six” and that the choice of 4-firm concentration as arbitrary (Kanyenga, Mangisoni, 2007). However, it has to be conceded that the 4-firm and 8-firm concentration ratios are used conventionally and are widely recognized as very common concentration indices (Kanyenga, Mangisoni, 2007; Alvarado, 1999). A further disadvantage of the k-firm concentration ratio is that it provides limited insights in the actual market structure, because it accounts for the k largest firms and thereby totally ignores the other firms in the industry. To name an example, two industries with the same CR<sub>4</sub> might differ significantly in terms of their structure, because one industry might have many firms while the other has very few firms (Khemani, Shapiro, 1993). Another example is a market where the largest four firms have a market share of 22,5% each, resulting in a CR<sub>4</sub> of 90%. The same CR<sub>4</sub> of 90% could be realized by one firm accounting for a market share of 60% and 3 firms accounting for a market share of 10% each (Kanyenga, Mangisoni, 2007). Thus, two very different industries might have the same concentration ratios. However, despite this limited meaningfulness of k-firm concentration ratios, they are used as screening device by antitrust authorities and regulators (Belleflamme, Peitz, 2010).

Altogether, the calculation of the k-firm concentration ratio is quite easy, but its meaningfulness is limited. Nonetheless, its use as concentration index is very common widely appreciated.

### 3.2 Herfindahl-Hirschman Index (HHI)

This section aims at describing the calculation of the k-firm concentration ratio and at outlining some advantages and drawbacks of this concentration index. The Herfindahl-Hirschman Index (HHI) accounts for the total number and market share distribution of all firms in the industry (Kheman, Shapiro, 1993). “It is defined as the sum of squared market shares for all [...] firms active on the market” (Belleflamme, Peitz, 2010), as the following formula illustrates:

$$HHI = \sum_{i=1}^n S_i^2$$

$S_i$  is the percent market share of firm  $i = 1, \dots, n$  (Kanyenga, Mangisoni, 2007).

The HHI ranges from a value approaching zero (many small firms) to  $100^2 = 10000$  (one large firm), whereas a higher value indicates a higher concentration (Belleflamme, Peitz, 2010; Nissan, 2003).

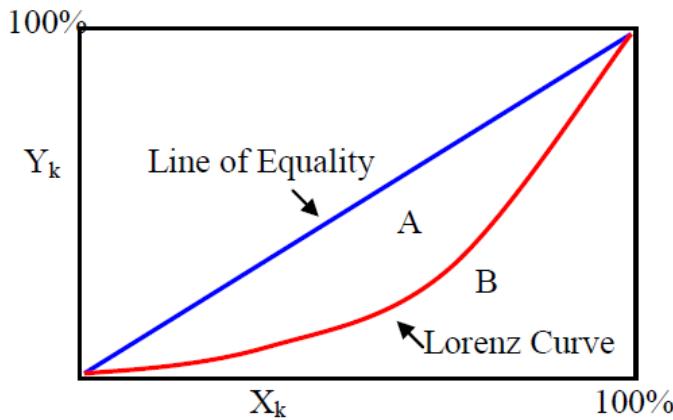
The Herfindahl-Hirschman Index might be considered as a better concentration measure compared to the k-firm concentration ratio, as it captures both the number of all firms and the dispersion of the market shares of all firms (Bellaflamme, Peitz, 2010). This, in turn, means that data about all firms in the industry are needed for the calculation (Kanyenga, Mangisoni, 2007), what can be regarded as a drawback of the HHI. However, according to Kanyenga and Mangisoni (2007) and Nissan (2003), squaring of the market shares gives heavier weights to larger firms, what results in an underrepresentation of smaller firms. This alleviates the mentioned drawback related to a need for data about all firms in the industry, because a lack of data about small firms is not critical as such firms do not affect the HHI significantly (Kanyenga, Mangisoni, 2007). The HHI is considered as “one of the most common means for measuring market power [...]” (Alvarado, 1998) and as “[...] a desirable concentration measure” (Kheman, Shapir, 1993). There is a “[...] considerable visibility [of the HHI] because of its use by the [US] Department of Justice and the Federal Reserve when deciding on the competitive effects of mergers” (Nissan, 2003).

Altogether, the calculation of the Herfindahl-Hirschmann Index requires data about a substantial share of the companies in the respective industry. Despite this obstacle, the Herfindahl-Hirschmann Index is a widely used concentration index.

### 3.3 Lorenz Curve and Gini Coefficient (GC)

The purpose of this section is to describe the calculation and some advantages and drawbacks of the Lorenz curve and Gini coefficient as concentration index. In general, the Lorenz curve and Gini coefficient are used to measure inequality in resource distribution (Kanyenga, Mangisoni, 2007). In terms of industrial concentration, the Lorenz curve and Gini coefficient can be used to explore how the distribution of market shares changes over time

and to indicate whether inequality is increasing or decreasing over time (Kanyenga, Mangisoni, 2007). The Lorenz curve represents the cumulative distribution of the market shares (vertical axis) among the companies (horizontal axis). The Gini coefficient is defined as the ratio of the area between the Lorenz curve and the line of equality to the lower triangle, as Figure 1 illustrates:



$$GC = \frac{A}{|A+B|}$$

Figure 2 Lorenz Curve and Gini Coefficient

*A is the area between the Lorenz curve and the line of equality. B is the area under the Lorenz curve.  $Y_k$  is the cumulative percentage of the market shares of the firms.  $X_k$  is the cumulative percentage of the number of firms (Kanyenga, Mangisoni, 2007).*

The Gini coefficient ranges from zero to one, whereas a value of zero indicates a perfect equal distribution of market shares and a value of one indicates a perfect unequal distribution of market shares (Kanyenga, Mangisoni, 2007).

An advantage of the Lorenz curve and Gini coefficient is the possibility to illustrate the development of inequality over a period of time and the fact that it is more sensitive to the market shares of the medium sized firms than to the shares of the very large ones (Kanyenga, Mangisoni, 2007). It can be regarded as disadvantageous that data about all firms in the industry are needed to draw the Lorenz curve and that it might be complicated to exactly determine the size of the areas A and B.

Altogether, the Lorenz curve and Gini coefficient are well suited as concentration indices as they measure the inequality of the distribution of market shares among companies. Data about all companies are needed for the possibly complicated calculation. Its commonness as concentration ratio is lower compared to the k-firm concentration ratio or Herfindahl-Hirschmann Index.

### **3.4 Usefulness and Limitations of Measurement Tools for Industry Consolidation**

In this section, some general remarks on the usefulness and limitations of the described measurement tools for industry consolidation are given. Each concentration index entails certain advantages and drawbacks in terms of data requirements and meaningfulness. Many aspects of an industry like rivalry among firms are not captured by the presented concentration indices (Alvarado et al., 1999). Therefore, concentration indices provide a very limited insight into the structures of an industry and comprehensive conclusions cannot be drawn based on one concentration index (Kanyenga, Mangisoni, 2007). However, “the greatest usefulness of these [concentration] indices may be their value as relative market power indicators: a larger value [...] indicates greater market concentration than a smaller value” (Alvarado et al., 1999). This means that concentration indices provide the possibility to compare and rank different industries in terms of their concentration. Besides that, concentration indices enable the comparison of concentrations in one industry at different points in time, thereby allowing the depiction of the development of the industry concentration or, in the case of this study, allowing the depiction of a concentration process.

### **3.5 Summary of Measurement Tools for Industry Consolidation**

In this chapter, the third sub question is answered, namely “Which measurement tools for industry consolidation can be found in scientific literature?” Therefore, three different concentration indices are described, namely the k-firm concentration ratio, the Herfindahl-Hirschmann Index and the Lorenz Curve and the Gini Coefficient. The k-firm concentration ratio is defined as “the percentage of total industry output (or other such measure of economic activity, e.g. sales revenue, employment) which a given number of large firms account for” (Khemani, Shapiro, 1993). The Herfindahl-Hirschman Index (HHI) is calculated as “[...] the sum of squared market shares for all [...] firms active on the market” (Belleflamme, Peitz, 2010). The Lorenz curve represents the cumulative distribution of the market shares (vertical axis) among the companies (horizontal axis). The Gini coefficient is defined as the ratio of the area between the Lorenz curve and the line of equality to the lower triangle (see Figure 1 in sub chapter 3.3). When using the described concentration indices, one has to consider the related limitations. Nevertheless, concentration indices allow the depiction of concentration processes.

## **4 Methodology**

The purpose of this chapter is to describe the methods used in this study. The first section outlines the methods to describe the consolidation process in the German compound feed industry. The other sections of this chapter are related to the qualitative part of this study and describe the required data-set, the data sources, the methodology used to gather the data and the operationalization of the key concepts with the derived interview questions.

### **4.1 Description of the Consolidation Process in the German Compound Feed Industry**

To describe the consolidation process in the German compound feed industry, it was planned to apply the tools and methods for the assessment of industry consolidation, which are presented in chapter 3, to the data from the German Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung, BLE). However, due to the limited availability of relevant data, only the k-firm concentration ratios CR<sub>4</sub> and CR<sub>8</sub> could be calculated. Because of §15 Abs. 4 Gesetz über Meldungen über Marktordnungswaren, a German law that governs the reporting about goods that are subject to EU market regulations, and because of statistical nondisclosure reasons, the BLE is not allowed to publish firm specific data like the market shares of single firms. However, the BLE suggested an alternative strategy and accordingly executed the necessary calculations for the k-firm concentration ratios CR<sub>4</sub> and CR<sub>8</sub>. As the CR<sub>4</sub> and CR<sub>8</sub> do not enable to draw any inferences about single companies, the provision of the CR<sub>4</sub> and CR<sub>8</sub> is in line with §15 Abs. 4 Gesetz über Meldungen über Marktordnungswaren. Besides that, data from the BLE are aggregated and transformed into figures which illustrate the change of important variables of the German compound feed industry like total production volume, number of companies or average production volume per company.

### **4.2 Required Data-Set**

The data to be gathered is required to answer the second and fifth sub question of this research study, respectively “Which of the possible effects [of M&A’s on innovation] can be recognized in the examined cases?” and “Which reasons for the consolidation process in the German compound feed industry can be extracted from the examined cases?” These sub questions will be answered in chapter 8. For that reason, the data must clearly reveal which of the identified effects of M&A’s on innovation are at hand in the examined cases and which were the main reasons for the companies to engage in M&A’s. The data is gathered through in-depth interviews and are of a qualitative nature.

### **4.3 Data Sources**

The data sources are managers from German compound feed companies. The term “managers” refers to owner-managers or employees who have substantial decision-making authority in their companies. The companies of the interviewed managers are engaged in the production of compound feed for farm animals. Compound feed is defined as “a mixture of at least two feed materials, whether or not containing feed additives, for oral animal-feeding in the form of complete or complementary feed” (FEFAC, 2014). In defining the

dataset the following four restrictions apply: First, companies which are engaged in the production and marketing of premixes, vitamins or other ingredients of compound feed are excluded from this research, as these companies differ categorically from compound feed companies in terms of margins and R&D activities. Thus, a comparison would be misleading. Second, it is possible that one and same company produces both premixes or other feed ingredients and compound feed, for example as a result of a merger between a compound feed company and a feed ingredients company. These companies might also be considered in this study, but with special attention on the origin of their innovations and on the intention of compound feed companies merging with feed ingredient companies. Third, the examined companies are located in Germany. In the case of multinational compound feed companies, only the compound feed business in Germany is object of this research. The reason for this restriction is that Germany has several regions with intensive animal husbandry. The annual consumption of feed of the German agricultural animal husbandry is approximately 80 mln. tons grain equivalent units, whereby one grain equivalent unit is equivalent to the nutritional value of barley (DVT, 2015). Approximately 89% of the German annual feed consumption is produced in Germany (DVT, 2015). Therefore, the German compound feed industry is crucial for the production and supply of animal derived foodstuffs in Germany. Another reason why this research is limited to Germany is the data availability and the German citizenship of the researcher, bringing in knowledge of and interest in the German compound feed industry. Fourth and final, the examined companies were involved as acquirer or target in at least one M&A since the turn of the century. It is assumed that only managers whose companies have been involved in M&A's can make valuable statements in relation to the research questions. In a nutshell, the data sources for this research are managers of compound feed companies, which are located in Germany and which were involved in at least one M&A since the turn of the century.

In the planning phase of the interviews, 17 German compound feed companies, which have been involved in at least one M&A since the year 2000, were contacted. More specifically, they received a mail which contained a short introduction of the researcher, a short description of the study and a request for an interview with an executive manager from that respective company. Furthermore, the interview questions were attached to the email in order to provide more information related to the study and to reduce possible inhibitions of the managers. Five days after sending the emails, the companies were called by phone in order to make sure that the emails were noticed by the appropriate persons. From the 17 contacted companies, merely 5 were willing to participate in an interview. From the remaining 12 companies, 7 did not reply at all, even not after several emails or phone calls. Moreover, 2 companies considered themselves as not suitable for the study and 3 companies explicitly stated their unwillingness to take part in an interview. Furthermore, one interview did not result in the actually requested information. The homepage of the respondent's company gave the researcher the impression that the respective company was included in several M&A's since the change of the century. In the interview the respondent explained that no real M&A's occurred, but that several companies have been integrated

into a group of companies. Every integrated company is still independent. For that reason, the interviewee explained that the interview questions, which are all related to M&A's, would not apply to his company. Therefore, this company is not included in the dataset. However, the respondent gave very interesting insights in the development and organization of his company. This information is considered to be very interesting and worth mentioning in the discussion chapter. For the reasons mentioned above, the dataset consists of merely four cases in total.

The results of the four conducted interviews are summarized and presented in chapter 6 in the form of tables. If possible, literally quotes of the interviewees are presented in the tables. However, in some cases the answers are rather implicit and too lengthy to cite. In these cases, the essential aspects of the answers are paraphrased and presented in the table. Below the tables, the results are summarized and interpreted.

#### **4.4 Research Methods**

To gather the required information, face to face in-depth interviews are conducted, which is a type of semi-structured interviews (Kumar, 2005). The interviews are held in German, as German is the native language of both the interviewees and interviewer. The goal of the interviews is to find out whether the possible effects of M&A's on innovation, which are indicated during the literature review, can be recognized in the examined cases. Furthermore, the interviews are intended to explore the main reasons for the company to engage in M&A's. In-depth interviews are the best research method to accomplish this goal, because they enable the exploration of the managers' views on the reasons and effects of the M&A's in their companies (Boyce, Neale, 2006; Taylor, Bogdan, 1998). A regular survey is not used, because it is assumed that a regular survey does not provide the required in-depth information. Scientists confirm that in-depth interviewing is a qualitative research technique, which is useful to explore a person's perspective on a particular topic and which is characterized by intensive individual interviews and a rather small number of interviewees (Boyce, Neale, 2006; Taylor, Bogdan, 1998).

The interviews contain 36 questions, which are developed by the researcher. The questions are based on the operationalization of the concepts, which is detailed in the upcoming sections. 26 questions are open and afford a deep insight in the respondent's perceptions and opinions. The open questions are intended to indicate whether an effect can be recognized in the examined case. However, there are also 10 closed questions which have to be answered in terms of the scale of Mock (2015) or a Likert scale. The scale of Mock (2015) is further explained in Appendix II. During the interviews, the respective scales are presented to the interviewees before the related questions are asked. The closed questions are intended to provide a rough quantification of the identified effect, what enhances the comparability. Furthermore, one question is intended to explore the main reasons which induced the companies to engage in M&A's. For this purpose, 12 possible reasons for M&A's are explicitly named and the interviewee is asked to rank these reasons according to their

relevance in the respective M&A. Besides the 12 reasons, the interviewee has the opportunity to include one additional own reason in the ranking.

For validity reasons, the questions are designed in a way that elicits answers which provide a clear indication whether the effects were at hand and which were the main reasons for the respective M&A. Moreover, pre-structured interview questions are used in order to obtain comparable results on the one hand and in-depth information on the other hand. More specific, a detailed interview protocol is used, which ensures that in every interview the questions are asked in the same order and with the same wording. This contributes to the reliability of the results. The interview protocol is in German and can be found in the Appendix.

The interviews are recorded, for which permission is asked, and transcribed for analysis. The interview questions, which are presented in English in this chapter, are translated and stated in German, as the native language of the interviewees and interviewer is German (for translation see interview protocol in Appendix). The interviews are transcribed in German and relevant parts are translated into English.

## **4.5 Operationalization and Interview Questions**

The identified effects of M&A's on innovation and the related concepts are rather abstract and not directly observable. In this section, they are operationalized, meaning that each effect is translated into a clear indicator which enables an unambiguous observation of each effect. From these indicators, the interview questions are derived.

Concepts are abstractions or generalizations of experiences or ideas. They are subjective and their meaning may vary from person to person (Bernarte, 2015). Therefore, they need to be operationalized in measurable terms in order to reduce or eliminate the extent of variation in the understanding of the concepts' meaning (Bernarte, 2015). Concretely, operationalization involves the clarification of abstract concepts and the development or selection of indicators of the concepts (De Vaus, 2001). An indicator can be defined as "a sensory observable phenomenon that provides us with information on the (not directly observable) phenomenon to which the concept that is to be defined refers" (Verschuren, Doorewaard, 2010). From the selected indicators, variables can be derived, which can take different values and which are measurable (Bernarte, 2015). For the measurement, different scales can be used. A scale defines the type of categories which can be used for the measurement. The selection of a scale has a direct impact on the ability to describe relationships between the variables (Bernarte, 2015).

The identified effects of M&A's on innovation, which are described in chapter 4, are aggregated into 10 categories. In the following sections, the operationalization of the 10 categories is detailed. For the categories (dis-) economies of scale and scope, variables are derived from the indicators, which can be measured and quantified. For the other categories, the interview questions are directly based on the indicators and variables are not developed.

#### **4.5.1 Economies and Diseconomies of Scale**

In this section, (dis-) economies of scale related to either innovation or production are investigated. Table 1 presents the related operationalization. As indicated in chapter 2, (dis-) economies of scale are cost (dis-) advantages due to a more (less) efficient use of resources. Economies of scale can be realized by spreading (additional) costs over a larger output (Cockburn, Henderson, 2001). Diseconomies of scale might be the result of costs which are related to the joining of two companies (Schulz, 2007). The overall results of (dis-) economies of scale are lower (higher) unit costs. Therefore, unit costs serve as indicators for (dis-) economies of scale in this research.

In the case of (dis-) economies of scale in R&D, the unit costs of R&D are used as indicator. The variable to be measured is the total costs for the development of a new product. Feed that contains new ingredients or that is processed with new techniques is regarded as new product. New ingredients and new technologies are regarded as ingredients and technologies which are new to the company. A change in the composition of an existing feed type is not regarded as a new product. Total costs refer to any expenses for activities that aim at developing a new product.

In the case of (dis-) economies of scale in production, the unit costs of production are used as indicator, which are measured as total costs for the production of 1 ton feed.

The questions which relate to (dis-) economies of scale start rather general by asking after possible changes in the scale of R&D and/or production, i.e. by asking whether the M&A has led to a change in the number of new products or in the total production volume. This question is intended to make sure that the precondition for economies of scale is given (increased number of products / increased production volume) and gives the respondent the possibility to become aware of possible economies of scale. If the respondent indicates a change in the scale of R&D or production, it is asked whether the changed scale has led to any economies, i.e. whether the changed scale influenced unit costs of R&D or production. This question is directly related to economies of scale, what elicits an unambiguous answer, and it is open, allowing the respondent to answer freely, what might result in more in-depth information. If applicable, the impact of the changed scale on unit costs in R&D or production is quantified in terms of the scale of Mock, what enhances the comparability of different cases.

Table 1 Operationalization of Economies and Diseconomies of Scale

Concept	Indicator	Variable	Interview Question	Measurement Scale / Answer Category
Economies and diseconomies of scale in R&D	Unit costs of R&D	Total costs for the development of a new product	Please describe whether the number of annually introduced new feed products of your company changed after the M&A.	Open
			If applicable, please describe the impact of the changed number of annually introduced new feed products on the total costs for the development of a new product.	Open
			Please quantify this impact in terms of the scale of Mock.	Scale of Mock
Economies and diseconomies of scale in production	Unit costs of production	Total production costs for 1 ton feed in €/ton	Please describe whether the total annual production volume of feed in your company changed after the M&A.	Open
			If applicable, please describe the impact of the changed total annual production volume of feed on the total production costs for 1 ton feed.	Open
			Please quantify this impact in terms of the scale of Mock.	Scale of Mock

#### 4.5.2 Economies of Scope

This section investigates economies of scope related to either innovation or production. Table 2 presents the operationalization. Economies of scope can be realized if the total costs of producing two goods jointly are lower than producing each of the goods separately (Marques, De Witte, 2011). Economies of scope are perceivable through a wider usability or applicability of inputs, as these inputs can be used for a wider range of outputs. “It is straightforward to see that the economies of scope due to joint production entail cost complementarities” (Nehring, Puppe, 2000), which result in the reduction of unit costs.

In the case of economies of scope in R&D, the unit costs of R&D are used as indicator. The variable to be measured is the total costs for the development of a new product. Feed that contains new ingredients or that is processed with new techniques is regarded as new product. New ingredients and new technologies are regarded as ingredients and technologies which are new to the company. A change in the composition of an existing feed type is not regarded as new product. With total costs, any expenses for activities that aim at developing a new product are meant.

In the case of economies of scope in production, the unit costs of production are used as indicator, which are measured as total costs for the production of 1 ton feed.

The questions which relate to economies of scope start rather general by asking whether the scope of R&D or production changed, i.e. whether the M&A has led to a change in the number of R&D projects or in the range of different products. A R&D project is regarded as a planned set of interrelated tasks, which are accomplished within a predefined period of time with the goal to improve existing products or develop new products. Different products are regarded as different feed types that are either designed for different farm animal species or feed types for the same animal species which contain different ingredients or which have different functionalities for different purposes. The first question is intended to make sure that the precondition for economies of scope is given (increased number of R&D projects / increase in range of different products) and gives the respondent the possibility to become aware of possible economies of scope. If the respondent indicates a change in the scope of R&D or production, it is asked whether the changed scope has led to any economies, i.e. whether the changed scope influenced unit costs of R&D or production. This question is directly related to economies of scope, eliciting an unambiguous answer. However, it is open and allows the respondent to answer freely, what might result in more in-depth information. If applicable, the impact of the changed scope on unit costs in R&D or production is quantified in terms of the scale of Mock, what enhances the comparability of different cases.

Table 2 Operationalization of Economies of Scope

Concept	Indicator	Variable	Interview Question	Measurement Scale / Answer Category
Economies of scope in R&D	Unit costs of R&D	Total costs for the development of a new product	Please describe whether the number of different R&D projects in your company changed after the M&A.	Open
			If applicable, please describe the impact of the changed number of R&D projects on the total costs for the development of a new product.	Open
			Please quantify this impact in terms of the scale of Mock.	Scale of Mock
Economies of scope in production	Unit costs of production	Total production costs for 1 ton feed in €/ton	Please describe whether the number of different products that are produced in your company changed after the M&A.	Open
			If applicable, please describe the impact of the changed number of products on the total costs for the production of 1 ton feed.	Open
			Please quantify this impact in terms of the scale of Mock.	Scale of Mock

The indicators and variables for (dis-) economies of scale and scope are the same, as both effects result in cost reductions. Nevertheless, the related interview questions are designed in a way that enables a clear distinction between cost savings due to economies of scale and

cost savings due to economies of scope and are therefore capable of recognizing (dis-) economies of scale or scope in the examined cases.

#### **4.5.3 Synergies**

This section specifies the interview questions on synergies related to either innovation or production. Table 3 outlines the operationalization. Synergies emerge through the combination of different inputs and become visible through the occurrence of improvements or efficiencies that were not achievable before (Cassiman, Ueda, 2006). In this study, the combination of different inputs is understood as a joining or joint use of different and previously unrelated inputs for a certain purpose.

Synergies in R&D become mainly visible through the improvement of existing products which was not achievable in the pre merger situation (Griffin, 1997). In this study, the improvement of an existing product is regarded as an increase in the quality of a feed type, for example in terms of functionality or digestibility. Such a quality gain or improvement of existing products through the combination of previously unrelated R&D inputs is used as an indicator for synergies in R&D. R&D inputs are regarded as all inputs that flow into the R&D process.

Synergies in production mainly become visible through new efficiencies that were not achievable in the pre merger situation. The term efficiency of the production process can be defined as the degree to which “[...] the maximum possible output has been achieved, given a fixed set of inputs and given a certain technology” (OECD, 2015). New efficiencies in the production process as the result of the combination of previously unrelated production inputs or technologies serve as indicator for synergies in production.

The first interview questions related to synergies in R&D or production are intended to explore whether there has been a combination of previously unrelated R&D inputs, production inputs or technologies after the M&A, what is regarded as a prerequisite for a synergy. Starting with an open question enables the manager to describe what exact inputs were combined and to think about further details, which he might also speak out. This increases the amount of in-depth information. If the prerequisite for synergies is given, the impact of the combination of different inputs or technologies on the product quality or production efficiency is subject to the next questions. This question directly asks for visible results of synergies (increase in quality / increase in efficiency) and is open. This elicits an unambiguous answer on the one hand and in-depth information on the other hand.

Table 3 Operationalization of Synergies

<b>Concept</b>	<b>Indicator</b>	<b>Interview Question</b>	<b>Measurement Scale / Answer category</b>
Synergies in R&D	Improvement of existing products through the combination of previously unrelated R&D inputs	Please describe whether there has been a combination of previously unrelated R&D inputs after the M&A in your company.	Open
		If applicable, please describe the impact of the combination of previously unrelated R&D inputs on the quality of your products.	Open
Synergies in production	New efficiencies as the result of the combination of previously unrelated production inputs or technologies	Please describe whether there has been a combination of previously unrelated production inputs or technologies after the M&A in your company.	Open
		If applicable, please describe the impact of the combination of previously unrelated production inputs or technologies on the efficiency of your production process.	Open

#### 4.5.4 Creation of a New Growth Platform

In this section, the creation of a new growth platform is investigated. Table 4 presents the related operationalization. A M&A possibly results in the creation of a new growth platform, which is a kind of synergy and results from the combination of different and previously unrelated R&D inputs (Ranft, Lord, 2002). A new growth platform can be described as “[...] a new technology development trajectory oriented at creating new products and / or markets. Such a growth platform enables the realization of breakthrough innovations, followed by a continuous flow of new products within the same product family” (Batterink, 2009). In this study, a new growth platform in terms of compound feed can be regarded as a new processing technology or a new feeding concept that results in a group of products (product family) that show better characteristics or functionalities. Therefore, a new processing technology or feeding concept that is the base for a group of products with better characteristics or functionalities is used as an indicator for a new growth platform.

The first question related to synergies in R&D (see section above) also serves as starting point to explore whether a new growth platform can be recognized in the examined cases. The question is asked only once. If the respondent approves a combination of previously unrelated R&D resources after the M&A, the prerequisite for a new growth platform is given. After that, it is directly asked whether the combination of previously unrelated R&D inputs has until the interview day led to a new processing technology or feeding concept which resulted in a group of new products with better characteristics or functionalities, what is regarded as new growth platform. This question is directly related to the occurrence of a new growth platform and therefore elicits unambiguous answers. However, its openness allows the respondent to answer freely, what might result in more in-depth information.

Table 4 Operationalization of Creation of a New Growth Platform

Concept	Indicator	Interview Question	Measurement Scale / Answer Category
New growth platform	New processing technology or feeding concept as base for a group of products with new characteristics or functionalities	Please describe whether there has been a combination of previously unrelated R&D inputs after the M&A. (same as for synergies)	Open
		If applicable, please describe whether this combination has until today led to a new processing technology or feeding concept which resulted in a group of new products with better characteristics or functionalities.	Open

#### **4.5.5 Innovation Lead Time**

In this section, the innovation lead time is investigated. The operationalization is outlined in Table 5. Innovation lead time can be described as the time to bring a new product to the market (Drucker, 1985). In this research study, innovation lead time is specified as the time period between the first activities for the development of a new product and the first delivery of the new product to the customer.

The first question related to innovation lead time is directly pointing at the time period between the first activities to develop a new product and the delivery of that new product. This question elicits an unambiguous answer on the one hand and in-depth information on the other hand. If the respondent indicates a change in this time period, he is asked to quantify this change in terms of the scale of Mock. Using a scale enhances the comparability with other cases.

Table 5 Operationalization of Innovation Lead Time

Concept	Indicator	Interview Question	Measurement Scale / Answer Category
Innovation lead time	Time period between the first activities for the development of a new product and the first delivery of the new product to the customer	Please describe whether the time period between the first activities to develop a new product and the first delivery of the new product to the customer changed after the M&A in your company.	Open
		Please quantify this change in terms of the scale of Mock.	Scale of Mock

#### **4.5.6 Risk Management in R&D**

In this section, risk management in R&D is investigated. The related operationalization is presented in Table 6. A popular risk management instrument is risk spreading. In R&D, risk spreading can be realized through the spreading of R&D related risks across a more diversified portfolio of R&D projects (Schulz, 2007). In this study, R&D related risks are specified as the risks that a R&D project does not reach its intended goal and does not pay off. A more diversified portfolio of R&D projects is understood as a set of R&D projects that are more different in terms of the field of research or duration and riskiness. Risk spreading in R&D results in a decreased variance in return of R&D projects, as the overall R&D return is less dependent on a single R&D project (Cassiman, Ueda, 2006). The variance in return of R&D projects is used as an indicator for risk spreading in R&D. Besides that, the possibility to spread R&D related risks across a larger portfolio of R&D projects might result in an increased willingness to invest in longer term and riskier R&D projects. Therefore, the

willingness to invest in longer term and riskier R&D projects is also used as an indicator for risk spreading in R&D.

The first question related to risk management in R&D directly aims at exploring whether the variance in return of R&D projects changed after the M&A in the respective company. This question increases the respondent's awareness of risk issues and allows discovering whether the respective M&A led to the spreading of risks. If applicable, the respondent is asked to quantify the change in the variance in return of R&D projects in terms of the scale of Mock, what enables a subsequent comparison with other cases. The second question refers to the willingness to invest in longer term and riskier R&D projects after the M&A. This question is intended to uncover the respondent's personal perceptions and opinions related to risk. Despite its high degree of subjectivity, it elicits in-depth information.

Table 6 Operationalization of Risk Management in R&D

<b>Concept</b>	<b>Indicator</b>	<b>Interview Question</b>	<b>Measurement Scale / Answer Category</b>
Risk management in R&D	Variance in return of R&D projects	Please describe whether the variance in return of R&D projects in your company changed after the M&A.	Open
	Willingness to invest in longer term and riskier R&D projects	Please describe whether your willingness to invest in longer term and riskier R&D projects changed in your company after the M&A.	Open

#### 4.5.7 Market Power and Appropriation

In this section, the concepts market power and appropriation are investigated. Table 7 outlines the operationalization. A M&A can substantially change the market power and appropriation of the merged company, as well in the technology market as in the product market (Cassiman, Ueda, 2006). An increased market power and appropriation in the technology market results in entry barriers for potential new entrants (Cassiman, Ueda, 2006) and becomes observable through a lower aggressiveness of (potential) competitors compared to the pre merger situation. In this study, aggressiveness of (potential) competitors is regarded as the extent to which potential competitors try to enter the feed market and capture market shares of the incumbent companies. A lower aggressiveness of (potential) competitors as a result of entry barriers is used as an indicator for market power and appropriation in the technology market. An increased market power and appropriation in the product market becomes visible through a higher market share. In this study, which is concerned with the case of the German compound feed industry, the national market share of a certain compound feed company is calculated by dividing the production volume in tons of that company by the overall production of compound feed in tons in the national market in a year. A higher market share in the national product market serves an indicator for an increased market power in the product market.

The interview question related to market power and appropriation in the technology market points to the aggressiveness of (potential) competitors. This question is open and enables

the respondent to answer freely, what might result in the discovery of further details. The interview question related to market power and appropriation in the product market first aims to explore whether the market share in the product market of the respective company changed after the M&A. The market share is an objective measure and therefore the answer to this question is unambiguous and clear. If applicable, the respondent is asked in a next question to quantify the change of the market share in the product market in terms of the scale of Mock. This enables a subsequent comparison of the examined cases.

Table 7 Operationalization of Market Power and Appropriation

Concept	Indicator	Interview Question	Measurement Scale / Answer Category
Market power and appropriation in the technology market	Aggressiveness of potential new entrants	Please describe whether the aggressiveness of (potential) competitors changed after the M&A?	Open
Market power and appropriation in the product market	Percentage market share in the national product market	Please describe whether the market share in the product market of your company changed after the M&A.	Open
		Please quantify the change in market share in terms of the scale of Mock.	Scale of Mock

#### 4.5.8 Agency Problems in R&D

In this section, agency problems in R&D are investigated. The related operationalization is presented in Table 8. Agency costs result from interest conflicts between the principal and the agent (i.e. between the owners and the managers of a company) or between the principal and the principal (i.e. between the different owners of a company) (Deng et al., 2012). An interest conflict can be defined as “[...] a situation in which a person has a private or personal interest sufficient to appear to influence the objective exercise of his or her official duties as, say, a public official, an employee, or a professional” (MacDonald et al., 2002). Interest conflicts which are caused by a M&A and which obstruct the R&D process are used as indicator for agency problems in R&D. Furthermore, an inward directed and autonomous innovation approach hints at asymmetric information and a lack of transparency and trust to external parties (Deng et al. 2012), what is a precondition for agency problems. Therefore, the extent to which a company pursues an inward directed and autonomous innovation approach is used as a further indicator for agency problems in R&D.

The first interview question related to agency problems in R&D aims at exploring whether interest conflicts occurred in the respective company before (announcement), during (integration) and after (post-integration) the M&A. This question relates to a cause of agency problems and helps the respondent to remember possible interest conflicts. If applicable, the second question points at the impact of the interest conflicts on the R&D process in the respective company. This question is clear and precise, and its openness enables the

respondent to answer freely, resulting in in-depth information. The third interview question aims at exploring the innovation approach of the company and uses the following self-created 5-point Likert scale: 1=inward directed and autonomous, 2= rather inward directed and autonomous, 3=neutral, 4=rather outward directed and collaborative, 5= outward directed and collaborative. To answer this question, the respondent has to make a clear choice, what results in unambiguous answers. Furthermore, as the respondent has to use a scale to answer this question, the answers or rather the innovation approaches of the examined cases can be compared afterwards.

Table 8 Operationalization of Agency Problems in R&D

Concept	Indicator	Interview Question	Measurement Scale / Answer Category
Agency problems in R&D	Interest conflicts which are caused by a M&A and which obstruct the R&D process	Please describe whether interest conflicts occurred in your company before, during and after the M&A? (announcement, integration, post-integration)	Open
		If applicable, please describe the impact of these interest conflicts on the R&D process in your company.	Open
	Innovation approach: inward directed and autonomous or outward directed and collaborative	Please use the given 5-point Likert scale to describe the innovation approach of your company after the M&A.	5-point Likert scale: 1=inward directed and autonomous, 2= rather inward directed and autonomous, 3=neutral, 4=rather outward directed and collaborative, 5= outward directed and collaborative

#### 4.5.9 Motivation of Employees

In this section, the motivation of employees is investigated. Table 9 presents the operationalization. A M&A usually requires restructuring processes in the involved companies, which might be detrimental for the motivation and attitude of involved employees (Schulz, 2007). Motivation can be defined as the combination of a person's desire and energy directed at achieving a certain goal (Military Leadership, 1993). In terms of the R&D process, the efforts of employees to bring a new product to the market are used as an indicator for the motivation of R&D employees in this study. A new product is regarded as a feed type feed that contains new ingredients or that is processed with new techniques. A change in the composition of an existing feed type is not regarded as new product. In terms of the production process, the efforts of employees to increase the efficiency of the production process are used as an indicator for the motivation of production employees in this study. The term efficiency of the production process can be defined as the degree to

which “[...] the maximum possible output has been achieved, given a fixed set of inputs and given a certain technology” (OECD, 2015).

The first interview question relates to the motivation of employees in the R&D process and asks the respondent to assess the efforts of employees to bring a new product to the market before and after the M&A. This question uses a scale, what provides an unambiguous answer. Asking for the respondent's assessment before and after the M&A results in a clear indication whether the motivation of employees in R&D projects changed in the course of the M&A. The second question relates to the motivation of employees in the production process and asks the interviewee to assess the efforts of employees to increase the efficiency of the production process before and after the M&A. This question uses the same scale as the above mentioned one and also asks for the respondent's assessment before and after the M&A. This provides an unambiguous answer and a clear indication whether the motivation of employees in the production process changed in the course of the M&A. For the assessment, the following 5-point Likert scale is used: 1=poor, 2=fair, 3=good, 4=very good, 5=excellent (Vagias, Wade, 2006). Asking for an assessment before and after the M&A enables the identification of changes in the motivation of employees.

Table 9 Operationalization of Motivation of Employees

Concept	Indicator	Interview Question	Measurement Scale / Answer Category
Motivation of employees	Efforts of employees to bring a new product to the market	Please use the given 5-point Likert scale to assess the efforts of employees in your company to bring a new product to the market before and after the M&A.	5-point Likert scale: 1=poor, 2=fair, 3=good, 4=very good, 5=excellent
	Efforts of employees to increase the efficiency of the production process	Please use the given 5-point Likert scale to assess the efforts of employees in your company to increase the efficiency of the production process before and after the M&A.	5-point Likert scale: 1=poor, 2=fair, 3=good, 4=very good, 5=excellent

#### 4.5.10 Efficiency of Internal Capital Markets / Financial Discipline

In this section, the concepts efficiency of internal capital markets and financial discipline are investigated. The related operationalization is outlined in Table 10. The effects of a M&A on the internal capital markets and financial resources of the involved companies are ambiguous. On the one hand, a M&A can increase the financial resources of the merged companies if the financial resources are combined. On the other hand, a M&A can result in fewer financial resources of the acquiring company if the M&A is debt financed (Cassiman, Ueda, 2006). In this study, financial resources are specified as the money that is available to a company for investments or other expenses. Which of the both effects is dominant, more efficient internal capital markets or an increased financial discipline becomes visible through

the change of the financial resources of the merged companies in the course of the M&A. An increase of financial resources is regarded as an indicator for more efficient internal capital markets, while a decrease of financial resources is regarded as an indicator for increased financial discipline.

The first interview question related to efficiency of internal capital markets and financial discipline aims to explore the impact of the M&A on the financial resources of the respective company. This question is objective and elicits an unambiguous and clear answer from the respondent. Its openness enables the respondent to provide further details. If applicable, the respondent is asked in a next question to quantify the change in the financial resources in terms of the scale of Mock. This enables a subsequent comparison of the changes in the financial resources of the examined cases.

Table 10 Operationalization of Efficiency of Internal Capital Markets / Financial Discipline

<b>Concept</b>	<b>Indicator</b>	<b>Interview Question</b>	<b>Measurement Scale / Answer Category</b>
Efficiency of internal capital markets / Financial discipline	Financial resources, compared to pre merger situation	Please describe whether the M&A had an impact on the financial resources in your company.	Open
		If applicable, please quantify the change in the financial resources of your company in terms of the scale of Mock.	Scale of Mock

#### 4.6 Question Related to Reasons for M&A's

Besides the interview questions which are intended to explore whether the possible effects of M&A's on innovation can be recognized in the examined cases, one interview question is intended to identify the main reasons why the examined cases engaged in M&A's. To find out the main reasons, the respondents are asked to rankorder 9 (10) possible reasons for M&A's in terms of their relevance for the M&A in the respective company. Besides that, the respondents may include one additional reason in the ranking.

The reasons for M&A's which the respondents are asked to rankorder are the following:

1. Increase market share and bargaining power
2. Accelerate company growth
3. Access to knowledge and expertise
4. Diversification to new products or markets
5. Restrict opportunities of competitors
6. Adaption to a changing industry
7. Taxation considerations
8. Improve company reputation
9. Survival
10. .... (own reason)

Using a ranking enables a distinct identification of the main reasons for M&A's and a clear comparison of the examined cases. Moreover, an average rank for each reason can be calculated. The possibility of the respondents to include one own reason in the ranking ensures that no important reasons or aspects are forgotten.

#### **4.7 Validity and Reliability**

In this section it is described how this research study accounts for validity and reliability issues. To do so, in the following sub sections the concepts internal validity, external validity, construct validity and reliability are shortly outlined and it is described how these concepts are regarded in this research study.

Internal validity is the capacity of a research design to sustain the causal conclusions which are claimed (De Vaus, 2001). More specific, it is the extent to which the research design enables the researcher to draw unambiguous conclusions from the results (De Vaus, 2001). A high internal validity can be reached through the elimination of alternative explanations for the findings (De Vaus, 2001). In this research study, a sufficient level of internal validity is ensured through a thorough literature study and an appropriate operationalization of the concepts into indicators and interview questions. The interview questions are comprehensible and elicit answers that are unambiguous and clear.

External validity can be defined as the extent to which the results of a study are generalizable beyond the particular study (De Vaus, 2001). This study is concerned with companies which produce compound feed, which are located in Germany and which were involved in at least one M&A during the past ten years. The selected sample consists of four companies from different size classes, companies which are private or cooperative and companies which were involved in M&A's as acquirer or target. Therefore, the examined companies differ substantially in terms of their size, organization and role in M&A's. However, a sample consisting of merely four cases is rather small and restricts the generalizability of the findings. Nevertheless, due to the fact that the selected sample represents the population quite well, the results may be informative on and for other German compound feed companies. Altogether, the level of external validity of the results within the German compound feed industry has to be classified as moderate. Moreover, as this study is specifically concerned with companies from the compound feed industry, the generalizability of the results to other industries is very limited, as the characteristics and conditions in other industries are different. Furthermore, as this study is concerned with compound feed companies which are located in Germany, the generalizability of the results to compound feed companies from other countries is limited, as the companies in other countries might face different circumstances and conditions. Therefore, the external validity of the results in other industries than the German compound feed industry is not given or very limited.

Construct validity can be defined as the extent to which the operational measures are correctly measuring the concepts under study (Yin, 2003). In this study, construct validity is

ensured through an appropriate and reasoned operationalization of the concepts into indicators. These indicators are clear delineations of the concepts. Special attention is paid to avoid that one indicator refers to or points at more than one concept.

Reliability can be defined as the extent to which the indicators consistently come up with the same measurements (De Vaus, 2003). In other words, reliability means that research activities like data collection can be repeated by other researchers and result in the same findings. In this study, reliability is ensured by the use of a detailed interview protocol, which guarantees that in every interview the questions are asked in the same order and with the same wording. Moreover, a recording of the interviews and a subsequent transcription contribute to the reliability of the findings.

Altogether, this study is designed in a way that ensures a sufficient level of internal validity, construct validity and reliability and a moderate level of external validity.

#### **4.8 Summary of Methodology**

This section provides a short summary of chapter 4. The consolidation process in the German compound feed industry is described through the k-firm concentration ratios CR<sub>4</sub> and CR<sub>8</sub> and through figures which illustrate the change of important variables of the German compound feed industry like total production volume, number of companies or average production volume per company. Regarding the qualitative part of this study, the data is required to answer the second and fifth sub question and is gathered through in-depth interviews with managers from German compound feed companies. The 36 interview questions are developed by the researcher and are based on the operationalization of the key concepts. Furthermore, the research design ensures a sufficient level of internal validity, construct validity and reliability and a moderate level of external validity.

## 5 Description of the Consolidation Process in the German Compound Feed Industry

The purpose of this chapter is to answer the fourth sub question, which is formulated as "Based on the identified measurement tools and the data from the German Federal Office for Agriculture and Food, how can the consolidation process in the German compound feed industry be described?" To do so, data from the German Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung, BLE) are aggregated and transformed into figures which clearly illustrate the change of important variables of the German compound feed industry like total production volume, number of companies or average production volume per company. Besides that, the k-firm concentration ratios CR<sub>4</sub> and CR<sub>8</sub> are calculated for a five-year period and presented in a figure.

### 5.1 Descriptive Data

The following figures illustrate the change of important variables of the German compound feed industry like total production volume, number of companies or average production volume per company. Explanations for the presented developments are given and a brief conclusion is given in the end.

Figure 3 shows that the annual production volume of compound feed in Germany clearly increased since 1995/96 up to approximately 23 mln. tons in 2013/14. However, since 2012/13 there is a very slight decrease in production volume (BLE, 2015; BMELV, 2004-2012).

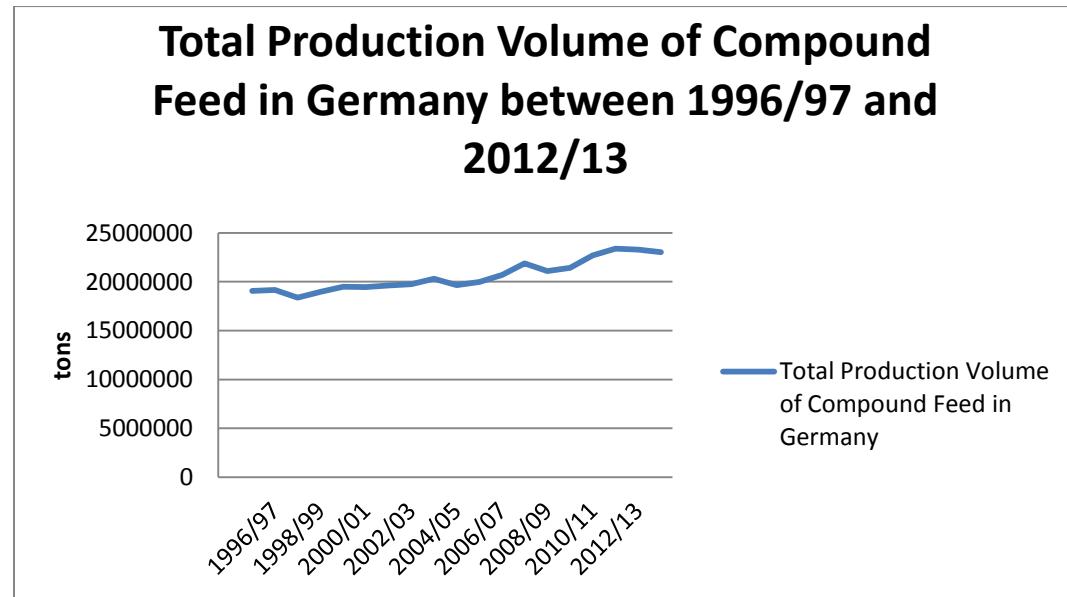


Figure 3 Total Production Volume of Compound Feed in Germany between 1996/97 and 2012/13.  
Source: BLE (2015); BMELV (2004-2012)

Figure 4 clearly confirms a drastic and systematic decrease in the number of German compound feed companies from 568 companies in 1995/96 to 286 companies in 2012/13 (BLE, 2015; BMELV, 2004-2012). This indicates a decrease of approximately 50% in the number of companies within a period of 18 years, what corresponds to a compound annual growth rate of approximately -3.7%. In terms of the scale of Mock (2015), this annual decrease is modest. However, it is a clear indication for a structural change in the German compound feed industry. Figure 6 provides a more detailed view on the development of the number of German compound feed companies, as it considers the different size classes.

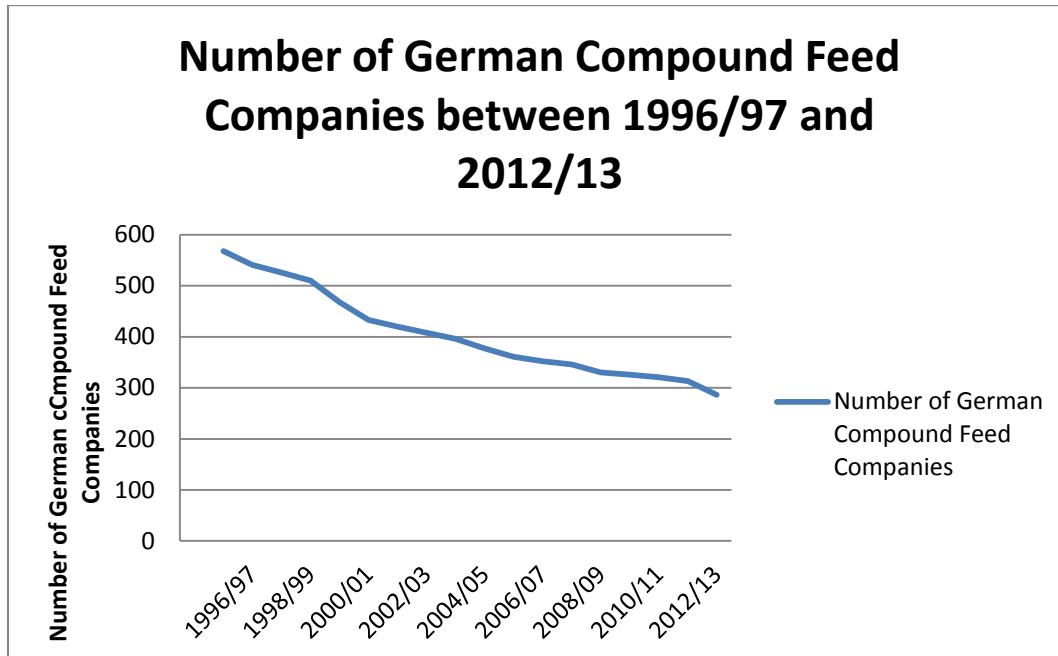


Figure 4 Number of German Compound Feed Companies between 1996/97 and 2012/13. Source: BLE (2015); BMELV (2004-2012)

As a consequence of an increased overall production volume (Figure 3) and a decreased number of companies (Figure 4), the remaining companies are increasing in their average production volume, as Figure 5 shows. The average annual production volume of German compound feed companies increased from approximately 33,000 tons in 1995/96 up to approximately 81,000 tons in 2012/13 (BLE, 2015; BMELV, 2004-2012), which is an increase of approximately 145% within 18 years. This corresponds to a compound annual growth rate of approximately 5.1%, what can be denoted as limited in terms of the scale of Mock (2015).

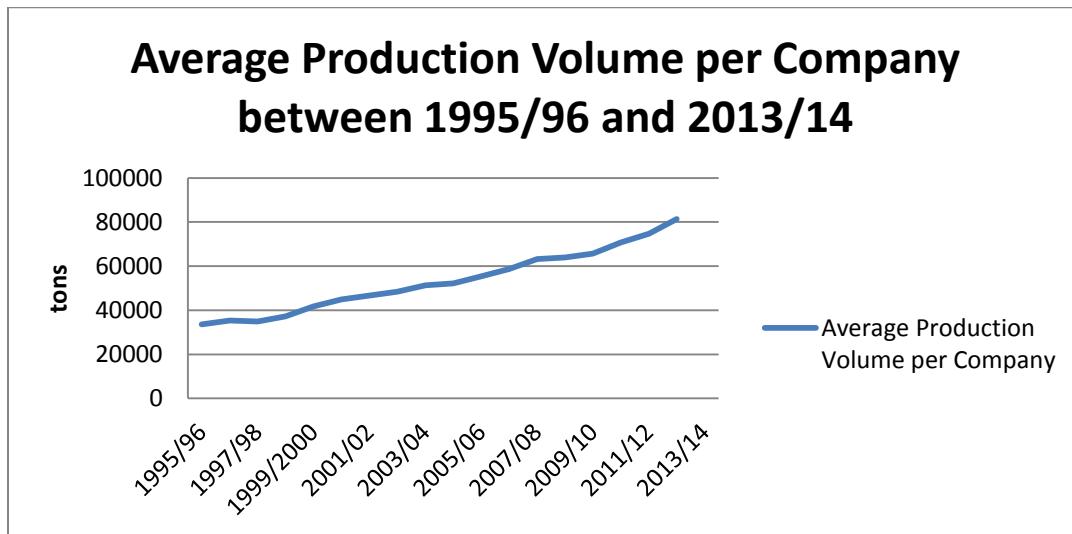


Figure 5 Average Production Volume per Company between 1995/96 and 2013/14. Source: BLE (2015); BMELV (2004-2012)

Figure 6 provides a more detailed view on the development of the number of German compound feed companies, as it considers the different size classes. The number of companies which produce between 250 tons and 10,000 tons per year declined from 321 companies in 1995/96 to 101 companies in 2011/12 (BLE, 2015; BMELV, 2004-2012). This is a decline of approximately 68% within 17 years, which corresponds to a compound annual growth rate of approximately -6.6%. This annual declines have to be classified as limited in terms of the Scale of Mock (2015). The number of companies which produce between 10,000 tons and 50,000 tons per year declined from 140 companies in 1995/96 to 92 companies in 2011/12 (BLE, 2015; BMELV, 2004-2012). This is a decline of approximately 34% within 17 years, which corresponds to a compound annual growth rate of approximately -2.4%. This annual declines can be denoted as modest in terms of the Scale of Mock (2015). Among those companies whose annual production lies between 50,000 tons and 100,000 tons, a decline in the number of companies can be observed, namely from 49 companies in 1995/96 to 37 companies in 2011/12 (BLE, 2015; BMELV, 2004-2012). This is a decline of approximately 24% within 17 years, which corresponds to a compound annual growth rate of approximately -1.6%. This annual declines can be classified as marginal in terms of the Scale of Mock (2015). The number of companies which produce between 100,000 tons and 200,000 tons per year increased between 1995/96 and 2011/12 from 35 companies to 43 companies (BLE, 2015; BMELV, 2004-2012). This is an increase of

approximately 22% within 17 years, which corresponds to a compound annual growth rate of approximately 1.2%. This annual increases can be denoted as marginal in terms of the Scale of Mock (2015). Also the number of companies whose annual production volume lies between 200,000 tons and 300,000 tons increased from 16 companies in 1995/96 to 25 companies in 2011/12 (BLE, 2015; BMELV, 2004-2012). This is an increase of approximately 56% within 17 years, what corresponds to a compound annual growth rate of approximately 2.7%. This annual increases can be classified as modest in terms of the Scale of Mock (2015). The number of companies which produce more than 300,000 tons per year increased from 7 companies in 1995/96 up to 15 companies in 2011/12 (BLE, 2015; BMELV, 2004-2012). This is an increase of approximately 114% within 17 years, what corresponds to a compound annual growth rate of approximately 4.6%. This annual increases have to be classified as limited in terms of the Scale of Mock (2015).

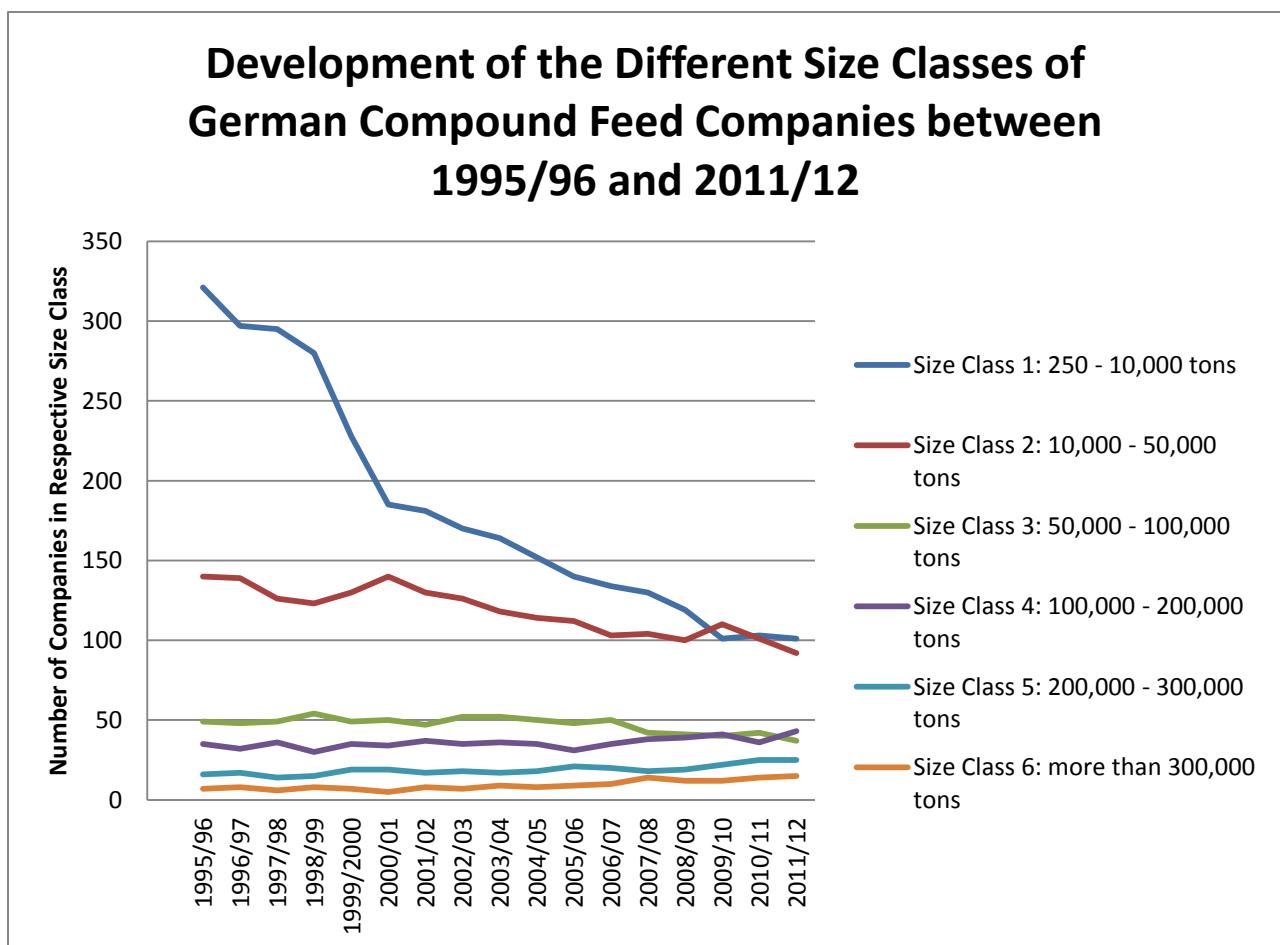


Figure 6 Development of Different Size Classes of German Compound Feed Companies between 1995/96 and 2011/12. Source: BLE (2015); BMELV (2004-2012)

Especially Figure 6 clearly reflects a concentration or consolidation process. The number of the rather small and medium sized companies with an annual production volume up to 100,000 tons decreased, while the number of the rather large companies with an annual production volume larger than 100,000 tons increased. Figure 6 can be explained as follows: the rather small and medium sized companies merge into larger companies and thereby

decrease the number of the small and medium sized companies and increase the number of large companies. The large companies themselves also merge with or acquire especially small and medium sized companies, thereby reducing the number of small and medium sized companies and increasing the number of large companies. Of course, the number of small and medium sized companies might also decrease because of the bankruptcy of companies in this size class. Moreover, the increase in the number of large companies might result from large companies which step into the German compound feed market. The former has been materialized, but the latter is not the case because during the past five years the group of the largest eight companies did not change and the largest three companies successfully defended their top positions (BLE, 2015). Altogether, the researcher regards the above mentioned explanation for Figure 6 as plausible as it explains both the decline of the number of small and medium sized companies and the increase in the number of large companies.

Altogether, the figures on the total production of compound feed, number of companies, average production volume per company and development of different size classes clearly indicate a trend toward larger and fewer compound feed companies in Germany. This can be regarded as a strong evidence for a concentration or consolidation process in the German compound feed industry, as the market power is concentrating among larger and fewer companies.

## **5.2 Description of the Concentration Process through the k-firm concentration ratio**

Due to the limited availability of relevant data, only the k-firm concentration ratios CR4 and CR8 could be calculated and are presented in the following section. Because of §15 Abs. 4 Gesetz über Meldungen über Marktordnungswaren, a German law that governs the reporting about goods that are subject to EU market regulations, and because of statistical nondisclosure reasons, the Federal Office for Agriculture and Food (Bundesanstalt für Landwirtschaft und Ernährung, BLE) is not allowed to publish firm specific data like the market shares of single firms. However, the BLE offered to execute the necessary calculations for the k-firm concentration ratios CR4 and CR8. As the CR4 and CR8 do not enable to draw any inferences about single companies, the provision of the CR4 and CR8 is in line with §15 Abs. 4 Gesetz über Meldungen über Marktordnungswaren.

Table 1 and Figure 7 show the CR4 and CR8 of the German compound feed industry for the years 2009/10 to 2013/14. The relevant output which was used for the calculations is the production volume in tons. The CR4 increased from 25,79% in 2009/10 up to 28,59% in 2013/14. The CR8 increased from 38,62% up to 41,94% in the same time period. A market can be regarded as highly concentrated if the CR4 or the CR8 are equal to or larger than 75% (Kanyenga, Mangisoni, 2007), or, in general, if the k-firm concentration ratio approaches 100% (Belleflamme, Peitz, 2010). Therefore, the calculated concentration ratios for the German compound feed industry indicate rather low levels of concentration. Nevertheless, both the CR4 and the CR8 increased by approximately three percentage points between

2009/10 and 2013/14. According to the BLE (2015), the relative large increase in CR<sub>4</sub> and CR<sub>8</sub> in the year 2012/13 is due to a change in the obligations to report. In particular, since 2012/13 compound feed companies which produce less than 1,000 tons per year do not have the obligation anymore to report their production volume (BLE, 2015). As a result, the BLE involves the production volumes of fewer companies in its calculations and the relative market shares of large companies increase. What is also worth mentioning is that the group of the largest eight companies did not change during the past five years and that the largest three companies successfully defended their top positions (BLE, 2015).

Table 11 CR<sub>4</sub> and CR<sub>8</sub> in the German Compound Feed Industry between 2009/10 and 2013/14. Source: BLE (2015)

Year	CR <sub>4</sub>	CR <sub>8</sub>
2009/10	25.79 %	38.62 %
2010/11	25.59 %	39.06 %
2011/12	26.49 %	39.81 %
2012/13	28.87 %	41.77 %
2013/14	28.59 %	41.94 %

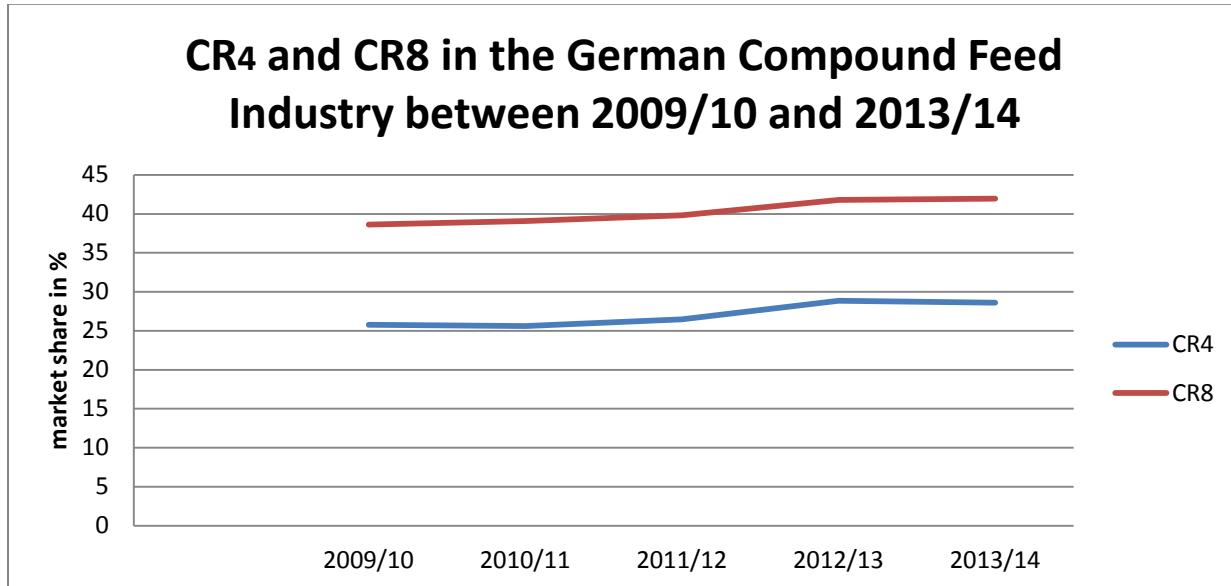


Figure 7 CR<sub>4</sub> and CR<sub>8</sub> in the German Compound Feed Industry between 2009/10 and 2013/14. Source: BLE (2015)

The concentration level in the German compound feed industry is rather low and an increase of three percentage points of the CR<sub>4</sub> and CR<sub>8</sub> within five years might seem to be minimal and negligible. However, in absolute terms, the gain in production volume of the four largest companies between the years 2009/10 and 2013/14 is 1,064,370,165 tons. Considering that the average annual production volume of a German compound feed industry in the years 2012/13 was approximately 81,000 tons, the gain of the four largest companies can be

regarded as substantial, replacing about 13 average German compound feed companies. Furthermore, the considered time period of five years is quite short for such a structural change in the German compound feed industry.

The increase in the k-firm concentration ratios CR<sub>4</sub> and CR<sub>8</sub> during a quite short period of five years indicates a trend towards larger and fewer compound feed companies in Germany. This can be regarded as an indication for a concentration or consolidation process, as the market power concentrates among fewer companies.

A question to be considered is whether the trend toward larger and fewer companies is caused by M&A's or whether there are also other factors that influence this trend. For the reduction of the number of producers two reasons are conceivable. First, companies which exit the German compound feed market contribute to the reduction of the number of companies. This exit of some companies helps other companies to grow and extend market share. Second, the merger of two companies or the acquisition of one company by another company always has the effect that two different companies become one unified company. The operations of the formerly separated companies are continued under the name of the new company. Therefore, M&A's result in a net reduction of the number of companies, with a continuation of the production capacities. For the growth of the annual production volume of the German compound feed companies, two reasons are conceivable. First, the growth might be autonomous, meaning that the company extends its market share and production volume on its own account. Second, the growth might be a result of a M&A. For example, a compound feed company which produces 100,000 tons per year might acquire another company which also produces 100,000 tons per year and thereby doubles its production volume and market share.

### **5.3 Summary on the Consolidation Process in the German Compound Feed Industry**

Chapter 5 answers the fourth sub question namely "Based on the identified measurement tools and the data from the German Federal Office for Agriculture and Food, how can the consolidation process in the German compound feed industry be described?" The figures in sub chapter 5.1 illustrate a change of important variables of the German compound feed industry. The total production volume of compound feed in Germany clearly increased since 1996/97. The number of companies decreased by approximately 50% within 18 years, while the average production volume per company increased by approximately 145% in the same period. The figures in sub chapter 5.2 depict a change of the concentration indices CR<sub>4</sub> and CR<sub>8</sub> in the magnitude of three percentage points within five years, what can be regarded as substantial. Altogether, the figures clearly indicate a trend towards more and fewer companies in the German compound feed industry and can therefore be considered as strong evidence for a consolidation or concentration process. Especially the number of small and medium sized companies with a production volume up to 50,000 tons decreased significantly, whereas the number of the larger companies increased. This means that market power is concentrating among fewer and larger companies.

## **6 Results**

This chapter answers the second and fifth sub question of this research study, respectively “Which of the possible effects can be recognized in the examined cases?” (Chapter 6.1) and “Which reasons for the consolidation process in the German compound feed industry can be extracted from the examined cases?” (Chapter 6.2).

### **6.1 Recognized Effects of M&A’s on Innovation in the Examined Cases**

In order to determine which of the possible effects of M&A’s on innovation can be recognized in the examined cases, the interview results are systematically described and interpreted afterwards. To do so, the answers of each respondent to each question are summarized and presented in tables. Only relevant parts of the answers are presented. If possible, the original quotes of the respondents are presented, whereby the German answers are translated into English by the researcher. After that, the results are interpreted, meaning that it is clearly stated whether a possible effect of M&A’s on innovation can be recognized in the examined cases or not.

One interview did not result in the actually requested information. The homepage of the respondent’s company gave the researcher the impression that the respective company was included in several M&A’s since the change of the century. In the interview the respondent explained that no real M&A’s occurred, but that several companies have been integrated into a group of companies. Every integrated company is still independent. For that reason, the interviewee explained that the interview questions, which are all related to M&A’s, would not apply to his company. However, he gave very interesting insights in the development and organization of his company. This information is not included in this chapter, but it is considered to be very interesting and worth mentioning in the discussion and conclusion chapter.

### 6.1.1 Result Related to Economies of Scale in R&D

This section summarizes the interview results related to economies of scale in R&D. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 12. Below the table, the answers are interpreted and it is concluded whether Economies of scale in R&D can be recognized in the examined cases or not.

Table 12: Interview Results Related to Economies of Scale in R&D

<b>Question 1</b>	<b>Please describe whether the number of annually introduced new feed products of your company changed after the M&amp;A.</b>
Respondent 1	The number of products in the field of compound feed is increasing. Especially if one enters new regions [through a M&A], the product diversity is increasing. In our case it increased by approximately 10%.
Respondent 2	"We created a lot of new products and successfully sold them on the market."
Respondent 3	The number of new products in the single product fields increased.
Respondent 4	We have some new products in the new regions, but the increase in the number of new products is very limited.
<b>Question2</b>	<b>If applicable, please describe the impact of the changed number of annually introduced new feed products on the total costs for the development of a new product.</b>
Respondent 1	The increased product diversity did not lead to increased costs.
Respondent 2	The costs for the development of new products are minor in our company, as we do not hire new employees for this purpose.
Respondent 3	Minor impact.
Respondent 4	The impact is rather modest.
<b>Question3</b>	<b>Please quantify this impact in terms of the scale of Mock.</b>
Respondent 1	Limited (4-7%)
Respondent 2	Marginal (0-2%)
Respondent 3	Between Modest (2-4%) and Limited (4-7%)
Respondent 4	Modest (2-4%)

All respondents confirmed an increase in the number annually introduced new feed products in their companies. Respondent 2 stated to have introduced several new products since the M&A, while Respondent 4 stated that the number of new products is rather limited. Respondent 1 quantified the increase in the number of annually introduced new feed products in his company with 10%. Altogether, it can be stated that the number of annually introduced new feed products increased in all examined cases and therefore it can be concluded that the precondition for economies of Scale in R&D can be recognized in all examined cases. However, the respondents indicated that the impact of the increased number of annually introduced new feed products on the total costs for the development of a new feed product is rather negligible. In terms of the scale of Mock, they quantified this impact with grades between marginal (0-2%) and limited (4-7%). This rather small impact means that the increased number of annually introduced new feed products did not lead to substantial cost savings or increases in the R&D process. Altogether, it can be concluded from the interview results that the M&A's in the examined cases did not lead to substantial economies of scale in R&D.

### 6.1.2 Results Related to Economies of Scale in Production

This section summarizes the interview results related to economies of scale in production. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 13. Below the table, the answers are interpreted and it is concluded whether economies of scale in production can be recognized in the examined cases or not.

Table 13: Interview Results Related to Economies of Scale in Production

<b>Question 1</b>	<b>Please describe whether the total annual production volume of feed in your company changed after the M&amp;A.</b>
Respondent 1	"Yes, it increased". We continued the tonnages of the acquired company and transferred the production volumes of external companies to ourselves.
Respondent 2	The production volume increased substantially.
Respondent 3	"The production [volume] of compound feed changed noticeably."
Respondent 4	"Yes, we are producing more."
<b>Question2</b>	<b>If applicable, please describe the impact of the changed total annual production volume of feed on the total production costs for 1 ton feed.</b>
Respondent 1	The production costs for one ton meal feed are approximately 15€. The M&A resulted in a cost depression of 1€ to 2€ per ton.
Respondent 2	The total production costs for one ton feed decreased due to the increased production volume by 2€ to 3€ per ton.
Respondent 3	We certainly save 0.10€ to 0.20€ per deciton (=100kg), as we can spread the fixed costs among a larger production volume.
Respondent 4	We have a better utilization of our plants and therefore lower production costs.
<b>Question3</b>	<b>Please quantify this impact in terms of the Scale of Mock.</b>
Respondent 1	Significant (12-20%)
Respondent 2	Marked (7-12%)
Respondent 3	Considerable (30-45%)
Respondent 4	Between Modest (2-4%) and Considerable (30-45%), dependent on the plant

All respondents clearly confirmed that the annual production volume of feed in the respective companies increased as a result of the M&A's. Respondent 2 described the increase in the annual production volume as "substantial" and Respondent 3 described it as "noticeably". Altogether it can be stated that the M&A's have led to increases in the annual production volume of feed in all examined cases and therefore it can be assumed that the precondition for economies of scale is given in all examined cases. All respondents indicated that the larger annual production volume resulted in lower production costs per one ton feed. Respondent 1 and Respondent 3 mentioned cost savings in the amount of 1€ to 2€ per ton feed. Respondent 2 quantified the cost savings with 2€ to 3€ per ton. Respondent 4 quantified the cost savings between modest (2-4%) and considerable (30-45%). Altogether, it can be stated unequivocally that the M&A's in all examined cases resulted in higher annual production volumes, which have led to obvious cost savings in the production process. From

this, it can be concluded that the M&A's resulted in economies of scale in production in all examined cases.

### 6.1.3 Results Related to Economies of Scope in R&D

This section summarizes the interview results related to economies of scope in R&D. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 14. Below the table, the answers are interpreted and it is concluded whether economies of scope in R&D can be recognized in the examined cases or not.

Table 14: Interview Results Related to Economies of Scope in R&D

<b>Question 1</b>	<b>Please describe whether the number of different R&amp;D projects in your company changed after the M&amp;A.</b>
Respondent 1	The number of R&D projects which are unrelated to compound feed is increasing.
Respondent 2	The number of new products and the efforts to develop new products increased.
Respondent 3	We do not really have R&D projects in that sense. Here we rather resort on our suppliers.
Respondent 4	The number of R&D projects decreased. But this is not a result of M&A's, but rather of the fact that the topics and issues became more complex.
<b>Question2</b>	<b>If applicable, please describe the impact of the changed number of R&amp;D projects on the total costs for the development of a new product.</b>
Respondent 1	The increased number of R&D projects results in higher costs, which offset the realized economies of Scale.
Respondent 2	The costs for the development of a new product are still minor.
Respondent 3	Not applicable
Respondent 4	We are conducting R&D with the same number of employees. Therefore we hardly have additional costs for R&D.
<b>Question3</b>	<b>Please quantify this impact in terms of the scale of Mock.</b>
Respondent 1	Significant (12-20%)
Respondent 2	Marginal (0-2%)
Respondent 3	Not applicable
Respondent 4	Between Modest (2-4%) and Limited (4-7%)

The answers regarding the change in the number of R&D projects after the M&A's are quite different. Respondent 1 stated that the number of R&D projects, which are unrelated to feed, increased after the M&A. Respondent 2 indicated that the efforts to develop new products increased after the M&A, but from this it cannot be concluded that the number of R&D projects increased. Respondent 3 indicated that there were no R&D projects at all in his company and Respondent 4 stated that the number of R&D projects decreased as a result of more complex issues, but not as a result of M&A's. Therefore, the results related to the change in the number of R&D projects are not unambiguous. However, it can be stated that in none of the examined cases was a clear increase in the number of different feed related R&D projects as a result of M&A's. Therefore, in none of the examined cases the precondition for economies of scope in R&D was given. In terms of the impact of the changed number of R&D projects on the costs for the development of a new product, Respondent 1 stated to have higher costs as a result of the increased number of R&D

projects. Respondent 2 and Respondent 4 indicated to have hardly additional costs as a result of a changed number of R&D projects. No respondent indicated to have lower costs for the development of a new product as a result of an increased number of R&D projects. For that reason, it can be concluded that in none of the examined cases the M&A's resulted in economies of scope in R&D.

#### **6.1.4 Results Related to Economies of Scope in Production**

This section summarizes the interview results related to economies of scope in production. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 15. Below the table, the answers are interpreted and it is concluded whether economies of scope in production can be recognized in the examined cases or not.

Table 15: Interview Results Related to Economies of Scope in Production

<b>Question 1</b>	<b>Please describe whether the number of different products that are produced in your company changed after the M&amp;A.</b>
Respondent 1	"There was an increase. I quantified it with 10%"
Respondent 2	The number of different products increased, as we usually produce an individual product for every customer.
Respondent 3	"Yes. I mentioned that already."
Respondent 4	We now produce more products that are tailor-made. But that is not a result of M&A's, but rather a requirement of the market.
<b>Question2</b>	<b>If applicable, please describe the impact of the changed number of products on the total costs for the production of 1 ton feed.</b>
Respondent 1	We do not see any increases in the costs for the production of one ton feed due to a higher number of products.
Respondent 2	The increased number of different products led to increases in the production costs.
Respondent 3	The increased number of products might lead to higher production costs.
Respondent 4	We do not really have an increased number of products. We produce these tailor-made products, but we wouldn't do that if it would result in additional costs.
<b>Question3</b>	Please quantify this impact in terms of the scale of Mock.
Respondent 1	Marginal (0-2%)
Respondent 2	Limited (4-7%)
Respondent 3	Between Modest (2-4%) and Limited (4-7%)
Respondent 4	Modest (2-4%)

All respondents confirmed an increase in the number of different products that are produced in the respective companies. Therefore, it can be stated that the precondition for economies of scope in production was given in all examined cases. In terms of the impact on the production costs, the respondents declared that a larger set of different feed products rather leads to higher production costs, as the production of more different products is more laborious. However, the respondents quantified the impact of the increased number of different products on the production costs with grades between marginal (0-2%) and limited (4-7%). No respondent stated that the increased number of different products have resulted

in obvious production cost savings, and therefore it can be concluded that in none of the examined cases the M&A's have led to economies of scope in production.

### **6.1.5 Results Related to Synergies in R&D**

This section summarizes the interview results related to synergies in R&D. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 16. Below the table, the answers are interpreted and it is concluded whether synergies in R&D can be recognized in the examined cases or not.

Table 16: Interview Results Related to Synergies in R&D

<b>Question 1</b>	<b>Please describe whether there has been a combination of previously unrelated R&amp;D inputs after the M&amp;A in your company.</b>
Respondent 1	There was a combination, for example in the fields industrial safety, energy management, commodities management or communication. Conducting such projects together enhances the speed and quality of implementation.
Respondent 2	The things which three companies did separately in the pre-merger situation are now done corporately.
Respondent 3	There has been no combination of previously unrelated R&D inputs in our company.
Respondent 4	"Yes. We now have a product management for all companies."
<b>Question2</b>	<b>If applicable, please describe the impact of the combination of previously unrelated R&amp;D inputs on the quality of your products.</b>
Respondent 1	"Due to our modern mixing plants, the technical quality of our products is certainly state of the art." The products (feed) are rather independent from the combination of different R&D inputs.
Respondent 2	Today I can say that the quality of our products increased [as a result of the combination of different R&D inputs]."
Respondent 3	Not applicable
Respondent 4	The quality of our products is similar in all our plants.

Respondent 1 indicated a combination of such R&D inputs in his company, which are not related to feed. Respondent 2 stated that some R&D inputs were combined after the M&A in his company. Respondent 3 declared that there was no combination of R&D inputs after the M&A in his company and therefore it can be concluded that the M&A in the company of Respondent 3 did not lead to synergies in R&D. Respondent 4 indicated that the M&A in his company has led to an overall product management for all plants. Altogether, it can be stated that only in the companies of Respondent 2 and Respondent 4 feed related R&D inputs were combined after the M&A. In terms of the impact of the combination of previously unrelated R&D inputs on the product quality, Respondent 1 declared that their products are state of the art and that the products are rather independent from the combination of different R&D inputs. For that reason, it can be concluded that the M&A in the company of Respondent 1 did not lead to synergies in R&D. Respondent 2 stated that the product quality in his company has increased as a result of the combination of previously unrelated R&D inputs. Consequently, it can be concluded that the M&A in the company of Respondent 2 resulted in synergies in R&D. Respondent 4 declared that the implementation of an overall product management resulted in a similar product quality in all plants.

Therefore, it can be stated that the combination of R&D inputs after the M&A had an impact on the product quality. For that reason, it is concluded that the M&A in the company of Respondent 4 has resulted in synergies in R&D. In a nutshell, it can be concluded that in the companies of Respondent 1 and Respondent 3 the M&A's have not led to synergies in R&D, while in the companies of Respondent 2 and Respondent 4 the M&A did lead to synergies in R&D.

### **6.1.6 Results Related to Synergies in Production**

This section summarizes the interview results related to synergies in production. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 17. Below the table, the answers are interpreted and it is concluded whether Synergies in production can be recognized in the examined cases or not.

Table 17: Interview Results related to Synergies in Production

<b>Question 1</b>	<b>Please describe whether there has been a combination of previously unrelated production inputs or technologies after the M&amp;A in your company.</b>
Respondent 1	We bunch the different product lines so that we do not have to produce the same products in every plant. So we split the work and have a new organization of work.
Respondent 2	In the pre-merger situation, it was not possible that every company had its optimal equipment. Today we do have optimal and modern equipment, for example a roller mill.
Respondent 3	In the production of broiler feed we are now able to use a hygienisation (-machine), which we could not use before.
Respondent 4	"Yes. That the plants do complement each other in terms of their tonnage is clear. We have more plants and more possibilities."
<b>Question2</b>	<b>If applicable, please describe the impact of the combination of previously unrelated production inputs or technologies on the efficiency of your production process.</b>
Respondent 1	It is positive for the efficiency of our production process, as we can deal with the processes in more detail and reduce the error rate. Through the larger production volume, we have the opportunity to specialize.
Respondent 2	Of course the productivity and quality increased, because only through modern equipment we can warrant a good quality.
Respondent 3	The efficiency of our production process changed significantly or strongly.
Respondent 4	"If one distributes the different product segments among plants, than the reason is to work more efficient and to save costs."

All respondents clearly confirmed that the M&A's in their companies resulted in the combination of previously unrelated production inputs or technologies. Respondent 1 and Respondent 4 explained that the M&A's enabled them to distribute the different products segments among the different plants, with the result that every plant could specialize in producing one certain product segment. Respondent 2 and Respondent 3 declared that the M&A's afforded the use and access to better and more modern production equipment. Altogether, it can be stated that the M&A's in all examined cases have resulted in the combination of previously unrelated production inputs or technologies. In terms of the impact of the combination of previously unrelated production inputs or technologies on the efficiency of the production process, all respondent indicated an increase in efficiency and

productivity. For example, Respondent 1 explained that the product segment specialization of the plants enables to deal with the processes in more detail and reduces the error rate, what increases the efficiency of the production process. Altogether, it can be stated that the M&A's in all examined cases have led to the combination of previously unrelated production inputs and technologies, what increased the efficiency of the production process. For that reason, it is concluded that the M&A's in all examined cases have led to synergies in production.

### **6.1.7 Results Related to the Creation of a New Growth Platform**

This section summarizes the interview results related to the creation of a new growth platform. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 18. Below the table, the answers are interpreted and it is concluded whether the creation of a new growth platform can be recognized in the examined cases or not.

Table 18: Interview Results related to the Creation of a New Growth Platform

<b>Question 1</b>	<b>Please describe whether there has been a combination of previously unrelated R&amp;D inputs after the M&amp;A.</b>
Respondent 1	There was a combination, for example in the fields of industrial safety, energy management, commodities management or communication. Conducting such projects together enhances the speed and quality of implementation.
Respondent 2	The things which three companies did separately in the pre-merger situation are now done corporately.
Respondent 3	There has been no combination of previously unrelated R&D inputs in our company.
Respondent 4	"Yes. We now have a product management for all companies."
<b>Question2</b>	<b>If applicable, please describe whether this combination has until today led to a new processing technology or feeding concept which resulted in a group of new products with better characteristics or functionalities.</b>
Respondent 1	In the field of the nutrition of sows and piglets we generated a new product line. Furthermore, we are now able to use an extruder / expander in this mixing plant.
Respondent 2	Through the knowledge of new production processes, we are going to purchase a special mixer for the production of a feed for calves.
Respondent 3	As a result of the M&A we have jointly developed new feeding concepts for cattle or pigs.
Respondent 4	One needs a critical production volume in order to employ skilled scientists and to develop complicated and complex products. The effects of a M&A is that the costs of employees can be distributed among a larger tonnage.

The initial interview question related to the creation of a new growth platform is identical with the initial interview question related to synergies in R&D. As already described in Section 6.1.5, Respondent 1 indicated a combination of such R&D inputs in his company, which are not related to feed. Respondent 2 stated that some R&D inputs were combined after the M&A in his company. Respondent 3 declared that there was no combination of R&D inputs after the M&A in his company and therefore it can be concluded that the M&A in the company of Respondent 3 did not lead to Synergies in R&D. Respondent 4 indicated that the M&A in his company has led to an overall product management for all plants.

Despite the fact that only Respondent 2 and Respondent 4 indicated the combination of feed related R&D inputs, Respondent 1, Respondent 2 and Respondent 3 declared to have developed and introduced new products or feeding concepts. For example, Respondent 1 mentioned a new product line for the nutrition of sows and piglets and the installation of an extruder / expander in his mixing plant. Respondent 2 detailed the plan to purchase a special mixer for the production of a feed for calves. Respondent 3 specified that the sales personal of the two merged companies jointly developed new feeding concepts for cattle and pigs. Respondent 4 did not mention the development or introduction of new products. Altogether, it can be stated that the M&A's in the companies of Respondent 1, Respondent 2 and Respondent 3 have led to a new processing technology or feeding concept which resulted in a group of new products. Therefore, it can be concluded that the M&A's in the companies of Respondent 1, Respondent 2 and Respondent 3 resulted in the creation of one or more new growth platforms.

### **6.1.8 Results Related to Innovation Lead Time**

This section summarizes the interview results related to the innovation lead time. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 19. Below the table, the answers are interpreted and it is concluded whether a change in the innovation lead time can be recognized in the examined cases or not.

Table 19: Interview Results Related to Innovation Lead Time

<b>Question 1</b>	<b>Please describe whether the time period between the first activities to develop a new product and the first delivery of the new product to the customer changed after the M&amp;A in your company.</b>
Respondent 1	"The speed increased. [...] I can clearly affirm that. The time period has been shortened."
Respondent 2	In the pre-merger situation, when we were a small company, we could introduce new products very quickly, maybe even quicker than today.
Respondent 3	"No. No change."
Respondent 4	The time for the development increased due to more complex topics. This is no result of M&A's.
<b>Question2</b>	<b>Please quantify this change in terms of the scale of Mock.</b>
Respondent 1	Strong (20-30%)
Respondent 2	Marginal (0-2%)
Respondent 3	Marginal (0-2%)
Respondent 4	Between Strong (20-30%) and Considerable (30-45%)

Respondent 1 explained that the innovation lead time in his company shortened after the M&A and quantified this change as strong (20-30%). As an explanation, he stressed that the M&A enabled the employment of new skilled employees, who increased the quality and speed of the execution of R&D projects. Respondent 2 indicated that the innovation lead time rather prolonged after the M&A and quantified this change as marginal (0-2%). Respondent 3 stated that the innovation lead time in his company did not change after the M&A. Respondent 4 declared that the innovation lead time prolonged in his company, but

he stated that this was not due to a M&A, but due to the fact that the topics and issues, which have to be solved through R&D projects, became more and more complex. He quantified this change as strong (20-30%) to considerable (30-45%). Altogether, it is concluded that the M&A in the company of Respondent 1 led to a strong shortening of the innovation lead time and in the company of Respondent 2 to a marginal prolongation of the innovation lead time. The M&A's in the companies of Respondent 3 and Respondent 4 had no impact on the innovation lead time.

### **6.1.9 Results Related to Risk Management in R&D**

This section summarizes the interview results related to risk management in R&D. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 20. Below the table, the answers are interpreted and it is concluded whether a change in the risk management in R&D can be recognized in the examined cases or not.

Table 20: Interview Results Related to Risk Management in R&D

<b>Question 1</b>	<b>Please describe whether the variance in return of R&amp;D projects in your company changed after the M&amp;A.</b>
Respondent 1	"The variance in return of R&D projects decreased, because the quality of the execution [of R&D projects] increased."
Respondent 2	In the pre-merger situation, not everything worked that we wanted to reach with new products. I think this improved a bit.
Respondent 3	"As we do not have R&D projects in that sense, this is difficult to answer."
Respondent 4	The success rate of our R&D projects increased.
<b>Question2</b>	<b>Please describe whether your willingness to invest in longer term and riskier R&amp;D projects changed in your company after the M&amp;A.</b>
Respondent 1	"Yes, [the willingness] [...] increased. We now act in a proactive way, whereas in the past we rather reacted."
Respondent 2	"Actually, that didn't change."
Respondent 3	As already mentioned, we are not very active in R&D.
Respondent 4	"No."

Respondent 3 indicated that there were no real R&D projects in his company and therefore he could not answer the interview questions which are related to the variance in return of R&D projects and the willingness to invest in longer term and riskier R&D projects. However, Respondent 1, Respondent 2 and Respondent 4 confirmed that the variance in return of R&D projects decreased after the M&A's in the respective companies. As a reason for this, Respondent 1 explained that the quality of the execution of R&D projects increased after the M&A. A decrease in the variance in return of R&D projects means that the failure rate of R&D projects decreased and / or that the success rate of R&D projects increased. From this it is concluded that the M&A's in the companies of Respondent 1, Respondent 2 and Respondent 4 resulted in a reduction of the R&D related risks. In terms of the respondents' willingness to invest in longer term and riskier R&D projects, Respondent 2 and Respondent 4 indicated that their willingness to invest in longer term and riskier R&D projects did not

change after the M&A. Respondent 1 stated that his willingness to invest in longer term and riskier R&D projects increased after the M&A. He detailed that his company had changed from a reactive way of acting towards a proactive way of acting. In summary, in the company of Respondent 1, the variance in return of R&D projects decreased and the willingness to invest in longer term and riskier R&D projects increased after the M&A. From this it is concluded that the M&A in the company of Respondent 1 had a significant impact on the risk management in R&D. In the companies of Respondent 2 and Respondent 4, the variance in return of R&D projects decreased after the M&A's. However, this had no impact on the willingness of Respondent 2 and Respondent 4 to invest in longer term and riskier R&D projects. Consequently it is concluded that the M&A's in the companies of Respondent 2 and Respondent 4 had no impact on the risk management in R&D.

### **6.1.10 Results Related to Market Power and Appropriation**

This section summarizes the interview results related to market power and appropriation. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 21. Below the table, the answers are interpreted and it is concluded whether a change in the market power and appropriation can be recognized in the examined cases or not.

Table 21: Interview Results Related to Market Power and Appropriation

<b>Question 1</b>	<b>Please describe whether the aggressiveness of (potential) competitors changed after the M&amp;A?</b>
Respondent 1	"The competitive situation increased."
Respondent 2	The aggressiveness of our competitors increased minimally.
Respondent 3	We didn't notice an increase in the aggressiveness of our competitors. Rather, our aggressiveness increased.
Respondent 4	"Yes." The aggressiveness increased.
<b>Question2</b>	<b>Please describe whether the market share in the product market of your company changed after the M&amp;A.</b>
Respondent 1	The marked share increased. In national terms, we are a small supplier, but in our region we are strong.
Respondent 2	"I can clearly answer that, because the market share increased."
Respondent 3	Our market share increased considerably or sharply.
Respondent 4	Our market share increased significantly.
<b>Question3</b>	<b>Please quantify the change in market share in terms of the scale of Mock.</b>
Respondent 1	Modest (2-3%)
Respondent 2	Limited (4-7%)
Respondent 3	Between Considerable (30-45%) and Sharp (more than 45%)
Respondent 4	Significant (12-20%)

Regarding market power and appropriation in the technology market, a change was recognized in the companies of Respondent 1, Respondent 2 and Respondent 4, as these respondents indicated an increased aggressiveness of (potential) competitors. In this study, a lower aggressiveness of (potential) competitors is used as an indicator for an increased

market power and appropriation in the technology market. Respondent 3 reversed the question and explained that not the aggressiveness of competitors, but that their own aggressiveness had increased after the M&A. As no respondent indicated a lower aggressiveness of (potential) competitors, it is concluded that the market power and appropriation in the technology market did not increase after the M&A's in the examined cases. Regarding the market shares, all respondents declared that their market share in the German market for compound feed had increased as a result of the M&A's. However, the respondents' quantifications of the increases of the market shares of their companies range from modest (2-3%) to sharp (more than 45%). Altogether, it can be concluded that in general M&A's increase the market shares of the included companies, what often leads to a tightening of the competitive situation.

### **6.1.11 Results Related to Agency Problems**

This section summarizes the interview results related to agency problems. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 22. Below the table, the answers are interpreted and it is concluded whether agency problems can be recognized in the examined cases or not.

Table 22: Interview Results Related to Agency Problems

<b>Question 1</b>	<b>Please describe whether interest conflicts occurred in your company before, during and after the M&amp;A? (announcement, integration, post-integration)</b>
Respondent 1	There were no interest conflicts, as we plan these collaborations long-ranging. Before the M&A the collaborations has been synchronized.
Respondent 2	There were no interest conflicts. We informed and involved all stakeholders (employees) and reached a good result and solution.
Respondent 3	"Not really, no."
Respondent 4	"No. That always went smoothly. [...] I cannot see any interest conflicts."
<b>Question2</b>	<b>If applicable, please describe the impact of these interest conflicts on the R&amp;D process in your company.</b>
Respondent 1	Not applicable
Respondent 2	Not applicable
Respondent 3	Not applicable
Respondent 4	Not applicable
<b>Question3</b>	<b>Please use the given 5-point Likert scale to describe the innovation approach of your company after the M&amp;A.</b>
Respondent 1	4=rather outward directed and collaborative
Respondent 2	5=outward directed and collaborative
Respondent 3	4=rather outward directed and collaborative
Respondent 4	4=rather outward directed and collaborative

The results regarding interest conflicts are very clear, as all respondents stated that there have been no interest conflicts before, during or after the M&A's in their companies. For that reason, the question regarding the impact of interest conflicts on the R&D process did not apply to any of the respondents. As interest conflicts are regarded as indicator for

agency problems in this research, the absent of interest conflict means that there have been no agency problems in the examined cases. In terms of their innovation approach, Respondent 1, Respondent 3 and Respondent 4 declared to have a rather outward directed and collaborative innovation approach and Respondent 2 declared to have an outward directed and collaborative innovation approach. A (rather) outward directed and collaborative innovation approach indicates the willingness to share knowledge with third parties and the willingness to incorporate external knowledge in the own innovation process. Such cooperation with external knowledge sources requires symmetric information and transparency among the involved parties. From this it is concluded that there has been no asymmetric information or a lack of transparency in the examined cases. As asymmetric information and a lack of transparency are regarded as indicators for agency problems in this research, the absent of asymmetric information and a lack of transparency means that there have been no agency problems in the examined cases. Altogether, because of the absent of interest conflicts, asymmetric information or lacking transparency, it is concluded that the M&A's did not lead to agency problems in the examined cases.

### **6.1.12 Results Related to the Motivation of Employees**

This section summarizes the interview results related to the motivation of employees. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 23. Below the table, the answers are interpreted and it is concluded whether a change in the motivation of employees can be recognized in the examined cases or not.

Table 23: Interview Results Related to the Motivation of Employees

<b>Question 1</b>	<b>Please use the given 5-point Likert scale to assess the efforts of employees in your company to bring a new product to the market before and after the M&amp;A.</b>
Respondent 1	Before the M&A: 2=fair // After the M&A: 3=good
Respondent 2	Before the M&A: 2=fair // After the M&A: Between 3=good and 4=very good
Respondent 3	Before the M&A: 3=good // After the M&A: 4=very good
Respondent 4	Before the M&A: 4=very good // After the M&A: 4=very good
<b>Question2</b>	<b>Please use the given 5-point Likert scale to assess the efforts of employees in your company to increase the efficiency of the production process before and after the M&amp;A.</b>
Respondent 1	Before the M&A: 3=good // After the M&A: 3=good
Respondent 2	Before the M&A: 2=fair // After the M&A: 3=good
Respondent 3	Before the M&A: 3=good // After the M&A: 4= very good
Respondent 4	Before the M&A: 4=very good // After the M&A: 4=very good

Regarding the efforts of employees to bring a new product to the market, Respondent 1, Respondent 2 and Respondent 3 indicated an increase in their employees' efforts to bring a new product to the market. Respondent 4 indicated that the efforts of his employees to bring a new product to the market did not change through the M&A. Therefore, it can be stated that in 3 cases the motivation of employees in the R&D process improved after the M&A and in one case it remained unchanged after the M&A. Regarding the efforts of

employees to increase the efficiency of the production process, Respondent 2 and Respondent 3 indicated that their employees' efforts to increase the efficiency of the production process increased after the M&A. Respondent 1 and Respondent 4 indicated that their employees' efforts to increase the efficiency of the production process did not change after the M&A. Therefore, it can be stated that in 2 cases the motivation of employees in the production process improved after the M&A and in 2 cases it remained unchanged after the M&A. Altogether, it is concluded that the M&A's in the examined cases either resulted in an improvement of the motivation of employees in both the R&D process or the production process or did not influence the motivation at all. In none of the examined cases the M&A's resulted in a decline of motivation or in motivation problems.

### **6.1.13 Results Related to Efficiency of Internal Capital Markets / Financial Discipline**

This section summarizes the interview results related to the efficiency of internal capital markets and financial discipline. For that purpose, the core statements of each respondent to each of the related interview questions are presented in Table 24. Below the table, the answers are interpreted and it is concluded whether a change in the efficiency of internal capital markets and financial discipline can be recognized in the examined cases or not.

Table 24: Interview Results Related to Efficiency of Internal Capital Markets / Financial Discipline

<b>Question 1</b>	<b>Please describe whether the M&amp;A had an impact on the financial resources in your company.</b>
Respondent 1	"We say that we married rich."
Respondent 2	"[...] the financial situation improved essentially."
Respondent 3	"As we merged with a bank, [...] this changed sharply."
Respondent 4	"Yes. I would say marked to significant."
<b>Question2</b>	<b>If applicable, please quantify the change in the financial resources of your company in terms of the scale of Mock.</b>
Respondent 1	Marginal (0-2%)
Respondent 2	Considerable (30-45%)
Respondent 3	Sharp (more than 45%)
Respondent 4	Between Marked (7-12%) and Significant (12-20%)

Regarding the impact of the M&A's on the financial resources of the examined cases, all respondent clearly confirmed that their financial situation has improved after the M&A's. However, the respondents' quantifications of the improvements of their financial situations range from marginal (0-2%) to sharp (more than 45%). Altogether, it can be concluded that the M&A's in the examined cases resulted in more efficient internal capital markets and in less restricted financial discipline.

## 6.2 Summary of Interview Results

This section summarizes the interview results and answers the second sub question, which is formulated as “Which of the possible effects can be recognized in the examined cases?” For this purpose, Table 25 gives an overview on the interview results related to the possible effects of M&A’s on innovation in the German compound feed industry. It becomes clear that some effects can be recognized in all examined cases (economies of scale in production, synergies in production, change in market power and appropriation, change in efficiency of internal capital markets and financial discipline), while other effects were not recognizable in any of the examined cases (economies of scale in R&D, economies of scope in R&D, economies of scope in production, agency problems, motivation problems). However, the recognition of some effects differs across the examined cases (synergies in R&D, creation of a new growth platform, change in risk management in R&D).

Table 25: Summary of the Results Regarding the Possible Effects of M&A’s on Innovation in the German Compound Feed Industry

<b>Effect</b>	<b>Cases in which effect can be recognized</b>	<b>Cases in which effect cannot be recognized</b>
Economies of Scale in R&D	/	All cases
Economies of Scale in Production	All cases	/
Economies of Scope in R&D	/	All cases
Economies of scope in Production	/	All cases
Synergies in R&D	2 4	1 3
Synergies in Production	All cases	/
creation of a new Growth Platform	1 2 3	4
Change in Innovation lead time	1 (shortening) 2 (prolongation)	3 4
Change in Risk Management in R&D	1	2 3 4
Increase in Market Power and Appropriation	All cases (product market)	All cases (technology market)
Agency Problems	/	All cases
Motivation Problems	/	All cases
Change in Efficiency of Internal Capital Markets / Financial Discipline	All cases	/

### 6.3 Results Related to the Reasons for M&A's

This sub chapter answers the fifth sub question of this research, namely "Which reasons for the consolidation process in the German compound feed industry can be extracted from the examined cases?" The smaller the number in the ranking, the more important the respondent considers that reason (1=most important,...,10=least important). Additionally, an average rank for every reason is calculated, which is the base for an absolute rank of each reason. Table 26 presents the ranking by the respondents of the different reasons for M&A's. It has to be taken into account that Respondent 4 assigned some numbers several times, as he considered some reasons as equally important.

Table 26: Interview Results Related to the Reasons for M&A's

Reason	Resp. 1	Resp. 2	Resp. 3	Resp. 4	Average Ranking	Absolute Rank
Increase market share and bargaining power	1	3	4	1	2.25	2
Accelerate company growth	2	2	1	2	1.75	1
Access to knowledge and expertise	6	4	2	3	3.75	4
Diversification to new products or markets	3	1	3	3	2.50	3
Restrict opportunities of competitors	7	6	6	4	5.75	6
Adaption to a changing industry	4	5	5	4	4.50	5
Taxation considerations	9	8	7	4	7.00	8
Improve company reputation	5	7	8	4	6.00	7
Survival	10	9	9	4	8.00	9
Other reason	8	/	/	/	/	/

In accordance with Table 26, it can be stated that in the examined cases, the market related M&A reasons like "Accelerate company growth" or "Increase market share and bargaining power" surpass the rather innovation related M&A reasons like "Diversification to new products or markets" or "Access to knowledge and expertise" in terms of their relevance. It clearly turned out that market related reasons were more decisive than innovation related reasons for the M&A's in the examined cases.

## **6.4 Summary of Results Related to the Reasons for M&A's**

This section summarizes the results related to the reasons for the M&A's in the examined cases and thereby answers the fifth sub question, which is formulated as "Which reasons for the consolidation process in the German compound feed industry can be extracted from the examined cases?" Table 26 in the previous sub chapter already provides a quite condensed overview on the reasons for the M&A's in the examined cases. Altogether, the results reveal that market related reasons like "Accelerate company growth", "Increase market share and bargaining power" or "Diversification to new products or markets" clearly dominate among the possible reasons for M&A's. On the other hand, reasons which are related to innovation like "Access to knowledge and expertise" or "Adaption to a changing industry" have been found to be less important.

## **7 Discussion**

In this chapter, the results and the limitations of this research are discussed. More specifically, it is expounded what the results actually mean in terms of the impact of the consolidation process on innovations in the German compound feed industry. Furthermore, the results are compared to scientific theories on the relationship between industry consolidation and innovation and to the findings of other studies. In the end of this chapter, it is discussed what the limitations of this research mean to the results. Based on the limitations, some suggestions for further research are outlined.

### **7.1 Discussion of Results**

In this sub chapter, the interview results are discussed in terms of their actual meaning for the impact of the concentration process on innovations in the German compound feed industry. For this purpose, the findings related to every single effect of M&A's on innovation are expounded in a wider context. Besides that, the connection between the reasons for M&A's and the effects of M&A's on innovation is discussed in this sub chapter. Detailed descriptions of the possible effects of M&A's on innovation can be found in chapter 2, and the operationalization of the effects is described in sub chapter 4.5.

Economies of scale and scope in R&D have not been recognized in any of the examined cases (see sub chapters 6.1.1 and 6.1.3). Conversely, Batterink (2009) found that "Especially in the M&As from sectors in which the costs to develop innovations are enormous (e.g. pharma and agricultural chemicals), lowering the (relative) costs of R&D by increasing the scale and scope and by improving R&D productivity were important drivers for the M&As." One possible explanation for the absence of economies of scale and scope in R&D in the examined cases might be the fact that the costs for the development of innovations in the compound feed industry are not enormous like in the pharma or agricultural chemicals industry and therefore the interest of compound feed companies to reduce innovation costs is much lower. This explanation for the absence of economies of scale and scope in R&D in the examined cases is congruent with the researcher's impression that R&D is only a minor issue in the examined companies and that R&D costs are not really relevant. Altogether, the M&A's in the examined cases did not foster the innovativeness through economies of scale and scope in R&D.

Economies of scale in production have been recognized in all examined cases (see sub chapter 6.1.2). Economies of scale in production increase the efficiency of the production process and result in cost savings. The presence of economies of scale in production matches with the two most important reasons for M&A's. The reason which the respondents designated as most important is "Accelerate company growth". The realization of economies of scale in production helps the companies to accelerate their growth, as economies of scale in production result in cost savings, which can be invested into the growth of the company. The second most important reason for M&A's is "Increase market share and bargaining power". The realization of economies of scope in production helps the companies to increase their market shares, as a more efficient production process enables the companies

to offer the products for a lower price, what in turn leads to an increase in sales and market share. Contrary to these findings, Respondent 5, whose company, against the expectation of the researcher, turned out to have not been involved in M&A's, explained that the potential for economies of scale and related cost savings is minimal in large compound feed companies. For instance, he clarified that items like sales personal, production plants, trucks and drivers or plant managers cannot be saved as a result of M&A's. He further expounded that a M&A in his company would potentially lead to the saving of one accounting employee, what he considered as minimal. Nevertheless, economies of scale in production have clearly been recognized in all examined cases. However, because of the fact that "Accelerate company growth" and "Increase market share and bargaining power" have been designated as the most important reasons for M&A's by the respondents, one might consider it as unlikely that the cost savings due to economies of scale in production are invested into the innovation process. For that reason, it is derived that the beneficial impact of economies of scale in production on innovation is only limited in the examined cases.

Contrary to economies of scale in production, economies of scope in production have not been recognized in any of the examined cases (see sub chapter 6.1.4). Instead, slight diseconomies of scope in production due to more different products have been recognized in 3 out of 4 examined cases, as these respondents mentioned higher production costs due to a larger product portfolio. These diseconomies lead to a less efficient production process and additional production costs, what might result in a reduction of R&D funds. Therefore, the recognized diseconomies of scope in production in the examined cases have a rather detrimental impact on innovation.

Synergies in R&D have been recognized in two out of four cases (see sub chapter 6.1.5). Synergies in R&D increase the R&D output and improve the R&D performance. Considering the main reasons for M&A's, synergies in R&D seem to be intended or at least desired by the examined cases. For instance, the reason "Access to knowledge and expertise" has been designated as the fourth most important reason for M&A's by the respondents. This means that the companies were deliberately looking for new knowledge and expertise which they could integrate into their R&D process and which is the base for synergies in R&D. This is in accordance with the fact that the complexity of technologies and issues is increasing, what might force companies to cooperate and to combine their knowledge in order to innovate (Schön, Pyka, 2009). Despite the indicated relevance of new knowledge and expertise, only half of the examined cases actually managed to realize synergies in R&D. The other half of the companies either did not get access to new knowledge or expertise through the M&A's or did not manage to integrate this knowledge and realize synergies in R&D. Besides that, the respondents designated "Diversification to new products or markets" as third most important reason. Synergies in R&D help companies to diversify to new products or markets through a better R&D output and R&D performance. Altogether, synergies in R&D clearly contribute to the innovativeness of a company. However, as synergies in R&D have been recognized in only half of the examined cases, the positive impact of M&A's on innovations through synergies in R&D is rather limited.

Synergies in production have clearly been recognized in all examined cases (see sub chapter 6.1.6). The results of synergies in production are new products or efficiencies that were not achievable in the pre-merger situation. The recognition of synergies in production in the examined cases fits the identified three most important reasons for M&A's. The reason for M&A's which was found to be most important is "Accelerate company growth". Company growth can be accelerated by synergies in production, as new products increase a company's market share and new efficiencies result in cost savings, which can be invested into company growth. The reason for M&A's which was identified as second most important is "Increase market share and bargaining power". Synergies in the production process help companies to increase their market share, as the new products which result from synergies in production lead to additional sales and thereby increase the market share. The reason for M&A's which was identified as third most important is "Diversification to new products or markets". Synergies in production clearly help companies to diversify, as they result in new products that were not achievable before. On the contrary to this, M&A's might lead to substantial transaction costs, which can easily cancel out the realized synergies (Schulz, 2007). Nevertheless, synergies in production can directly benefit innovation through new products, or indirectly through new efficiencies and cost savings, which can be reinvested into the innovation process. However, due to the fact that "Accelerate company growth" and "Increase market share and bargaining power" have been designated as the most important reasons for M&A's by the respondents, one might consider it as unlikely that the cost savings due to synergies in production are invested into the innovation process. For that reason, it is concluded that the beneficial impact of synergies in production on innovation is limited in the examined cases.

In three out of four examined cases, the M&A's have led to a new processing technology or feeding concept, which resulted in new growth platforms (see sub chapter 6.1.7). It can be assumed that the creation of a new growth platform was deliberated or desired in the examined cases, as the creation of a new growth platform is obviously related to the M&A reason "Diversification to new products or markets", which was found to be the third most important reason for M&A's among the examined cases. Actually, a new growth platform is the base for a group of new products, and therefore a new growth platform is an effective means for companies to diversify. Besides that, from the fact that the M&A's in three out of four cases have led to a new processing technology or feeding concept, it can be derived that the well known "not invented here syndrome" (Schulz, 2007) was not a problem in these three cases, as these cases are willing to incorporate new and external knowledge in their innovation process. Altogether, in three out of four examined cases the M&A's had a clear beneficial impact on innovation through the creation of new growth platforms.

A change in the innovation lead time was recognized in two out of four examined cases (see sub chapter 6.1.8). However, in one case the innovation lead time shortened after the M&A, and in one case it prolonged. In terms of the research question of this study, only a shortening of the innovation lead time is considered to be beneficial for innovation, as it helps companies to win the innovation race and to be first at market, thereby sooner

recovering innovation costs. The reduction of innovation lead time is related to some important reasons for M&A's, especially "Adaption to a changing industry" and "Restrict opportunities of competitors". The shorter the innovation lead time is, the faster a company can react to a changing industry, for instance to changing customer demands or changing laws. If a company can react faster to these changes than its competitors, for instance if a company is the first who brings out a new product for a new customer demand, than this company wins the innovation race and restricts its competitors in the opportunity to satisfy that new customer demand. This, in turn, increases the market share and growth of the company. Altogether, a reduced innovation lead time has a very positive impact on innovation. However, due to the fact that a reduction in innovation lead time was found in only one out of the four examined cases, it is concluded that the positive impact of M&A's on innovation through reduced innovation lead time is only limited.

Regarding R&D related risks, three out of four examined cases confirmed that the M&A's have led to a reduction of R&D related risks and to an increase in the success rate of R&D projects (see sub chapter 6.1.9), what results in a reduction of R&D costs. However, the risk spreading in R&D had an impact on the risk management in R&D in only one case, as only one respondent confirmed an increased willingness to invest in longer term and riskier R&D projects. Investments in longer term and risky R&D projects might increase the innovative performance of a company, but the related risk and uncertainty is substantial. Therefore, the beneficial impact of an increased willingness to invest in longer term and riskier R&D projects on innovation is limited. Altogether, due to the fact that a change in risk management after M&A's was found in only one out of four cases, the impact of M&A's on innovation through a changed risk management in R&D is negligible.

An increase in market power and appropriation in the technology market was recognized in none of the examined cases (see sub chapter 6.1.10). This means that the M&A's did not lead to the expected entry barriers in the technology market, which intimidate (potential) competitors and prevent them from attempting to gain market share. Considering M&A reasons like "Increase market share and bargaining power" or "Restrict opportunities of competitors", it can be assumed that many companies desire such an entry barrier and an increase in market power and appropriation in the technology market. However, the results indicate that the opposite is the case, namely a tightening of the competitive situation. This strong competition might force the companies to innovate in order to remain competitive. Moreover, the degree of substitutability is very high in the compound feed industry. This high degree of substitutability leads to higher innovation efforts of companies (Schulz, 2007). This, in turn, matches the M&A reason "Diversification to new products or market", as diversification is a way to circumvent the consequences of a high degree of substitutability. An increase in market power and appropriation in the product market was recognized in all examined cases, as all respondents indicated that their market shares increased after the M&A's. This fits the M&A reason "Increase market share and bargaining power", which was ranked as the second most important reason for M&A's by the respondents. The impact of an increased market power and appropriation in the product market on innovation is

ambiguous. On the one hand, the increased appropriation is an incentive for the merged company to invest in R&D. On the other hand, every increase in market share decreases the potential to further increase market share, what is rather a disincentive to invest in R&D. Despite the ambiguous effects of a changed market power and appropriation in the technology and product market on innovation, the researcher's impression is that the examined companies feel compelled to use innovations as a means for the purpose to remain competitive and to stay in the market. Altogether, the impact of M&A's on innovation through changes in market power and appropriation is definitively significant in the examined cases.

Agency problems have not been recognized in any of the examined cases (see sub chapter 6.1.11). Both indicators for agency problems which were used in this study, namely interest conflicts which are caused by M&A's and which obstruct the R&D process and an inward directed and autonomous innovation approach, have not been found in the examined cases. It is obvious that the issue of agency problem is a sensitive one and that respondents are likely to withhold information regarding interest conflicts or agency problems in their companies. Moreover, managers might be not aware of possible agency problems in their companies. Therefore, one has to consider the results regarding agency problems with caution. Altogether, despite the absence of both indicators for agency problems, a conclusion on the impact of agency problems on innovation in the examined cases is not possible.

According to the results on the motivation of employees, the M&A's in the examined cases either resulted in an improvement of the motivation of employees in both the R&D process and the production process or did not influence the motivation at all (see sub chapter 6.1.12). In none of the examined cases the M&A's resulted in a decline of motivation or in motivation problems. This means that the M&A's did not cause the expected motivation problems among R&D or production employees in the examined companies. Furthermore, because of the realization of synergies in R&D in two out of four cases and the creation of new growth platforms in three out of four cases, it is derived that the M&A's in the most cases did not lead to motivation problems in the form of the "not invented here syndrome". Again, it has to be taken into account that respondents are likely to withhold information regarding problems their companies. Moreover, it is possible that the respondents simply did not recognize possible motivation problems in their companies and are therefore not aware of it. Therefore, one has to consider the results regarding motivation problems with caution. Altogether, a conclusion on the impact of motivation of employees on innovation in the examined cases is not possible.

Regarding the impact of the M&A's on the financial resources of the examined cases, all respondent clearly confirmed that their financial situation has improved after the M&A's (see sub chapter 6.1.13). However, the substantial improvement of the financial situation of the company of Respondent 3 might be due to the fact that his company merged with a bank. The fact that the financial situations of the examined companies improved is related to

the M&A reason which the respondents ranked as most important, namely “Accelerate company growth”, as the additional financial resources can be invested into the growth of the company. In this study, an increase of financial resources is regarded as an indicator for more efficient internal capital markets. Therefore, the M&A’s resulted in more efficient internal capital markets and in less restricted financial discipline in the examined cases. In terms of innovation, more efficient internal capital markets might imply more financial resources for R&D and lower R&D costs. However, due to the fact that “Accelerate company growth” and “Increase market share and bargaining power” have been designated as the most important reasons for M&A’s by the respondents, one might consider it as unlikely that the additional financial resources are invested into the R&D process. Moreover, the researcher got the impression that innovation and R&D are rather minor issues in the examined companies. For that reasons, it is concluded that the impact of the M&A’s in the examined cases on innovation through more efficient internal capital markets is rather limited.

## 7.2 General Discussion

The core issue of this research is the impact of the consolidation process in the German compound feed industry on company level innovations in that industry. In this sub chapter, the impact of the consolidation process in the German compound feed industry on company level innovations is discussed and compared to other scientific theories.

Already Schumpeter (1926) claimed that a firm’s innovation effort is likely to be higher when markets are concentrated and / or firms are large in size. This proposition on the relationship between innovation and market concentration and company size can, if at all, not more than partially be confirmed by this study, as only 7 out of the 13 aggregated effects of M&A’s on innovation have been found to increase innovation in the examined cases. However, the beneficial impact of these seven effects on innovation was often classified as limited. The remaining six possible effects of M&A’s on innovation either have not been recognized in the examined cases or have been found to have a detrimental or negligible impact on innovation. Therefore, this research does not provide strong confirmation for Schumpeter’s proposition that high market concentrations and large firm sizes increase innovativeness.

Contrary to Schumpeter, Arrow (1962) claims that a high concentration implies a low incentive for companies to innovate. He argues that in a monopoly, which he considers as the extreme case of concentration, the monopolist can earn profits with and without innovation and has therefore a very low incentive to innovate (Arrow, 1962). On the other hand, a company in a competitive market has to innovate in order to withstand the competition and earn profits (Arrow, 1962). In this research, the researcher often had the impression that the examined companies feel compelled to use innovations as a means for the purpose to remain competitive and to stay in the market. In terms of Arrow, this means that the German compound feed industry is quite competitive and far away from being a monopoly, as the competition constitutes an incentive for the companies to innovate in order to remain competitive.

Taking into account the seemingly conflicting propositions from Schumpeter and Arrow, Peneder (2012) expounds that the propositions are not conflicting, but that Schumpeter and Arrow refer to totally different levels of concentration in their assertions. While Schumpeter presumes low levels of initial concentration in his examinations, Arrow compares a monopoly to a competitive duopoly in his examinations, what implicates high levels of concentration (Peneder, 2012). Combining the findings of Arrow and Schumpeter results in an inverted U-shape relationship between concentration and innovation. Put simply, an inverted U-shape relationship between concentration and innovation means that companies in markets with initial low concentration will raise their innovation efforts if concentration increases, while companies in markets with initial high concentration will reduce their innovation efforts if concentration increases (Aghion et al., 2002). Taking into consideration the results of this research, the German compound feed industry can be positioned at the upward sloping part of the inverted U, as an increase in the concentration resulted in slight increases in innovation of the examined companies. Figure 8 outlines the position of the German compound feed industry on the inverted U. The position implies that the level of concentration in the German compound feed industry is rather low, what is also indicated by the concentration indices CR<sub>4</sub> and CR<sub>8</sub> (see sub chapter 5.2). For that reason, the findings of this research support the inverted U-shape relationship between concentration and innovation, which is proposed by Aghion et al. (2002).

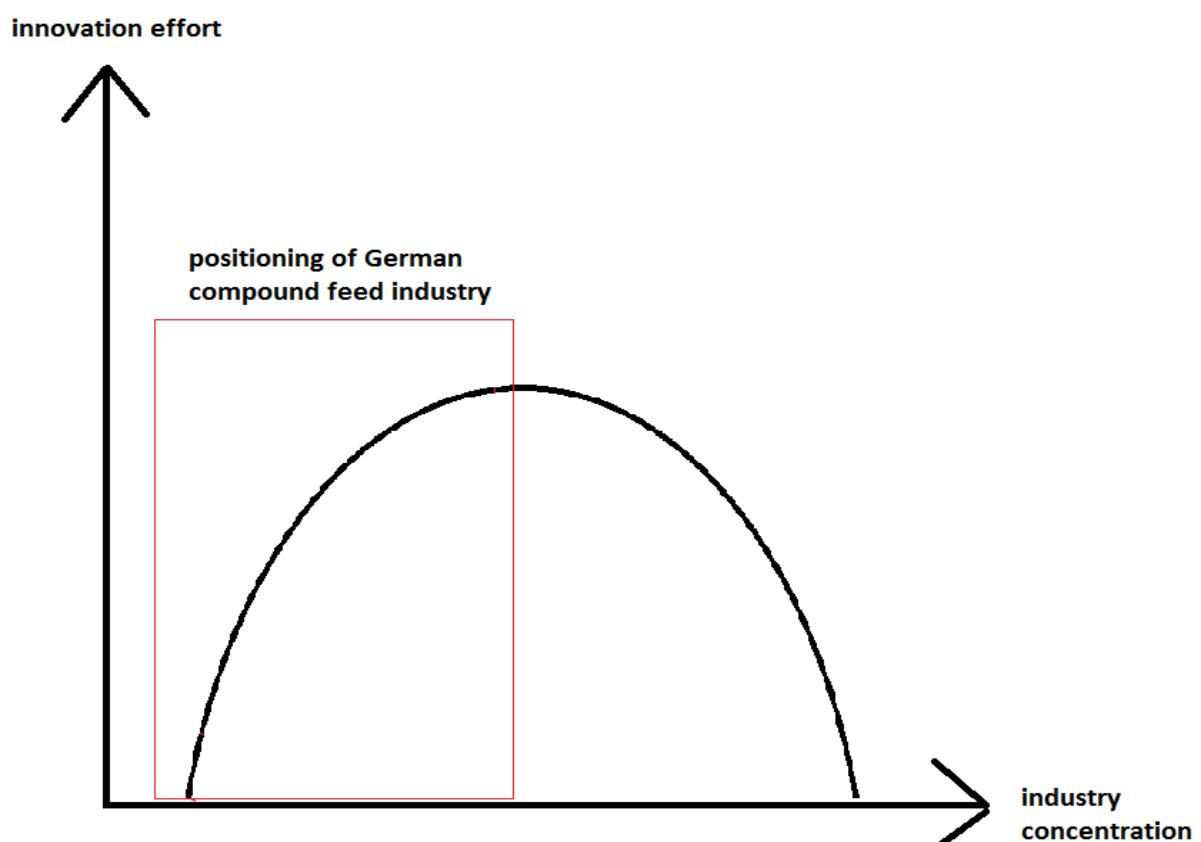


Figure 8 Position of the German compound feed industry on the inverted U

Altogether, the relationship between concentration and innovation is discussed controversially in scientific literature. For instance, Aghion et al. (2002) argue in favor of the inverted U-shape relationship between concentration and innovation, while Hashem and Ugur (2012) find a U-shape relationship between concentration and innovation. However, the relationship between concentration and innovation depends significantly on the underlying assumptions and methods of a study (Hashem, Ugur, 2012).

### 7.3 Limitations

This research faces quite some limitations, which one has to take into account when making statements on the impact of the consolidation process in the German compound feed industry on innovations in that industry. These limitations are outlined in the following sections.

To start with, this research deliberately and exclusively considers innovations which originate from within the compound feed industry itself. However, one might argue that innovations in the field of compound feed and animal nutrition do not originate from the compound feed industry itself, but rather from upstream sectors and companies like producers of premixes, vitamins or other ingredients of compound feed. This means that compound feed companies can simply buy innovative premixes or vitamins from those upstream companies, blend it into the feed and claim to have a new innovative feed product, but without having it developed on their own. This possibility of compound feed companies to adopt innovations from others is not regarded in this research, although this possibility can be considered as a strong innovation source in the field of compound feed. Not regarding this aspect might distort the findings of this research and can therefore be seen a clear limitation of this research, which might reduce the internal validity.

A further aspect, which is not fully regarded in this research, is the reaction of outsiders of M&A's (competitors). Schulz (2007) emphasized the importance of considering the reactions of merger outsiders and claims that this aspect might have relevant implications for empirical studies. Indeed there was an interview question on the aggressiveness of the competitors of the examined companies, but this question does not ensure a comprehensive inclusion of the reaction of M&A outsiders into this research. As the reaction of M&A outsiders might have consequences on the actions of the M&A parties in terms of innovation, not fully regarding this aspect can be considered as a limitation of this research, which might reduce the internal validity.

Moreover, while this research is intended to clarify the impact of M&A's on innovation, the reverse impact of innovations on M&A's is not regarded in this research. According to Schulz (2007), "the impact of mergers on innovation can only be rigorously assessed, if the converse direction of influence – mergers caused by innovation – is accounted for." Although a M&A between two compound feed companies which is caused by an innovation might seem unlikely, the disregard of this aspect constitutes a limitation of this research.

Besides that, the market and technology relatedness between the target and acquirer in the pre-merger situation is not regarded in this research. Cassiman et al. (2006) mention the strategic fit of merger target and acquirer as important factor in M&A's. In this context, Cassiman et al. (2006) refer to market relatedness and technology relatedness. Market relatedness is the degree to which the target and acquirer have been active on the same market in the pre-merger situation. Technology relatedness is the degree to which the target and acquirer have been using the same technologies in the pre-merger situation. Market and technology relatedness can significantly influence the effects which M&A's have on innovation (Cassiman et al., 2006). For that reason, not regarding market and technology relatedness of target and acquirer is a clear limitation of this research, which might reduce the internal validity.

A further limitation of this research is the relatively small sample size. Although the sample consists of companies from different size classes, companies which are private or cooperative and companies which were involved in M&A's as acquirer or target, a sample consisting of merely 4 cases provides a moderate level of external validity at best. Therefore, the small sample size is regarded as a substantial limitation of this research.

Altogether, this research entails limitations which are related to the source of innovations, the reactions of M&A outsiders, the impact of innovations on M&A's, the relatedness between target and acquirer and the sample size. Some of these limitations reduce the internal and external validity of this research and have therefore to be considered when making propositions based on the findings of this research. Nevertheless, it is assumed that this research entails a sufficient level of internal validity and a moderate level of external validity.

#### **7.4 Suggestions for Further Research**

In this section, suggestions for further research in the field of M&A's and innovation in the compound feed sector are made. These suggestions are derived from the limitations of this research study, which are presented in sub chapter 7.3.

To begin with, it is suggested to identify all sources of innovations in the field of animal nutrition in further research. These innovation sources might comprise producers of premixes, vitamins and other feed ingredients, compound feed companies, but also universities and public institutions. Taking into account all innovation sources provides a comprehensive picture on where innovations in the compound feed industry originate from and facilitates the clarification of the impact M&A's on innovations in the feed sector.

Besides that, it is suggested to include the reactions of M&A outsiders into the analysis of the impact of M&A's on innovation in further research studies. More specific, it is suggested to explore the reactions of merger outsiders in a first step and to examine the impact of these reactions on the innovativeness of the merged parties in a second step. This would be a valuable and interesting addition to the findings of the present research study.

Furthermore, it is suggested to examine the impact of innovations on M&A's in the feed sector in further research. In the words of Schulz (2007), this is necessary to rigorously assess the impact of M&A on innovation.

A further aspect which is suggested to be taken into consideration in further research is the relatedness between the merger parties. Especially market and technology relatedness between target and acquirer can significantly influence the impact of a M&A on innovation (Cassiman et al., 2006). Therefore, the inclusion of market and technology relatedness into the analysis of the impact of M&A's on innovation in the feed sector would result in interesting and valuable additional findings.

Finally, it is suggested to strive after a larger sample size in further research. This would contribute to the external validity of the findings and enable the use of quantitative data analysis methods, like for instance regression analysis. Applying quantitative data analysis methods to a larger sample size would enrich the present research study, as it contributes to the validity and reliability of the findings.

## 7.5 Summary of Discussion

According to the results of this study, the beneficial impact of the consolidation process in the German compound feed industry on company level innovations in that industry is rather limited. In accordance to that finding, the identified main reasons for M&A's in the German compound feed industry reveal that R&D and innovation do not have top priority in the examined cases. This fits the statement from Batterink (2009) that market related motives for M&A's prevail, while motives related to innovation are less important. Nevertheless, Schön and Pyka (2009) assert that "since the time of the fifth merger wave, [...] innovation related motives became increasingly important." The findings of this research partially confirm Schumpeter's proposition that high market concentrations and large firm sizes increase innovativeness. However, the findings of this research support the inverted U-shape relationship between concentration and innovation, which is proposed by Aghion et al. (2002). In terms of Arrow, the research findings imply that the German compound feed industry is quite competitive and far away from being a monopoly, as the competition constitutes an incentive for the companies to innovate in order to remain competitive. Altogether, this research found a limited impact of M&A's in the German compound feed industry on company level innovations in that industry. However, one needs to consider the limitations of this research when making propositions based on this finding.

## **8 Conclusion**

In this chapter, conclusions which are related to the central research question and to every single sub question of this research are drawn. The conclusions are based on and can be regarded as short summaries of the findings of the previous chapters. Of course, references to the previous chapters are given in order to provide the reader the possibility to quickly find the detailed information and findings. The following sections first give conclusions which are related to the sub questions of this research. After that, a general conclusion is drawn which answers the central research question. Finally, some recommendations for managers are presented.

### **8.1 Conclusion on Possible Effects of M&A's on Innovation**

This section shortly answers the first sub question, which is formulated as "Which possible effects of M&A's on innovation can be extracted from scientific literature?" An extensive answer to this sub question is given in chapter 2. In general, one can differentiate between direct and indirect effects of M&A's on innovation. Self-explaining, direct effects influence innovation directly and without an interstage, while indirect effects influence innovation via an interstage. The following direct effects of M&A's on innovation have been found during the literature study: economies of scale in R&D, economies of scope in R&D, synergies in R&D, creation of a new growth platform, innovation lead time reduction, risk spreading in R&D, market power and appropriation in the technology market, diseconomies in R&D due to bureaucracy and internal organization, agency problems in R&D and motivation problems in R&D. Besides that, the following indirect effects of M&A's on innovation have been found during the literature study: economies of scale in production, more efficient internal capital markets, economies of scope in production, synergies in production, market power and appropriation in the product market, diseconomies in production due to bureaucracy, internal organization, agency and motivation problems and financial discipline.

### **8.2 Conclusion on the Recognition of the Possible Effects of M&A's on Innovation in the Examined Cases**

This section gives a short answer to the second sub question of this research, namely "Which of the possible effects can be recognized in the examined cases?" This question is answered in a detailed way in chapter 6.1. Moreover, Table 25 in chapter 6.1 provides a quick overview on the recognized effects in the examined cases. It is concluded that the following effects have not been recognized in the examined cases: economies of scale in R&D, economies of scope in R&D, economies of scope in production and agency problems. Further, it is concluded that a change in the risk management in R&D have been concluded in one case, that synergies in R&D have been recognized in two cases and that the creation of new growth platforms have been recognized in three cases. Finally, it is concluded that the following effects have been recognized in all cases: economies of scale in production, synergies in production, change in market power and appropriation and change in the efficiency of internal capital markets / financial discipline.

### **8.3 Conclusion on the Measurement Tools for Industry Consolidation**

This section outlines the identified measurement tools for industry consolidation and thereby shortly answers the third sub question, which is formulated as "Which measurement tools for industry consolidation can be found in scientific literature?" In chapter 3, three measurement tools for concentration are described, which help to reflect the concentration process and thereby the consolidation process and M&A's in the German compound feed industry. In general, the purpose of a measurement tool for industrial concentration, a so called concentration index, is to quantify the degree of industrial concentration (Alvarado et al., 1999). Industry concentration can be defined as "[...] a function of the number of firms and their respective shares of the total production or sales [in the respective industry or market]" (Kanyenga, Mangisoni, 2007). The first way to measure industry concentration is to calculate the k-firm concentration ratio, which is defined as "the percentage of total industry output (or other such measure of economic activity, e.g. sales revenue, employment) which a given number of large firms account for" (Khemani, Shapiro, 1993). The second identified concentration index is the Herfindahl-Hirschman Index (HHI), which is calculated as "[...] the sum of squared market shares for all [...] firms active on the market" (Belleflamme, Peitz, 2010). The third way to measure industry concentration is to draw the Lorenz curve and calculate the Gini Coefficient. Altogether, three different concentration indices have been found, namely the k-firm concentration ratio, the Herfindahl-Hirschmann Index and the Lorenz Curve and the Gini Coefficient. It has to be considered that each of these concentration indeces comes along with its own advantages and drawbacks in terms of data requirements and meaningfulness.

### **8.4 Conclusion on the Description of the Consolidation Process in the German Compound Feed Industry**

This section gives a short answer to the fourth sub question, namely "Based on the identified measurement tools and the data from the German Federal Office for Agriculture and Food, how can the consolidation process in the German compound feed industry be described?" This sub question is extensively answered in chapter 4, which contains several figures that clearly confirm a consolidation process. Figure 3 shows that the annual production volume of compound feed in Germany clearly increased since 1995/96 up to approximately 23 mln. tons in 2013/14. Figure 4 clearly confirms a drastic decrease in the number of German compound feed companies from 568 companies in 1995/96 to 286 companies in 2012/13 (BLE, 2015; BMELV, 2004-2012). As a consequence of an increased overall production volume (Figure 3) and a decreased number of companies (Figure 4), the remaining companies are getting larger and larger, as Figure 5 indicates. Furthermore, Figure 6 clearly reflects a concentration or consolidation process. The number of the rather small and medium sized companies with an annual production volume up to 100,000 tons decreased, while the number of the rather large companies with an annual production volume larger than 100,000 tons increased. Figure 7 further confirms the existence of a consolidation process in the German compound feed industry, as it reveals an increase in the k-firm concentration ratios CR<sub>4</sub> and CR<sub>8</sub>. This confirms a trend towards larger and fewer compound

feed companies in Germany. Altogether, the figures in chapter 4 clearly indicate a trend toward larger and fewer compound feed companies in Germany. This can be regarded as a strong evidence for a concentration or consolidation process in the German compound feed industry, as the market power is concentrating among larger and fewer companies.

## **8.5 Conclusion on the Reasons for the Consolidation Process in the German Compound Feed Industry**

This section shortly answers the fifth sub question, which is formulated as “Which reasons for the consolidation process in the German compound feed industry can be extracted from the examined cases?” This question is answered in a detailed way in chapter 6.2. Moreover, Table 26 in chapter 6.2 provides a quick overview on the results regarding the reasons for M&A’s in the examined cases. The results reveal that market related reasons like “Accelerate company growth”, “Increase market share and bargaining power” or “Diversification to new products or markets” clearly dominate among the possible reasons for M&A’s. On the other hand, reasons which are related to innovation like “Access to knowledge and expertise” or “Adaption to a changing industry” have been found to be less important. From this it is concluded that innovation and R&D are rather minor issues in the examined companies and not decisive or relevant for M&A’s. Rather, market related motives dominate the decisions related to M&A’s.

## **8.6 Main Conclusion on the Impact of the Consolidation Process in the German Compound Feed Industry on Innovations in that Industry**

This section answers the central research question of this study: “What is the impact of the consolidation process in the German compound feed industry on innovation in companies in that industry?” All previous chapters and sections are intended to contribute to an answer to the central research question. However, especially chapter 7 sheds light on the impact of M&A’s in the German compound feed industry on company-level innovation. As a main conclusion of this research, it can be stated that the impact of the consolidation process in the German compound feed industry on company-level innovations in that industry is rather limited. The figures in chapter 4 clearly confirm the presence of a consolidation process in the German compound feed industry. This consolidation process emerges through M&A’s on company-level. In the literature study, 17 direct and indirect possible effects of M&A’s on innovation have been found. However, both the presence of these effects in the examined cases and the actual meaning of these effects on innovation in the examined cases are limited. Furthermore, the results related to the reasons for M&A’s reveal that innovation and R&D are rather minor issues in the examined companies and not decisive or relevant for M&A’s. Altogether, this research concludes that the impact of the consolidation process in the German compound feed industry on company-level innovation is limited and secondary and that market related motives are decisive for M&A’s in that industry.

## **8.7 Recommendations for Managers**

This section gives some recommendations to managers of German compound feed companies how to increase innovations through M&A's. The recommendations are based on the findings and regard the limitations of this study. When deciding on and implementing a M&A, managers should become more aware of the possible effects of M&A's on innovation, as this might impact the choice of a M&A or steer the related effects. Furthermore, besides market relatedness, managers should check the technology relatedness between the involved parties, as relatedness can significantly influence the impact of a M&A on innovation. Moreover, managers should observe the reactions of outsiders to the M&A (competitors) in order to be prepared for possible re-actions (retaliations), such as, for instance, the introduction of an innovative product. Finally, managers of German compound feed companies should not have high expectations related to the beneficial impact of M&A's on innovation, as this impact was found to be limited in the examined cases.

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## 10 Appendices

### 10.1 Appendix I: Transcripts of the Interviews in German

F = Forscher (Researcher)

B = Befragter (Interviewee)

#### Interview 1 (01.10.2015)

F: Bitte stellen Sie Ihr Unternehmen und Ihre Position kurz vor.

B: Wir sind eine Warengenossenschaft. Das können Sie einordnen?

F: Ja.

B: Die Umsatzzahlen können Sie sich aus dem Bundesanzeiger ziehen.

F: Dazu habe ich auch schon mehrere Zeitungsartikel gelesen.

B: Ich empfehle den Bundesanzeiger. Da stehen sämtliche Strukturdaten drin. Wichtig ist, dass wir eben eine klassische Warengenossenschaft sind, die im hundertprozentigen Besitz ihrer Eigentümer ist. Wir haben nur eine Warengenossenschaft, also nicht eine Beteiligung der Banken, wie zum Beispiel bei XXXXX. Ich bin jetzt im 14. Jahr in diesem Unternehmen und jetzt im 4. Jahr hier als Vorstand tätig und war vorher im Handel tätig bei der XXXXX und davor in der Unternehmensberatung bei der XXXXX und habe davor in Bonn am Institut für landwirtschaftliche Betriebslehre promoviert, habe in Bonn studiert und vorher Landwirt gelernt. Meine Heimat ist hier Hamm in Westfalen. Bin also hochgradig geerdet in dieser Branche.

F: Danke. Dann geht es nun mit der nächsten Frage weiter. Bitte schildern Sie die wichtigsten Fusionen und Übernahmen Ihres Unternehmens der vergangenen 10 Jahre.

B: Die Grundlage unseres Unternehmens ist eine Fusion vor 13 Jahren im Jahr 2002 zur XXXXX, zur XXXXX, das war eine Dreierfusion. Das können Sie auch weiter in der Zeitung recherchieren. Wenn Sie einfach unseren Namen eingeben, dann brauche ich das nicht weiter ausführen. Das war sicherlich der Kristallisierungspunkt, dass man eine starke Primärgenossenschaft an der Basis etabliert. Dann hat sich das Ganze in strategischer Zusammenarbeit über die Jahre weiterentwickelt. Wir haben einen Zusammenschluss mit der XXXXX, die seinerzeit XXXXX. Mit diesem Unternehmen haben wir die XXXXX gegründet. Das ist eine Dreiergesellschaft zwischen XXXXX, XXXXX und uns. Dort betreiben wir seit 2009 einen Umschlagsbetrieb für Sojaschrot. Haben dort im Jahr 2011 eine Siloanlage für Getreide errichtet und betreiben dort seit April 2015 ein gemeinsames Mischfutterwerk. Das war die zweite elementare Fusion oder ich sage mal keine Fusion sondern ein strategischer

Zusammenschluss. Und die dritte strategische Ebene der Zusammenarbeit heißt bei uns GB, das ist eine genossenschaftliche Beteiligungsgesellschaft als GmbH, die wir mit 6 Warengenossenschaften wahrnehmen. Das sind hier aus dem direkten Umfeld die XXXXX, die XXXXX, die XXXXX, die XXXXX und die XXXXX. Dort sind wir gemeinsam Gesellschafter bei der XXXXX, das ist ein Pflanzenschutzgroßhandelsbetrieb. Dann haben wir als zweite Maßnahme dort unser XXXXX – Aktienpaket gebündelt. Dann haben wir als dritte Maßnahme dort jetzt gemeinsam unsere Versicherungen abgebildet um dort leistungsfähig zu sein und auch gut versichert zu sein. Die vierte Maßnahme ist jetzt, dass wir Themen des Arbeitsschutzes gemeinsam abarbeiten. Und das ist die dritte wichtige strategische Plattform die wir in den letzten Jahren etabliert haben.

F: Vielen Dank. Die nächste Frage ist: Bitte schildern Sie Ihre Rolle bei diesen Fusionen und Übernahmen.

B: Unsere Rolle. Als Unternehmen?

F: Nein. Speziell Ihre Rolle als Person.

B: Ich als Person, ja. Das kann man sicherlich sagen, dass bei der Erstfusion zur XXXXX ich persönlich, das ist jetzt natürlich wirklich eine persönliche Information, die vertraulich zu behandeln ist, bin ich von der XXXX als Prokurist ausgeschieden und bin in diesem Unternehmen als Geschäftsführer eingestiegen und das war sicherlich die Grundlage für die dann anstehende Fusion der drei Genossenschaften XXXXX, XXXXX und XXXXX. Also von daher war die Funktion sicherlich zentral. Wir sagen ja in unserer Branche immer, Geschäfte werden unter Menschen gemacht. Wir sind natürlich in unserer kleinen Branche hier hochgradig vernetzt. Das führt dann natürlich mal dazu, dass man auch gewisse Einschätzungen von gewissen Menschen hat, wie man mit denen Geschäfte macht und das war sicherlich eine zentrale Grundlage der Zusammenarbeit. Das zweite was ich Ihnen beschrieben habe, dieses Thema Agrarlogistik, lebt sicherlich auch von der guten Bekanntschaft, die wir mit den Leitungspersonen der XXXXX haben. Das ist einmal der Herr XXXXX als Geschäftsführer und der Herr XXXXX als Prokurist. Das hat uns dann zu Herrn XXXXX geführt, dem Inhaber der XXXXX. Auch da haben wir sicherlich für unseren Bereich, habe ich da sicherlich auch als Geschäftsführervorstand da diese zentrale Vermittlungsfunktion wahrgenommen. Aber immer replizierend zu den Gremien unseres Unternehmens. Ich sagte eingangs wir sind eine Genossenschaft und das geht bei uns natürlich immer mit dem ehrenamtlichen Vorstand und Aufsichtsrat. Das dritte Konstrukt, die XXXXX, da halten wir einen Anteil von XX%, die XXXXX hält einen Anteil von XX%, ist erwachsen auf der persönlichen Bekanntschaft oder vielmehr der persönliche Zusammenarbeit der Leitungsgremien mit meiner Funktion hier als Geschäftsführer und des Herrn XXXXX als Geschäftsführer der XXXXX, dass man sich dort eben auch persönlich über diese Zielrichtung einig war. Von daher kann man zusammenfassend feststellen, dass natürlich für diese Fusion die Zusammenarbeit der hauptamtlichen Geschäftsführer eine ganz zentrale ist. Das wäre nun auch ein Grund, um Ihnen drei vier Sachen zu schildern, die

eben nicht funktionieren. So funktioniert es aktuell relativ mäßig in der Zusammenarbeit mit der XXXXX, was eben auch mit diesen persönlichen Sachen zusammenhängt.

F: Gut. Dann kommen wir als nächstes zu den Skaleneffekten beziehungsweise Größenvor- und nachteilen. Ich lese die Frage mal vor. Bitte beschreiben Sie, ob sich die Anzahl der durch Ihr Unternehmen jährlich eingeführten neuen Produkte, also in diesem Fall Futterprodukte, nach der Fusion oder Übernahme verändert hat.

B: Ja. Die Anzahl der Produkte im Bereich Mischfutter nimmt zu. Wir haben sowieso hier ein sehr großes Produktportfolio. Wir produzieren 400 unterschiedliche Artikel, die sich aber teilweise nur in Nuancen unterscheiden. Die sind dann in der Futtergrundlage, in der Genetik, in der Stallhaltung oder eben auch in der Meinung des Landwirtes begründet. Und wenn Sie eben zusätzlich Räume erschließen führt das natürlich dazu, dass die Produktvielfalt eher zunimmt. Auf der anderen Seite ist man natürlich auch durch Beratung in der Lage, in etablierten Gebieten das Produktportfolio zu mindern, aber in der Summe hat es eine Zunahme gegeben. Sicherlich bei der Fusion mit der XXXXX um 10%.

F: Ok. Dann kommt die nächste Frage. Falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl jährlich eingeführter neuer Produkte auf die Gesamtkosten für die Entwicklung eines neuen Produktes.

B: Das sehe ich nicht als Problem. Das sind erst mal keine Mehrkosten. Nur von der Positionierung her haben wir natürlich sprungfixe Personalkosten durch gestiegenes Volumen. Zum Beispiel haben wir durch die Fusion XXXXX eine Produktverantwortliche in der Rinderfütterung eingestellt. Das ist auch eine Bonner Agrarabsolventin, Frau XXXXX, die dann in der Kundenberatung diese Anforderungen umsetzt und solche Personalkosten können Sie immer mit 70.000€ quantifizieren. Aber die sind dann eben sprungfix und sicherlich auch ein Stück weit der zunehmenden Anzahl an Kunden und dem gestiegenen Produktionsvolumen geschuldet, sodass bezogen auf die produzierte Tonne Mischfutter keine Kostensteigerungen entstanden sind. Im Gegenteil, wir haben Kostendegression durch verbesserte Auslastung.

F: Danke. Ich lese jetzt die nächste Frage vor. Bitte nutzen Sie die folgende Skala um diesen Einfluss zu beziffern.

B: Wenn ich das mit der Skala beziffere sage ich verhalten.

F: Ok. Dann geht es mit der nächsten Frage weiter. Bitte beschreiben Sie, ob sich das jährliche Mischfutter – Produktionsvolumen Ihres Unternehmens nach der Fusion / Übernahme verändert hat.

B: Ja, das ist gestiegen. Wir haben die Tonnagen des übernommenen Unternehmens im Grunde bei uns fortgeführt und haben die Produktmengen die sonst Fremdlieferanten produziert haben auf uns umgelagert.

F: Danke. Dann die nächste Frage. Falls zutreffend, bitte beschreiben Sie den Einfluss dieses veränderten Produktionsvolumen auf die Produktionskosten für eine Tonne Mischfutter.

B: Wenn ich die auf die Tonne beschreibe, Sie können die Produktionskosten mal grob hier im Interview beziffern bei Mehlfutter mit 15 Euro die Tonne. Dann haben Sie da eine Degression von mir aus im Bereich der Fixkosten, die sich überschaubar auf ein bis zwei Euro die Tonne beziffert. Das ist bei uns schon durchaus signifikant. Und das ist ja komplett ertragsrelevant.

F: Dann nutzen Sie bitte die folgende Skala, um diesen Einfluss zu beziffern.

B: Ich hatte signifikant angegeben.

F: Dann fahren wir fort mit den Kostensynergieeffekten. Bitte beschreiben Sie, ob sich die Anzahl der Forschungs- und Entwicklungsprojekte in Ihrem Unternehmen nach der Fusion / Übernahme verändert hat.

B: Die Zahl der Forschungs- und Entwicklungsprojekte unabhängig von Mischfutter nimmt zu. Wir stellen uns weiteren Fragestellungen, das habe ich vorhin angeführt. Wir analysieren Themen des Arbeitsschutzes, das ist für uns sehr umfänglich. Wir haben dort Gefährdungsbeurteilungen zu erbringen et cetera. Das ist abgeschlossen. Das nächste Thema dem wir uns jetzt stellen ist das Thema Energiemanagement. Da sind wir auch in der Lage, das über unseren Zusammenschluss der XXXX effektiv und effizienter abzuwickeln als wenn wirs alleine täten. Also wir sind schon in der Lage, durch diese Fusionen oder Kooperationen möchte ich es mal nennen, diffizile Fragestellungen arbeitsteilig abzuarbeiten. Da habe ich Ihnen ja die beiden Beispiele genannt, eben Arbeitsschutz - Gefährdungsbeurteilung und eben das Thema Energiemanagement.

F: Ja. Danke. Und falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl an Forschungs- und Entwicklungsprojekten auf die Kosten für die Entwicklung eines neuen Produktes.

B: Die sind schon relevant. Die sind so relevant, dass sie die Vorteile der Kostendegression durch gesteigertes Volumen, also diese Skaleneffekte, quasi auffressen. Von daher würde ich das in Frage c als signifikant einordnen.

F: Ok. Danke. Dann geht es mit Frage d weiter. Bitte beschreiben Sie, ob sich die Anzahl an verschiedenen Produkten, die in Ihrem Unternehmen produziert werden, nach der Fusion / Übernahme verändert hat.

B: Es hat dort eine Steigerung gegeben. Ich habe sie mit 10% beziffert.

F: Falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl an Produkten auf die Produktionskosten für eine Tonne Futter.

B: Da sehen wir keine Kostensteigerungen. Außer diese Beratungskosten. Habe ich ausgeführt, mit 70.000€ habe ich Ihnen die beziffert, die ich aber dann wieder auf die größere Tonnage umlege.

F: Wie würden Sie diesen Einfluss auf der Skala beziffern?

B: Geringfügig, also null bis zwei Prozent.

F: Dann befassen wir uns als nächstes mit Synergien oder Verbundeffekten. Bitte beschreiben Sie, ob die Fusion oder Übernahme zu einer Kombination von vormals getrennten Forschungs- und Entwicklungsinputs in Ihrem Unternehmen geführt hat.

B: Ja, hat es geführt. Ich habe diese beiden technischen Bereiche, Arbeitsschutz und Energiemanagement genannt. Kann das aber noch ergänzen um Bereiche wie warenwirtschaft oder auch Kommunikation. Wir sind jetzt dabei, Bestell-Apps zu generieren. Dass man solche Projekte eben auch gemeinsam aufsetzt und nicht alleine macht verbessert die Umsetzungsgeschwindigkeit, die Umsetzungsqualität und somit auch die Wahrscheinlichkeit dass Sie es überhaupt umsetzen. Ohne diese Fusionen und Übernahmen könnten Sie diese zusätzlichen Aufgaben gar nicht bewältigen. Dazu sind Sie alleine zu klein, da haben wir auch gut ausgebildete Mitarbeiter die sich um diese Projekte kümmern und das machen wir auch eben arbeitsteilig in diesem Verbund.

F: Danke. Falls zutreffend, bitte beschreiben Sie den Einfluss der Kombination vormals getrennter Forschungs- und Entwicklungsinputs auf die Qualität Ihrer Produkte.

B: Die technische Qualität unserer Produkte entspricht sicherlich aufgrund der modernen Mischwerke die wir haben dem Stand der Technik. Wir haben ein Mischfutterwerk jetzt im Jahr 2015 in Betrieb genommen, und das hier stehende Werk ist aus dem Jahr 2002. Das ist also in Ordnung. Ich möchte dann gerne diesen Einfluss der Kombination von vormals getrennten Forschungs- und Entwicklungsinputs auf diese Randbedingungen beschreiben. Das heißt, wir haben eine bessere Organisation, wir haben eine Optimierung im Bereich der Warenwirtschaft, wir setzen Navigationssysteme ein, wir haben Schnittstellen zwischen Warenwirtschaft und Steuerungstechnik gemeinsam etabliert. Das heißt also das tangiert für uns spürbar stärker diese Randbereiche, die ich dann eben mit Warenwirtschaft und Steuerungstechnik beschrieben habe. Das eigentliche Produkt ist davon relativ unabhängig.

F: Vielen Dank. Bitte beschreiben Sie, ob die Fusion oder Übernahme zu einer Kombination von vormals getrennten Produktionsinputs oder -technologien in Ihrem Unternehmen geführt hat.

B: Ja, hat es. Wir sind dabei, entsprechende Produktlinien zu bündeln, dass wir nicht in allen Werken dasselbe produzieren. Und wir teilen, wir haben eine neue Arbeitsorganisation generiert mit Produktverantwortlichkeiten, so nennen wir das, dass die einzelnen Sparten von verantwortlichen Mitarbeitern operativ geleitet werden. Das ist aus diesen Fusionen und Übernahmen erwachsen.

F: Danke. Falls zutreffend, bitte beschreiben Sie den Einfluss der Kombination von vormals getrennten Produktionsinputs oder –technologien auf die Effizienz des Produktionsprozesses in Ihrem Unternehmen.

B: Das ist positiv für die Effizienz des Produktionsprozesses in unserem Unternehmen, weil wir uns detaillierter mit den Prozessen auseinandersetzen und die Fehlerquote reduzieren und eben das Nutzenpotential durch eine intensivere Bearbeitung dieser Themen erreichen. Auch das ist ein Beispiel für sprungfixe Kosten. Da haben wir durch das größere Volumen eben die Möglichkeit, uns arbeitsteilig zu organisieren. Dass wir nicht diese Generalisten haben, sondern fein differenzierte Produktverantwortlichkeiten haben, Stellvertreterregelungen hinterlegen können wenn die Leute im Urlaub sind, wenn sie krank sind, dass dann unsere Organisation immer noch funktioniert. Das ist sicherlich ganz klar aus dieser organisatorischen Entwicklung erwachsen. Ich unterstreiche nochmal, dass diese organisatorischen Aufgaben eine viel größere Bedeutung haben als die eigentliche technische Produktqualität. Die ist leistbar, wenn Sie eine moderne Technik haben, wenn Sie ein vernünftiges Optimierungsprogramm haben und gut ausgebildete Tierernährer. Das ist Standard, da sind keine weiteren Synergien zu erwarten. Das betrifft sehr stark, ich würde auch eine Zahl nennen, zu 80% diese organisatorischen Bereiche, die dort drum herum hängen.

F: Vielen Dank. Die nächste Frage hängt mit einer möglichen neuen Wachstumsbasis zusammen. Bitte beschreiben Sie, ob die Fusion oder Übernahme zu einer Kombination von vormals getrennten Forschungs- und Entwicklungsinputs in Ihrem Unternehmen geführt hat. Das hatten Sie ja soeben schon beantwortet. Daher schon die nächste Frage. Falls zutreffend, bitte beschreiben Sie, ob die Kombination verschiedener Forschungs- und Entwicklungsinputs zu einer neuen Produktionstechnologie oder zu einem neuen Fütterungskonzept geführt hat, welches die Basis für eine Gruppe neuer Produkte ist.

B: Ja. Auch hier haben wir durch gestiegenes Volumen uns in die Lage versetzt, uns weiter zu spezialisieren. Ich nenne Ihnen zwei Beispiele. Wir haben uns im Bereich der Sauen- und Ferkelnährung auf eine Eigenproduktlinie konzentriert seit November 2014. Wir haben das vorher mit der Firma XXXXX, das ist eine Tochter der Firma XXXXX. Machen das seit November 2014 eigenständig. Wir arbeiten dort zusammen mit der Firma XXXXX aus XXXXX, die für uns der Vormischungslieferant sind. Und ab der Prestarterproduktion generieren wir eben eigene Produkte mit einem eigenen Produktverantwortlichen nur für dieses Segment Ferkel und Sauen. Das ist ganz klar neu. Weiterhin ist neu, dass wir durch das gestiegene Volumen in der Lage sind, hier im Werk XXXXX einen Extruder / Expander einzusetzen, mit dem wir thermisch aufgeschlossenes Rapsschrot produzieren und eine thermisch aufgeschlossene Getreide – Mais – Mischung selber produzieren. Daraus generieren wir natürlich auch die Vorteile wirtschaftlicher Natur und haben dann mit der uns bekannten Produktqualität diese Rohstoffe bei uns in der Produktion.

F: Danke. Die nächste Frage beschäftigt sich mit der Einführungszeit neuer Produkte. Bitte beschreiben Sie, ob sich der Zeitraum zwischen den ersten Entwicklungsbemühungen und der ersten Auslieferung eines neuen Produktes nach der Fusion oder Übernahme in Ihrem Unternehmen verändert hat.

B: Die Geschwindigkeit ist gestiegen. Wir haben uns natürlich erst einmal diesen Fragestellungen überhaupt stellen können. Wir waren vorher aufgrund, ja, dass wir die Mitarbeiter gar nicht an Bord hatten, nicht in der Lage, uns mit Themen auseinander zu setzen. Kann ich ganz klar bejahen. Der Zeitraum ist verkürzt worden.

F: Bitte nutzen Sie die folgende Skala um diese Veränderung zu beziffern.

B: Das würde ich also gewichtig einordnen.

F: Ok. Danke. Die nächsten Fragen beziehen sich auf das Risikomanagement in der Forschung und Entwicklung. Bitte beschreiben Sie, ob sich die Varianz der Erträge der Forschungs- und Entwicklungsprojekte in Ihrem Unternehmen nach der Fusion oder Übernahme verändert hat.

B: Die Varianz der Erträge der Forschungs- und Entwicklungsprojekte ist gesunken, weil die Durchführungsqualität gestiegen ist.

F: Ok. Bitte beschreiben Sie, ob sich Ihre Bereitschaft in länger andauernde und risikoreichere Forschungs- und Entwicklungsprojekte zu investieren nach der Fusion oder Übernahme verändert hat.

B: Ja, die ist gestiegen. Wir agieren jetzt proaktiv, wobei wir in der Vergangenheit eher reagiert haben. Wir positionieren uns eigenständig und laufen nicht Marktentwicklungen hinterher.

F: Ok. Dann geht es in der nächsten Frage um Marktmacht. Bitte beschreiben Sie, ob sich die Aggressivität Ihrer (potenziellen) Mitbewerber nach der Fusion oder Übernahme verändert hat.

B: Die Wettbewerbssituation ist gestiegen. Wir verfolgen allerdings eine Qualitätsführerschaft. Wir haben ein hohes Maß an Kundenbindung und versuchen das über gute Beratung, qualifizierte Beratung möglichst weit nach vorn abzusichern.

F: Danke. Dann lese ich nun die nächste Frage vor. Bitte beschreiben Sie, wie sich der Marktanteil Ihres Unternehmens im deutschen Markt für Mischfutter nach der Fusion oder Übernahme verändert hat.

B: Wir sind ein relativ kleines Unternehmen. Wir sind vor zwölf Jahren hier begonnen mit der Produktion von 20.000 Tonnen Mischfutter. Wir werden in diesem Wirtschaftsjahr 150.000 Tonnen Mischfutter produzieren. Das ist entsprechend bei einem Mischfutterausstoß in Deutschland von 23 Millionen Tonnen irgendwo ein halber Prozentpunkt. Daher sind wir

bundesweit ein kleiner Anbieter. Nehmen für uns zwar regional in Anspruch, dass wir hier im Einzugsgebiet 70 bis 100 Kilometer um unsere Betriebsstellen Marktanteile zwischen 40 und 70 Prozent haben und in NRW haben wir einen Marktanteil von knapp 10 Prozent. Also wir sind ein lokal ausgerichtetes Unternehmen, was eben auch unserer genossenschaftlichen Philosophie entspricht. Von daher klemmt eine Vergleichbarkeit mit national agierenden Mischfutterproduzenten. Und ich ergänze noch, dass wir im Bereich Geflügelfutter so gut wie nicht präsent sind, uns nur auf regionale Legehennen- und Junghennenaufzüchter, kleine Mäster beschränken und nicht in der Region in der vertikalen Integration tätig sind.

F: Und wie hat sich Ihr Marktanteil auf dem deutschlandweitem Markt durch die Fusion entwickelt?

B: Der hat sich natürlich erhöht. Wir haben bundesweit einen Marktanteil wenn Sie die Sparten Pflanzenschutz und Düngemittel sehen, oder Getreide haben wir ein Volumen das irgendwo 0,25 Prozent mit einer Weite zwischen 0,2 und 0,4 Prozent darstellt. Wir haben aber eben jedes Jahr deutlich zweistellige Zuwächse in der Mischfutterproduktion und wir werden in diesem Kalenderjahr eben mit 150.000 Tonnen abschließen. Das sind deutlich zweistellige Zuwächse, die natürlich aus diesen Akquisen resultieren. Der Marktzuwachs liegt vielleicht bei zwei bis drei Prozent. Und das was wir deutlich darüber wachsen begründet sich natürlich auch stark, ich sage mal zu zwei Dritteln, aus dieser Zusammenarbeit mit Nachbarunternehmen, oder eben dieser Fusion.

F: Ok. Vielen Dank. Die nächsten Fragen befassen sich mit Interessenkonflikten oder Prinzipal – Agent Problemen. Dazu die erste Frage: Bitte beschreiben Sie, ob vor, während oder nach der Fusion oder Übernahme Interessenkonflikte in Ihrem Unternehmen aufgetreten sind.

B: Bezieht sich die Frage auf unser Unternehmen intern?

F: Ja genau, in Ihrem Unternehmen.

B: Die hat es nicht gegeben, weil wir diese Zusammenarbeiten langfristig planen. So haben wir bei der zurückliegenden Fusion mit der XXXXX erst eine vierjährige operative Zusammenarbeit dieser Fusion vorgeschaltet. Auch da wieder sicherlich meine Funktion als Geschäftsführer in Verbindung mit dem Herrn XXXXX, der als Geschäftsführer der XXXXX das Unternehmen dort verantwortet hat. Da ist entsprechend erst die Zusammenarbeit synchronisiert worden um dann im Folgeschritt in die Fusion einzutreten. Da hat es keine internen Probleme gegeben und das kann man auf die anderen Prozesse der Zusammenarbeit übertragen.

F: Danke. Die nächste Frage ist damit eigentlich überflüssig. Fürs Protokoll lese ich sie trotzdem vor. Falls zutreffend, bitte beschreiben Sie, wie sich diese Interessenkonflikte auf die Forschung und Entwicklung in Ihrem Unternehmen ausgewirkt hat. Daher nun die letzte Frage hierzu. Bitte nutzen Sie die folgende Skala, um Ihren Innovationsansatz zu beschreiben.

B: 4.

F: Danke. Dann geht es als nächstes um die Motivation Ihrer Mitarbeiter. Bitte nutzen Sie die folgende Skala, um die Bemühungen Ihrer Mitarbeiter vor und nach der Fusion oder Übernahme zu beurteilen, neue Produkte zu entwickeln und einzuführen.

B: Wir sind in Westfalen und wir beurteilen das hier eher konservativ. Deswegen sage ich drei und gut. Der Rheinländer würde fünf sagen, aber der Westfale sagt drei.

F: Für beides, also vorher und nachher?

B: Ist besser geworden. Dann wars vorher zwei und ist hinterher drei.

F: Danke. Dann noch eine ähnliche Frage. Bitte nutzen Sie die folgende Skala, um die Bemühungen Ihrer Mitarbeiter vor und nach der Fusion oder Übernahme zu beurteilen, die Effizienz Ihres Produktionsprozesses zu steigern.

B: Würde ich jeweils als drei beschreiben. Da hat es keine Veränderungen gegeben.

F: Ok. Dann folgen noch zwei Fragen zu den Finanzmitteln. Bitte beschreiben Sie, ob die Fusion oder Übernahme einen Einfluss auf die zur Verfügung stehenden Finanzmittel Ihres Unternehmens hatte.

B: Wir sagen wir haben reich geheiratet, also gering.

F: Ok. Vielen Dank. In der letzten Frage geht es um die Gründe für die Fusion oder Übernahme. Hierzu sehen Sie nachfolgend eine Liste mit möglichen Gründen für Fusionen und Übernahmen. Bitte ordnen Sie diese Gründe nach der Wichtigkeit bei der Fusion oder Übernahme in Ihrem Unternehmen, indem Sie die Gründe mit Zahlen von 1 bis 10 versehen. Hierbei ist 1 das wichtigste und 10 das unwichtigste. Zusätzlich können Sie einen weiteren Grund nennen und in die Rangfolge aufnehmen.

B: Mach ich. (Befragter füllt Liste aus und gibt dem Forscher das ausgefüllte Blatt)

F: Vielen Dank. Damit sind wir am Ende des Interviews.

## Interview 2 (02.10.2015)

F: Wir starten mit der ersten Frage. Bitte stellen Sie Ihr Unternehmen und Ihre Position kurz vor.

B: Das Unternehmen, in dem ich Geschäftsführer sein darf, ist die XXXXX, hier in XXXXX. Es handelt sich um ein Joint Venture zwischen zwei deutschen und einem niederländischem Betrieb. Wir produzieren Biofutter, zu 90 Prozent für Legehennen und 10 Prozent für Rindvieh. Das besondere an der Konstellation ist des Weiteren, dass hier sowohl genossenschaftlich organisierte als auch privatwirtschaftlich organisierte Unternehmen zusammenarbeiten.

F: Danke. Bitte schildern Sie die wichtigsten Fusionen und Übernahmen Ihres Unternehmens der vergangenen 10 Jahre.

B: Unser Betrieb besteht erst seit einem Jahr. Wir sind seit einem halben Jahr mit der Produktion beschäftigt. Es ist also eine Neugründung, keine Fusion, sondern eine Neugründung zwischen drei Gesellschaften.

F: Bitte schildern Sie Ihre Rolle bei dieser Neugründung.

B: Als einer der drei Gesellschafter war ich maßgeblich an der Konstellation und am Aufbau dieses neuen Betriebes beteiligt. Außerdem bin ich Geschäftsführer dieses Unternehmens, zusammen mit einem holländischen Kollegen.

F: Ok. Danke. Dann geht es mit den Fragen zu Skaleneffekten weiter. Bitte beschreiben Sie, ob sich die Anzahl der durch Ihr Unternehmen jährlich eingeführten neuen Produkte, also in diesem Fall Futterprodukte, nach der Fusion oder Übernahme verändert hat.

B: Die Frage kann ich ganz eindeutig mit ja beantworten. Es hat sich sehr zum Positiven verändert. Wir haben viele neue Produkte kreiert und auch erfolgreich am Markt verkauft.

F: Falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl jährlich eingeführter neuer Produkte auf die Gesamtkosten für die Entwicklung eines neuen Produktes.

B: Die Kosten für die Entwicklung sind eigentlich in unserem Betrieb relativ gering, da für diesen Zweck nicht speziell neue Mitarbeiter eingestellt worden sind und die Kosten durch den normalen Betrieb mitgetragen werden. Also würde ich dies mit Blick auf die nächste Frage als geringfügig einstufen.

F: Vielen Dank. Bitte beschreiben Sie, ob sich das jährliche Mischfutter – Produktionsvolumen Ihres Unternehmens nach der Fusion oder Übernahme verändert hat.

B: Diese Frage kann ich eindeutig mit ja beantworten. Die produzierte Menge ist wesentlich gestiegen, auch die Menge an Biomischfutter, die wir vorher nicht verkaufen konnten. Des

Weiteren kann ich zu Frage c sagen, die Produktionskosten für eine Tonne Mischfutter sind dadurch verringert worden. Wir gehen davon aus zwei bis drei Euro je Tonne. Mit Blick auf die Frage d würde ich sagen, dass die Verringerung der Produktionskosten merklich ist.

F: Vielen Dank. Dann geht es mit der nächsten Frage weiter. Bitte beschreiben Sie, ob sich die Anzahl der Forschungs- und Entwicklungsprojekte in Ihrem Unternehmen nach der Fusion / Übernahme verändert hat.

B: Ja selbstverständlich. In unserem Betrieb, da wir jetzt nur Biofutter herstellen, hat sich die Anzahl der neuen Produkte und somit auch die Bemühungen neue Produkte zu entwickeln wesentlich erhöht. Zum Beispiel sind wir jetzt dabei, ein neues Futter speziell für Kälber zu kreieren, was besonders für Biobetriebe geeignet ist.

F: Ok. Falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl an Forschungs- und Entwicklungsprojekten auf die Kosten für die Entwicklung eines neuen Produkts.

B: Die Kosten sind immer noch gering.

F: Bitte nutzen Sie die folgende Skala um diesen Einfluss zu beziffern.

B: Geringfügig, null bis zwei Prozent.

F: Vielen Dank. Wir machen weiter. Bitte beschreiben Sie, ob sich die Anzahl an verschiedenen Produkten, die in Ihrem Unternehmen produziert werden, nach der Fusion / Übernahme verändert hat.

B: Ja, die Anzahl hat sich verändert. Denn es ist so, dass wir auch im Bio-Bereich sehr oft für jeden Kunden das eigene spezielle Futter herstellen müssen.

F: Ok. Falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl an Produkten auf die Produktionskosten für eine Tonne Futter.

B: Durch die größere Anzahl an Produkten, das heißt, dass wir oft für Landwirte ein spezielles Futter herstellen müssen, steigen natürlich etwas die Kosten. Ich würde sagen um zwei bis drei Euro je Tonne.

F: Bitte nutzen Sie die folgende Skala um diesen Einfluss zu beziffern.

B: Verhalten, also vier bis sieben Prozent.

F: Die nächsten vier Fragen beziehen sich auf Synergien oder Verbundeffekte. Bitte beschreiben Sie, ob die Fusion / Übernahme zu einer Kombination von vormals getrennten Forschungs- und Entwicklungsinputs in Ihrem Unternehmen geführt hat.

B: Ja durchaus, denn was vorher drei Betriebe jeder für sich gemacht haben, machen wir jetzt als Joint Venture zusammen. Nicht mehr jeder Betrieb muss sich mit speziellem

Biofutter befassen, sondern wir machen das zentral von einer Stelle aus. Das sehen wir sehr positiv.

F: OK. Falls zutreffend, bitte beschreiben Sie den Einfluss der Kombination von vormals getrennten Forschungs- und Entwicklungsinputs auf die Qualität Ihrer Produkte.

B: Ich kann heute sagen, dass die Qualität unserer Produkte dadurch gestiegen ist. Denn, wenn nicht jeder sein eigenes Süppchen kocht, haben wir die Qualitätsüberwachung an einer Stelle und können die komplette Qualitätsüberwachung viel besser bewerkstelligen.

F: Vielen Dank. Dann lese ich die nächste Frage vor. Bitte beschreiben Sie, ob die Fusion oder Übernahme zu einer Kombination von vormals getrennten Produktionsinputs oder -technologien in Ihrem Unternehmen geführt hat.

B: Das kann ich mit ja beantworten. Als Beispiel: früher als einzelner Betrieb war es nicht möglich, dass jeder seine optimale Produktionstechnik anschafft. Heute, wenn wir diese Produktion zusammen betreiben mit drei Firmen, haben wir modernste Technik eingesetzt, zum Beispiel einen Walzenstuhl.

F: Danke. Falls zutreffend, bitte beschreiben Sie den Einfluss der Kombination von vormals getrennten Produktionsinputs oder -technologien auf die Effizienz des Produktionsprozesses in Ihrem Unternehmen.

B: Ja, das lässt sich leicht erklären. Selbstverständlich ist dadurch die Produktivität gestiegen und auch die Qualität der Produkte, denn nur durch gute vernünftige Technik können wir diese Qualität gewährleisten.

F: Danke. Die nächste Frage ist dieselbe wie zu den Synergieeffekten. Die hatten Sie ja bereits positiv beantwortet. Von daher verlese ich nun die nächste Frage. Falls zutreffend, bitte beschreiben Sie, ob die Kombination verschiedener Forschungs- und Entwicklungsinputs zu einer neuen Produktionstechnologie oder zu einem neuem Fütterungskonzept geführt hat, welche(s) die Basis für eine Gruppe neuer Produkte ist.

B: Ja, da kann ich Ihnen sogar ein aktuelles Beispiel aus unserem Betrieb nennen. Durch die Kenntnis der neuen Produktionsverfahren sind wir jetzt so weit, dass wir einen speziellen neuen Mischer anschaffen werden, um ein Bio-Kälbermüsli zu produzieren. Das wäre ohne die Kenntnis der Punkte, die wir heute wissen und früher nicht wussten, nicht möglich gewesen.

F: Vielen Dank. Ich möchte nun gerne zwei Fragen zur Einführungszeit eines neuen Produktes stellen. Bitte beschreiben Sie, ob sich der Zeitraum zwischen den ersten Entwicklungsbemühungen und der ersten Auslieferung eines neuen Produktes nach der Fusion oder Übernahme in Ihrem Unternehmen verändert hat.

B: Zu dieser Frage kann ich sagen, das sich eigentlich nicht viel verändert hat, denn auch früher, als wir ein kleines Unternehmen waren, konnten wir neue Produkte sehr schnell

einführen, vielleicht noch etwas schneller als heute. Je kleiner man ist, desto schneller ist man oft mit diesen Sachen. Daher, wenn ich auf Frage b schaue, dort möchten Sie von mir eine Einordnung auf einer Skala wissen, da würde ich geringfügig sagen, also null bis zwei Prozent.

F: Vielen Dank. Die nächsten zwei Fragen befassen sich mit dem Risikomanagement in der Forschung und Entwicklung. Bitte beschreiben Sie, ob sich die Varianz der Erträge der Forschungs- und Entwicklungsprojekte in Ihrem Unternehmen nach der Fusion oder Übernahme verändert hat.

B: Dazu kann ich sagen, auch damals, als wir noch ein kleiner Betrieb waren, hat nicht alles funktioniert, was man mit neuen Produkten erreichen wollte. Ich denke das ist heute etwas besser geworden.

F: Ok. Bitte beschreiben Sie, ob sich Ihre Bereitschaft in länger andauernde und risikoreichere Forschungs- und Entwicklungsprojekte zu investieren nach der Fusion oder Übernahme verändert hat.

B: Die hat sich bei uns eigentlich nicht verändert, da wir auch damals als kleiner Betrieb es gewohnt waren, ständig Nischenprodukte zu entwickeln. In diesen Sachen waren wir damals schon und sind auch heute noch sehr erfolgreich.

F: Ok. Danke. Drei Fragen würde ich nun gerne zum Thema Marktmacht stellen. Bitte beschreiben Sie, ob sich die Aggressivität Ihrer (potenziellen) Mitbewerber nach der Fusion oder Übernahme verändert hat.

B: Das ist immer schwer einzuschätzen, wie die Mitbewerber sich verhalten. Da müssten Sie eigentlich die Mitbewerber fragen. Ich würde sagen, dass die Aggressivität, wenn man es denn so bezeichnen kann, ganz minimal gestiegen ist.

F: Ok. Bitte beschreiben Sie, wie sich der Marktanteil Ihres Unternehmens im deutschen Markt für Mischfutter nach der Fusion oder Übernahme verändert hat.

B: Das kann ich eindeutig beantworten, denn der Marktanteil ist gestiegen.

F: Bitte nutzen Sie die folgende Skala, um diese Veränderung zu beziffern.

B: Da würde ich sagen verhalten, vier bis sieben Prozent.

F: Als nächstes würde ich gern drei Fragen zum Thema Interessenkonflikte stellen. Bitte beschreiben Sie, ob vor, während und nach der Fusion oder Übernahme Interessenkonflikte in Ihrem Unternehmen aufgetreten sind.

B: Das kann ich beantworten. Glücklicherweise gab es diese Konflikte in unserem Betrieb kaum. Wir haben mit allen zuständigen und betroffenen Gruppen die Sachlage durchgesprochen und sind auch mit unseren Mitarbeitern zu einem guten Ergebnis und

einer guten Lösung gekommen. Erfreulicherweise kann ich sagen, dass alle Mitarbeiter sehen, dass wir im selben Boot sitzen und alle rudern kräftig mit.

F: Ok. Die nächste Frage lese ich dann nicht vor, da diese nicht mehr zutrifft. Somit würde ich Sie nun bitten, die folgende Skala zu nutzen, um Ihren Innovationsansatz zu beschreiben.

B: Der Innovationsansatz unseres Betriebes, den kann ich wie folgt beschreiben. Die Ziffer fünf Ihrer Skala ist eigentlich sehr passend: nach außen gerichtet und gemeinschaftlich.

F: Vielen Dank. Die nächsten Fragen beschäftigen sich mit der Motivation der Mitarbeiter in Ihrem Unternehmen. Bitte nutzen Sie die folgende Skala, um die Bemühungen Ihrer Mitarbeiter vor und nach der Fusion oder Übernahme zu beurteilen, neue Produkte zu entwickeln und einzuführen.

B: Ja. Es handelt sich um dieselben Mitarbeiter. Ich würde sagen vorher lag die Motivation bei zwei, also mittelmäßig. Und nach der Fusion ist die Motivation gestiegen. Das hängt sicherlich auch damit zusammen, dass einige Leute jetzt ein besseres Gehalt beziehen können. Daher würde ich sagen drei bis vier, also gut bis sehr gut.

F: Danke. Ich lese dann die nächste Frage vor. Bitte nutzen Sie die folgende Skala, um die Bemühungen Ihrer Mitarbeiter vor und nach der Fusion oder Übernahme zu beurteilen, die Effizienz Ihres Produktionsprozesses zu steigern.

B: Die Motivation der Mitarbeiter die Effizienz des Produktionsprozesses zu steigern war vorher mittelmäßig und heute würde ich sie als gut beschreiben.

F: Vielen Dank. In der nächsten Frage würde ich gern etwas zum Thema Finanzmittel erfahren. Bitte beschreiben Sie, ob die Fusion oder Übernahme einen Einfluss auf die zur Verfügung stehenden Finanzmittel Ihres Unternehmens hatte.

B: Ja, auf jeden Fall. Wir haben ja einen neuen Betrieb aufgebaut mit drei Gesellschaftern. Und ich kann sagen, durch die Kapitaleinlagen der Gesellschafter verfügen wir über ein sehr gutes Kapital, sprich auch eine gute Eigenkapitalrate. Das hätten wir als einzelnes Unternehmen nicht schaffen können. Also die finanzielle Situation hat sich dadurch wesentlich verbessert.

F: Falls zutreffend, bitte nutzen Sie die Folgende Skala, um die Änderung der Ihrem Unternehmen zur Verfügung stehenden Finanzmittel zu beschreiben.

B: Beträchtlich, also 30 bis 45 Prozent.

F: Vielen Dank. Die letzte Frage beschäftigt sich mit Gründen für Fusionen oder Übernahmen. Ich verlese jetzt die Frage und würde Sie dann bitten, die Liste auszufüllen. Nachfolgend sehen Sie eine Liste mit möglichen Gründen für Fusionen und Übernahmen. Bitte ordnen Sie diese Gründe nach der Wichtigkeit bei der Fusion oder Übernahme in Ihrem Unternehmen, indem Sie die Gründe mit Zahlen von 1 bis 10 versehen (1=wichtig, ...,

10=unwichtig). Zusätzlich können Sie einen weiteren Grund nennen und in die Rangfolge aufnehmen.

(B füllt Liste aus und gibt sie dem Forscher)

F: Vielen Dank. Dies war die letzte Frage und somit ist das Interview beendet.

### Interview 3 (07.10.2015)

F: Die ersten Fragen sind grundsätzliche Fragen, also bitte nur ganz kurz beantworten. Bitte stellen Sie Ihr Unternehmen und Ihre Position kurz vor.

B: Mein Name ist XXXXX, Geschäftsführer der XXXXX, Geschäftsführer und Prokurist. Unsere Firma ist einmal eine Bank mit angeschlossenem Warengeschäft. Insgesamt 350 Millionen Euro Bilanzsumme im Bankenbereich. Im Warengeschäft machen wir neben dem Futtergeschäft das landwirtschaftliche Warengeschäft, Tankstellen und Einzelhandel.

F: Okay. Danke. Bitte schildern Sie die wichtigsten Fusionen und Übernahmen Ihres Unternehmens der vergangenen 10 Jahre.

B: Als ehemaliger Geschäftsführer der XXXXX kann ich von der Fusion berichten, die vor über 12 Jahren die XXXXX betroffen hat. Das war die Fusion in der XXXXX. Dort sind drei Genossenschaften zusammenfusioniert. Das war die Raiffeisen Warengenossenschaft XXXXX mit der Raiffeisen Warengenossenschaft XXXXX und der Raiffeisen Warengenossenschaft XXXXX zur XXXXX. Und dann, vor drei Jahren, als ich dann als Geschäftsführer der XXXXX die Fusion mit der jetzigen XXXXX beziehungsweise XXXXX im XXXXX gewonnen habe.

F: Alles klar. Ihre Rolle bei dieser Fusion hatten Sie ja bereits erwähnt, nämlich Geschäftsführer.

B: Ja, richtig.

F: Gut. Die nächsten Fragen beziehen sich auf Skaleneffekte oder Größenvor- und –nachteile. Die erste Frage hierzu wäre: Bitte beschreiben Sie, ob sich die Anzahl der durch Ihr Unternehmen jährlich eingeführten neuen Produkte nach der Fusion / Übernahme verändert hat.

B: Produkte im Bereich Futtermittel?

F: Ja. Futtermittelprodukte.

B: Ja durchaus. Futtersparten oder ich sage mal nicht Futtersparten sondern Futterprodukte sind dadurch, dass wir insgesamt auch mengenmäßig uns steigern konnten, sind nicht eine Vielzahl aber doch in den einzelnen Produktsparten einige Produkte dazugekommen. Und ob man den Einfluss jetzt auf die Gesamtkosten für die Entwicklung neuer Produkte zu beziffern ist ja, ich sage mal eher zwischen verhalten und ja, verhalten bis mäßig.

F: Ja okay. Es ist vielleicht etwas schwierig mit dieser Skala, aber es dient der groben Einordnung und der Vergleichbarkeit.

B: Es ist aber eine Anzahl neuer Produkte in den einzelnen Produktsparten dazugekommen.

F: Aber der Einfluss (auf die Gesamtkosten für die Entwicklung neuer Produkte) ist jetzt nicht besonders groß?

B: Ne.

F: Alles klar. Dann lese ich die nächste Frage vor. Bitte beschreiben Sie, ob sich das jährliche Mischfutter- Produktionsvolumen Ihres Unternehmens nach der Fusion / Übernahme verändert hat.

B: Die Mischfutterproduktion hat sich merklich verändert. Zumindest nach der Fusion vor drei Jahren, Fusion zwischen der XXXXX und XXXXX, beziehungsweise XXXXX.

F: Okay. Dann wäre die nächste Frage: Falls zutreffend, bitte beschreiben Sie den Einfluss dieses veränderten Produktionsvolumen auf die Produktionskosten für eine Tonne Mischfutter.

B: In Euros oder?

F: Ja. In Euro pro Tonne.

B: Ich sage mal sicherlich 0,10 bis 0,20 Cent je Dezitonnen. Das kann man durchaus sagen. Und das ist auch hier mehr als merklich, sondern eher signifikant bis gewichtig. Ja, was die Produktionskosten angeht und was das Produktionsvolumen anbelangt nach der Fusion ist eher beträchtlich.

F: Okay. Also haben sich durch das größere Produktionsvolumen Größenvorteile ergeben.

B: Ja. Vor allem im Bereich Energie. Energie und sonstige Fixkosten was das Futterwerk angeht. Wir haben Produktionsmengen hier von einem Standort von circa 100.000 auf mittlerweile, innerhalb von drei Jahren, auf 170.000 Tonnen steigern können, so dass im Grunde genommen die Fixkosten auf eine größere Menge verteilt werden können.

F: Okay, alles klar. Die nächsten Fragen sind zum Thema Kostensynergieeffekte. Bitte beschreiben Sie, ob sich die Anzahl der Forschungs- und Entwicklungsprojekte in Ihrem Unternehmen nach der Fusion / Übernahme verändert hat.

B: Ja, Forschungs- und Entwicklungsprojekte in dem Sinne haben wir eigentlich gar nicht so viele. Es geht eher drum, das haben wir vorhin bei der einen Frage schon mal beantwortet, dass wir mehr neue Produkte haben in den einzelnen Sparten, aber dass sich da jetzt Forschungs- und Entwicklungsprojekte, dafür sind wir wahrscheinlich in unserer Größenordnung noch etwas zu klein. Da greifen wir eher auf unsere Zulieferfirmen und Vormischungsfirmen zu. Also das ist eher geringfügig bis mäßig.

F: Ja okay. Die nächste Frage lese ich dann nicht vor, weil sie nicht zutrifft. Dann als nächstes: Bitte beschreiben Sie, ob sich die Anzahl an verschiedenen Produkten, die in Ihrem Unternehmen produziert werden, nach der Fusion / Übernahme verändert hat.

B: Ja, hatten wir ja soeben schon gesagt.

F: Dann, falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl an Produkten auf die (gesamten) Produktionskosten für eine Tonne Futter.

B: Veränderte Anzahl der Produkte. Die sind eher, in Anführungsstrichen, eher etwas negativ korreliert, weil je mehr neue Produkte Du hast, umso weniger oft kannst Du eine Charge durchlaufen lassen, also du hast mehr Produktwechsel, mehr Chargenwechsel. Das muss nicht unbedingt negativ sein, aber ist auch nicht unbedingt dass das rein für die Gesamtproduktionskosten positiv ist. Also das ist nicht, also insgesamt ist das so, aber für die einzelne Tonne Mischfutter kann das durchaus auch mal eher negativ korreliert sein, und so ist das eher mäßig bis verhalten.

F: Gut. Das wäre dann auch beantwortet denke ich. Dann geht's als nächstes weiter mit Synergien oder Verbundeffekten. Bitte beschreiben Sie, ob die Fusion / Übernahme zu einer Kombination von vormals getrennten Forschungs- und Entwicklungsinputs in Ihrem Unternehmen geführt hat.

B: Eigentlich nicht.

F. Okay. Das nächste wird dann auch nicht zutreffen. Dann, bitte beschreiben Sie, ob die Fusion / Übernahme zu einer Kombination von vormals getrennten Produktionsinputs oder -technologien in Ihrem Unternehmen geführt hat.

B: Ja, das ist durchaus so, dass wir jetzt im Broilerbereich eine Hygienisierung nutzen können, die wir vorher im Grunde genommen so hier nicht hatten. Ja, das ist so. Ja. Vor allem die Hygienisierung im Bereich Broilerfutter haben wir so hier nicht nutzen können, können wir jetzt aber gemeinsam nutzen, wir produzieren Broilerfutter ja nur noch in XXXXX, an einem Standort.

F. Alles klar. Falls zutreffend, bitte beschreiben Sie den Einfluss der Kombination von vormals getrennten Produktionsinputs oder -technologien auf die Effizienz des Produktionsprozesses in Ihrem Unternehmen.

B: Das ist dann schon, wenn's jetzt ums Broilerfutter geht wie wir's vorher hergestellt haben und wie wir's jetzt herstellen können, dann ist das schon signifikant bis gewichtig.

F: Okay. Die nächsten zwei Fragen sind ähnlich.

B. Entschuldigung. Das gleiche zählt auch im anderen Bereich, also im Geflügelbereich ist das schon signifikant. Bei Legehennenfutter, so wie wir hier Legehennenfutter herstellen, haben die so vorher Legehennenfutter gar nicht herstellen können. Deshalb haben wir ja auch getrennte Produktionsstätten, wo Legehennenfutter hier produziert wird und Broilerfutter auch nur noch an dem Standort in XXXXX.

F: Also macht jeder das, was er am besten kann.

B: Ja genau.

F: Gut. Dann lese ich die nächste Frage vor. Bitte beschreiben Sie, ob die Fusion / Übernahme zu einer Kombination von vormals getrennten Forschungs- und Entwicklungsinputs in Ihrem Unternehmen geführt hat. Das ist wieder die gleiche Eingangsfrage wie vorhin. Falls zutreffend, bitte beschreiben Sie, ob die Kombination verschiedener Forschungs- und Entwicklungsinputs zu einer neuen Produktionstechnologie oder zu einem neuem Fütterungskonzept geführt hat, welche(s) die Basis für eine Gruppe neuer Produkte ist.

B: Fütterungskonzepte sind durchaus durch diese Fusion, in den einzelnen Gruppen kann es durchaus dazu geführt haben, dass wir neue Fütterungskonzepte gemeinsam entwickelt haben. Zum Beispiel, dass im Rinderbereich noch ein stärkeres Augenmerk auf die Gruppe, auf den Bereich gelegt werden konnte. Und das hat durchaus dazu geführt, dass da in der Rinderberatung und Schweineberatung neue Fütterungskonzepte entwickelt wurden. Das ist schon so.

F: Okay, alles klar. Die nächsten Fragen beziehen sich dann auf die Einführungszeit neuer Produkte. Bitte beschreiben Sie, ob sich der Zeitraum zwischen den ersten Entwicklungsbemühungen und der ersten Auslieferung eines neuen Produktes nach der Fusion / Übernahme in Ihrem Unternehmen verändert hat.

B: Nein. Keine Veränderung.

F: Okay. Also null?

B: Ja, geringfügig wäre das dann.

F: Als nächstes geht's um Risikomanagement. Bitte beschreiben Sie, ob sich die Varianz der Erträge der Forschungs- und Entwicklungsprojekte in Ihrem Unternehmen nach der Fusion / Übernahme verändert hat.

B: Da wir Forschungs- und Entwicklungsprojekte in dem Sinne nicht haben, kann man das schlecht beantworten.

F: Okay. Bitte beschreiben Sie, ob sich Ihre Bereitschaft in länger andauernde und risikoreichere Forschungs- und Entwicklungsprojekte zu investieren nach der Fusion / Übernahme verändert hat.

B: Ja, wie gesagt, in Forschungs- und Entwicklungsprojekten sind wir nicht großartig tätig. Ist natürlich so, wenn's drum geht, um Futterwerkskapazitäten auszubauen und künftig zu entwickeln, natürlich, jetzt durch die größere Masse, die man insgesamt hat, mehr Möglichkeiten hat, vielleicht auch um das ein oder andere an Kosten, das ist aber keine Forschung und Entwicklung in dem Sinne, sondern in den Ausbau eines Futterwerkes zu stecken. Das geht natürlich mit einer größeren Schwungmasse, die man jetzt hat, besser, als wenn man damals eher kleiner gewesen ist, dann tut man sich da schon etwas schwieriger.

Und man muss heute, das ist eben so, um gewisse Kapazitäten zu entwickeln, etwas mehr Schwungmasse und Geld in die Hand nehmen.

F: Alles klar. Das nächste ist dann zum Thema Marktmacht. Bitte beschreiben Sie, ob sich die Aggressivität Ihrer potenziellen Mitbewerber nach der Fusion / Übernahme verändert hat.

B: Sollte man annehmen, aber können wir nicht unbedingt so merken. Wenn wir aber die Frage anders herum stellen, dann würde ich sagen, unsere Aggressivität auf die Mitbewerber hat sich gewaltig verändert. Da sind wir jetzt stärker geworden. Das kann man eigentlich eher sagen und das sieht man auch an den Mengen, die in den letzten drei Jahren dazugekommen sind. Ich denke, dass unsere Aggressivität durch unsere gemeinsame Geschlossenheit im XXXXX und in XXXXX sich hier in der Region deutlich bemerkbar macht und eben auch über die Grenzen hinweg nach Holland hin.

F: Interessant. Bitte beschreiben Sie, wie sich der Marktanteil Ihres Unternehmens im deutschen Markt für Mischfutter nach der Fusion / Übernahme verändert hat. Und ich lese das nächste auch gleich vor. Bitte nutzen Sie die folgende Skala um diese Veränderung zu beziffern.

B: Also das kann man hier auch durchaus mit beträchtlich bis stark auslegen, weil wir hatten vorher einen Anteil, der lag vielleicht in der nähere Region insgesamt bei 20 Prozent, 10, 20, 30 Prozent, und ich würde das jetzt deutlich Richtung 40, 50 Prozent in gewissen Marktsegmenten auch, im Bereich der Geflügelfutter und Legehennenfutter, über 50 Prozent beschreiben wollen. Mit dem Ausbau auch des holländische Gebietes.

F: Okay. Als nächstes geht's dann Um Interessenkonflikte. Bitte beschreiben Sie, ob vor, während und nach der Fusion / Übernahme Interessenkonflikte in Ihrem Unternehmen aufgetreten sind.

B: Eigentlich nicht, ne.

F: Gut. Das nächste brauche ich dann nicht vorlesen, da es nicht zutrifft. Dann geht's jetzt um den Innovationsansatz. Bitte nutzen Sie die folgende Skala, um Ihren Innovationsansatz zu beschreiben. 1 ist dabei nach innen gerichtet und eigenständig, 2 ist eher nach innen gerichtet und eigenständig, 3 ist neutral, 4 ist eher nach außen gerichtet und gemeinschaftlich und 5 ist nach außen gerichtet und gemeinschaftlich.

B: Eher nach außen gerichtet und gemeinschaftlich.

F: Also die 4.

B: Ja.

F: Okay. Dann geht's jetzt um die Motivation der Mitarbeiter. Bitte nutzen Sie die folgende Skala, um die Bemühungen Ihrer Mitarbeiter vor und nach der Fusion / Übernahme zu beurteilen, neue Produkte zu entwickeln und einzuführen.

B: Also vor der Fusion war das sicherlich auch, war das gut. Und jetzt ist das sicherlich nicht schlechter geworden, eigentlich sehr gut.

F: Danke. Die nächste Frage ist ähnlich. Bitte nutzen Sie die folgende Skala, um die Bemühungen Ihrer Mitarbeiter vor und nach der Fusion / Übernahme zu beurteilen, die Effizienz Ihres Produktionsprozesses zu steigern.

B: Vorher gut, und jetzt sehr gut.

F: Alles klar. Dann kommen wir jetzt zur nächsten Frage zum Thema Finanzmittel. Bitte beschreiben Sie, ob die Fusion / Übernahme einen Einfluss auf die zur Verfügung stehenden Finanzmittel Ihres Unternehmens hatte.

B: Ja. Dadurch, dass wir jetzt mit einer Bank fusioniert sind, zu einer XXXXX, ist das natürlich ungesprochen, oder ich sage mal dadurch, dass wir mit einer Bank fusioniert sind, hat sich das natürlich stark verändert. Wir können jetzt also auf Liquide Mittel zurückgreifen oder auf Finanzmittel zurückgreifen.

F: Okay, danke. Dann sind wir jetzt schon bei der letzten Frage. Nachfolgend sehen Sie eine Liste mit möglichen Gründen für Fusionen und Übernahmen. Bitte ordnen Sie diese Gründe nach der Wichtigkeit bei der Fusion / Übernahme in Ihrem Unternehmen, indem Sie die Gründe mit Zahlen von 1 bis 10 versehen, wobei 1 das wichtigste und 10 das unwichtigste ist. Zusätzlich können Sie einen weiteren Grund nennen und in die Rangfolge aufnehmen.

B: Ja. Mach ich. (Befragter füllt Liste aus und gibt sie dem Forscher)

F: Vielen Dank. Damit ist das Interview nun beendet.

## Interview 4 (14.10.2015)

F: Es geht los mit den grundsätzlichen Fragen. Bitte stellen Sie Ihr Unternehmen und Ihre Position kurz vor.

B: Wir können das durchaus im Dialog machen. Meine erste Frage: Kennen Sie XXXXX? Was muss ich über XXXXX erzählen? Soll ich das tun?

F: Ich kenne XXXXX. Ein Unternehmen, das sehr aktiv in der Futtermittelbranche ist.

B: Lass uns das mal so sagen. XXXXX, reines Familienunternehmen, im Besitz der Familie XXXXX. Einzelne Gesellschafter lasse ich jetzt mal weg. Nächstes Jahr werden wir 125 Jahre alt. Sind jetzt in der vierten Generation gelandet. Wo ich jetzt sage, meine Zeit mit dem Senior, ich sage jetzt immer Senior dazu, ist die dritte Generation. Also ein reines Familienunternehmen. Die ganze Chronik, das wäre jetzt zu viel gesagt. Schwerpunkt ist bei uns die Mischfutterproduktion für alle Tierarten außer Petfood und außer Fischfutter. So sage ich das jetzt einfach mal. Kann man auch umdrehen: Schweinefutter, Rinderfutter, Geflügelfutter. Und 15 bis 20% Agrarprodukte. In diesem Bereich Agrar ist auch Mischfutter mit drin in gebundener Form, also Säcke und BigBags. Das ist wieder ein Drittel vom Agrarbereich. Und der Rest ist Düngemittel, Saaten und Pflanzenschutz. Insofern sind wir Vollsortimenter kann man sagen, also mit dem ganzen Futtermittelprogramm und dem ganzen Agrarprogramm, was ja bei vielen Wettbewerbern nicht der Fall ist.

F: Also viele haben sich auf die Mischfutterproduktion spezialisiert?

B: So ist das. In dieser Gegend gibt es wenige, die nur Agrar machen. Es gibt in anderen Regionen, zum Beispiel in der Börde, auch Betriebe, die nur Agrar machen. Wir machen das Vollsortiment.

*(Es folgen vertrauliche Informationen).*

B: Ich sage jetzt etwas zu unserer Konstruktion. Wir firmieren seit dem Jahr 2001 unter dem Stichwort Unternehmensgruppe.

*(Es folgen vertrauliche Informationen).*

B: Damals ist die Gruppe entstanden, das ist jetzt wieder fürs Interview wichtig. XXXXX Unternehmensgruppe bildet die Mutter, und die XXXXX bildet die Tochter. Hat einen langen Hintergrund, aber gehört heute zu 100% zu XXXXX. Und es gibt die XXXXX Geflügelernährung, haben Sie vielleicht schon mal gehört.

F: Ja, habe ich.

B: Diese gehört zu 75% XXXXX. Das Werk in XXXXX ist unser Eigentum, und die Gesellschaft betreibt das. 25% gehört den Bauern, also der Erzeugergemeinschaft. Das ist also ein kleines genossenschaftliches Modell. Die Bauern als Erzeugergemeinschaft haben sich an der

Produktionsgesellschaft beteiligt. Aber das Werk an sich, also die Hardware, gehört uns. Aber die Bauern sind auch stolz darauf, weil sie Teil der Produktionskette sind und sagen, dass sie ihre eigene Mühle haben.

*(Es folgen vertrauliche Informationen).*

B: Zur Geschäftsverteilung sage ich nun noch etwas. Wir sprechen über den Vertriebsbereich und wir sprechen über Funktionsbereiche. Der Vertriebsbereich ist ja die Speerspitze nach draußen. Und da sind wir aufgeteilt in Sparten, die operativ nach außen wirken: Sparte Rind, Sparte Schwein, Sparte Legegeflügel und Sparte Geflügelmast. So spezialisieren sich ja auch die Landwirte. Die fünfte Sparte ist Agrar.

*(Es folgen vertrauliche Informationen).*

B: In jeder Sparte gibt es einen Spartenleiter. Und in jeder Sparte findet sich der Vertrieb wieder, da findet sich wieder das Produktmanagement und die Optimierung, also intern Wissenschaft und Optimierung. Also eine Sparte hat eigene Kunden, eigene Mitarbeiter, theoretisch ein eigenes Werk. Das ist also der Vertrieb.

*(Es folgen vertrauliche Informationen).*

B: Dann kommen die Funktionsbereiche. Wir sind ja Dienstleister. Einkauf, Produktion und Technik, Logistik, Finanzen, Personal.

*(Es folgen vertrauliche Informationen).*

B: Ich denke damit ist die erste Frage beantwortet.

F: Ja. Vielen Dank für die deutlichen Ausführungen. Ich habe jetzt eine grobe Vorstellung von der Organisation Ihres Unternehmens und lese nun die nächste Frage vor. Bitte schildern Sie die wichtigsten Fusionen und Übernahmen Ihres Unternehmens der vergangenen 10 Jahre.

B: Da endet unsere Unterhaltung. Weil wir keine Fusionen gemacht haben. Und auch Übernahmen in dieser Zeit gab es nicht. In meiner Zeit in der ich jetzt hier bin ist das Wachstum aus eigener Organisation entstanden. Es gab keine Übernahmen.

*(Es folgen vertrauliche Informationen).*

F: Dann habe ich die Informationen auf Ihrer Homepage wohl falsch verstanden. Also sind Sie in den vergangenen 10 Jahren organisch gewachsen und nicht durch Fusionen und Übernahmen.

B: Genau. Und somit ist es auch schwierig, die folgenden Fragen zu beantworten.

F: Ja das verstehe ich, da es ja nicht zutrifft.

*(Es folgen vertrauliche Informationen).*

B: Die Firmen sind zwar in die Unternehmensgruppe zusammengeführt worden, aber nicht rechtsverbindlich. Die Firmen sind selbstständig geblieben.

(*Es folgen vertrauliche Informationen*).

B: Es ist auch nicht geplant, diese Firmen zu fusionieren. Bei diesen Größenordnungen sind die Möglichen Kosteneinsparungen minimal. Stellen wir uns mal eine Fusion vor. Was könnte man denn einsparen. Vertriebler könnte man nicht einsparen. Das Werk steht auch schon da, kann man also nicht sparen. Die LKWs mit den Fahrern kann man auch nicht sparen. Auch ist ein Geschäftsführer oder Betriebsleiter vor Ort, den man auch nicht einsparen kann. Wenn es vielleicht gelingt, dann kann man in der Debitoren- und Kreditorenbuchhaltung vielleicht eine Person sparen. Das ist also minimal. Und dafür nimmt man die dezentrale Verantwortung, dicht am Kunden zu sein, noch weg. Und jetzt sind die eigenverantwortlich, für ihre Strategie und für das Wachstum. Und wir haben es ja auch mit keinem internationalen, sondern mit einem regionalen Geschäft zu tun. Wenn ich jetzt international tätig bin, dann hat das vielleicht andere Konsequenzen. Eine Fusion würde also kostenmäßig keine Skaleneffekte. Im Produktmanagement sind wir über die Gruppe durchorganisiert. Da gibt es auch nichts zu sparen.

(*Es folgen vertrauliche Informationen*).

B: Auch unsere Internetseite wird zentral betreut, das macht natürlich nicht jeder für sich. Das wird zentral gemacht für die Gruppe. Da können wir also auch nicht sparen. Wo wir was sparen könnten, das haben wir schon gemacht.

F: Also würde eine Fusion die genannten potenziellen Effekte nicht bringen?

B: Nein. Im Gegenteil. Es hat zum Beispiel auch strategische Vorteile, eine etablierte Marke als solche bestehen zu lassen. Warum soll man da was dran ändern. Und nur von der Umbenennung einer Marke hat man keine Kostenvorteile, sondern nur Imagenachteile.

F: Ja, das verstehe ich.

B: Andere Firmen denken da anders. Die übernehmen international etwas und behaupten, sie wachsen damit. Das kann bei uns nun nicht sagen. Wir wachsen organisch in der Region.

F: Also haben Sie eine andere Wachstumsstrategie als Ihre Mitbewerber?

B: Ja, ganz klar. Die Wachstumsstrategie der Diversifikation verfolgen wir nicht. Eher verfolgen wir ein Wachstum über Marktanteile. Also sich mit alten Produkten auf neuen Märkten behaupten. Und auch mit neuen Produkten auf alten Märkten. Das sind Innovationen, die wir ständig haben. Also eine Strategie ist Wachstum durch Marktanteile in der Region. Die andere Strategie ist, die Region auszudehnen.

F: Also versuchen Sie schon auch, neue Märkte zu erschließen?

B: So ist das. Informieren Sie sich zum Beispiel über unser Produkt XXXXX auf unserer Internetseite.

Ja danke, das werde ich mal recherchieren.

*(Es folgen vertrauliche Informationen).*

B: XXXXX ist eine der größten Innovationen die wir herausgebracht haben. Und mit diesem Produkt haben wir die deutschen Grenzen verlassen. Wir vertreiben es in Dänemark, Holland, Belgien, Spanien, Italien, Polen, Rumänien.

F: Also das ist ein ganz entscheidendes Produkt für Sie?

B: Ja, ein Wachstumsschritt. Und erst seit eineinhalb Jahren im Gange. Und wir produzieren alles selber. Auch die Technik, also gern mal auf der Internetseite nachschauen. Dann sehen Sie, was dahinter steckt.

F: Ja gerne.

*(Es folgen vertrauliche Informationen).*

F: Die weiteren Fragen treffen leider nicht auf Ihr Unternehmen zu, da jede Frage eine Fusion oder Übernahme voraussetzt.

B: Ja. Da sind wir ein schlechtes Beispiel.

*(Es folgen vertrauliche Informationen).*

F: Gut. Vielen Dank für das Interview.

## Interview 5 (19.10.2015)

F: Bitte stellen Sie Ihr Unternehmen und Ihre Position kurz vor.

B: Wir sind die XXXXX mit Sitz in XXXXX und XXXXX. Sie befinden sich hier in der XXXXX. Und unter dieser XXXXX sind viele Gesellschaften in dieser Holding-Struktur subsummiert. Zum Beispiel gibt es hier die XXXXX. Die XXXXX hat das Gebiet um die Kraftfutterwerke XXXXX und XXXXX. Die einzelnen Gesellschaften sind ergebnisverantwortlich, sind autark in ihren Entscheidungen. Was Einkauf angeht machen wir das aber primär mit unserem Einkauf, weil die auch nicht alle am Ticker sitzen wollen und führen den Außendienst und die Produktion. So gibt es verschiedene Gesellschaften, da gibt es eine die sitzt in XXXXX mit Werk XXXXX und XXXXX. Dann gibt es eine Gesellschaft in XXXXX, eine XXXXX in XXXXX, dann gibt es die XXXXX mit den Werken XXXXX und XXXXX. Und das ist praktisch die Struktur. Mein Name ist XXXXX und meine Gruppe ist verantwortlich für den Bereich Produktmanagement. Wir haben Produktmanager für die verschiedenen Zieltierarten und sind verantwortlich praktisch für die Ausgestaltung der einzelnen Mischfutter. Das Unternehmen möchte, dass die Mischfutterqualität und die Ausgestaltung der Programme, dass die für alle Gesellschaften gleich sind, weil die Tiere auch gleich sind, weil der Bedarf der Tiere im Norden nicht anders ist als im Süden. Der ist überall gleich. Also wir machen's zentral, das Produktmanagement, wir sind verantwortlich also für die Spezifikation, also für die Rohproduktspezifikation und für die Fertigprodukte spezifikation.

F. Also heißt das, dass Sie auch von hier vorgeben, was am Standort XXXXX produziert wird?

B: In Zusammenarbeit, in enger Abstimmung mit den einzelnen Gesellschaften.

F: Achso. Danke. Dann werde ich nun die nächste Frage vorlesen. Bitte schildern Sie die wichtigsten Fusionen und Übernahmen Ihres Unternehmens der vergangenen 10 Jahre.

B: Ja wir hatten eine große Fusion, das war mit der XXXXX, zur jetzigen XXXXX. Und die letzte, Sie sagen Übernahme, wir sagen Zukauf, ist die Produktion der XXXXX.

F. Danke. Bitte schildern Sie Ihre Rolle bei diesen Fusionen und Übernahmen.

B: Unsere Funktion ist natürlich zu sehen, jetzt bei XXXXX, dass dort die Kunden gehalten werden, dass wir die guten Produkte, die schon bei XXXXX produziert worden sind, weiter entwickeln. Und wir werden auch die Versuchskapazitäten dort weiter nutzen. Also das ist unsere Rolle, dass XXXXX ein gutes Standing in unserem Unternehmen hat.

F: Okay. Danke. Die nächsten Fragen sind zum Thema Skaleneffekte oder Größenvorteile und -nachteile. Bitte beschreiben Sie, ob sich die Anzahl der durch Ihr Unternehmen jährlich eingeführten neuen Produkte nach der Fusion oder Übernahme verändert hat.

B: Also ich würde sagen, wenn überhaupt, dann hat es sich mäßig verändert. Also mäßig bis verhalten verändert hat. Wir haben einiges an neuen Produkten natürlich in den neuen Gebieten, aber ansonsten hält sich das, was die Anzahl angeht, das hält sich sehr in Grenzen.

F: Danke. Falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl jährlich eingeführter neuer Produkte auf die Gesamtkosten für die Entwicklung eines neuen Produktes.

B: Ja, also das ist auch eher mäßig.

F: Also auf der Skala mäßig?

B: Ja, mäßig.

F: Bitte beschreiben Sie, ob sich das jährliche Mischfutter- Produktionsvolumen Ihres Unternehmens nach der Fusion oder Übernahme verändert hat.

B: Ja, wir produzieren mehr.

F: Dann lese ich gleich die nächste Frage vor. Falls zutreffend, bitte beschreiben Sie den Einfluss dieses veränderten Produktionsvolumen auf die gesamten Produktionskosten für eine Tonne Mischfutter.

B: Also wir produzieren mehr. Wir haben eine höhere Werksauslastung und haben dadurch auch einen geringen Produktionskostenpreis.

F: Bitte nutzen Sie die folgende Skala um diesen Einfluss zu beziffern.

B: Ja das ist natürlich abhängig vom Werk, an welchem Werk jetzt mehr produziert wird. Ich würde mal sagen von mäßig bis beträchtlich.

F: Dankeschön. Die nächsten Fragen sind zum Thema Kostensynergieeffekte. Bitte beschreiben Sie, ob sich die Anzahl der Forschungs- und Entwicklungsprojekte in Ihrem Unternehmen nach der Fusion oder Übernahme verändert hat.

B: Also die Anzahl ist eher geringer geworden. Aber insgesamt, das ist aber eigentlich kein Thema von Fusionen, die Themen sind einfach viel komplexer geworden. Und wenn Themen komplexer werden, dann dauern diese in der Entwicklung auch entsprechend. Früher, als die Fragestellungen nicht so komplex waren, hat man sich leichter getan, neue Produkte an den Markt zu bringen. Aber wenn man komplexe Fragestellungen hat, kann das schon mal zwei, drei Jahre dauern.

F: Okay. Falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl an Forschungs- und Entwicklungsprojekten auf die Kosten für die Entwicklung eines neuen Produkts.

B: Also wir haben keinen. Mäßig bis verhalten würde ich sagen. Also wir haben da kaum zusätzliche Kosten. Wir machen das mit der gleichen Anzahl Mitarbeiter. Von daher haben wir da keine zusätzlichen Kosten.

F: Danke. Dann lese ich die nächste Frage vor. Bitte beschreiben Sie, ob sich die Anzahl an verschiedenen Produkten, die in Ihrem Unternehmen produziert werden, nach der Fusion oder Übernahme verändert hat.

B: Also was sich verändert hat, das ist aber auch nicht abhängig von den Fusionen, das wir mehr Produkte machen die tailormade sind.

F: Also ganz kundenspezifische Produkte?

B: Genau. Aber ist nicht ein Effekt der Fusion, das ist eine Forderung des Marktes.

F: Also hat das mit der Fusion eigentlich nichts zu tun?

B: Nein.

F: Dann zu Frage e. Falls zutreffend, bitte beschreiben Sie den Einfluss der veränderten Anzahl an Produkten auf die gesamten Produktionskosten für eine Tonne Futter.

B: Wir haben ja keine zusätzlichen Produkte. Wir machen die tailormade Produkte mit und wir würden es nicht machen wenn wir da jetzt erhöhte Kosten hätten.

F: Bitte nutzen Sie die folgende Skala um diesen Einfluss zu beziffern.

B: Mäßig.

F: Danke. Dann geht's als nächstes um Synergien oder Verbundeffekte. Bitte beschreiben Sie, ob die Fusion oder Übernahme zu einer Kombination von vormals getrennten Forschungs- und Entwicklungsinputs in Ihrem Unternehmen geführt hat.

B: Ja. Es gibt ein Produktmanagement für alle Gesellschaften.

F: Falls zutreffend, bitte beschreiben Sie den Einfluss der Kombination von vormals getrennten Forschungs- und Entwicklungsinputs auf die Qualität Ihrer Produkte.

B: Die Qualität der Produkte ist gleichgeschaltet.

F: Bitte beschreiben Sie, ob die Fusion oder Übernahme zu einer Kombination von vormals getrennten Produktionsinputs oder -technologien in Ihrem Unternehmen geführt hat.

B: Ja, dass sich Werke hinsichtlich ihrer Tonnage dort ergänzen ist eigentlich klar nach einer Fusion. Man hat mehr Werke und mehr Möglichkeiten.

F: Danke. Ich lese dann die nächste Frage vor. Falls zutreffend, bitte beschreiben Sie den Einfluss der Kombination von vormals getrennten Produktionsinputs oder -technologien auf die Effizienz des Produktionsprozesses in Ihrem Unternehmen.

B: Wenn man verschiedene Produktsegmente auf Werke aufteilt, dann macht man das um effizienter zu arbeiten und Kosten zu sparen.

F: Danke. Als nächstes geht es um eine neue Wachstumsbasis. Die erste Frage hierzu habe ich vorhin schon vorgelesen. Da hatten Sie ja gesagt, dass es jetzt ein Produktmanagement für alle Gesellschaften gibt. Falls zutreffend, bitte beschreiben Sie, ob die Kombination verschiedener Forschungs- und Entwicklungsinputs zu einer neuen Produktionstechnologie oder zu einem neuen Fütterungskonzept geführt hat, welches die Basis für eine Gruppe neuer Produkte ist.

B: Ja das ist eigentlich auch wieder kein Effekt der Fusion. Wenn man ein Produktmanagement hat, dann kann man das nur haben, weil man fusioniert hat. Man braucht eine kritische Masse, um qualifizierte Wissenschaftler zu beschäftigen. So würde ich das sehen. Wenn wir nicht die Tonnage als XXXXX darstellen würden, könnte man sich auch eine Gruppe qualifizierter Wissenschaftler nicht leisten. So würde ich das sehen.

F: Aber mit einer Fusion oder Übernahme hat das nichts zu tun? Man braucht nur diese Masse?

B: Es gibt eine kritische Masse, und die braucht man, um dann auch kompliziertere und komplexe Produkte entwickeln zu können. Das ist eigentlich kein Fusionseffekt. Der Fusionseffekt ist indirekt, dass die Kosten der Mitarbeiter auf eine höhere Tonnage umgelegt werden können.

F. Vielen Dank. Ich lese nun die nächste Frage vor. Bitte beschreiben Sie, ob sich der Zeitraum zwischen den ersten Entwicklungsbemühungen und der ersten Auslieferung eines neuen Produktes nach der Fusion oder Übernahme in Ihrem Unternehmen verändert hat.

B: Also es gibt komplexe Themen, die brauchen längere Zeit für die Entwicklung. Das ist aber auch kein Fusionseffekt. Also wenn man sich die letzten Projekte anguckt, dann würde ich sagen, dass es gewichtig bis beträchtlich ist, da man dort eine Vorlaufzeit braucht.

F: Danke. Als nächstes geht's ums Risikomanagement in der Forschung und Entwicklung. Bitte beschreiben Sie, ob sich die Varianz der Erträge der Forschungs- und Entwicklungsprojekte in Ihrem Unternehmen nach der Fusion oder Übernahme verändert hat.

B: Das versteh ich nicht.

F: Mit Varianz der Erträge ist die erfolgsrate der Forschungs- und Entwicklungsprojekte gemeint.

B: Also die Erfolgsrate ist eher gestiegen.

F: Okay. Dann die nächste Frage. Bitte beschreiben Sie, ob sich Ihre Bereitschaft in länger andauernde und risikoreichere Forschungs- und Entwicklungsprojekte zu investieren nach der Fusion oder Übernahme verändert hat.

B: Nein.

F: Danke. Als nächstes geht's um Marktmacht. Bitte beschreiben Sie, ob sich die Aggressivität Ihrer potenziellen Mitbewerber nach der Fusion oder Übernahme verändert hat.

B: Ja.

F: Also ist gestiegen?

B: Ja.

F: Bitte beschreiben Sie, wie sich der Marktanteil Ihres Unternehmens im deutschen Markt für Mischfutter nach der Fusion oder Übernahme verändert hat.

B: Signifikant würde ich sagen.

F: Alles klar, danke. Die nächsten Fragen sind zum Thema Interessenkonflikte oder Prinzipal-Agent Probleme. Bitte beschreiben Sie, ob vor, während und nach der Fusion oder Übernahme Interessenkonflikte in Ihrem Unternehmen aufgetreten sind.

B: Was könnte das zum Beispiel sein?

F: Zum Beispiel beim Zukauf eines Werkes, dass die Mitarbeiter dort damit nicht einverstanden sind oder dass es seitens der Außendienstler irgendwelche Probleme gibt.

B: Nein, das ging immer glatt durch. Da achten wir auch als Unternehmen drauf. Ich sagte das ja eingangs. Wir kaufen zu und wir übernehmen nicht.

F: So dass die Firmen eigenständig bleiben?

B: Genau. Also Interessenkonflikte kann ich dort nicht sehen.

F: Okay. Frage b lese ich nicht vor, da es nicht zutrifft. Daher geht es weiter mit Frage c. Bitte nutzen Sie die folgende Skala, um Ihren Innovationsansatz zu beschreiben. Eins ist dabei nach innen gerichtet und eigenständig, 2 ist eher nach innen gerichtet und eigenständig, drei ist neutral, vier ist eher nach außen gerichtet und gemeinschaftlich und fünf ist nach außen gerichtet und gemeinschaftlich.

B: Können Sie mir diese Attribute mal erklären, was Sie damit meinen?

F: Also nach innen gerichtet ist, dass man die ganze Forschung und Entwicklung selbst und eigenständig betreibt, ohne mit anderen Partnern zu kooperieren. Das wäre eins und fünf wäre dann das Gegenteil. Dass man auch externe Experten hinzuzieht und auch bereit ist, Informationen und Wissen zu teilen.

B: Dann würde ich vier sagen.

F: Danke. Als nächstes geht es um die Motivation Ihrer Mitarbeiter. Bitte nutzen Sie die folgende Skala, um die Bemühungen Ihrer Mitarbeiter vor und nach der Fusion oder Übernahme zu beurteilen, neue Produkte zu entwickeln und einzuführen.

B: Weiterhin sehr gut. Da gibt es keine Abstriche.

F: Also vorher sehr gut und auch hinterher sehr gut?

B: Ja.

F: Gut. Die nächste Frage ist ähnlich. Bitte nutzen Sie die folgende Skala, um die Bemühungen Ihrer Mitarbeiter vor und nach der Fusion oder Übernahme zu beurteilen, die Effizienz Ihres Produktionsprozesses zu steigern.

B: Auch sehr gut, vorher und nachher.

F: Danke. Dann sind wir beim Thema Finanzmittel. Bitte beschreiben Sie, ob die Fusion oder Übernahme einen Einfluss auf die zur Verfügung stehenden Finanzmittel Ihres Unternehmens hatte.

B: Ja. Da würde ich merklich bis signifikant sagen.

F: Danke. In der letzten Frage geht es um die Gründe für die Fusion oder Übernahme. Nachfolgend sehen Sie eine Liste mit möglichen Gründen für Fusionen und Übernahmen. Bitte ordnen Sie diese Gründe nach der Wichtigkeit bei der Fusion oder Übernahme in Ihrem Unternehmen, indem Sie die Gründe mit Zahlen von 1 bis 10 versehen. 1 ist dabei das wichtigste und 10 das unwichtigste. Zusätzlich können Sie einen weiteren Grund nennen und in die Rangfolge aufnehmen.

B: Also ich würde sagen an erster Stelle steht die Steigerung des Marktanteils. Unternehmenswachstum ist an 2. Und der Rest ist alles nachrangig. Also da eine Gewichtung zu finden, da tu ich mich schwer. Das sind ja alles weiche Faktoren. Also da tu ich mich schwer. Also ich sage mal Zugang zu Fachwissen und Kompetenz, Diversifikation hin zu neuen Produkten und Märkten würde ich beides eine 3 geben. Das andere ist eigentlich eine Resultante aus 1, 2 und 3. Weil man fusioniert um den Marktanteil zu steigern und um zu wachsen. Das steht an erster Stell. Und das andere Ergibt sich natürlich daraus. Man will überleben, steuerlich hat man vielleicht auch was gewonnen, die Reputation des Unternehmens ist auch verbessert. Dass man es den Wettbewerbern dadurch nicht einfacher macht ist auch klar. Ich will da kein Ranking festlegen.

F: Also würden Sie alle übrigen Gründe mit 4 beziffern?

B: Ja. Weil das Resultanten sind.

F: Ich bedanke mich herzlich für Ihre Zeit. Das Interview ist nun beendet.

## 10.2 Appendix II: Scale of Mock

Percentage	English Term	German Term (own translation)
0 – 2%	Marginal	Geringfügig
2 – 4%	Modest	Mäßig
4 – 7%	Limited	Verhalten
7 – 12%	Marked	Merklich
12 – 20%	Significant	Significant
20 – 30%	Strong	Gewichtig
30 – 45%	Considerable	Beträchtlich
> 45%	Sharp	Stark

Adapted from the website of Harry Mock (2015).

### **10.3 Appendix III: Personal Declaration**

I hereby affirm that I have prepared the presented paper self-dependently, and without the use of any other tools, than the ones indicated. All parts of the text, having been taken over verbatim or analogously from published or not published scripts, are indicated as such. The thesis hasn't yet been submitted in the same or similar form, or in extracts within the context of another examination.

Hoogskede, 27.11.2015

Place, date of submission

Hennig Körster

Student's signature