Motives and outcomes of vertical coordination from the processors' perspective
Insights from the Ukrainian dairy industry

Dissertation
zur Erlangung des
Doktorgrades der Agrarwissenschaften (Dr. agr.)

der

Naturwissenschaftlichen Fakultät III
Agrar- und Ernährungswissenschaften,
Geowissenschaften und Informatik

der Martin-Luther-Universität Halle-Wittenberg

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Verteidigung am: 19.05.2014

Halle (Saale) 2014

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

Throughout my studies at the Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO) I met many great people whose direct and indirect support contributed much to my doctoral thesis.

This thesis would not have been possible without the support of my principal supervisor Prof. Dr. Alfons Balmann, whose valuable advice and constructive comments both supported this research and provided important guidance. The good advice, encouraging and detailed comments on the structure and the content of the thesis from my second supervisor Dr. Franziska Schaft have been of great value and improved the quality of this book. My time at IAMO also enabled me to participate in many interesting discussions, presentations at international conferences, and in various seminars and workshops.

I gratefully acknowledge the Konrad-Adenauer-Stiftung (KAS) for providing financial support for conducting this research, offering great insights into global political and economic topics, and giving me a great opportunity to meet interesting people. I would like to thank Dr. Detlev Preuße for great organizational and personal support in all years of the scholarship.

A great contribution to this thesis was time spent at the University of Missouri as a visiting research scholar during the fall semester of 2009. I would like to thank Professor Fabio Chaddad, Professor Harvey James and Professor Michael Cook from the Department of Agricultural & Applied Economics for their excellent scientific and organizational support. I would like to further thank Professor Chaddad for his willingness to review my work.

I would also like to thank my friends, who not only supported me during the time I have been working on this thesis, but filled this time with happiness and joy.

My very special thank goes to my family for their encouragement and endless support. This work is dedicated to them.

SUMMARY

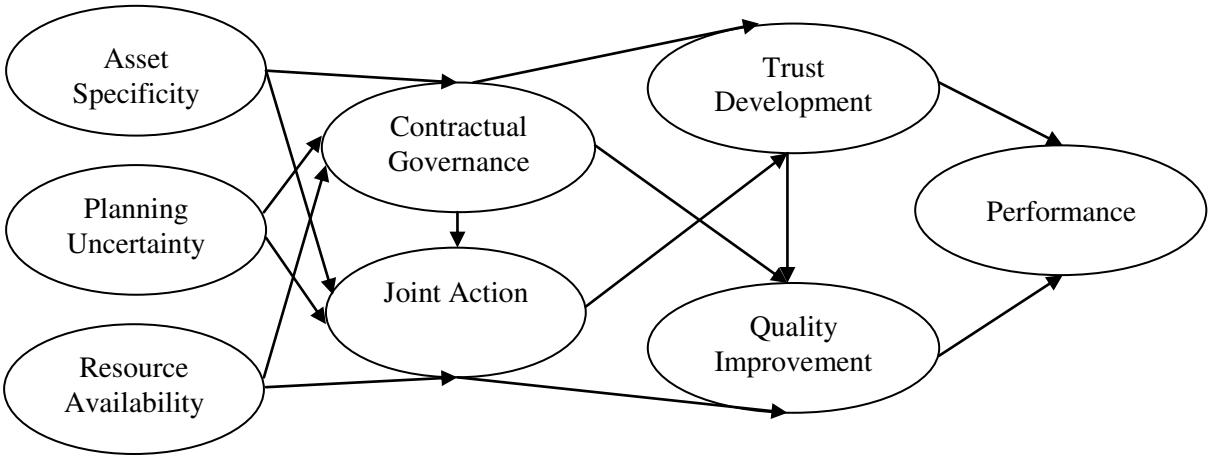
Similar to the other branches of the Ukrainian economy, milk production and the dairy processing industry were state controlled until the transition period at the beginning of the 1990s. After the breakup of the centrally planned economy, the coordination mechanisms between milk suppliers and the processing industry vanished rather quickly. At the same time, the whole milk production industry in Ukraine steeply declined and shifted, both relatively and absolutely, from corporate farms (large production units) to semi-subsistence farms (rural households). The actors in the dairy industry were confronted with the challenge of adjusting to the new market conditions (MYKHAYLENKO et al., 2009). At present, establishing an efficient milk supply chain is a major challenge for the Ukrainian milk processing industry. The organization of the buyer-supplier relationship is hampered by fundamental issues such as information asymmetry, a lack of trust between trade partners, low market transparency, and missing institutional mechanisms. In response to these challenges, the Ukrainian milk processing companies (buyers) are implementing tighter coordination mechanisms and additional support measures for the milk farms (suppliers).

The main objective of this dissertation is to analyze the organization of the buyer-supplier relationship and the current issues of vertical coordination in the Ukrainian dairy sector. To address the first objective, the analysis refers to the main drivers of vertical coordination implemented by Ukrainian milk processing companies. The second part of the conceptual model applied in this research refers to questions about the achievements and performance of the vertical coordination.

A distinctive characteristic of this study is that it adopts a multi-strategy approach by employing a combination of qualitative and quantitative study methods. The first empirical part of the study presents explorative case study interviews with managers of milk-processing companies. The case study interviews indicate that the companies faced almost identical coordination problems in the value chain, but nevertheless established different coordination strategies and incentive systems for their suppliers. Though the uncertainty of the milk supply turned out to be the major challenge in the transition to liberal markets for all interviewed processing companies, the available resources could explain considerable differences of the intensity and the set-up of vertical coordination among the interviewed companies. Based on the results of the case study interviews, three main drivers of vertical coordination were identified: uncertainty, asset specificity, and the abovementioned availability of resources. In addition, implementing vertical coordination was assumed to secure supplies,

increase quality and quantity in production, and to extend the companies' respective market shares. Moreover, the issue of trust played an important role in the buyer-supplier relationship. The case study interviews provided important insights into the behavioral patterns of the processing companies, and in this way contributed to the elaboration of the quantitative part of the study.

The conceptual framework consists of a mix of theories (transaction cost theory and resource-based view) and the concepts of quality management, trust and firm performance. This eclectic approach was chosen to cover the specific features of the Ukrainian dairy industry, with its high transaction costs, opportunistic supplier behavior, lack of trust between trading partners and uncertainty of milk deliveries. The transaction cost theory offered an appropriate approach to explain the impact of planning uncertainty and asset specificity on different forms of contractual governance and joint action between milk suppliers and the milk processing companies in Ukraine. Additionally, the role of the available resources for vertical coordination has been analyzed through the lens of the resource-based view of the firm. The concepts of quality management, trust and firm performance have been applied to understand the complexity and interrelations in the buyer-supplier relationship. The combination of the presented theories and concepts enabled the unification of the various aspects into a complex conceptual framework. The chosen eclectic approach provided deeper insights into the drivers and the outcomes of vertical coordination and allowed a better understanding of the inter-firm cooperation and alternative governance forms in Ukraine. In total, fourteen hypotheses form the present conceptual framework.



In order to evaluate the conceptual framework, the partial least squares (PLS) technique was used; PLS Path Modeling is a statistical approach that facilitates the modeling of complex multivariable relationships. This approach allows the estimation of theoretical causal relationships – the linkages between not directly observable concepts (constructs of the model) that are measured by observable indicators covered by the questionnaire (VINZI et al., 2010). Developed as a soft modeling technique, this approach offers great flexibility for solving various

modeling problems when the difficult assumptions of traditional multivariate statistics cannot be fulfilled.

The results of the survey support the initial assumptions and findings of the case study interviews. Planning uncertainty was a significant factor that encouraged processing companies to implement closer forms of contractual governance and participate in joint actions with their suppliers. On the one hand, high asset specificity led to the implementation of tighter governance structures in the analyzed relationships. On the other hand, asset specificity did not show significant influence on the level of joint action implemented for the milk suppliers. These results illustrate that although almost no contracts were signed with semi-subsistence farms, the level of joint action was still significantly high with this type of producer. Tighter forms of contractual governance positively influenced trust between processing companies and milk suppliers, and trust also played a crucial role for improved quality practices, which in turn had a positive impact on the pace of performance. An additional finding of the study is that although financial resources were considered the most important by the majority of the interviewed companies, resources such as managerial knowledge, employees' educational level, consultancy support and cooperation with scientific institutions all played decisive roles for the choice of embodiment and extent of vertical coordination schemes.

The following managerial implications can be derived from the study: Those processing companies that participate in vertical coordination showed significant performance increases. Also, the applied coordination patterns resulted in a positive response, increased willingness to share information, and created confidence from the side of the involved farms. The author assumes that there are still unexploited potentials for cooperation with semi-subsistence farms: The processing companies are dependent on milk deliveries from semi-subsistence farms, at least in a middle-term. Therefore, improving cooperation with these suppliers could offer a significant source of additional growth for the overall performance of suppliers and buyers in the Ukrainian dairy chain.

ZUSAMMENFASSUNG

Wie auch andere Sektoren der ukrainischen Wirtschaft wurden die Milchproduktion und –Verarbeitung bis zum Anfang des Transformationsprozesses in den 1990er Jahren staatlich gesteuert. Nach dem Zusammenbruch der Planwirtschaft ist auch die Koordination zwischen den Milchproduzenten und den Verarbeitungsunternehmen weitgehend zusammengebrochen. Diese Zeit war durch einen starken Rückgang sowie einen Strukturwandel der ukrainischen Milchproduktion gekennzeichnet, bei dem sich die Produktion aus großbetrieblichen Strukturen in deutlich kleinere Semi-Subsistenz Betriebe (Hauswirtschaften) verlagerte. Die Akteure auf dem ukrainischen Milchmarkt wurden mit der Herausforderung konfrontiert, sich an die neuen Marktbedingungen anzupassen (MYKHAYLENKO et al., 2009). Heutzutage zählt die effiziente Organisation der Milchlieferkette zu den größten Herausforderungen der ukrainischen Milchverarbeitungsindustrie. Die Beziehungen zwischen den Käufern und den Lieferanten werden durch grundliegende Probleme wie Informationsasymmetrie, unzureichendes Vertrauen zwischen den Handelspartnern, geringe Markttransparenz, sowie fehlende Institutionsmechanismen gehemmt. Um diesen Herausforderungen entgegenzutreten, setzen die ukrainischen Milchverarbeitungsunternehmen (Käufer) vertikale Koordinationsmechanismen ein und bieten Unterstützungsmaßnahmen (Seminare, Bereitstellung von Inventar, Investitionsbeihilfen etc.) für die Milcherzeuger (Lieferanten) an.

Das Hauptziel dieser Studie ist es, die Organisation der Beziehungen zwischen den Käufern und den Lieferanten sowie gegenwärtige Probleme der vertikalen Koordination in der ukrainischen Milchwirtschaft zu analysieren und betriebswirtschaftliche Empfehlungen abzuleiten. Das erste Teilziel besteht in der Analyse wichtiger Motive der vertikalen Koordination, die von den ukrainischen Milchverarbeitungsunternehmen initiiert wird. Der zweite Teil des konzeptuellen Modells betrachtet aus Perspektive der milchverarbeitenden Unternehmen die Ergebnisse und Auswirkungen vertikaler Koordination. Die vorliegende Studie ist durch eine sogenannte multistrategische Vorgehensweise charakterisiert, die eine Kombination qualitativer und quantitativer Forschungsmethoden impliziert.

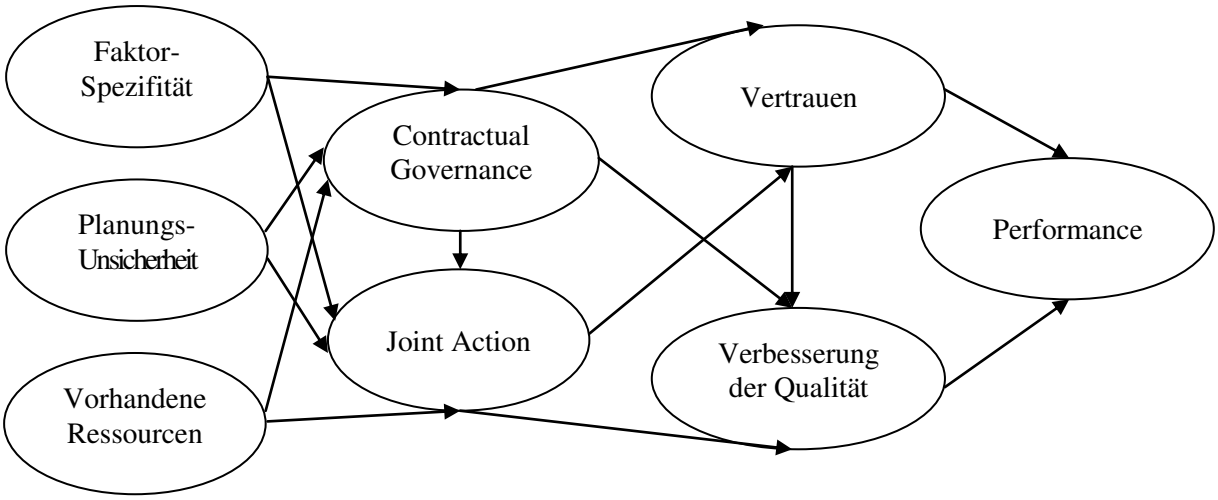
Der erste empirische Teil der Arbeit befasst sich in Form einer Fallstudie mit der Situation in den Verarbeitungsunternehmen, indem, Interviews mit Managern betreffender Unternehmen durchgeführt wurden. Die Ergebnisse dieser Interviews zeigen, dass die befragten Unternehmen fast identische Probleme mit der Koordination der Lieferketten hatten, dennoch unterschiedliche

Koordinationsstrategien und Leistungsanreize für ihre Lieferanten anboten. Basierend auf den Ergebnissen der Fallstudien-Interviews wurden drei wichtige Motive der vertikalen Koordination herausgearbeitet: die Faktorspezifizität, die Unsicherheit über Qualität und Quantität angelieferter Rohmilch sowie Ressourcen, die dem Unternehmen zur Verfügung standen. Außerdem verhalfen die Ergebnisse der Fallstudien zu der Schlussfolgerung, dass die vertikale Koordination zur Verlässlichkeit der Milchanlieferung, steigender Milchqualität und –Quantität führen kann, was wiederum zu wachsenden Marktanteilen der Unternehmen beitragen kann. Darüber hinaus spielt das Vertrauen in den Beziehungen zwischen Milchlieferanten und den Verarbeitungsunternehmen eine wichtige Rolle. Des Weiteren lieferten die Interviews Einblicke in Verhaltensmuster der Verarbeitungsunternehmen und trugen als solche zur Interpretation der Ergebnisse aus dem quantitativen Teil der Studie bei.

Der konzeptuelle Rahmen kombiniert verschiedene Theorien (Transaktionskostentheorie und Ressourcenbasierter Ansatz) und Konzepte (Qualitätsmanagement, Vertrauen und Performance). Diese eklektische Vorgehensweise wurde gewählt, um den Spezifika der ukrainischen Milchwirtschaft, wie hohen Transaktionskosten, opportunistischem Verhalten der Lieferanten, fehlendem Vertrauen zwischen den Handelspartnern und der Unsicherheit der Anlieferungen, gerecht zu werden. Die Transaktionskostentheorie bietet einen geeigneten Erklärungsansatz für die Auswirkungen der Planungsunsicherheit und der Faktorspezifität auf die Vertragsgestaltung und das Ausmaß der gemeinsamen Aktivitäten zwischen den Milchlieferanten und den Verarbeitungsunternehmen. Zusätzlich wurde die Rolle der vorhandenen Ressourcen für die Wahl der Koordinationsformen mit Hilfe des Ressourcenbasierten Ansatzes analysiert. Die Konzepte des Qualitätsmanagements, des Vertrauens und der Performance wurden angewendet um die Komplexität und deren Zusammenhänge innerhalb Käufer-Lieferanten Beziehung abzubilden. Die Kombination der dargestellten Theorien und Konzepte ermöglicht die Einbindung unterschiedlicher Aspekte in den konzeptionellen Rahmen. Diese Vorgehensweise bietet ein kohärentes Verständnis der wichtigen Motive und der Auswirkungen der vertikalen Koordination. Somit liefert diese Arbeit Einblicke in die Zusammenarbeit zwischen Unternehmen und alternative Vertragsformen in der ukrainischen Milchwirtschaft.

Um das konzipierte Modell empirisch zu bewerten, wurde die Methodik der Partial Least Squares (PLS) angewendet. Der Begriff PLS (Path Modeling) beschreibt eine statistische Methode, die die Modellierung komplexer multivariabler Beziehungen erlaubt. Somit wird die Bewertung der theoretisch kausalen Beziehungen zwischen den nicht direkt beobachtbaren Konzepten (Konstrukt des Models) und den messbaren Indikatoren (Element des Fragebogens) ermöglicht (VINZI et al., 2010). Die PLS Methode wurde als

Technik zur weichen Modellierung entwickelt und bietet größere Flexibilität im Vergleich zur traditionellen multivariaten Statistik.



Die Ergebnisse der quantitativen Auswertung unterstützen die Anfangshypothesen und Erkenntnisse aus den Fallstudie-Interviews. Die Planungsunsicherheit war ein signifikanter Faktor für die Verarbeitungsunternehmen, engere Vertragsformen umzusetzen und gemeinsame Aktivitäten (Joint Action) mit ihren Lieferanten zu entwickeln. Auf der einen Seite führte die Faktorspezifität zur engeren Vertragsgestaltung, jedoch zeigte sie auf der anderen Seite keine signifikante Wirkung auf das Ausmaß der Joint Action mit den Milchlieferanten. Die Ergebnisse zeigen, dass zwar keine Vertragsbindungen mit den Semi-Subsistenz Betrieben bestehen, die Verarbeitungsunternehmen dennoch eng mit diesen Betrieben zusammenarbeiten. Die engeren Vertragsformen mit den Großbetrieben Strukturen zeigten jedoch einen positiven Einfluss auf die Entwicklung des Vertrauens zwischen den Verarbeitungsunternehmen und diesen Milchproduzenten. Vertrauen spielte ferner eine wichtige Rolle für die Verbesserung der Milchqualität seitens der Milchproduzenten. Dies zeigte wiederum eine positive Wirkung auf die Performancesteigerung. Als interessante Erkenntnis dieser Studie lässt sich hervorheben, dass vorhandene finanzielle Ressourcen von den befragten Unternehmen als am wichtigsten für die Durchführung der vertikalen Koordination und eine verbesserte Effizienz der Wertschöpfungskette eingestuft wurden. Doch die Managementfähigkeiten, das Bildungsniveau, das Vorhandensein von Beratungsorganisationen und die Kooperation mit den wissenschaftlichen Institutionen spielten eine entscheidende Rolle bei der Wahl der Form und des Ausmaßes der vertikalen Koordinationsmechanismen.

Folgende betriebswirtschaftliche Empfehlungen lassen sich aus den Studienergebnissen ableiten: Verarbeitungsunternehmen, die in vertikale Koordination mit ihren Lieferanten involviert waren, zeigten eine Steigerung der Unternehmensperformance. Die angewandten Koordinationsmuster hatten eine

positive Wirkung auf das Vertrauen und die Bereitschaft der involvierten Milchproduzenten Informationen zu teilen. Darüber hinaus zeigen die Ergebnisse der Studie, dass nach wie vor nicht ausgeschöpfte Potenziale in der Kooperation mit den Semi-Subsistenz Betrieben existieren. Dies ist insbesondere deshalb relevant, da die Verarbeitungsunternehmen zumindest mittelfristig auf die Anlieferungen aus dieser Organisationsform angewiesen sind. Demzufolge könnte eine Verbesserung der Zusammenarbeit mit diesen Lieferanten eine wichtige Quelle für zusätzliches Performanceverbesserung in der gesamten ukrainischen Milchlieferkette darstellen.

LIST OF ABBREVIATIONS

approx.	Approximately
AVE	Average Variance Extracted
BIZPRO	Support to Micro, Small and Medium Company Development
BSR	Buyer-supplier relationship
CEE	Central and East-European
CEO	Chief Executive Officer
CF	Corporate farms
CR	Composite Reliability
DSTU	State Quality Standard of Ukraine
EC	European Commission
EFQM	European Foundation for Quality Management
e.g.	exemplī grātiā (lat. "for example")
EQS	Equations
et al.	et alii (masculine), et aliae (Feminine) or et alia (Neutral) (lat. „and others")
etc.	et cetera (latin „and other things")
EU	European Union
FDI	Foreign Direct Investments
GDP	Gross Domestic Product
HACCP	Hazard Analysis and Critical Control Points
ISO	The International Organization for Standardization
JSC	Joint Stock Company
Kg	Kilogram
LLC	Limited Liability Company
LV	Latent Variable
MV	Manifest variable
n/a	Not available
PF	Private farms

PhD	Doctor of Philosophy
PLS	Partial Least Squares
QM	Quality Management
RBV	Resource Based View of the Firm
SCM	Supply Chain Management
SEM	Structural Equation Modeling
SSF	Semi-subsistence farms
SSSU	The State Statistic Service of Ukraine
SYBAU	Statistical Yearbook of Agriculture of Ukraine
SYBU	Statistical Yearbook of Ukraine
T	Ton
TCE	Transaction Cost Economics
USAID	United States Agency International Development
USD	United States Dollar
VC	Vertical Coordination
WTO	World Trade Organization

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

SECTION I RESEARCH BACKGROUND

1. INTRODUCTION

Agricultural production worldwide is increasingly performed by large, strongly vertically integrated companies. As a result, corporate networks rather than single firms compete against each other. BOEHLJE (1999) interprets this development as a new form of industrialization in agriculture, where the competitiveness of farms and agricultural regions depends to an increasing extent on whether integration in increasingly international operating value chains can be successfully realized. According to BOEHLJE (1999) the supply chain approach is expected to improve efficiency through better flow scheduling and resource utilization, to increase quality through improved management and oversight abilities, to reduce risks associated with food safety and contamination, to increase traceability, and to improve industry response speed to changes in consumer demands.

After the collapse of the central planned economies in the early 1990s, transition and globalization processes greatly influenced the coordination mechanisms of agri-food businesses in Central and Eastern European countries (GOW/SWINNEN, 2001). In the first stage of transition, low investment flows in agricultural production caused a significant decrease of raw supplies, which negatively affected the processing industry (GOW/SWINNEN, 2001). The buyer-supplier relationships were thus characterized by delayed or missing payments for the delivered products, lack of trust between existing and new trade partners, information asymmetry and insufficient institutional enforcement (see e.g. SWINNEN, 2005). Vanishing state planning mechanisms, rapid privatization and farm restructuring during the early stages of transition caused the collapse of existing coordination mechanisms and networks between input suppliers, producers and the processing industry. Therefore, it was important to identify new trading partners, and to handle the lack of goods and rising prices for input goods. Concurrently, agricultural food production was affected by the worldwide internationalization of processing and retailing, as well as changing consumption patterns and consumer demand. This in turn increased the need for efficiency and quality improvements at all levels of the supply chain. As a consequence, the whole network of buyers and suppliers were forced to adjust to changing market conditions.

A number of papers analyze the issue of vertical coordination in Eastern European countries. These are mostly based on individual case studies (e.g. GORTON et al., 2007; VAN BERKUM, 2004; SZABO/BARDOS, 2005; SWINNEN, 2005). Additionally, GAGALYUK (2011), in the context of his PhD study, elaborates on the concept of network success and investigates the achievement

of strategic management goals in the Ukrainian food industry. However, to the best of the author's knowledge there have been no detailed studies done on the organization of relationships between processors and farms, or on the implementation of vertical coordination mechanisms with a focus on individual managerial decisions at the processor level. Particularly, little research exists that focuses on the Ukrainian dairy sector, which is characterized by a dualistic farm structure with large farms on the one hand, and semi-subsistence farms on the other hand. In the author's opinion, the main reason for the lack of detailed analyses might be caused by the low availability of primary company data on both the farm- and processor levels.

Similar to the other branches of the Ukrainian economy, milk production and the dairy processing industry were state owned until the transition period at the beginning of the 1990s. Subsequently implemented reforms then caused deep structural and institutional changes in the dairy sector. During Soviet times, production and delivery plans were submitted by the State Committee of Planning; consequently, agricultural producers were bound to the processing companies through centrally organized purchase and allocation schemes (PEREKHOZHUK, 2007). After the breakup of the centrally planned system, the coordination mechanisms between milk suppliers and the processing industry quickly vanished. The actors in the dairy industry were thus confronted with the challenge of adjusting their forms of coordination to new market conditions (MYKHAYLENKO et al., 2009).

After the beginning of transition, milk production in Ukraine strongly declined and reached a low of 12.6 million tons in 2000 (or 51% of milk production in 1990; see table 2.1, p.31). This negative trend was primarily caused by the production decrease of corporate farms. At the same time, production volumes shifted both relatively and absolutely from corporate farms to semi-subsistence farms. While more than 76% of whole milk was produced by corporate farms in 1990, in 2009 more than 80% of milk production was located on semi-subsistence farms (see table 2.7, p.38), which are characterized by extremely small-scale production and low labor productivity. The production decrease by the corporate farms caused an excess of demand over the production capacity for fresh milk on the Ukrainian dairy market. Suffering under the low availability of raw milk, the processing industry had to decrease or in some cases even stop production entirely due to low capacity utilization. Since 1990, milk deliveries to the processing industry have decreased and in 2009 constituted just slightly more than 26% of the milk deliveries of 1990. In 2009, more than 53% of the milk deliveries to the processing stage came from semi-subsistence farms, while 39% of milk was delivered by corporate farms and 6% was sourced from other economic entities (THE STATE STATISTIC SERVICE OF UKRAINE (SSSU), 2010).

Milk deliveries from semi-subsistence farms usually imply significantly higher transport and quality control costs. As this system involves a large number of

small deliveries of variable quality, the processing firms must devise complicated logistical plans for milk collection. Based on official data from the SSSU, the total volume of milk delivered from semi-subsistence farms is classified as second-grade milk[1] (see subchapter 2.3.2, p.37). At present, organizing an efficient milk supply chain is a major challenge for the Ukrainian milk processing industry.

Organizing buyer-supplier relationships in the Ukrainian dairy industry is hampered by such basic problems as information asymmetry, lack of trust between trading partners, low market transparency and missing institutional mechanisms. Milk deliveries are often characterized by high uncertainty and low milk quality. Insufficient technical equipment of the farms, communication problems and lack of information about quality requirements represent the biggest challenges in the dairy sector (MYKHAYLENKO/SCHAFT, 2010). In response to these challenges, Ukrainian milk processing companies have implemented tighter coordination mechanisms and additional support measures for their milk suppliers (SWINNEN, 2005; PEREKHOZHUK, 2007; see also Chapters 3 and 6).

Vertical coordination mechanisms are perceived to be a promising tool to reduce uncertainty and transaction costs, as well as to facilitate access to input factors, technology, capital, and know-how (BUVIK, 2002). More specifically, the increased use of vertical coordination strategies can be considered a response to transition-specific shortcomings. For instance, in Ukrainian agriculture, access to credits and input factors is often seriously impeded by poor liquidity and high investment risks such as variable yields, volatile market prices, and institutional problems such as legal uncertainty and corruption. In addition, agricultural producers and processors often lack sufficient technological capacities. Uncertainty over milk supplies and high seasonal fluctuations of milk production also increase the demand for tighter vertical coordination mechanisms (MYKHAYLENKO/SCHAFT, 2010).

1.1 Conceptual framework and initial research questions

Theoretical considerations of vertical coordination in the context of this study are derived from transaction cost economics (TCE) and the resource-based view

[1] Second-grade milk is, along with the extra grade and first grade, one of the milk quality classes accepted in Ukrainian food production. Due to a low level of mechanization (the milking process is done manually), insufficient cooling and storage capacities, the total amount of milk produced by semi-subsistence farms is classified as second-grade milk. Though still accepted for the production of milk products, second-grade milk is currently in danger of being excluded from industrial (commercial) food production due to its low quality. Though such discussions have taken place at the agrarian ministry for some years, this decision still has not been made. The main reason is that excluding this milk grade would cause serious supply problems for the processing companies, and in many cases would lead to the financial devastation of rural producers.

of the firm (RBV), as both of these approaches are considered important for understanding inter-firm cooperation and competitive advantages (MADHOK, 2002; COMBS/KETCHEN, 1999). Since both of these theories provide explanations to inter-firm cooperation (COMBS/KETCHEN, 1999), in this study they are applied as two complementary approaches to the problem of vertical coordination. To the best of the author's knowledge, there is no empirical research based on transaction cost theory and the resource-based view of the firm in the Ukrainian dairy industry. This fact offers additional motivation for this research. Additionally, the concepts of quality management, trust and firm performance are applied to help understand the expectations of the company managers and the outcomes of the vertical coordination.

The main objective of this research is to analyze the organization of the buyer-supplier relationships and vertical coordination mechanisms implemented in the Ukrainian dairy sector. The study is based on primary empirical data collected through personal interviews with processing company managers.

1.1.1 Drivers of vertical coordination

The first part of the research questions refers to the main drivers of vertical coordination. Based on the explorative case studies conducted during the initial stage of this research, the following questions can be put forth: Why do different companies introduce different coordination mechanisms for their suppliers? What kind of vertical coordination schemes are implemented in the Ukrainian dairy supply chain? Are different coordination schemes applicable to different types of suppliers?

Many empirical studies have observed the dependency between vertical coordination intensity and TCE attributes (e.g. HAN et al., 2006; FRANK/HENDERSON, 1992). The transaction cost concept was initially introduced by COASE (1937) and further expanded through WILLIAMSON'S transaction cost economics, which is used to explain a firms' economic governance form and the extent to which it will integrate vertically. The search for efficient governance structures is the primary driver of TCE (WILLIAMSON, 1988; MADHOK, 2002). Under the behavioral assumptions of bounded rationality and opportunism, WILLIAMSON (1979b, 1981) identifies frequency[2], asset specificity[3] and uncertainty[4] as the main variables that determine whether transaction costs will be lowest in a market or hierarchy. Cooperation between firms is only advisable if it leads to cost reductions in governing organizational

[2] WILLIAMSON (1979) recognizes three categories of frequency referring these to activities on the market: one-time, occasional and recurrent.

[3] Asset specificity (transaction-specific investment) is related to the extent to which investments are specific for a given transaction and have no or less value in any alternative use.

[4] Uncertainty results from the difficulties of gathering and processing information and therefore increases transaction costs (SCHLEINITZ, 1998).

activities (HESTERLY et al., 1990). Aligning governance arrangements promotes governance performance and reduces transaction costs (WILLIAMSON, 1981; 1985). Thus, the buyer-supplier relationships should be organized to reduce the search-, contracting-, monitoring- and enforcement costs (WILLIAMSON, 1985; DYER, 1997).

Since transaction frequency is generally very high in the dairy industry it is assumed that a high level of uncertainty and asset specificity will have a positive impact on the decision of processing companies to implement tighter forms of vertical coordination for their suppliers. Given the presence of opportunism, transaction-specific investments in physical and human capital made by one party cause an incentive for another party to make use of this dependence, which would cause additional costs for the first party. This evidently requires governance structures that would be able to decrease opportunism and favor inter-relational confidence. Due to the enormous number of small-scale producers, and deliveries, milk quality attributes are expensive to measure (BARZEL, 1982) in the Ukrainian dairy sector. Producers can, on the one hand, see incentives to engage in opportunistic behavior, and on the other hand find few incentives to invest in quality improvements. Food scandals such as the Nestle baby-milk scandal in Italy, Spain and Portugal in 2005, or the melamine scandal in China in 2008 emphasize the importance of transparency and traceability in the milk production process.

The resource-based view of the firm shifts the focus away from cost minimization to the firms' skills, capabilities, and knowledge (MADHOK, 2002), and allows one to approach vertical coordination from a strategic management perspective. In this context, inter-firm cooperation is understood as the possibility of resource sharing and overcoming resource-based constraints to growth (HAMEL, 1991). The firm's resources can be defined as strategic if they enable the firm to implement value-creating strategies and to create a unique competitive advantage (WERNERFELT, 1984; BARNEY, 1991). As COMBS AND KETCHEN (1999, p. 868) argue, "some resource-poor firms confront a dilemma in that the resource-based concept points them toward cooperation whereas organizational economics discourages cooperation: the resolution is that firms in need of certain resources will have to use inter-firm cooperation even when cooperation is not prudent from the organizational economics perspective." From the RBV perspective, a firm's existing resources influence the decision about governmental forms of coordination, as well as the firm's performance.

It is assumed that a high level of uncertainty and asset specificity has a positive impact on the tight contractual governance of buyer-supplier relationships in the Ukrainian dairy supply chain. Furthermore, it is assumed that a processing firm's financial resources, as well as its managerial and organizational knowledge has a positive influence on its decision to implement tighter forms of vertical coordination, and furthermore offers it strategic advantages over its

competitors. To the best of the author's knowledge, no extensive empirical study exists of such dependency in the Ukrainian dairy industry.

1.1.2 Outcomes of vertical coordination

Vertical coordination mechanisms implemented by Ukrainian milk-processing companies are expected to play a crucial role in securing high-quality raw milk deliveries, and in this way contribute to productivity advantages. Therefore, the second part of the conceptual model applied in this research refers to the following question: What are the outcomes of the vertical coordination?

According to BARRY (1993), it is assumed that vertical coordination helps to reduce information asymmetry and possible hold-up problems by self-interested, opportunistic parties. Closer vertical relationships between producers and processors should provide access to additional information about e.g., product requirements, and generally enhance the information flow along the supply chain (BARRY et al., 1992). Considering their potential effects, the author expects that vertical coordination mechanisms will have a positive impact on the delivered milk quality and thus provide strategic advantages for both the processing firms (e.g., through securing raw materials, new products, etc.) and the producers (e.g., through improved access to financial resources, technologies and knowledge). Moreover, it is expected that implementing vertical coordination positively facilitates the development of trust among actors at the production and processing stages (in this context the term trust includes interpersonal and inter-organizational trust). Both types of trust can evolve during a business relationship and can improve the stress resistance and resilience of relationships: interpersonal trust arises from previous interactions, experiences, or memberships in social groups; inter-organizational trust results from the embedded trust behavior of corporate units, i.e. firms with a strong corporate identity and high-trust culture (WILLIAMSON, 1979).

Various empirical studies show the positive impact of tighter forms of vertical coordination on quality management (e.g., HAN et al., 2006; SWINNEN, 2005). The total quality management approach, with its main principles of customer- and supplier satisfaction and continuous improvement of quality control systems becomes the basic business strategy for firms to remain competitive. Moreover, cooperation within the supply chain is expected to increase managerial abilities and quality control in the chain, as it can be done by one individual firm (BOEHLJE, 1999). The proverb that a chain is only as strong as its weakest link seems appropriate for supply chains. Though many processing companies apply quality management systems as well as public and private quality standards (HACCP, ISO) to achieve customer satisfaction and to remain competitive, only cooperation with milk suppliers allows dairy processors to increase milk quality along the whole supply chain. Trust is an important feature of relationships and is considered to be a positive expectation of one party about the other party's

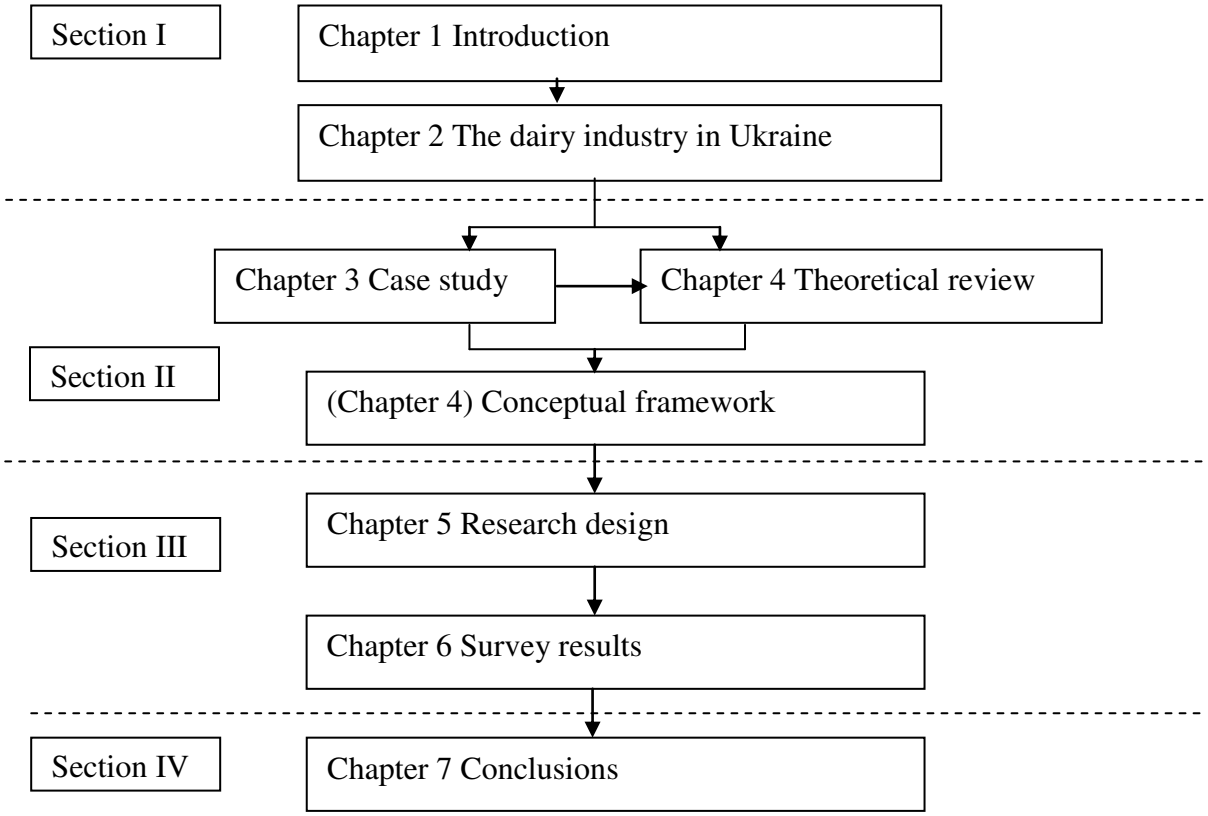
intentions (LU, 2007). BAHLMANN et al. (2007) argues that trust develops positively along the continuum of vertical coordination, and assumes conflict and opportunism at the open market and trustful cooperation and vertical partnership on the opposite end. Trustful cooperation appears if both partners are convinced that long-term collaboration is likely and take the relevant risks. In addition, cooperation incentives and trustful relationships with partners are seen as risk minimization tools that are important for establishing self-enforcing contracts, and might contribute to stimulating investment conditions.

1.2 Research approach and thesis structure

This study contributes to the existing literature in the following ways. First, the integrated research framework of two theoretical approaches is used to elaborate the main drivers and the outcomes of vertical coordination. Second, an innovative conceptual model is devised and presented, based on the theoretical review and the results of the case interviews with company managers. In the final stage, the quantitative analyses of primary survey data allow the author to empirically evaluate the research hypotheses.

The overall approach of this work relies on a combination of qualitative and quantitative research methods, which, according to BRYMAN (2004) can be identified as "multi-strategy research." For example, a multi-strategy approach can be conducted in sequences: Qualitative research facilitates quantitative research, or vice versa. Qualitative research, which is applied in the first sequence, can provide hypotheses for further research, but also provides support for the interview and survey design of the quantitative sequence. Moreover, qualitative research can facilitate the interpretation of variable relationships. Quantitative research methods, on the other hand, facilitate qualitative research by preparing the ground for the interview subjects. Another possibility of applying the multi-strategy approach is the "filling-the-gaps" strategy: when the research question cannot be sufficiently answered by one method, the application of another research method allows gathering additional information not available through the initial method (based on BRYMAN, 2004). In the context of this thesis, the quantitative research is based on the findings of the preceding qualitative case studies. Since no empirical evidence or secondary data on the research topic was available, the case studies can be characterized as an exploratory phase, which enabled the author to gain basic insights on vertical coordination mechanisms and relevant actors in the Ukrainian dairy industry. This exploratory phase allowed the research focus to be narrowed (e.g., focus was placed on the empirical work on the processing level) and the literature to be reviewed. As a result, the conceptual model that details the initial research questions was improved by elaborating the central hypothesis. In a second step, a quantitative survey was conducted to test the hypotheses derived in the conceptual model.

Figure 1.1: The structure of the thesis



Source: Own research.

The outlined research process can be further detailed as follows:

1. In the first stage of this research, the Ukrainian dairy sector was analyzed based on official statistical information, media reports and market research analyses. This was done to identify the main problems in the Ukrainian dairy industry and thus to better understand the motivation of the companies that evolve into closer vertical coordination schemes. The main issues refer to the shortage of high quality milk on the Ukrainian market, and also basic cooperation problems between the processing companies and their milk suppliers (corporate farms and semi-subsistence farms).
2. In the next stage, the case study approach was applied to better understand the motives of the processing companies that evolve into tighter coordination forms with their suppliers. Conducted interviews with the top managers of milk processing companies allowed the author to analyze the relationship between the processing industry and their milk suppliers (hereafter referred to as a buyer-supplier relationship);
3. Empirical findings from the case studies offered a basis for further elaborating more precise study questions. One important observation was that the processing companies mainly initiate the tighter vertical

coordination and offer various support programs for their suppliers. This fact was a primary reason for focusing attention on processing companies.

4. Theoretical assumptions of transaction cost theory and the resource-based view provided important interrelationships for the conceptual model. This was later tested empirically through the quantitative research. The case study approach and the theoretical review allowed the author to elaborate on the main research hypotheses and the conceptual framework for the survey
5. The next step dealt with survey implementation. To test the research hypotheses, a questionnaire was prepared for the interviews. Interviews were conducted through personal conversation with the managers of processing companies. This reduced the number of missing answers, as well as helped gather additional qualitative data (i.e., managers' opinions and experience).
6. To process the interview data and test the hypotheses, a partial least squares approach was applied to the data sample. Based on the modeling results, main conclusions were drawn on the motives for tighter forms of vertical coordination, as well as the impact of vertical coordination on milk quality, trust and performance.

This thesis is structured into four sections (figure 1.1) that correspond to the outlined research process. Accordingly, section I introduces the research background and gives a short overview of the main research ideas. Chapter 1 (Introduction) presents the research motivation and lays out the main theoretical considerations the study is based on. Moreover, the main research questions and research design, as well as the outline of the thesis are presented. Chapter 2 presents the analyses of the main statistical data on the Ukrainian dairy industry. These analyses explore the main developmental tendencies and existing problems in Ukrainian milk production, and the processing and distribution of dairy products.

Section II (Chapters 3 and 4) represents the conceptual framework of this research. Chapter 3 describes the motivation and data population of case studies, as well as the applied methodology. This chapter also presents the results of the case studies. Chapter 4 presents a review of the main theoretical concepts employed in the present study. These concepts include the transaction cost theory, resource-based view, concept of trust, quality management and firm performance. Moreover, this chapter discusses the advantages of combining given theoretical concepts in the present research, and presents the research hypotheses as well.

Section III (Chapters 5 and 6) presents the empirical results of the survey conducted for this research. Chapter 5 presents the survey's methodology and describes the data collection, the applied evaluation method of the data analyses, and the measurement procedures. Chapter 6 then presents the results of the

survey; these include the results of the validity and reliability tests, the results of the model estimation, as well as tests on the research hypotheses.

Finally, Section IV presents the conclusions of the study. This chapter includes the implications of the study results for the managerial decisions concerning the organization of buyer-supplier relationships. Furthermore, the limitations of the study and suggestions for future research are discussed.

2. THE DAIRY INDUSTRY IN UKRAINE

This chapter outlines the main characteristics of the Ukrainian dairy industry. First, a short review of the transition process and its specific effects on the industry is provided; the dairy sector's role in the national economy is then discussed. Next, the stages of the dairy chain are analyzed in more detail. The chapter concludes with implications for the conceptual framework of this thesis.

2.1 The dairy industry in transition

After the collapse of the Soviet Union in 1991, fundamental reforms were introduced in Ukraine to create a democratic environment and a liberal market economy that were meant to replace the former centrally planned economic system. The planned economy in the Soviet Union was characterized by administrative price setting and public ownership of production factors. As such, decisions regarding production, supply, and distribution were made based on 5-year plans developed by the Council of Ministers of the Soviet Union. To a limited degree, private farming was also present in this system, which was mainly carried out on rural semi-subsistence farms (WEGREN, 1998). Since the early 1990s, the production volume generated by these producers (also known as part-time farming) increased, and became an essential source of food for many urban and rural semi-subsistence farms. The agricultural transition process in Ukraine has been widely discussed in the scientific literature (cf. LISSITSA, 2002; PEREKHOZHUK, 2007; MACOURS/SWINNEN, 2002; and ZORYA, 2003). The following section has a special focus on the dairy farming structure, and as such provides a literature review and up-to-date statistical insights into the Ukrainian dairy industry. This provides a better foundation for understanding both producers' and processors' roles in the transition process and now.

In the former Soviet Union, dairy processors were owned by the state and subordinated to the Ministry of Meat and Dairy Industry; thus, dairy farming was strongly supported by numerous state subsidies. In the 1980s, almost 50% of all subsidies were directed towards the agricultural sector: of these, 80% were allocated to dairy farming. The share of subsidies in the milk purchasing price varied between 28% in 1970 and 78% in 1990 (KARPENKO/BUTENKO, 2007). The Act on Privatization of State Ownership of 4 March 1992 created the initial legal basis for privatizing Ukrainian state companies. Transformation and privatization in the agricultural sector was regulated by several acts and decrees. For example, in 1990 the agricultural "Land Reform" law was installed in the Soviet Union, and in 1999 was continued by the decree "on urgent measures for

accelerating the reformation of the agricultural sector," by the Ukrainian president (WEGREN, 2002).

The start of the transformation and privatization process was connected to great structural and legal changes. At the operational level, adapting to the new market guidelines implied extensive restructuring within the dairy industry and enforced the creation of new networks because the previous sales, distribution and marketing channels of the centrally planned system had disappeared. In addition, the sector had to adapt internally and externally to a new, challenging environment. Some effects of this transition process are summarized in table 2.1.

Table 2.1: Milk production in Ukraine, 1990-2009

Indicators	1990	2000	2001	2004	2005	2006	2007	2008	2009
Number of milk cows, Mio. heads	8.4	4.9	4.9	3.9	3.6	3.4	3.1	2.9	2.7
Milk production, Mio. tons	24.5	12.6	13.4	13.7	13.7	13.3	12.3	11.8	11.6
Profitability level of milk production[5], %	32.2	-6.0	-0.8	-0.4	12.2	-3.7	13.8	4.1	1.4
Amount of milk supplied to processing industry, Mio. tons	17.9	3.3	4.4	5.2	5.7	5.6	6.1	5.4	4.7
- percentage of production	73.3	26.5	32.7	38.2	41.5	42.5	49.4	46.1	40.9

Source: Data of the SSSU: SYBU for the years 1995 (p. 257-258), 2001 (p.192, 195), SYBAU for the years 2002 (p.107), 2006 (p.109, p.131) and 2009 (p. 58, p.117, p.143).

In transition, the number of cattle decreased substantially due to low milk prices, the processing companies' low purchasing capacity, and the producers' lack of financial resources. Compared to 1990, the total number of dairy cows was 40% lower in 2000. In subsequent years, the number of cows continued to decline: In 2009 the number of dairy cows amounted to only one-third (32.7%) of the population in 1990. This trend resulted in a decrease in production of over 53% within the observation period. The total production decline was not only caused by a shrinking number of livestock, but also by low milk yields per cow. Market insecurities and delayed payments made bartering attractive (DOLUD, 2004) and were the main reason that corporate farms reduced their milk supplies to the processing industry. In 1990, 73.3% of Ukraine's total milk production was delivered to the processing industry, whereas in 2000 only 26.5% of produced milk was supplied to the processors (SSSU, 1990-2000). Due to delayed or missing payments from the processing companies, milk was most often sold on

[5] The profitability level of operation (production) is the ratio of net profits (losses) to all expenditures of the operating company, in percentages, was calculated by the Statistical Yearbook Agriculture of Ukraine, 2009 (p.28).

open markets or directly offered to a farm's employees. In 2003 the downward trend stopped, and an increase in milk supply to the processing companies could be observed. However, in 2008 and 2009 the share of milk supplied to processing companies fell again and amounted only 46.1%, or 40.9% of total production (SSSU, 2003-2009). During transition, the profitability of milk production strongly declined and dropped to -13.8% in 2002. However, since 2007 these figures have improved. The literature identifies various causes for the low profitability of the Ukrainian milk industry, which encompass e.g., ineffective management of livestock farming (BAKER, VON CRAMON-TAUBADEL et al., 1999), low milk yields (PEREKHOZHUK, 2007) or low labor productivity (BIESOLD, 2003). Confronted with open market conditions, many farmers who were accustomed to working under the planned system were not capable of making essential managerial decisions by themselves. Low availability of high quality forage, wrong fodder rations, and improper farm management all led to the strong decline of milk yields and overall milk production. Additionally, as noted by PEREKHOZHUK (2007), inefficient milk processing and low capacity utilization of the milk processing industry, as well as the energy crisis of the late 1990s were important reasons for the decline of the Ukrainian dairy sector.

2.2 The role of the dairy industry for the national economy

With production of about 11.6 million tons of milk in 2009, Ukraine's share of total world cow milk production amounted to 1.6% (FAO, 2009).[6] Despite the production decline in recent decades, in 2009 the dairy self-sufficiency level reached more than 106% due to a strong decrease in consumption.[7] Therefore, the dairy sector is perceived to be of vital importance for Ukrainian agriculture.

Dairy imports strongly increased in recent years. In 2009, e.g., 455,000 tons were imported, which translates into an increase of almost 200% compared to the year before. Despite these growth rates, imports remain noticeably lower than exports. In 2009, Ukraine exported 919,000 tons of milk and dairy products. For the first 9 months of 2006, exports of milk products decreased by 30% (by 33.1% for butter and 59.7% for cheese) which is mainly due to an import ban (issued on 20.01.2006) by the Russian Federation (VOSKOBIJNYK, 2007). Russia is a major importer of dairy products from Ukraine: In 2007, more than 50% of Ukrainian dairy production (monetary value) was exported to Russia (predominantly hard cheeses) and Algeria (predominantly dried milk). In 2007 the exports of dairy products increased by 70% compared to 2006, and 660 million USD (KVITKA, 2008). In 2008, an increase in Ukrainian exports was

[6] World milk production in 2009 constituted 701 million tons, based on FAO – Food Outlook 2009: Global Market Analyses.

[7] Statistical Yearbook Agriculture in Ukraine, 2009, p. 153. Self-sufficiency in milk and milk products is defined as the ratio of production (output) to domestic use (consumption, annual stocks and fodder).

observed. However, in 2009 the export rates declined again and amounted to only 80% compared to 2008. The balance sheet provided in table 2.2 contains figures from selected years.

Table 2.2: National balance of dairy products in selected years, thousand tons

Indicator	1995	2000	2001	2004	2005	2006	2007	2008	2009
Total national production	17,274	12,658	13,444	13,710	13,714	13,287	12,262	11,761	11,610
Change of stocks at the end of year[8]	-440	-394	-338	-360	27	174	-72	-78	230
Imports	58	50	100	80	112	150	199	234	455
Total resources	17,772	13,102	13,882	14,150	13,799	13,263	12,533	12,073	11,835
Export	1,420	1,100	1,900	2,126	1,901	950	939	1,140	919
Expenditures on animal feed	3,723	2,203	1,990	1,296	1,270	1,326	1,141	1,038	1,126
Losses and waste[9]	80	10	5	3	3	7	5	5	10
National Consumption	12,549	9,789	9,987	10,725	10,625	10,980	10,448	9,890	9,780

Source: Data of the SSSU: SYBAU for the years 2002 (p.117), 2006 (p. 138), 2009 (p.150).

Milk production and processing in Ukraine is governed by the "Milk and Dairy Products" act, No. 1870 – IV of 24 June 2004. The act provides, inter alia, the following definitions concerning milk production, storage and processing:[10]

- Milk – an unprocessed product of normal secretion by one or more cows, sheep, goats, or mares with a temperature of no more than 40°C.
- Raw milk – already physically processed milk (filtered, refrigerated) intended for further processing; also includes cream and skimmed milk which is produced by separation as required by the guidelines.
- Dairy products – products with a raw milk content of no less than 50%.
- Processing companies – companies that buy milk and raw milk, and operate in production facilities that guarantee security and quality in the production of dairy products as required by the regulations.

[8] Changes in stocks show the differences between the products available at the end of the year compared to the beginning of the year – the data are calculated by the State Committee of Statistics of Ukraine based on conceptions and methodological approaches of the Food and Agricultural Organization of United Nations (FAO).

[9] Total product losses include losses of producers and losses connected to processing, transportation and storage.

[10] Law of Ukraine "About milk and milk products" № 1870-IV from 24 June 2004.

2.3 The dairy supply chain

In the following sections, the production, processing, and distribution stages of the dairy supply chain in Ukraine are investigated in more detail. The analysis is based on data provided by the SSSU and supplemented by information obtained from the interviews conducted during this research.

2.3.1 The production stage

Ukrainian statistics differentiate between three farm types in the agricultural sector: semi-subsistence farms, corporate farms and private farms.

Semi-subsistence farms (SSF) are defined as rural households engaging in economic activity for two purposes: food production for their own use, and production of agricultural commodities for the market. This category also includes those persons registered as private entrepreneurs who work in the agricultural field (SSSU, SYBAU 2009, p.28). Semi-subsistence farms seldom own technical equipment and usually keep only one or two cows on their land. The cows are fed with home-grown feed and in most cases are milked by hand.

Corporate farms (CF) are defined as independent entities with legal rights to carry out agricultural production activities to obtain profit (SSSU: SYBAU 2009, p. 28). These farms mostly evolved from the former kolkhozes, though some were newly established. Compared to semi-subsistence farms, corporate farms own a greater number of cows (table 2.3) and have their own stables and technical equipment. In this research the term "corporate farm" refers to all possible legal identities such as private farms, economic partnerships, private companies, productive cooperatives, and state companies that the SSSU includes in the category "agricultural company."

Private farms (PF) represent a new legal form of corporate farms whose share of milk production is still very low. The total number of private farms in milk production was 923 in 2009, and contributed 0.9% (106,000 tons) to total milk production in Ukraine that year. The distinctive feature of these farms is that the founders are family members and must have Ukrainian citizenship.[11]A more detailed description of this farm type can be found in the Ukrainian Act "on farming" No. 973-IV of 19 June 2003. In the proposed analysis private farms are not the object of investigation, and in the following will only be mentioned parenthetically.

Semi-subsistence farms form a relatively homogenous group of rural households that are involved in agricultural production. Table 2.3 shows some important figures concerning their structure.

[11] Cf. Law of Ukraine "About farming" № 973-IV from 19 June 2003.

Table 2.3: Characteristics of semi-subsistence farms in Ukraine, 2005-2009

Indicator	2005	2006	2007	2008	2009
SSF total (1,000)	4,915	4,818	4,749	4,666	4,612
Thereof: dairy farms (1,000)	2,546	2,448	2,280	2,188	1,979
Average farm size (ha)	1.1	1.2	1.2	1.2	1.2
Average age of semi-subsistence farms head (years)	60	59	58	58	57
Average number of cows per farm (heads)	0.5	0.5	0.46	0.45	0.4
Average number of cows per dairy farm (heads)	1.0	1.0	1.0	1.0	1.0
Average milk production per dairy farm (tons)	4.4	4.4	4.4	4.4	47
SSF with more than 1 ha farm land					
Average farm size (ha)	3.8	4.1	4.1	3.9	4.0
Share of all SSF (%)	18.9	20.6	21.0	21.3	20.7
Share of total farm land of all SSF (%)	66.2	70.3	71.1	70.6	71.0

Source: Own calculations based on data of the SSSU: SYBAU 2009 (p. 178, p.179, p.182).

From table 2.3 one can conclude that the wide majority (nearly 80%) of semi-subsistence farms owned less than 1 ha of land in 2009. The average area of farm land increased by 9.3% from 2005 to 2009. However, in 2009 the 20.7% of the farms that were larger than 1 ha cultivated more than 70% of the total farm area of semi-subsistence farms. The average age of the semi-subsistence farm heads is quite high, but declined by 5% between 2005 and 2009. Also, the number of cows per farm has decreased by 20%. In 2009, 4 of 10 semi-subsistence farms kept cows, whereas in 2005 this number was 5 of 10 semi-subsistence farms. The growing share of total farm land observed among farms with more than 1 ha of farm land shows the growing interest of semi-subsistence farms in agricultural production. On the other hand, about 20%, or one of five semi-subsistence farms, have reduced their number of milk cows or exited milk production, respectively.

Table 2.4: Characteristics of corporate farms in Ukraine, 2005-2009

Indicator	2005	2006	2007	2008	2009
CF total	57,877	57,858	58,387	59,059	57,152
Thereof: dairy farms	7,860	7,138	6,010	4,961	4,294
Average farm size (ha)	375	359	351	359	375
Average number of cows per dairy farm (heads)	110.2	107.0	112.9	125.8	140.8
Average milk production per dairy farm (tons)	328.5	343.8	362.4	421.1	520.7

Source: Own calculations based on data of the SSSU: SYBAU 2005 (p. 52, p.119), 2006 (p.49), 2007 (p.51, p.115), 2008 (p.51, p.117), 2009 (p. 51, p.110, p.123).

Though the total number of corporate farms and the average farm size have not changed much from 2005 to 2009, the number of farms involved in milk production decreased by almost 55%. However, in 2009 the average number of cows per dairy farm increased by almost one-third. Also, the average milk production per dairy farm increased from 328.5 tons in 2005 to 520.7 tons in 2009. Whereas semi-subsistence farms present a relatively homogenous group of producers (regarding farm size and number of animals), corporate farms are divided into different sub-categories by their size and volume of milk production (table 2.5).

Table 2.5: Corporate farms by milk production volume, 2009

Ø annual milk production (tons/farm)	**Number of farms**		**Milk production volume**	
	Total	In percent (%)	Total, thousand tons	In percent (%)
CF total	4,294	100.0	2,235.3	100.0
below 100.0	1,961	45.7	55.6	2.5
100.1-500.0	1,132	26.4	289.2	12.9
500.1-1,000.0	558	13.0	401.0	17.9
1,000.1-2,000.1	358	8.3	493.9	22.1
2,000.1-3,000.1	156	3.6	374.4	16.7
3,000.1-4,000.0	60	1.4	204.8	9.2
4,000.1-5,000.0	30	0.7	131.1	5.9
more than 5,000.0	39	0.9	285.3	12.8

Source: Own calculations based on data of the SSSU: SYBAU 2009 (p.123).

As shown in table 2.5, the group of corporate farms with milk production below 500 tons per year represented more than 72% of all corporate farms involved in milk production; 13% of all corporate farms produced 500-1,000 tons milk per year, and 8.3% produced between 1,000-2,000 tons per year. The reason that a large number of farms fell into one of the first categories was that even if milk production was not profitable, farms often continued production. This was firstly because revenue from milk sales, in contrast to plant production, represented a weekly/monthly source of income, and secondly, because milk sales covered variable costs as well as a part of fixed costs that would not have been covered by the farm in any other way.[12] The biggest dairy farms that produced over 5,000 tons of milk per year represented only 0.9% of all corporate farms involved in milk production.

Clearly visible structural changes can also be observed for corporate farms in the analyzed years. There was a tendency of milk production to shift from corporate farms with a lower average size of milk production to farms with an average milk production above 2,000 tons per year. Data for selected years are provided below in table 2.6.

[12] This information is based on results from an oral survey of milk producers conducted in Ukraine from 2008 to 2009.

Table 2.6: Number of corporate farms by milk production volume, 2005-2009

Ø annual milk production (tons/farm)	2005	2006	2007	2008	2009
CF total	7,860	7,138	6,010	4,961	4,294
below 100.0	3,888	3,666	3,144	2,462	1,961
100.1-500.0	2,544	2,149	1,679	1,357	1,132
500.1-1,000.0	779	684	605	569	558
1,000.1-2,000.0	431	408	353	338	358
2,000.1-3,000.0	134	141	134	132	156
3,000.1-4,000.0	45	46	47	48	60
4,000.1-5,000.0	17	19	24	28	30
more than 5,000.0	22	25	24	27	39

Source: Own calculations based on data of the SSSU: SYBAU for years 2005 (p.119), 2006 (p.113), 2007 (p.115), 2008 (p.117), 2009 (p.123).

From table 2.6 one can conclude that the total number of corporate farms involved in milk production strongly decreased from 2005 to 2009. Compared to 7,860 farms in 2005, the number of dairy farms decreased by 55%, to 4,294 farms in 2009. This negative trend could mainly be observed in the category of farms that produced less than 2,000 tons milk per year. The number of farms with higher milk production volumes tended to increase in the analyzed period. The number of farms with annual milk production between 2,000-3,000 t increased by 16.4%. Furthermore, there was an increase of 33.3% in the category of farms with production of 3,000-4,000 t milk per year. Finally, the biggest increase was observed for farms with annual milk production of 4,000-5,000 t and more than 5,000 t per year. The number of farms in these two categories rose by 76.5% and 77.3%, respectively, in the past 5 years. These figures hint to the fact that entrepreneurial farms recognized the problem of the processing industry, which lacked raw milk due to shortfalls in milk production during transition. As a consequence, these farms might have started to invest into new machinery and expand production capacities, respectively. Smaller corporate farms that, in contrast to "production giants," cannot obtain any advantages by utilizing economies of scale might have started to exit milk production. In the following tables, detailed information on the dynamic development of milk production (in number of milk cows and milk yield) for the different types of farms is provided. Table 2.7 offers an overview of the development of milk production and milk yield between 1990-2009.

Table 2.7: Milk production and milk yield in Ukraine, 1990-2009

Year	Milk production						Average milk yield		
	Total	Share of					All farm types	Thereof	
		CF		PF	SSF			CF	SSF
	1000 tons	1000 tons	%	%	1000 tons	%	kg/cow	kg/cow	kg/cow
1990	24,508	18,634	76.0	-	5,874	24.0	2,863	2,941	2,637
1995	17,274	9,443	54.7	0.2	7,831	45.3	2,204	1,908	2,722
1999	13,362	4,719	35.3	-	8,643	64.7	2,358	1,719	2,868
2000	12,658	3,668	29.0	0.5	8,989	71.0	2,359	1,588	2,960
2001	13,444	3,636	27.0	0.6	9,808	73.0	2,709	2,071	3,068
2002	14,142	3,468	24.5	0.6	10,674	75.5	2,873	2,199	3,198
2003	13,661	2,680	19.6	0.6	10,981	80.4	2,887	2,043	3,220
2004	13,710	2,533	18.5	0.6	11,176	81.5	3,185	2,475	3,410
2005	13,714	2,582	18.8	0.7	11,132	81.2	3,487	2,952	3,643
2006	13,287	2,454	18.5	0.7	10,833	81.5	3,652	3,083	3,815
2007	12,262	2,178	17.8	0.8	10,084	82.2	3,665	n/a	n/a
2008	11,761	2,089	17.8	0.8	9,671	82.2	3,793	3,366	3,903
2009	11,609	2,236	19.3	0.9	9,374	80.7	4,049	3,893	4,090

Source: The SSSU: SYBAU for years 2006 (p.107, p.110), 2001 (p.197), 2009 (p. 116), Livestock breeding in Ukraine, 2010 (Tab.1.18) also see Footnote.[13]

Table 2.7 shows that milk production has strongly declined since 1990. In 2009, total milk production amounted to only 11.6 mil tons, which corresponds to just 47.9% of the total production in 1990. Only two production increases were experienced: from 2000 to 2001 there was an increase of 5.2 %, and from 2001 to 2002 there was an increase of 6.2%. Since 2005 milk production has decreased again. Furthermore, milk production from corporate farms shifted to small, semi-subsistence farms. In 1990 corporate farms produced over 76% of milk; in 2000, on the other hand, over 71% of total milk production in Ukraine originated from semi-subsistence farms. In subsequent years the trend continued, and in 2008 semi-subsistence farms accounted for 82% of the country's milk production. However, in 2009 a slight return of corporate farms to milk production could be observed: in that year milk production grew by 2% in the respective structures, and decreased by the same percentage for subsistence farms.

With regard to milk yield (kg/cow), recent years showed a positive trend that held true for all types of farms. In 1990 the average annual milk yield amounted to 2,863 kg per cow across all farm types. The average milk yield on corporate farms amounted to 2,941 kg per cow, and was thus 11.5% higher than the milk yield of semi-subsistence farms. The milk yield on semi-subsistence farms, however, has been greater than that of corporate farms since 1995. In 2002 the total average milk yield of all farm types reached 2,873 kg per cow, and thus

[13] "How much milk is produced in Ukraine and where it disappears?" "Dairy Industry" № 1 (36)/2007.

regained the yield level of 1990. In 2009 the average yearly milk yield rose above 4,000 kg per cow for the first time; corporate farms yielded 3,893 kg per cow, and semi-subsistence farms yielded 4,090 kg per cow. Corporate farms' increase in milk yields could be due to their recognizing and eliminating their main problems (such as low feed quality, wrong feeding ratio and bad management), as well as utilizing scale effects and improving farm management techniques.

Table 2.8: Number of dairy cows (in 1,000 heads) per farm type and year

Year	Total number of milk cows		Thereof				
			in CF		in PF (1,000 heads)	in SSF	
	1,000 heads	Change (%) to 1990	1,000 heads	In percent (%)		1,000 heads	In percent (%)
1990	8,378	100.0	6,192	73.9	0.1	2,187	26.1
1995	7,531	89.9	4,595	61.0	16.4	2,936	38.9
1999	5,431	64.8	2,476	45.6	11.2	2,955	54.4
2000	4,958	59.2	1,851	37.3	35.8	3,107	62.7
2001	4,918	58.7	1,675	34.1	39.9	3,243	65.9
2002	4,716	56.3	1,402	29.7	37.8	3,314	70.3
2003	4,284	51.1	1,100	25.7	36.0	3,184	74.3
2004	3,926	46.9	950	24.2	36.3	2,976	75.8
2005	3,635	43.4	866	23.8	38.2	2,769	76.2
2006	3,347	39.9	764	22.8	37.8	2,583	77.2
2007	3,096	36.9	679	21.9	38.1	2,417	78.1
2008	2,856	34.1	624	21.9	37.4	2,232	78.1
2009	2,736	32.7	605	22.1	37.4	2,132	77.9

Source: The SSSU: SYBAU 2001 (p.192), 2005 (p.176, p.177), 2009 (p. 109, p.110, p.111).

The number of dairy cows steadily decreased from 1990 to 2009. In 2009 just 33% of the cows in Ukraine remained compared to the reference year of 1990. In 2009 all farm types together held about 2.7 mil dairy cows. Since 1990 the figure continuously decreased for corporate farms, and one could also notice a distinctive change in the structure of milk production in Ukrainian semi-subsistence farms. In 1990, nearly 74% of all dairy cows were owned by corporate farms. By 2009, however, this number had decreased to 22.8%. In 1990 the share of semi-subsistence farms included in the annual production volume amounted to about one-third, whereas in 2009 semi-subsistence farms had 77.9% of the total dairy cows. According to these numbers, out of necessity small semi-subsistence farms became an important source of milk for the processing industry. The overall decrease in herd sizes across all types of farms, along with low average milk yield per animal led to a general decline of milk production, and consequently to a shortfall in supply for the processing industry.

A cow's milk yield strongly depends on its nutrition. Animal feed thus plays an important role in the cost structure of a dairy farm. As shown in table 2.9, in

2009 70.4% of material costs were spent on animal feed. Considering that material costs accounted for 76.6% of all costs in 2009, feeding costs made up more than 50% of all production costs, and were thus the highest costs borne by corporate farms.

Table 2.9: Cost structure of corporate farms with focus on livestock, in %

Types of cost	1990	2001	2004	2005	2006	2007	2008	2009	2009/ 1990 (%)
Wages	32.3	15.7	15.6	15.6	15.2	13.1	11.8	10.7	33.1
Social security contributions	0.6	0.4	0.5	1.8	1.7	2.2	2.8	3.2	533.3
Material, incl.:	56.2	72.5	76.3	75.0	75.4	77.1	75.9	76.6	136.3
Animal feed	82.2	71.7	73.2	69.2	71.4	73.6	71.8	70.4	85.6
Working materials	2.4	8.5	6.4	6.5	6.4	4.6	4.7	4.0	166.7
Energy	1.5	4.9	4.4	4.2	4.3	3.8	4.0	3.9	260.0
Fuel	0.7	0.6	0.8	1.0	1.7	1.9	1.7	2.1	300.0
Spare parts	4.6	5.9	4.7	4.6	4.3	4.5	3.6	4.4	95.6
Services	4.5	5.0	5.9	9.2	6.8	6.8	7.5	8.2	182.2
Other materials	4.1	3.4	4.6	5.3	5.1	4.8	6.7	7.1	173.2
Depreciation	8.2	5.8	3.9	4.1	4.1	3.8	3.9	4.2	51.2
Other	2.7	5.6	3.7	3.5	3.6	3.8	5.6	5.3	196.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

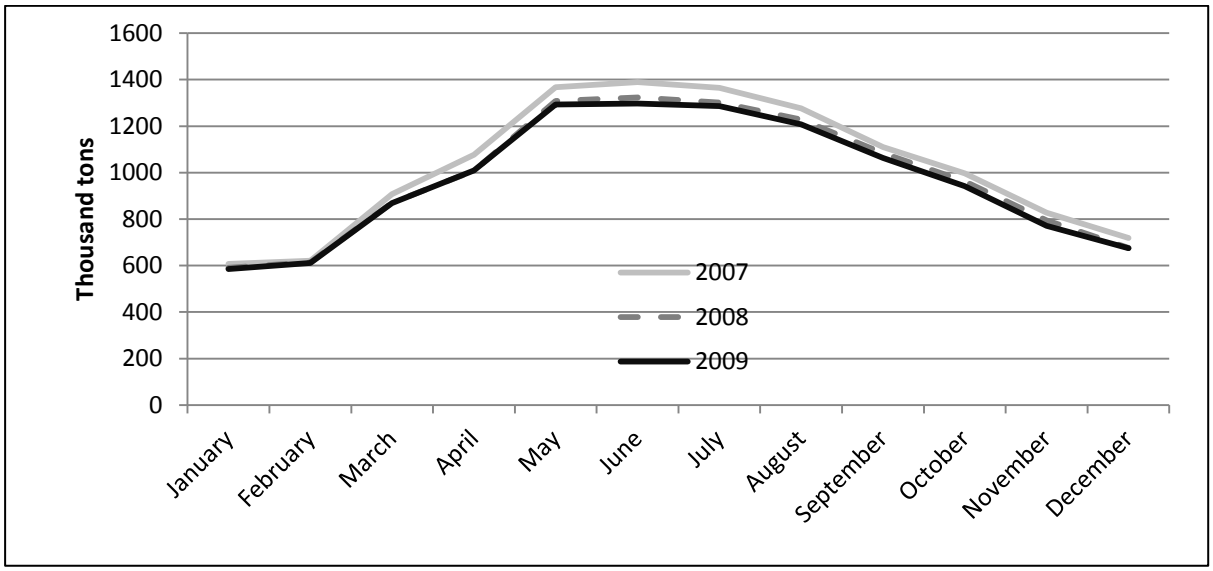
Source: The SSSU: SYBAU for the years 2001 (p. 46), 2005 (p.57), 2006 (p. 53), 2007 (p. 55), 2008 (p.57).

Among farms of both types, milk production is characterized by high seasonality that is mostly due to seasonal differences in feeding. Market prices for animal feed influence the raw milk supply in Ukraine. During the growing season, a large part of the daily food ration used for milk production is covered by inexpensive forage (grazing). But in the winter, feeding becomes more difficult and food quality worsens, i.e., comparatively "basic" and unbalanced. In this regard, semi-subsistence farms enjoy certain advantages over corporate farms (PEREKHOZHUK, 2007). For example, semi-subsistence farms feed their cows mostly with home-grown fodder (e.g., self-prepared hay, self-grown fodder beets, etc.). Because of the larger herd sizes of corporate farms, these farms have more difficulties finding pastures of a sufficient size. According to an interviewed production manager, there are also often too few suppliers of quality animal feed.[14] As a result, milk production reaches its highest level in late spring and its lowest level during winter (PEREKHOZHUK (2007, S. 29).

[14] Results of the interviews with the managers of processing companies conducted in Ukraine in April- June 2009.

The figure given below shows the monthly fluctuation in milk production. Comparing the years 2007-2009 indicates that monthly data on production exhibit the same seasonal fluctuations every year, and only differ by the magnitude of total production (cf. figure 2.1).

Figure 2.1: Milk production in all types of farms, monthly from 2007-2009



Source: Own presentation of the data of the SSSU for the years 2007 to 2009, http://www.ukrstat.gov.ua/.

The milk production volume was highest from May to July and the lowest in January and February. Overall, milk production during the summer months was 2.5 to 3 times higher than during the winter months. The seasonal fluctuations in milk production also have a great impact on the degree of capacity utilization in the milk processing industry. In summer, milk processing companies are forced to process the milk surplus into durables like dry milk, condensed milk, casein, etc. However, in winter the processing sector lacks the resources needed for production. The low buying price of raw milk offered by processors to milk producers during overproduction, and the limited price increases during wintertime further contribute to the decline in the number of dairy cows.

2.3.2 The processing stage

The decrease in milk production during the early years of transformation also had a negative influence on the Ukrainian milk processing industry. The total amount of raw milk supplied to the dairy industry fell by more than 80% from 1990 to 2000. Thus, activities in the processing stage strongly decreased during the 1990s, and in 1999 barely reached 10% compared to 1991.[15] To increase raw milk supplies, the milk processing industry is considering many possible solutions, including establishing business relations with semi-subsistence farms

[15] Cf. PEREKHOZHUK and GRINGS (2007).

and cooperating with corporate farms. In 1996, semi-subsistence farms already covered 60% of the total supply to the processing industry. Table 2.10 shows the shares of semi-subsistence and corporate farms for selected years.

Table 2.10: Raw milk supplies going to processing companies in selected years, thousand tons

Year	Milk supplied to processing industry							
	Total		Thereof supplied by					
			CF		SSF		Other entities	
	1,000 tons	Change to 1990 (in %)	1,000 tons	Share (in %)	1,000 tons	Share (in %)	1,000 tons	Share (in %)
1990	17,958	100.0	17,943	99.9	15	0.08	n/a	n/a
1995	6,066	33.8	5,911	97.4	155	2.6	0.9	0.0
2000	3,335	18.6	1,790	53.7	1,515	45.4	30	0.9
2001	4,376	24.4	2,021	46.2	2,325	53.1	30	0.7
2002	3,937	21.9	1,893	48.1	2,025	51.4	19	0.5
2003	4,413	24.6	1,577	35.7	2,799	63.4	37	0.8
2004	5,237	29.2	1,650	31.5	3,528	67.4	59	1.1
2005	5,689	31.7	1,797	31.6	3,814	67.0	78	1.4
2006	5,607	31.2	1,831	32.7	3,392	60.5	384	6.8
2007	6,039	33.6	1,671	27.7	3,848	63.7	510	8.6
2008	5,406	30.1	1,719	31.8	3,339	61.8	338	6.4
2009	4,742	26.4	1,867	39.4	2,550	53.8	254	6.8

Source: The SSSU: SYBU 2006 (p. 181), SYBAU for years 2006 (p. 131), 2007 (p.135), 2008 (p. 137), 2009 (p. 143), PEREKHOZHUK (2007, p.33).

In the upper portion of the table, two trends are visible: First, since 1990 the milk supply strongly declined due to a decrease in milk production; this also caused the degree of capacity utilization of processing companies to shrink. In 2009 only 4,742 thousand tons of milk were supplied to the processing industry, which was less than one-third the quantity from 1990. Second, the share of milk that semi-subsistence farms delivered to the processing industry increased dramatically over time. In 1990, 99.9% of the total milk production was supplied by corporate farms, while the supply of semi-subsistence farms was negligible; in 2000, semi-subsistence farms already supplied 42.4%. The milk supply provided by these farms peaked in 2004-2005, with a share of more than 67%, but this share declined to 54% in 2009. Various factors supported this shift of supply from corporate to semi-subsistence farms. Weak financial resources and outdated technologies, which were the main characteristic of the corporate farms after restructuring from kolkhozes and sovkhozes, forced many farms to exit milk production. Moreover, many corporate farms failed to adapt to the new market conditions and were constrained by the need of a strategic reorientation. In this situation it was important to identify new trading partners, and to handle the lacking supply and rising prices for input goods. In addition, the rather volatile financial situation among milk processing companies also led to delays

and even defaults on payments to milk producers. As a consequence, from 1998 until 2000 corporate farms sold over 30% of their milk output to buyers outside the processing industry (SSSU, 2002), for example about 20% was sold directly to the consumer on public markets. Because of the declining supply provided by corporate farms, the processing industry started to orient its sourcing strategy towards the semi-subsistence farms and aimed to improve their productivity.

The growing share of milk supplies from the semi-subsistence farms, induced losses in the milk quality, and correspondingly the amount of milk available for the production of high quality dairy products was limited. Milk produced by corporate farms is in general of better quality because of applied milking and cooling technologies. On the contrary, semi-subsistence farms often do not employ any milk- or cooling technologies; milking is mostly done by hand (KALINTCHIK et al., 2000).[16] Since 01 July 2002 a new national standard on the "procurement of un-skimmed cow milk" DSTU 3663-97 applies to all milk producing and processing companies in Ukraine.[17]According to the requirements set by this law, milk from the semi-subsistence farms is of the second class quality, and thus can only be used to a limited extent for food production. Following the Regulation of the European Parliament[18] milk of such quality cannot be used at all for the production of food. This fact of course presents a big challenge to Ukrainian processing companies that are eager to put quality labels on their products, or even plan to position their products on the market of the European Union. The following table provides information on the milk supplied to processing companies by corporate farms from 2002 until 2006. The SSSU distinguishes between four different qualities of milk as can be seen from the table 2.11.

Table 2.11: Milk quality from corporate farms according to DSTU 3662-97

Year	Milk supplies				
	Total (1,000 t)	Thereof, in %			
		Best quality	Quality type I	Quality type II	No grade
2002 GOST 13264-70 [19]	1,893	-	93.0	6.0	1.0
2003	1,577	12.1	76.1	10.2	1.5
2004	1,650	15.2	73.9	9.4	1.5
2005	1,797	16.9	73.4	8.7	1.0
2006	1,831	18.8	68.6	10.1	2.5

Source: Own presentation of data from Ukrainian Milk Union, 2007.

[16] See also www.fao.org Ruminant Livestock Production Systems.

[17] More information on Ukrainian quality systems and monitoring institutions may be found in the appendix.

[18] Regulation (EC) No 853/2004 of the European Parliament and of the Council of 29 April 2004.

[19] Russian quality standard GOST 13264-70 "Cow milk. Purchase requirements" was cancelled in 2005

The data above suggest that the majority of milk supplied by corporate farms falls into one of the first quality categories (best quality and quality type I). Better quality, greater and homogenous supply, transport and cooling options are important factors that lead processing companies to consider the milk from corporate farms as superior. Because all milk produced in semi-subsistence farms is automatically categorized as quality type II, it does not appear in table 2.11.

In spite of the lack of high quality raw milk, the processing industry has recovered and developed since the beginning of transformation. Milk production accounted for 14.6% of the total production volume of the food and processing industry in 2006, and thus had a greater share than meat processing (12.8%), tobacco (8.4%), and the confectionary industry (6%).[20] In 2000 and 2005, Ukraine ranked fifth on the list of largest world producers and exporters of skimmed milk powder, with a production share of 4% and 6%, respectively.[21] In 2009, Ukraine was the fourth-largest cheese exporter in the world (EU Report, 2009).[22]The Ukrainian milk processing industry recently started to compete with international companies currently supplying the domestic market. New production technologies are being introduced and used for the production of goods that Ukrainian companies have not produced before. The milk processing sector is widely segmented, and includes dairy products, cheese (light and fat), butter and bread spreads, dry and evaporated milk products, sour milk products (kefir, yoghurt, sour cream, rjazhenka, curd cheese), casein, and ice cream. Yoghurt and bread spreads are relatively new on the Ukrainian market. Moreover, the assortment of cheeses has grown steadily over the last years.

Table 2.12 presents the production volumes of the most important dairy products for selected years from 2000 to 2009. Since 2003, the data presentation methods have changed; therefore, the data are not completely comparable. Figures from 2000 to 2002 were presented in thousands tons of raw milk used for producing the corresponding dairy products. From 2003, the volumes for dairy products are given in thousand tons of processed products. Moreover, the category “bread spread” was first listed separately from butter in 2004. Thus, the focus of the analysis in the following section is on data from 2004 and 2009.

[20] Data of the SSSU, prepared by the Ukrainian Union of Dairy Companies.

[21] “Export streams of the milk products, or where the milk rivers flow to” № 1 (36)/2007 – Professional magazine of the Ukrainian Dairy Industry.

[22] Monitoring Agri-trade Policy: Directorate-General for Agriculture and Rural Development, European Commission, Nr. 03-09, 2009.

Table 2.12: Production volumes of selected dairy products 2000-2009, in thousand t

Dairy products	2000*	2001*	2004	2005	2006	2007	2008	2009	2009 /2004, in %
Milk	263**	431**	716	864	820	863	808	770	107.5
Cream	n/a	n/a.	24	21	14	15	18	16	67.8
Butter	135	158	116	120	104	100	85	75	64.4
Bread spreads	n/a	n/a	53	80	71	84	82	72	136.4
Cheese (light) and curd cheese	n/a	n/a	71	84	93	93	92	85	118.9
Cheese (fat)	68	105	224	274	217	247	236	228	101.8
Curdled milk products	158	212	467	499	524	532	532	492	105.4
Evaporated milk and cream with and without sugar and other sweeteners	n/a	n/a	104	107	98	106	99	82	78.8
Powdered milk and cream	11**	22**	106	113	106	125	95	67	62.9
Ice cream	n/a	n/a	117	125	121	131	125	108	92.3

Source: Own presentation of the data from SSSU: SYBU for the years 2003 (p.131, p.133), 2006 (p. 116, p.117, p.124), 2009 (p.118).

Note: An asterisk * denotes products that were converted into thousand t of processed milk until 2003; asterisks ** denote only non-skimmed milk.

In many areas the domestic milk processing industry has developed positively in past years, as can be seen in table 2.12. For example, the production of liquid milk and cheese (fat and light), as well as that of sour milk increased from 2004 to 2009. The biggest rise was observed for bread spreads (36.4%), cheese and curd cheese products (18.9%). In contrast, the production of butter, cream, dry and evaporated milk, cream products and ice cream declined. These trends might also indicate a change in consumer preferences: Nutrition value gained importance as a factor determining the choice of food products.[23] The increase in the production of light cheese and curd cheese, compared to fatty varieties of cheese, and the yearly decreasing production of butter in favor of bread spreads (low-fat butter, butter prepared with vegetable oils, margarines) also supports this conclusion.

[23] Analytical Report "Raising Consumer Awareness of Ukrainians," EU and UN Development Programs, 2007.

Moreover, the milk processing industry is undergoing massive structural changes. Specialization, mergers or vertical integration strategies not only transform processing structures, but the whole supply chain. PEREKHOZHUK (2007) estimated for 2004 that the milk processing industry consisted of approximately 610 companies; thereof, 80 companies specialized in ice-cream production. A reduction in milk processing companies can also be observed, which might be partly due to increased merger activities. Following an in-depth analysis of the Ukrainian milk processing industry, PEREKHOZHUK (2007) concluded that decreasing production costs are a decisive criterion for horizontal mergers (employing a horizontal concentration strategy) in the Ukrainian market. Moreover, there is a strong tendency for small dairies to be overtaken by corporations and consortiums (Cf. PEREKHOZHUK, 2007: p.53, p.67, p.69). Market leaders in several production areas can already be identified. For 2006 and 2007, the Invest-Consulting Group "ASTARTA-TANIT" and the Market Research Company AC Nielsen grouped leading companies according to their main production area, thereby dividing the Ukrainian dairy market into four segments: cheese, yoghurt, curd cheese and milk production. In 2007, the results of this study were published in "BUSINESS UKRAINE" and "KOMMERSANT UKRAINE." The following table summarizes the results of the study by presenting the market leaders along with their respective market shares.

Table 2.13: Market shares of selected companies, 2007

Cheese		Yoghurt		Cottage cheese		Milk	
Company	Market share, %	Company	Market share, %	Company	Market share, %	Company	Market share, %
Cheese Club Corp.	7.8	Wimm Bill Dan	20.78	Lactalis Group	20.0	Unimilk Ukraine	8.0
Shostka JSC Milk Factory	6.9	Danone JSC	15.41	Wimm-Bill-Dan	18.0	Milkiland N.V.	8.0
Milkiland N.V.	6.8	Unimilk Ukraine	14.02	Reinford	7.0	Loostdorf JSC	8.0
Milk Alliance	6.3	Fanni JSC *	11.9	Fanni JSC *	6.0	West Milk Group	4.0
Terra Food	4.4	Reinford	8.01	Danone JSC	5.0	Wimm-Bill-Dan	4.0
Bashtanski Cheese Factory JSC	4.4	Ehrmann	3.23	Unimilk Ukraine	4.0	Hercules JSC	3.0
Syrgrad	4.0	Lactalis Group	3.01	State Holding „Prydniprovski“	4.0	Galychyna JSC	3.0
West Milk Group	3.5	Galychyna JSC	1.13	Milkiland N.V.	4.0	Milk Alliance	2.0
Molis	3.1			West Milk Group	3.0	Zlagoda	2.0
Volyn Cheese	2.7			Hercules JSC	3.0	Lactalis Group	2.0
Litinski Milk Factory	2.3					Kupjanski KMK	2.0
Krasnograd Butter/Cheese Factory	2.1					Kagma	2.0
Zvenigorod Cheese State Holding (Bongrein)	1.8					Lubenski	2.0
Others	43.9	Others	22.51	Others	26.0	Others	50.0

Source: Research from IKG „AstartaTanit“ and AC Nielsen published by KOMMERSANT, 2007 (www.kommersant.ua); * Fanni JSC was taken over by Lactalis Group in 2008.

As presented in the table 2.13, yoghurt and curd cheese segments have been characterized by a high concentration. For instance, in the yoghurt segment the eight largest producers together accounted for a market share of over 77%. A similar situation can be observed in cottage cheese production: the ten largest companies have a market share of 74%. In the cheese and milk segment,

processor concentration is comparably lower: the thirteen largest producers control 50% of the market, while 50% of the market is left to other milk processors. A few years ago cheese production was the most successful production segment in the Ukrainian dairy market, which was mainly due to high demand from the Russian market. With a 320 mil USD export volume in 2005, cheese was the top export product in the structure of milk products.[24] After Russia's export ban in 2006,[25] many Ukrainian processors lost a major market, which induced a dramatic decrease of their total sales. As a result, in 2006 the total sales volume of cheese exports decreased to 144 million USD.[26] This in turn had drastic consequences for the whole supply chain: Since the domestic demand and other exports could not absorb the production overcapacities that were caused by the loss of the Russian market, Ukrainian cheese production declined by more than 30% (Data of UNION OF MILK PRODUCERS, 2007).

Often the respective market leaders in the segments presented in table 2.13 were large companies that owned a number of milk processing plants (e.g., Cheese Club Corporation, Milkiland N.V., Terra Food). Moreover, international corporations (e.g., Wimm Bill Dan, Unimilk, Lactalis Group), as well as a few companies specialized in one of the respective segments (e.g., Galychyna JSC). The category "Others" lists a number of middle-sized and smaller processors that rather supply within a certain region, as well as big corporations that to a lesser extent are involved in given product segments.

According to the origin of the respective organizations' capital, the international corporations may be distinguished as follows: Russian - Wimm Bill Dan, Unimilk; French - Bel Group (Shostka Milk factory JSC), Lactalis Group und Danone; Ukrainian - West Milk Group, Terra Food, and others. Approximately one-third of the companies competing in the Ukrainian dairy market were owned by foreign investors in 2007: Wimm Bill Dann (11% of total milk production), Unimilk (10%) and the French consortium Lactalis (6%). Larger companies also took the lead in the market for dry milk powder. In 2006, 65% of the total production of dry skimmed milk was shared by 10 companies. The biggest producers were: West Milk Group and Milkiland N.V. Further, 75% of the sales of dry not-skimmed milk were shared by five corporations, including the Cheese Club Corporation (BIOPROMGMBH, 2007). In addition to the transfer of financial capital, management and know-how, foreign investors also

[24] Data of the Customs Office of Ukraine, 2007.

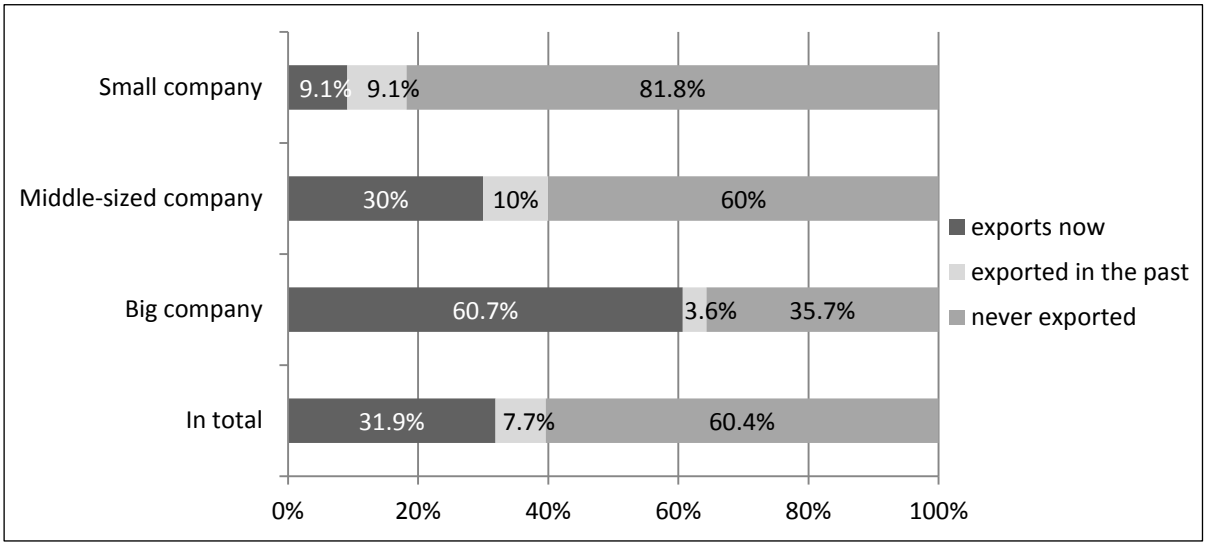
[25] Faulty auditing by the milk producers that supplied milk to the dairies was identified as the main reason for the Russian export ban. In particular, the cleanliness and cooling of milk produced by semi-subsistence farms was acknowledged as insufficient by the auditors (KOMMERSANT, 2007).

[26] Data of the Customs Office of Ukraine, 2007.

implemented international quality standards and production technologies into Ukrainian milk production.

Ukrainian companies also showed more interest in entering international markets. However, it is often the case that only market leaders are able to export their products abroad. Market reports on the dairy market in Ukraine (BIZPRO/USAID, 2006) indicated that most Ukrainian milk processing companies were only active on the domestic market (see figure 2.2).

Figure 2.2: Structure of exports by milk processing companies,[27] 2006



Source: Analyses of Ukrainian milk market „Milk processing and milk products", by BIZPRO (USAID), 2006.

Over 60% of the Ukrainian milk processing companies have never exported their products; 31.9% of the companies presently export their products; and 7% of the companies exported their products in the past but presently only participate on the domestic market. The results indicated that larger companies were more active in exporting their products. Over 64% of the larger companies have exported or presently export, whereas this is true for 40% of the middle-sized companies, and slightly above 18% of the small-sized companies. The structure of exports was as follows: 83% were finished products, 31% were semi-finished goods, and 6.9% were raw commodities.

According to interviews with managers[28] the interviewed milk processing companies reorganized their export strategies and intended to offer more high quality, end-processed, and therefore more expensive, dairy products to foreign markets. But in order to enter the European market, Ukrainian processing

[27] §63 of the Ukrainian Economy Codes states that small companies do not have more than 50 employees and an annual turnover of no more than 6.2 mil euro. Big companies have over 250 employees and an annual turnover of over 8.9 mil euro. Companies that fall in between these limits are considered middle-sized.

[28] Results of interviews with the managers of milk processing companies, conducted in 2008 and 2009 by the author in Ukraine.

companies have to comply with quality standards and certify their products according to international safety and quality norms. In summer 2008 several Ukrainian milk processing companies intending to export their products to the European Union were inspected by specialists from the EC Directorate General for Health and Consumer Affairs. The results of the milk inspection revealed inadmissible contents such as antibiotics and various chemical admixtures (KOMMERSANT, 2009). This case signifies that even modernized and well-equipped processing companies in Ukraine all face a common challenge: optimizing milk sourcing and improving the quality of raw milk.

2.3.3 The distribution stage

According to the SSSU, per capita consumption of milk and dairy products amounted to 212.4 kg (in milk equivalent) in 2009, which was equal to only 55% of the recommended annual per capita milk consumption.[29] Due to a decrease in milk production, the total average annual consumption of milk and dairy products in Ukraine also decreased in recent years (table 2.14).

Table 2.14: Annual consumption of dairy products in kg milk/capita

Year	1990	2000	2005	2006	2007	2008	2009
Consumption, kg per person, per a year	373.2	225.3	225.6	234.7	224.6	213.8	212.4

Source: Data from SSSU: SYBAU for years 2006 (p.311), 2009 (p.154).

However, from 1999 until 2008, per capita consumption of milk and dairy products rose by 20% for the interviewed semi-subsistence farms. Rural semi-subsistence farms consume more than semi-subsistence farms in urban areas (table 2.15). This may be explained by the fact that rural semi-subsistence farms tend to produce their own milk, which allows them to consume milk only for the production costs. In 1999 the difference in consumption between urban and rural semi-subsistence farms was more than 33%. Compared to other countries, the lower consumption figures from the 1990s and the early 2000s may first and foremost be explained by the low purchasing power of the Ukrainian population and the relatively small supply of milk and dairy products in the retail sector. Food expenditures consistently account for 50% of total income in Ukraine.[30] However, in recent years, incomes and purchasing power in Ukraine have increased. According to the SSSU, compared to 2008, average wages rose by 5.5% in 2009.[31]

[29] The Ukrainian Ministry for Health recommends an annual per capita consumption of milk and dairy products of 380kg.
[30] THE SSSU, SYBU 2009 (p.412).
[31] THE SSSU, SYBU 2009 (p.398).

Table 2.15: Monthly consumption of dairy products in kg milk/capita

Year	1999	2000	2005	2006	2007	2008	2009
All semi-subsistence farms	18.7	17.1	21.7	22.3	22.1	22.6	19.8
Urban areas	16.8	15.4	21.3	21.8	21.7	22.5	19.5
Rural areas	22.5	20.5	22.5	23.3	22.8	22.5	20.2

Source: Data from SSSU: SYBU for the years 2001 (p.438), 2003 (p. 449), 2004 (p.450), 2006 (p.415), 2008 (p.423), 2009 (p.421).

In 2007, urban semi-subsistence farms consumed approximately 5% less milk than rural semi-subsistence farms. In 2008 the consumption of both semi-subsistence farm types was equal. While per capita consumption of rural semi-subsistence farms remained relatively stable over the years, the consumption of milk and dairy products in urban areas increased by 16%. In 2009, total milk consumption of all semi-subsistence farms declined by about 12% compared to 2008. One of the reasons for such a drastic decrease is the relatively high price for dairy products in Ukraine. On the one hand, the rural semi-subsistence farms try to sell the maximum amount of milk to processing companies to increase their income. On the other hand, due to the financial crisis and decreased income, the urban semi-subsistence farms sank their expenditures for food products.

The increasing purchasing power of the Ukrainian population can be considered one driving factor for the expansion of retail markets in Ukraine, which is usually accompanied by rising consumer demands on food quality standards. Results from a study on consumer awareness of certain factors concerning food purchase[32] indicate that the consumers' familiarity with a brand is the most important factor for the buying decision. This finding may be explained by previous experience with the same or similar products from a certain producer. The shelf life of a product, including the production date and the product appearance, was named as the second important factor influencing the buying decision, while package design was ranked third. Regarding the purchase of unknown food brands, consumers were influenced by the following: completeness of information on content, ingredients, origin (national/local products preferred), and recommendations by sales staff or friends. The product price was seen as an indicator of quality: low prices indicated insufficient quality. The distribution of product samples also positively affected consumers' perception of quality, and thus constituted an additional buying incentive. Particularly for consumers aged 41-55, affordable prices, in addition to other factors already named, were of great importance.

[32] "Raising Consumer Awareness of Ukrainians" is a joint initiative of the European Union and United Nations Development Programme, April 2007.

According to SWINNEN (2005), successful vertical structures in Eastern Europe support the implementation of product quality, payment and delivery conditions, and also provide agricultural producers with extensive assistance. Further, consumers benefit from the development of the food and retail supply chains as new and high quality products are offered on the market. The retail markets seek to satisfy the higher customer demands and enforce strict price policies and quality standards down the supply chain. When entering a new market, modern retail chains implement their private high standards (SWINNEN, 2005) and prefer being supplied by bigger producers that have their delivery processes standardized as required. Particularly the high prices for positioning products in supermarkets and the required large deliveries make business for small and middle-sized producers almost impossible. Often, only large food producers can afford to comply with the required quality standards, and prove compliance with certificates. In addition, in smaller companies there is often still a need for modernization and in-service training.[33]

Table 2.16: Development of total sales volume[34] in Ukraine, mil USD[35]

Volume of sales	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Wholesale	30.8	50.9	54.5	73.9	102.9	99.8	132.1	171.1	199.4	110.5
Retail sales	8.7	11.0	12.9	16.4	21.9	34.0	47.1	64.4	86.6	57.0
Restaurant services	0.4	0.5	0.5	0.6	0.7	1.5	1.8	2.3	3.0	2.0
Retail (to end consumer)	5.3	6.4	7.5	9.4	12.7	18.4	25.7	35.3	46.9	29.6

Source: Calculated based on data from SSSU: SYBU 2009 (p.275).

The sales volume has grown in recent years through all types of traders. In 2009, wholesale and retail sales between companies grew more than three- and six fold, respectively, compared to 2000 figures. Retail sales to the end consumers grew more than fivefold during the same period of time. The volume of sales of restaurant services also grew by almost sixfold. This kind of rapid development implies a total increase of economic activity and transactions at the inter-company level. Moreover, it is a distinct indicator for the increasing purchasing

[33] Based on interviews with the managers of processing companies conducted in Ukraine, 2008- 2009.

[34] "Volume of sales" is separated into four groups: wholesale (by producing companies), retail sales, restaurant services and retail (to the end consumer). Wholesale includes the sales from a company to another company or organization (excluding the population) without any essential product changes for the further use or sale in Ukraine or abroad, excluding value-added and excise taxes. Retail sales include the sales of goods from one company to another, to the market, as well as sales to and between the individual sellers. Restaurant services include sales by companies belonging to the restaurant business. Retail (to end consumer) includes the sales of goods by producing companies, traders, and transport companies directly to the individual consumers.

[35] Annual exchange rate USD/UAH, the National Bank of Ukraine.

power of the Ukrainian population and its growing interest in shopping in retail store chains.

The Ukrainian food industry accounted for a 19.5% share in overall wholesale and a 40% share in overall retail sales in 2009 (the SSSU, 2009), and is characterized by the dynamic development of retail food chains. Altogether, 88.4% of the food produced in Ukraine was sold by trade organizations in 2009, which signifies a solid change from bartering and selling on the open markets in the beginning of transition (the SSSU, 2009). More than 30 retail chains working on the Ukrainian market make up about 15% of total retail (MDN Group, 2007[36]). Due to the growing gross domestic product (GDP) and increasing purchasing power of its population, the Ukrainian market represents one of the most attractive investment opportunities for foreign retail chains. From 2006 to 2007, retail in Ukraine boomed. As a consequence, Ukraine was ranked fourth and fifth, respectively, among economically rising countries worldwide by A.T. Kearney,[37] which illustrates its importance as an investment destination for foreign retailers.

Ukrainian food retailers mostly exhibit the following formats: Cash&Carry, supermarkets, hypermarkets, discount stores, small "neighborhood shops", and open-air markets. According to the results of the Shopping Monitor in the CEE region, supermarkets represent the food retail format most preferred by consumers: 72% of interviewed Ukrainian respondents chose supermarkets, 6% chose hypermarkets, and 3% chose small shops as their most preferred place to buy food (GfK, 2010). Table 2.17 summarizes the figures of the biggest supermarket chains in Ukraine (by turnover and number of sales outlets).

[36] MDN Group is a specialized advisory and consulting company in mergers and acquisitions, www.mdn-group.com.

[37] The Global Retail Development Index is prepared by A.T. Kearney on an annual basis. Four factors are included in the analysis: economic and political stability, modern sales area per 1,000 capita (department stores, supermarkets, discounter shops), number of international trading companies already in the market, as well as time pressure to enter the market (ratio of GDP to the growth rate of modern sales areas) www.atkearney.de.

Table 2.17: Overview of the leading supermarket chains in Ukraine, 2010

Corporation	Brands	Turnover, billion euro	Number of sales outlets	Country of origin
Fozzy Group	Silpo, Fozzy, Fora	1.4	323	Ukraine
"ATB Market" LLC	ATB Market	1.1	443	Ukraine
Rewe Group	Billa	0.86	19	Germany
Metro C&C	Metro Cash & Carry	0.77	23	Germany
JSC „Furshet"	Furshet	0.6	105	Ukraine
Auchan Group	Auchan, Furshet (20%)	0.5	8	France
„Kviza Trade" JSC	VelykaKyshenia	0.4	52	Ukraine
"Eko-Market" LLC	Eko Market Eko Plus Sympatic	0.2	68	Ukraine
„Amstor" LLC	Amstor	n/a	24	Ukraine, Great Britain
Pakko Group	Wopak, Pakko	n/a	68	Ukraine

Source: AllRetail, AMC „NIKO", and companies´ official information.[38]

The Ukrainian food market is still ruled by domestic retail chains. However, foreign investors are starting to show a higher interest in Ukrainian food retail. For example, the Rewe Group (Germany), Metro Cash&Carry (Germany), Auchan (France), which owns 20% of JSC Furshet, Billa (Austria), and Midland Capital (Great Britain), which has a share in Amstor LLC, are also among the largest retail food chains in Ukraine.

These retail food chains started in Kiev and several of the biggest Ukrainian cities, and are now expanding into other small cities and regions. Due to a currently lower income, discounters and smaller shops make up the majority of stores in distant and rural areas. However, this is likely to change over time as many large and successful retail chains are looking to expand into these regions (AllRetail Ukraine, 2010). The Ukrainian retail market is yet not saturated: the saturation level of the retail market in Kiev amounts to less than 50%; in other Ukrainian regions it is even lower (GFK, 2008).

2.4 Conclusions

Several driving forces that influence the development of the Ukrainian dairy sector can be observed. On the one hand, growth of consumer prosperity and purchasing capacity have increased the demand for highly processed and high

[38] www.amstor.us; www.rewe-group.com; www.groupe-auchan.com.

quality food products in Ukraine. The presence of FDI in the retail food and processing industry introduces management know-how, new production technologies, and enforces higher quality standards along the supply chain. The new emerging food retail capacities constitute a growing sales market for milk processing companies, which have recovered from the recession that accompanied the transition process. Ukrainian processors are now developing into modern and well-equipped companies that are able to compete with international companies delivering dairy products to Ukraine. The leading domestic processing companies show a high interest in increasing their shares of the Ukrainian market, as well as entering foreign markets.

On the other hand, the processing companies suffer from a shortage of homogeneous and high quality milk deliveries. Though corporate farms show an increasing interest in expanding their milk production (table 2.6), milk production in Ukraine is still characterized by highly heterogeneous producers. At present, processing companies source less than 40% of their milk from corporate farms (table 2.10), and milk collection from semi-subsistence farms both complicates delivery planning and quality control, and requires complex logistics. Having started to receive milk from semi-subsistence farms to increase their raw milk supplies, processing companies now experience problems with product quality when entering international (particularly European) markets. High competition for milk deliveries from corporate farms makes it difficult to find new milk suppliers and to establish long-term cooperation. The buyer-supplier relationships that were re-established after the collapse of the planned system are now negatively influenced by market insecurities and delayed or missing payments during transition. To a great extent this hampers a trusting cooperation between the trading partners (MYKHAYLENKO et al., 2009). The efficient organization of long-term buyer-supplier relationships and a sustainable milk supply chain represent major challenges to the Ukrainian milk processing industry at present (MYKHAYLENKO/SCHAFT, 2010).

SECTION II CONCEPTUAL FRAMEWORK

3. CASE STUDY APPROACH

The first chapter of this section presents the findings of the exploratory case study interviews, which were expected to fulfill the following objectives: to understand how buyer-supplier relationships in the dairy sector are organized, and to offer a cross-check of different data sources used in this research.

The case study approach is considered by many researchers as a method that helps to understand complex issues and extend existing knowledge through new experience (SOY, 1997). This qualitative research method is widely used in disciplines such as sociology, law, education, history, psychology, administrative studies, etc. (e.g. SOY, 1997; HAMEL, 1993) for its "giving special attention to totalizing in the observation, reconstruction and analyses of the cases under study," (ZONABEND, 1992, p. 52). The case study research method is used to "investigate a contemporary phenomenon within its real-life context" when the boundaries between phenomenon and context are not clearly evident, and when multiple sources of evidence are used (YIN, 2003).

YIN (2003) also differentiates between single and multiple case studies; both types can be exploratory, descriptive, or explanatory/causal. Explorative case studies - including fieldwork and data collection - represent a research strategy that occurs before the study questions and hypotheses are finally defined. The exploratory research phase helps to complete the research design, find new information sources and refine the initial hypotheses. Using an exploratory case study usually occurs as a pre-step within a larger research context that can then be extended by other research methods that vary from the case study approach (YIN, 2003).

Three reasons influenced the decision to conduct the case studies for this research. First, the case studies aimed to identify what types of processing companies implement vertical coordination to their milk suppliers, and what drives their decision. Second, the case studies should clarify how vertical coordination between processors and milk producers is organized, as well as which support mechanisms are used and which potential problems occur. Third, the case studies apply to multiple sources of information and therefore favor cross-checking different data sources such as interviews, annual statistics, market analyses and expert evaluations, etc. (EISENHARDT, 1989). As opposed to quantitative research methods, "softer" qualitative approaches that include multiple sources of information allow deeper insight into the research problem and the complexity of existing relationships.

3.1 Case study design

Several criteria were taken into account while selecting the interview cases. The milk processing companies were selected to cover the wide range of size and organizational structure: Among those were companies that were part of large holdings, as well as single companies, domestic companies and companies with FDI. Furthermore, the companies were located in different regions. In total, seven milk processing companies (table 3.1) were interviewed. The in-depth case interviews were conducted with managers in person from October - November 2007 in Ukraine.

Table 3.1: Basic information on the interviewed processing companies

Company	Region	Legal form	Capital origin	Number of employees, persons	Processed milk volume, thousand tons	Sales volume, mil USD
Company 1	Kiev	Holding[39]	Russia	340	150.0	114.0
Company 2	Kharkov	Holding	Russia	694	179.0	68.5
Company 3	Kiev	Holding	Netherlands	120	55.0	21.1
Company 4	Cherkassy	JSC[40]	Ukraine	223	70.0	22.8
Company 5	Zhitomir	Holding	Ukraine	604	148.0	38.4
Company 6	Poltava	Holding	Russia	494	179.0	61.8
Company 7	Lvov	JSC	Ukraine	592	80.0	97.0

Source: Results of the interview with managers of the processing companies, November 2007 in Ukraine.

Furthermore, the willingness of top managers to participate in the interviews, provide company data and explain their motives for implementing various coordination mechanisms for the milk suppliers was also one of the main preconditions for including the company into the case study research. The managers of the companies were contacted by phone, informed about the purpose of the interview and were asked for a convenient appointment. If an agreement was achieved, the interview took place in the main office of the company. Personal interviews were carried out with company managers to classify the most significant problems and motives of their cooperation with the milk producers. The interview partners chosen for the case studies all hold leading positions in their companies: four managers were CEOs responsible for

[39] Holding, affiliate, associate and subsidiary are types of business relationships and refer to the degree of ownership that a parent company holds in another company. The terms affiliate and associate companies are usually used in the case when parent company only possesses a minority stake in the ownership of the company. Subsidiary is a business entity that is majority controlled by the parent company. But still, a parent company and a subsidiary are separate entities and it is entirely possible for one of them to be involved in legal proceedings, bankruptcy, tax delinquency, etc., while the other is not (www.investopedia.com).

[40] A joint stock company (JSC) is a type of business entity (corporation or partnership) that involves two or more legal persons. Here JSC is to be understood as the single company, not affiliated with any bigger holding (www.investopedia.com).

the quality of raw milk deliveries, and three managers were the heads of the quality management department. This approach allowed direct access to strategic decisions of the company regarding quality management and coordination of suppliers, and also offered additional insights into sales and marketing channels and financial data. Each interview took between an hour and two hours.

A case study guideline (APPENDIX 1) encompassed general information about the company such as its market position, production volumes, financial shares, investment activities and forms of vertical coordination of the milk suppliers. The case study outline included several informational blocks and served as a basis for the interview. The outline was not constructed as a questionnaire for the respondents, but was used as an interview guideline. Additionally, the case study approach proved the willingness of the company managers to cooperate and provided required information for the subsequent survey. The results of the interviews showed that the managers were willing to provide information about the production process and the marketing and coordination strategies applied to their suppliers, but were rather unwilling to share financial information and contact data from their trade partners. The case interviews provided valuable information for further research and supported the elaboration of the research hypotheses and the survey questionnaire.

3.2 Case study findings

3.2.1 Organization of the buyer-supplier relationships

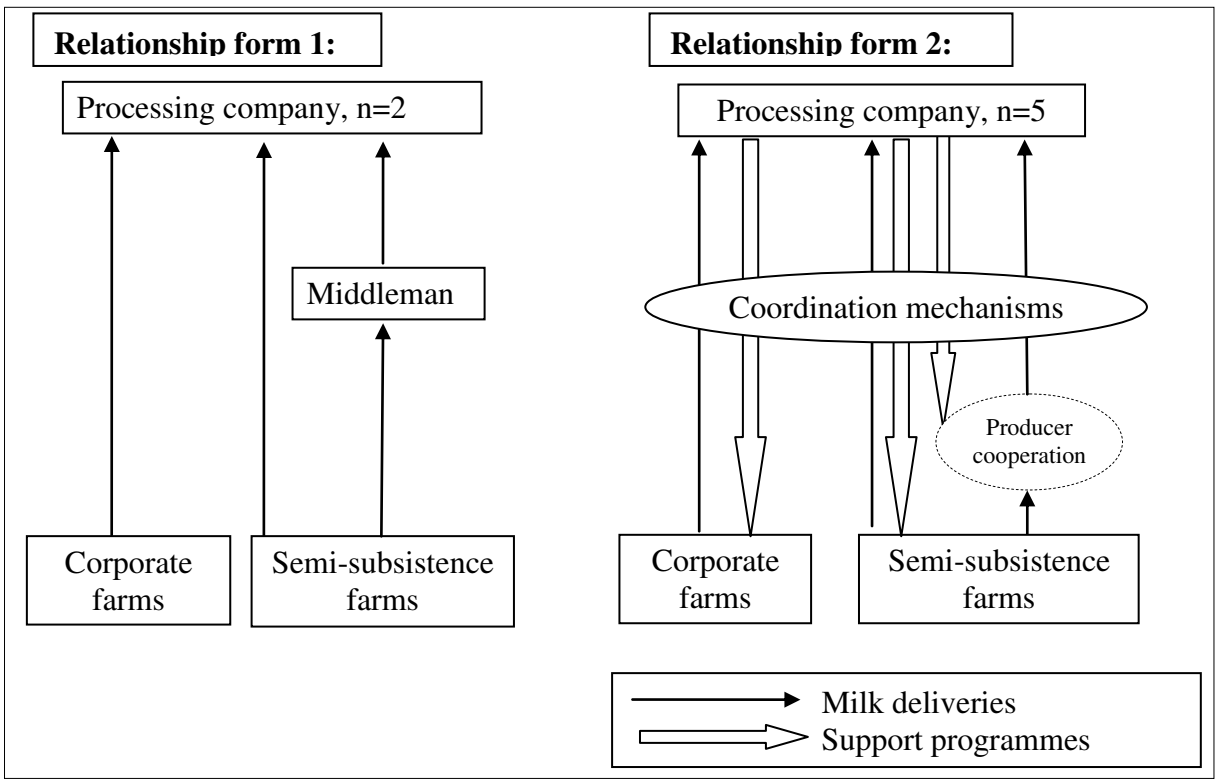
The general tendency stated by all interviewed managers was the predominance of semi-subsistence farms in the milk supply chain; this accurately reflected the situation on the milk producer market in Ukraine. The average share of the corporate farms in the supplier structure of the interviewed companies was 30-40%, whereas the share of the semi-subsistence farms was 60-70% (see APPENDIX 2). All interviewed managers confirmed the high volatility of milk supplies (also among all companies belonging to the interviewed holdings) during the summer and winter. Furthermore, the managers pointed out several problems in their cooperation with milk suppliers. For example there was a poor supply of high-quality raw milk which, in the opinion of managers, substantially limited the companies' further business development. In particular, semi-subsistence farms delivered only low-grade milk. From the processors' perspective, milk producers often had insufficient knowledge of the required hygiene and quality standards. In addition to communication problems and information asymmetries, milk processors also stated that many farmers showed a lack of motivation to produce high-quality milk, to follow the agreed schedules, and to deliver the required milk quantities (MYKHAYLENKO et al., 2009).

All interviewed companies used individual written contracts while cooperating with corporate farms, and only two companies used such contracts with semi-subsistence farms. Other forms of cooperation with semi-subsistence farms mentioned by the interviewed companies were the following: working through an intermediary agent, through oral agreement or through a written contract with the village municipality.

Basically, two relationship forms between the processing and production stage could be identified (figure 3.1). In the first relationship form, there were no additionally implemented coordination and support mechanisms, and a middleman was used for working with the semi-subsistence farms. Usually an independent person or an outside business assumed the role of the middleman who collected milk from the semi-subsistence farms and delivered it to the processing companies (MYKHAYLENKO et al., 2009).

In the second relationship form, the processing companies used additional coordination mechanisms with their milk suppliers. Of the surveyed businesses, five companies already implemented various coordination mechanisms and support measures (Relationship form 2). Two other companies implemented relationship form 1, but confirmed their interest in developing closer coordination forms in the future. From these two companies only one used the services of a middleman (Company 2); six other companies worked directly with both types of producers.

Figure 3.1: Forms of buyer-supplier relationship



Source: Adapted from MYKHAYLENKO et al., 2009.

Five companies involved in the second relationship form applied a variety of coordination mechanisms to build up cooperation with their suppliers. These were price incentives, technical assistance for semi-subsistence farms, financial support for corporate farms, extension seminars, and the integration of dairy farms. The interviewed companies used price incentives in the form of extra payments for increased milk quality and higher milk deliveries. The latter applied to corporate farms to motivate them not to split their deliveries between different processors, but rather supply only one company. Additionally, semi-subsistence farms were frequently offered technical assistance in the form of financial and organizational support. Establishing milk-collection centers was a common example of this support program. Local milk collection was organized through contracts with village authorities, and the village commune provided the necessary infrastructure in the form of buildings and communication with the producers. In return, the village authorities were provided with the necessary equipment, which they then passed on to the producers. A more advanced form of support mechanism was direct financial support in the form of credits and co-financing, which was particularly provided for the corporate farms. This program was especially applied to those farms that proved to be reliable partners over a long period of cooperation. In addition to the milk delivery contract, a credit contract was signed between the processing company and the milk producer, in which a rebate payment in the form of the milk deliveries was set over a fixed period of time. Since the processing companies often worked together with the dairy technology providers, they could pass on existing synergy advantages to milk producers. This was to the benefit of both parties, as much better payment conditions could be offered. In an attempt to increase the milk producers' expertise, the processing companies organized extension seminars for business managers and farm specialists. The topics varied from farm management to the selection and feeding of dairy cattle, modern technologies in milk production, and quality standards. Finally, the most advanced type of vertical coordination implemented by the interviewed companies was the integration of the dairy farms (see Chapter 4 for definitions). This measure was more capital-intensive and required a much higher level of organization compared to the financial support offered by the processing companies. The advantage of the integration was the complete control over the integrated stages of production (MYKHAYLENKO et al., 2009). Though most mentioned programs applied to both types of the suppliers, there were still some typical schemes used for the corporate farms and the semi-subsistence farms separately. For example, price incentives offered by all five processing companies using the second relationship form apply to marketing measures rather than to coordination mechanisms. Furthermore, the following four coordination schemes could be identified within the second relationship form. The first coordination scheme implied direct financial support in the form of credits and co- financing of the assets, while the second coordination scheme

referred to the integration of the dairy farms. The third coordination scheme implied the extension seminars for the farm managers and, finally, the fourth coordination scheme included the technical assistance offered to the semi-subsistence farms. In the following, each of these coordination schemes is presented in more detail.

In the context of the first coordination scheme, the processing companies provided credits and co- financing for the corporate farm assets. The main objective of this coordination scheme was to increase the productivity of the main suppliers. The processing companies, as well as the banks and machinery suppliers (directly or indirectly) were the partners involved in the coordination scheme. Here are some examples of the projects implemented in the context of this coordination scheme:

- After a long-term cooperation, Company 3 offered interest-free credits to two corporate farms that delivered milk to the company. The credits were provided in the form of prepayment for the delivered milk. The corporate farms had to deliver milk to the milk processing company over a defined period of time to pay back the credit. To participate in this support program, the farms had to agree with the following requirements: to deliver a higher volume of high quality milk and to engage in future long-term cooperation with the processing company. To secure their own investments, the processing company also included a written agreement of repayment with the purchase contract.
- Company 5 offered financial and organizational support to seven cooperating corporate farms. Financial support was offered in the form of credits and pre-financed assets, including inventory and materials necessary for milk production. Furthermore, the processing company provided organizational support for asset leasing, and technical support for machinery services. In turn, the corporate farms had to increase their livestock and milk production, and supply high quality milk to the processing company. Furthermore, the credits were paid off in the form of increased milk supplies or monetary value after a defined period of time. To secure these investments the processing company introduced an additional contract beyond the existing purchase contract.
- Similar support mechanisms were offered by Company 6. The service provided by the company included the credits and delivery of cooling and milking machinery, as well as the purchase of feed, fuel and detergents to the wholesale price. Corporate farms participating in this program were obliged to increase milk supplies, improve milk quality, and deliver to the processing company on a long-term basis. Also in this case, the processing company implemented an additional agreement to the existing purchase contract.

The second coordination scheme identified within the case study interviews represents the integration of the corporate farms with the milk processing companies.[41] Due to the extent of vertical integration, the processing companies applied instruments such as the acquisition of property rights through contracts and financial shareholding. Partners involved in this coordination scheme were processing companies and corporate farms. For example, Company 3 applied this scheme to two cooperating corporate farms. Farm A was 100% integrated with the processing company, while Farm B sold 70% of its assets to the processing company, and retained 30% in the farm management property. An additional incentive behind this project was to offer seminars and workshops for the managers of the cooperating milk farms. Therefore, Farm A was additionally equipped as a practical educational center. In addition to the processing company and corporate farms, WestfaliaSurge[42], Pöttinger[43] and Schaumann[44] also participated in this project and provided high-tech equipment for milk production and animal breeding. The processing company also implemented investment planning as described in table 3.2:

Table 3.2: Example of an investment planning strategy, Company 3

Farm	Actions 1st year	Actions 2nd year	Total investment
Farm A	500 cows	1.000 cows	15 Mio. UAH
Farm B	500 cows	1.000 cows	n/a
Both farms	Increase from 3,3 to 6,0 thousand tons	Increase from 6,0 to 7,0 thousand tons	

Source: Results of the interview with managers of Company 3, November 2007 in Ukraine.

Before implementing the extended financial support and the vertical integration of the corporate farms, the managers of the processing companies considered the advantages and disadvantages, and assessed potential risks and costs for both alternatives. A comparison of the two alternatives is presented in table 3.3.

Table 3.3: Financial support vs. vertical integration, Company 3

Indicator	Financial support	Vertical integration / Shareholding
Additional opportunities	Better supplier management Development of mutual interests and trust	Better coordination of the integrated unit Management of internal complexity Additional knowledge in milk production
Costs	Appropriate investments paid back in the next periods	High investment with a pay-off time of three to five years
Control	Through purchase and credit contracts	Property rights, ownership
Risks	Violation of contracts Loss of investment through the loss of suppliers	Resource split High production costs Insolvency

[41] For more information on the forms of vertical coordination, see Chapter 4 of this research.
[42] Producer of milking machinery.
[43] Producer of agricultural machinery.
[44] Specialist in animal feeding.

	Lower competitive advantage against other buyers offering higher price	

Source: Results of the interview with managers of Company 3, November 2007 in Ukraine.

The third coordination scheme included extension seminars for the farm managers and personnel. The seminars and workshops in different topics were offered to increase the professional knowledge of the farm managers and employees. The seminars in selection, feeding technology, quality standards, and modern technologies in milk production, etc., were initiated and organized by the processing companies. The cooperating partners were the representatives of the laboratories, research institutes, and professionals in feeding and milk production, as well as representatives of companies that produce equipment and materials for milk production.

- Company 1 offered seminars for their own milk suppliers in selection, modern technologies in milk production, scientific fundamentals of feeding, and quality standards in the food industry. The seminars confirmed their commitment to having well-educated and trained farm personnel.
- Company 3 implemented the international seminar "Cattle husbandry and technologies in the milk production" provided in Russia, the seminar "Milking parlour" and the seminar "Techniques of feed farming" for milk suppliers, particularly for managers of the corporate farms. These seminars were organized in cooperation with the partner-companies Pöttinger and Schaumann. The processing company was satisfied with the results and considered the education and training of the managers to be successful. As mentioned above, Company 3 additionally planned the development of the training center located in one of the integrated corporate farms.

The fourth coordination scheme implied technical assistance for small-scale milk producers, as semi-subsistence farms represent important potential sources of milk deliveries for the processing companies. Nevertheless, small-scale production complicates deliveries of the appropriate milk quantity and quality, and requires additional expenditures from the processing companies. To improve coordination and delivery planning with the semi-subsistence farms, processing companies have implemented various support strategies. The idea of the fourth coordination scheme can be summarized thusly: Coordinated milk collection from the semi-subsistence farms to provide better quality control, better cooling and storage facilities for milk and lower transport costs. The instruments used were written contracts securing investments in cooling and controlling equipment made by processing companies. The cooperating partners were processing companies, the village municipality and semi-subsistence farms. Milk deliveries from semi-subsistence farms to the interviewed companies were typically organized through a general agreement with the village municipality. Subsequently, a milk collection station was established and

organized as follows: the processing company rented a building, provided cooling tanks and quality control equipment. Since the investments were made by the processing company, this company also held the property rights over the equipment in the milk collection station. The village municipality was provided with the necessary inventory, which was then spread among the milk producers.

All five interviewed companies involved in relationship form 2 with the semi-subsistence farms reported improvements in communication, better milk quality and faster delivery times. Additionally, Company 3 and Company 7 stated they had started introducing individual contracts to their small-scale suppliers. In this way the companies try to establish direct communication with the semi-subsistence farms to improve the small producers' information sharing and motivation.

Company 5 declared cooperation with semi-subsistence farms to be the strategic target of its future supplier program. According to the manager of the company, this type of milk producer represents enormous growth potential for the company's raw milk supplies. The company implemented strategic development programs for semi-subsistence farms in western regions of Ukraine. In total, 6 stationary milk collection stations and 365 mobile milk collection stations were organized in different regions. The company provided the necessary inventory such as filters, measuring instruments and detergents directly to the village municipality. These were then spread among the milk producers. Additionally, complete station equipment was financed and provided by the processing company, including milk tanks, cooling equipment and mini-laboratories. The village municipality was responsible for milk quality control; for this, the processing company paid 11% of the total milk costs directly to the village municipality. The total investments made by the processing company in the context of this project constituted around Euro 1.2 million. A further partner in this coordination scheme was the DeLaval company, which sold cooling equipment to the processing company and provided maintenance and repair on a regular basis. The processing company stated positive results after implementing this coordination strategy: since 1999, when the program was implemented, milk supplies in the regions have increased by twenty-fold.

In general, all interviewed companies reported positive effects from the implemented coordination mechanisms on milk quality and cooperation performance with milk suppliers. Furthermore, the initiative of the interviewed companies served as an example of successful coordination and could be implemented by other companies or further groups of producers. For example, the establishment of milk collection stations by processing companies often gave rise to horizontal cooperation as producers joined forces (MYKHAYLENKO et al., 2009).

3.2.2 Motives and outcomes of vertical coordination

The interviewed managers of the processing companies supported the initial observation that the low quality and high uncertainty of milk supplies were important motives for implementing vertical coordination measures. Additionally, the managers of the companies involved in the case study interviews referred to two different types of uncertainty. The first type implied a seasonal fluctuation of milk production, low milk quality and high demand for deliveries from corporate farms. Another type of uncertainty resulted from the opportunistic behavior of milk producers if the producers broke their agreements and delivered milk to the companies currently offering a higher price for milk. To reduce supply uncertainty and to secure the required volume of milk, processing companies engaged in tighter forms of coordination and offered various support programs to their suppliers. The interviewed managers expected the tighter cooperation with milk producers to raise the efficiency of milk production and therefore to increase milk deliveries to the processing industry.

To offer various support programs for their milk suppliers, the milk processing companies made certain investments. The value of these investments depended on the extension of the support mechanisms, which differed from one company to another. These (transaction-specific) investments by the processing companies bear risks, for example the milk producers could change milk processing companies after taking advantage of the implemented support mechanisms. Moreover, the farms may fail to achieve the joint goals of higher quantity and quality milk. As not only financial resources but also managerial know-how and technologies were offered to the milk producers, the redemption of these resources became even more complicated. The interviewed managers of the milk processing companies acknowledged that by switching to the new suppliers they would also lose their investments in time and effort placed in establishing relationships. Moreover, due to the lack of high-quality milk and the high level of competition for deliveries from the corporate farms, the processing companies considered the loss of a large milk supplier as a vital strategic loss (MYKHAYLENKO, 2009). Therefore, the processing companies introduced additional contractual forms and sought long-term cooperation to consider the mutual interests of both trading partners (e.g., self-enforcing contracts).

A further factor influencing the decision about the extent of support mechanisms strongly considered by the interviewed managers was the availability of financial resources. The interviewed managers agreed on the necessity of supporting milk producers via vertical coordination schemes, and even expressed their interest in extending the existing support mechanisms. But many managers also mentioned that their limited budgets usually allowed them to offer these support programs to only a few suppliers. As stated by the interviewed managers, the availability of financial resources and managerial

competencies played a decisive role for establishing the various forms of vertical coordination and support programs for the suppliers. Even if a company was interested in supporting more of its milk suppliers, the final number and extent of implemented programs was often limited by available funds and assets. In such cases, only strategic suppliers were involved in tighter forms of vertical coordination.

The interviewed managers of the processing companies expressed their expectations about the results from vertical coordination and support of the milk suppliers. Since the main motivation expressed by all interviewed managers was to secure a sufficient amount of appropriate quality raw material, quality improvement was considered one of the main outcomes of the implemented support measures. The managers confirmed the improvement of milk quality by the milk producers involved in the vertical coordination schemes. New equipment and technologies available to milk producers through support programs enabled the fulfillment of hygienic norms and provided better milk quality. Though milk from the semi-subsistence farms could only be classified as second grade, better production, cooling and storage conditions increased the "shelf-life" of milk.

An improvement in milk quality was expected to bring additional advantages to the milk processing companies. To achieve good prices and consistently high orders from supermarkets and foreign trading partners, the quality of milk products should be in line with the requirements of such partners. One of the interviewees confirmed: "Especially for foreign customers the availability of the HACCP or ISO certificate can be decisive for the future cooperation," (Interviewee, Company 3). Five of the 7 interviewed companies implemented or planned to implement quality control systems: mainly HACCP and ISO. And "if the quality of the delivered milk is low, none of the quality systems implemented by the processing company could change it into the high grade milk. To solve this problem, processing companies should get at the root of this and start caring about raw milk production!" (Interviewee, Company 3).[45] Particularly for implementing new high-quality milk products or entering the European market, improving the quality of milk supplies is very important (see Chapter 2).

The interviewed managers reported that a lack of communication with milk suppliers and missing coordination mechanisms were the main reasons for the instability of milk supplies. In this context the issue of trust appeared to play an important role for building cooperation between the processing companies and the milk suppliers. On the one hand, positive experience based on long-term cooperation was the reason that processing companies offered extended support

[45] The results of the case studies conducted within this PhD research were published as a discussion paper in the IAMO Annual 2009, and presented at the 5th Annual International Symposium on Economic Theory, Policy and Applications 2010 in Athens, Greece.

programs for their suppliers (e.g., interest-free credits offered by Company 3). On the other hand, the interviewed managers expected the vertical coordination and individual support programs offered to the milk producers to improve communication with the suppliers and to encourage long-term relationships based on mutual interests and trust. In this way, the milk producers involved in vertical coordination were supposed to gain positive experience and become a reliable cooperation partner. The long-term relationships were expected to positively affect information sharing and the development of trust in the relationships between the processing companies and the milk suppliers.

3.3 Conclusions

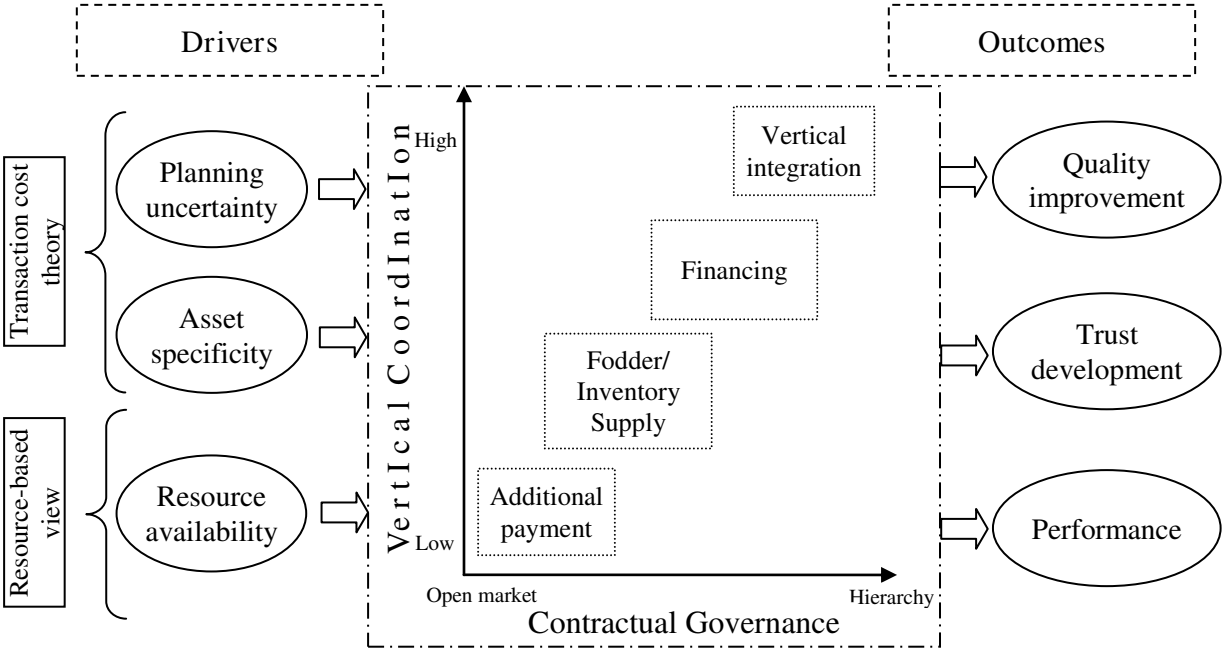
The interviewed companies faced almost identical problems but nevertheless established different coordination strategies and intensities for their suppliers. The author assumes that further strategic considerations affected their decisions concerning the degree and set-up of vertical coordination. The conducted case studies support the assumption that the companies belonging to (international) corporations have financial resources and managerial knowhow at their disposal: This is usually transferred from the mother company along with investments. This fact seems to have played a vital role for the decision on the form and extent of vertical coordination mechanisms in the interviewed companies. Though the uncertainty of milk supplies was experienced by all interviewed processing companies, the available resources and the extent of the investments could explain considerable differences of the intensity and set-up of vertical coordination among the interviewed processing companies. Based on the results of the case study interviews, three main drivers of the vertical coordination and establishment of closer relationships with the milk suppliers could be identified. These are uncertainty, specific investments and the availability of resources.

Additionally, the following (expected) outcomes of vertical coordination could be identified: quality improvement, development of trust and additional strategic advantages for the company. However, the improved milk quality could be empirically confirmed and retraced to the milk suppliers after implementing the support programs by the interviewed companies.[46] Nonetheless, the issues of trust and strategic advantages require additional and more detailed research. Based on the results of the manager interviews, it can be assumed that quality improvement offers additional advantages to the processing companies. Advantages reported by the managers are secure supplies, increased production and market shares, and the introduction of new technologies that, all of which can be summarized as firm performance. Also, the issue of trust in the buyer-supplier relationships requires more structured and extended analyses. The

[46] Information about the quality improvement provided by interviewed managers was based on the company records of milk deliveries and milk quality from corresponding milk suppliers.

development of trust as an outcome of vertical coordination should be analyzed, with an emphasis on behavioral changes within the given buyer-supplier relationships after implementing the coordination and support mechanisms. Figure 3.2 visualizes the observations and conclusions derived from the case study interviews with the managers of the processing companies.

Figure 3.2: Initial conceptual framework



Source: Adapted from MYKHAYLENKO/SCHAFT (2010).

4. VERTICAL COORDINATION: A THEORETICAL REVIEW

This chapter aims to explain the processing companies' behavioral patterns elaborated on in the case study interviews by exploring the theoretical literature. The transaction cost theory and the resource-based view examined in this research allow for a better understanding of the drivers of vertical coordination, which are uncertainty and asset specificity (derived from transaction cost theory) and the availability of resources (derived from the resource-based view). The combination of these two theories allows a broader view on the relationship aspects and the firm's strategic decisions.[47] Furthermore, the chapter considers the expected outcomes of vertical coordination in the context of the case study interviews with the company managers. These outcomes are improved milk quality, the development of trust, and improved firm performance. In addition to enhancing information flow and providing access to scarce resources, vertical coordination is also expected to increase quality levels within the milk supply chain (BARRY et al., 1992) and to reduce information asymmetry and possible hold-up problems by self-interested, opportunistic parties (BARRY, 1993). Better milk quality and increased trust in the buyer-supplier relationships are expected to positively influence the companies' performance. To better understand the impact of vertical coordination on the buyer-supplier relationships in the Ukrainian dairy industry, the quality management, trust and firm performance approaches will be analyzed in this chapter.

The chapter is organized in the following way: Section 4.1 presents theoretical considerations about the motives and outcomes of vertical coordination that have been derived from the reviewed theories and theoretical approaches. Subsection 4.1.1 presents the definition of vertical coordination and various forms of contractual governance. Subsection 4.1.2 introduces the considerations of the transaction cost theory, and subsection 4.1.3 presents the main aspects of the resource-based view. Subsection 4.1.4 provides the main aspects of the quality management approach, subsection 4.1.5 presents the concept of trust, and subsection 4.1.6 provides an overview of firm performance. Section 4.2 presents the conceptual framework of this research and the main hypotheses. Subsection 4.2.1 presents hypotheses on the motives of vertical coordination, while subsection 4.2.2 presents hypotheses on the outcomes of vertical coordination. Section 4.3 presents the conclusions.

[47] The TCE and RBV have been applied by MADHOK, 2002; COMBS/KETCHEN, 1999; SILVERMANN, 1999, COMBS/KETCHEN, 1999, DAS/TENG, 2000 to explain the organization of the inter-firm relationships.

4.1 Theoretical considerations

4.1.1 Vertical coordination

The literature provides various definitions of vertical coordination in the broad meaning of synchronizing the vertical stages of production or marketing. MIGHELL and JONES (1963) use the term vertical coordination in that it "includes all the ways in which the vertical stages of production are controlled and directed." Vertical coordination is similarly defined by KING (1992) as *"the* alignment of direction and control across segments of a production/marketing system*."* Price, quantity, quality and terms of exchange are the factors that are aligned and controlled through vertical coordination (SPORLEDER, 1992).Vertical coordination is usually treated as a continuum aligning different coordination options between the open market (via market prices) and complete vertical integration in the form of single ownership of different production and marketing stages (WILLIAMSON, 1975; SCHRADER, 1986; SPORLEDER, 1992; PETERSON/WYSOCKI, 1997). The classification of different coordination forms between open market and vertical integration differs from one industry to another, and refers to various types of cooperative arrangements such as contracts, joint ventures, cooperatives, partnerships, strategic alliances, etc. The literature on vertical coordination presents a broad discussion on the different stages along the continuum, as well as the following managerial implications for the firm. In this way, MIGHELL and JONES (1963) discuss the following stages of vertical coordination between the firms such as market specification, production management and resource providing contracts. Each of these forms consecutively increases the interdependence between the cooperating parties. Market specification contracts consider price (or its calculative basis), and the issues of production and marketing of goods. In this case the producer's risk, but also his management function, is partly transferred to a contractor. Thus, the producer obtains greater security on the market for at least one production period. The next type of vertical coordination specified by MIGHELL and JONES (1963) is the production management contract, which includes functions that are similar to the previous form, but that imply a higher level of participation in production management on the side of contractor. Especially while implementing new technologies required by the contractor, and for product quality as well, it is extremely important that this contract presumes management assistance. The resource-providing contract represents an extended option of support if the contractor provides necessary inputs to the producer in addition to management assistance. MIGHELL and JONES (1963) consider contract farming as a highly coordinated relationship that is characterized by centralized decision-making and long-term contracts. The main condition for this type of contracting is the processor's ability to manage the whole supply chain.

In many cases it is difficult to determine the precise boundary between the open market and tighter forms of coordination between the firms. For example, SPILLER et al. (2005) and SCHULZE et al. (2007) consider long-term relationships as those not bound by contracts. In this way, the long-lasting partnerships allow more reliability and lower search costs, while still providing switchover options. MAHONEY (1992) focuses on long-term contracts, including relational, inside contracts, joint ventures and clan (hierarchy) contracts as different options of vertical coordination between the firms. Considering the option of the long-term contract, MAHONEY (1992) presumes that in this way the obligations of the interacting agents are specified and enforced by third parties. The relational contract specifies that the obligations of the interacting principal and agent are self-enforced, while the inside contract represents a hybrid between the contractual arrangements and the hierarchical structure. A joint venture represents the results of cooperation between two firms, thus creating a new joint business unit. A hierarchy represents the final stage of vertical coordination, i.e., vertical integration. This form of contractual governance presumes that all production and management processes are united within a single organization.

HINES (2004) explores various partnerships, for example cooperative, coordinative and collaborative. According to his classification, cooperative partnerships are usually built in a single functional area over short time periods and involve a low number of suppliers. Coordinative partnerships are organized over a long time period and involve multiple functional areas. Collaboration presumes the integration of single supply chains, joint planning, technology sharing, as well as the integration of processes and administration over long time periods. Partnerships or cooperative relationships are classified by all or some of the following attributes: “information sharing; trust; coordinated planning arrangements; shared risks; mutual benefits; recognition of independence; shared goals; integrated processes; shared culture, compatibility and understanding; open book accounting,” (HINES, 2004). Vertical integration based on HINES (2004) applies to risk and reward sharing through a united legal entity and vertically integrated supply chain, which is owned and controlled by a single organization.

In addition to the issue of contracting, SPORLEDER (1992) implements the term of quasi-vertical integration and strategic alliance (SPORLEDER, 1992; SPORLEDER et al., 2005). In the case of quasi-vertical integration, the vertically linked firms can be controlled “without fully owning them.” The strategic alliance or quasi-vertical integration are based on a more extended level of contractual arrangements and allow a higher level of coordination. The idea of a strategic alliance is based on the assumption that any kind of agreement of cooperation between independent firms is meant to serve a strategic purpose. Therefore, sourcing contracts and partnerships can also be a component of a

strategic alliance. In this way the alliances imply stronger vertical control than that presented in the contractual arrangements. PETERSON et al. (2001) specifies a relation-based alliance that is based on mutual and more intensive control than that offered by open market or different types of (specification) contracts. However, implementing this kind of coordination form (PETERSON et al. 2001) divides the coordination forms along the continuum into two parts: those based on ex-ante control and those based on ex-post control. The first group of coordination forms includes the spot market and contracts, while equity-based alliances and vertical integration belong to coordination forms based on ex-post control. Equity-based alliances include organizational forms such as joint ventures, partial ownerships, and hierarchies, as well as further organization forms based on shared equity capital of the parties in an exchange relationship. Vertical integration is considered as the highest form of vertical coordination, and is defined as "the ownership of the production of a previously purchased input used in the manufacture of an output or the ownership of a production unit that previously had purchased the output from a particular firm," by KILMER (1986, p. 1155). A final overview of the discussed forms of contractual governance, including different forms of contracts, relationships, and alliances from the open market to the vertical integration is presented in the table 4.1.

Table 4.1: Forms of contractual governance

The type of contractual governance	Form terminology	Authors (Year)
Contracts	long term relationships market-specification production-management resource proving relational inside contracts	SPILLER et al. (2005) SCHULZE et al. (2007) MIGHELL/JONES (1963) MAHONEY (1992)
Alliances	strategic relations-based equity-based	SPORLEDER (1992) SPORLEDER et al. (2005) PETERSON et al. (2001)
Partnerships	cooperative coordinative collaborative	HINES (2004)
Hybrids	quasi-vertical integration inside contract	MARTINEZ/REED (1996) MAHONEY (1992)
Vertical integration	joint venture clan hierarchy	MAHONEY (1992) HINES (2004)

Source: Literature review.

4.1.2 Transaction cost theory

The issue of transaction costs was first raised in 1937 by COASE in his work "The nature of the firm" when he questioned "why a firm emerges at all." He argued that different costs would apply to the same transaction whether it is carried out by means of markets or hierarchies. COASE (1937) argued that the non-costless resource allocation that is coordinated by a pricing system can compete with other coordination mechanisms like direct management and firms or governments (ALLEN, 1999). As "all methods of allocating resources have costs and benefits and no single mechanism works for free," (ALLEN after COASE, 1999, p. 895) these transaction-cost differences represent the main incentive of choosing the form of organization for definite transactions (WILLIAMSON, 1979).

As WILLIAMSON states, "A transaction occurs when a good or service is transferred across a technologically separable interface. One stage of activity terminates and another begins," (WILLIAMSON, 1981, p.552). Transaction costs are similar to the frictions that occur in mechanical systems, and are considered to be their economic equivalent; misunderstandings or conflicts between exchanging parties lead to delays, breakdowns or other malfunctions (WILLIAMSON, 1981). The examination of comparative planning costs, adapting and monitoring under alternative governance structures, identifying the factors to classify transactions and identifying the governance structures within which transactions can be organized are the issues that the transaction cost analyzes (WILLIAMSON, 1981).

Depending on the time during which the transaction costs occur they can also be separated into ex-ante and ex-post costs. It is not a physical transfer of goods or services, but the time of signing a contract or establishing the coordination mechanism. This is the deciding moment of dividing the transaction costs into ex-ante or ex-post costs (BECKMANN, 2000). The ex-ante costs represent direct opportunity costs and refer to productivity losses from the lack of appropriate employment of specific assets (RINDFLEISCH/HEIDE, 1997; BUVIK, 1998). The ex-post costs include such costs as maladaption costs incurred when transactions drift out of alignment, haggling costs, setup and running costs, and the bonding costs of effecting secure commitments that are emphasized by transaction cost economics (WILLIAMSON, 1987). In his study of transaction cost effects in transaction processes in Central and East Europe, SCHLEINITZ (1998) defines transaction costs thusly: "all that costs emerging in the course of private, individual economic activity."

In contrast to traditional economic theory, which postulates an economic and also rational agent or homo economicus, the transaction cost theory applies to the bounded rationality of human agents. This is based on the assumption of individuals' limited cognitive capacity to gather and process information

(BECKMANN, 1997). The term "bounded rationality" was first used by SIMON (1955, 1961) to determine behavior that is "intendedly rational, but only limited so," (SIMON, 1961, pp. 24). This assumption presumes the willingness of actors to behave rationally, but also their incapability to do so. As a result they act inefficiently and cause transaction costs (WECKER/WIRTZ, 2007). A gap exists between the real environment and the environment as the actors perceive it, as the real environment, for purposes of choice, is simplified by a choosing organism of limited knowledge and ability (SIMON, 1955; 1978). The conclusion that human agents are subject to bounded rationality was further developed by WILLIAMSON (1979, 1981, 1985), and along with opportunism it is one of the key behavioral assumptions of transaction cost economics. The most significant consequence of bounded rationality of human agents in the context of transaction cost economics is incomplete contracting (WILLIAMSON, 1979; 1988). Especially in the case of complex transactions it is impossible to provide for every eventuality and "deal with the complexity in all contractually relevant respects," (WILLIAMSON, 1981, pp. 553-554). Incomplete contracts are therefore not the consequence of the lack of enforceability, but of bounded rationality that makes it impossible to foresee all possible future events (MACLEOD, 1996).

Another important behavioral assumption of the transaction cost analysis is the hypothesis that at least some agents tend towards opportunism, that is, self-interest-seeking behavior with guile (WILLIAMSON, 1981; 1983). Considering the existing information asymmetry, the behavior of the better-informed party cannot necessarily be predicted. There is a risk that the better-informed party might act for its own benefit by manipulating information or distorting its intentions. In this way, information asymmetry is a necessary condition for opportunistic behavior by exchanging actors. In a world of perfect information - as it is presumed, for example, by neoclassical economics - transaction costs are assumed to be zero (DYER, 1997). There are two ways in which asymmetric information can result in opportunistic behavior: adverse selection and moral hazard (WALTERS et al., 2008). An analysis of adverse selection caused by quality uncertainty and information asymmetry in exchange relationships was made by AKERLOF (1970).[48] Adverse selection refers to hidden characteristics, and moral hazard to hidden intention and hidden action (WALTERS et al., 2008 based on ARROW, 1985). Hidden intention occurs if an agent conceals his preferences or intentions to take advantage, and hidden action means an achievement of benefits at the expense of the exchange partner (BECKMANN,

[48] If information about quality characteristics is asymmetrical, the buyer would offer only average prices for goods based on his expectations for quality. This price falls within the range between the low and high quality of goods and is usually below that price the sellers of high quality goods expect. This causes a situation where sellers of high quality goods have lower motivation and leave the market. Moral hazard arises when an exchange party safeguarded against risk has a tendency to act less carefully than it normally would (AKERLOF, 1970).

1997). The potential for opportunistic behavior by human agents causes additional contractual hazards because it is very costly to distinguish between non-opportunistic types and those who behave dishonestly or in some other way confuse transactions ex-ante. The assumption of opportunistic behavior by exchange partners could result in relationships based on mistrust. Governance structures should both economize on bounded rationality and safeguard transactions from hazards of opportunism (WILLIAMSON, 1979; 1981; 1988).

WILLIAMSON (1979) defines three critical dimensions for characterizing transactions and identifying the most economical governance structure: transaction-specific investments, uncertainty and frequency. The term "transaction-specific investments" refers to investments that are made within a particular transaction and have no or less value if redeployed in any other relationship (WILLIAMSON 1975; 1985). Based on this, the term "asset specificity" has been defined as the extent to which investments are specific for a given transaction and have no or less value in any alternative uses (WILLIAMSON, 1979). WILLIAMSON (1983, 1991) distinguishes between the following types of asset specificity:

- Site specificity emerges in case of particularized territorial location, a "cheek-by-jowl" relationship between buyer and supplier that allows them to minimize transportation and inventory costs. Assets serving such relationship are highly immobile.
- Physical asset specificity refers to investments in machinery or equipment that is designed for the production of specific products and has less value if used alternatively.
- Human asset specificity refers to accumulating specific knowledge through specific training or learning-by-doing by workers, who apply this for more efficient or qualified work.
- Dedicated assets are those substantial general investments that have opportunity costs near zero outside a particular transaction. Such an investment is made, for example, by suppliers to sell a large volume of product to a particular customer (JOSKOW, 2003).
- Intangible assets or brand-name capital (KLEIN, 2004). Examples of such assets are logos or trademarks that are reflected in consumer perception. For example, investments made by McDonalds over time have significantly contributed to its brand name (JOSKOW, 2003).
- Temporal specificity (first raised by MASTEN et al., 1999) refers to assets that have to be used in a particular sequence (KLEIN, 2004), such as deadline dependence (SCHLEINITZ, 1998).

After a relationship-specific investment is made, both parties enter into a bilateral (or quasi-bilateral) trading situation for some period of time. This

creates a potential hold-up situation when the parties start bargaining in the pursuit of their own interests. If a supplier invests in some specific equipment that can only be used to produce particular products for the buyer, he enters into a "locked-in" situation, where the buyer can extend the delay to appropriate ex-post quasi-rents (KLEIN et al., 1978). The combination of incomplete contracts and post-contractual opportunism has adverse effects on ex-ante investments and ex-post performance (JOSKOW, 2003; GROSSMAN/HART, 1986). The higher the level of asset specificity dedicated to a particular transaction, the deeper the supplier or the buyer enters into a locked-in situation. With a higher level of asset specificity the contract's duration, mutual dependences of trading partners and transaction costs all increase; at the same time, the opportunity to use the assets alternatively decreases (SCHLEINITZ, 1998; DOLUD, 2004). With an increasing level of asset specificity both partners will try to organize exchange on a long-term basis. To protect potential problems and reduce the transaction costs, alternative governance structures will be applied to reduce the costs of contractual hazards, to stimulate investments ex-ante and to achieve more efficient performance ex-post (JOSKOW, 2003). In his comparative analyses of governmental structures in U.S. and Japanese companies, DYER (1996) shows that higher asset specificity and information exchange are the main factors for efficient coordination in the Japanese supply chain. Information exchange and high asset specificity increase the "learn ability" of the supply chain and provide the opportunity to produce high value and complex products. Conversely, an absence of asset specificity abolishes the incentives to vertical integration; with no risk for the productive factors it is also not necessary to protect them from opportunistic behavior (SUTCLIFFE/ZAHEER, 1998).

Uncertainty is another dimension of characterizing transactions that was defined by WILLIAMSON (1979), one which results from difficulties of gathering and processing information and which increases transaction costs (SCHLEINITZ, 1998). Two types of uncertainty can be found in the related literature: environmental and behavioral uncertainty. Based on the work of KOOPMANS (1957) and WILLIAMSON (1985), SUTCLIFFE and ZAHEER (1998) discuss the types of uncertainty that were defined as primary, competitive, and supplier uncertainty. Primary uncertainty refers to the issue of environmental uncertainty, whereas competitive and supplier uncertainty both apply to behavioral uncertainty.

Table 4.2: Types of uncertainty

Type	Subtype
Environmental (primary) uncertainty	Volume uncertainty Technological uncertainty
Behavioral uncertainty	Competitive uncertainty Supplier uncertainty

Source: WILLIAMSON (1985), WALKER/WEBER (1984), SUTCLIFFE/ZAHEER (1998).

Environmental or primary uncertainty refers to a lack of knowledge about exogenous factors such as natural phenomenon, change of consumer preferences, implementation of standards, etc. These factors cannot be influenced by the actors and require adjustments on their part. Environmental uncertainty includes volume uncertainty and technological uncertainty (WALKER/WEBER, 1984), where volume uncertainty arises from estimating changes in demand for particular products, as well as the confidence of such estimation. WALKER/WEBER (1984) define volume uncertainty as an inability to accurately forecast the quantity requirements in the relationship. High volume uncertainty can therefore give rise to higher production costs or overproduction (or otherwise underproduction) of the inputs by the suppliers. Conversely, the buyers can suffer from a lack of input factors. Another subtype of environmental uncertainty is technological uncertainty, which refers to changes in product specifications. If changes in the design of particular products necessitate some reconstruction of equipment, it creates additional costs for suppliers (and thus for the buyers included in the final price), as well as the need for re-negotiations with the suppliers.

Behavioral uncertainty refers to the difficulties of forecasting the behavior and future actions of economic actors, especially under the assumption of potential opportunistic behavior (SUTCLIFFE/ZAHEER, 1998). This type of uncertainty is considered by WILLIAMSON (1985) to be the most important in the transactional context. Competitive uncertainty is defined by SUTCLIFFE/ZAHEER (1998, p.4) as "the uncertainty arising from the actions of potential or actual competitors, which may be either 'innocent' or 'strategic'." Innocent uncertainty arises from the lack of knowledge about the actions of competitive firms. Strategic uncertainty refers to deliberate strategic decisions of competitors. Supplier uncertainty arises from behavioral uncertainty about the actions of vertical exchange partners and refers to ex-ante and ex-post opportunism (SUTCLIFFE/ZAHEER, 1998). Actions and moves of actual or potential competitors and/or suppliers of the firm (such as changing the scope or direction of production and/or distribution and new firms entering the market) can significantly influence the decision of the firm about the form and the scope of its vertical coordination strategy.

The role of uncertainty for the firm's decision about its vertical boundaries is treated differently by different authors. The agency theory argues that uncertainty directly affects the choice of a control mechanism and "plays a central role in the definition of a contract," (SAUVEE, 1988). Transaction cost theory considers asset specificity (at the intermediate level of uncertainty) as the main decision factor whether the firm should vertically integrate or not (WILLIAMSON, 1979; WALKER/WEBER, 1984; SUTCLIFFE/ZAHEER, 1998). Under a high level of asset specificity, uncertainty becomes an even more significant determinant of vertical integration as the costs and probability of opportunistic

behavior of the cooperating partners increase. Further, if asset specificity is low, there is no incentive for vertical integration (SUTCLIFFE/ZAHEER, 1998).

Frequency is the third critical dimension for characterizing transactions. WILLIAMSON (1979) recognizes three categories of frequency, referring these strictly to buyer activity in the market: one-time, occasional and recurrent. In addition, WILLIAMSON (1979) argues that buyers who intend to involve some businesses on a continuing basis should consider tighter forms of governance structures under the presence of mixed or idiosyncratic investments. Thus, tighter vertical coordination strategies should be initiated with suppliers, to whom long-term relationships exist and transaction-specific investments are made. Conversely, if the firm uses some services or goods very rarely, this will not be an incentive to vertical integration, but rather to outsourcing this kind of services (for more information on outsourcing strategies, see ANG/STRAUB, 1998; LEIBLEIN et al., 2002).

KLEIN (2006) summarizes three distinct forms of frequency defined by transaction cost economics: 1) frequency of trade between specific trading partners; 2) frequency of trade between many trading partners; and 3) frequency of the disturbances in the environment. The first type of frequency allows one to substitute the formal governance structure (KLEIN, 2006). In such relationships the relational contracts are used as "informal agreements and unwritten codes of conduct," (BAKER et al., 2002, p.39). Such contracts help to overcome difficulties of the formal contracts and reach those assets or services that were not foreseen in the contract. The relational contracts are self-enforcing if the value of future relationships is high enough to prevent both parties from ex-post opportunistic behavior (BAKER et al., 2002). The second form of frequency refers to transactions between multiple trading partners. In this case, a higher frequency of transactions with the given level of asset specificity would increase the probability of hierarchical governance. The higher volume of trade, the higher would be the probability that the benefits of hierarchical structures exceed the costs (KLEIN, 2006). In the discussion of the third form of frequency, KLEIN (2006) refers to WILLIAMSON (1991b), who compares the ability of different organizational forms (markets, hierarchies and hybrids) to adapt to changes. If the environment is stable, the level of asset specificity would primarily determine the choice of governance structure. If the environmental disturbances increase, the higher cost of coordinating many independent partners would make hybrid forms of organization less attractive, even if asset specificity is still at "the intermediate level," (KLEIN, 2006).

Also, the joint action of the transaction parties is an additional mechanism used to protect themselves from the opportunistic behavior of the partners. Joint action has been defined by HEIDE/JOHN (1990, p.25) as "the degree of interpenetration of organizational boundaries." Additionally, JOSHI/STUMP (1999, p.291) define joint action as "a non-equity mode of governance in which

both manufacturers and suppliers cooperate on certain activities that are important for both parties." In the buyer-supplier relationship, the parties can increase their mutual interest and interdependencies by developing bilateral cooperation. Empirical evidence of the positive impact of transaction-specific assets and the level of joint action in the buyer-supplier relationship is presented by ZAHEER et al. (1998). For example, while involving suppliers into the joint planning of production processes, the company would indicate its interest for further cooperation and acquire additional information on the suppliers' production process. Thus, joint action not only safeguards the buyer-supplier relationship but also coordinates the allocation of resources and activities between the partners. Joint action undertaken by partners in a relationship also provides better access to knowledge and working experience, and therefore allows for better problem solving, effective planning, and efficient production. Information sharing and joint work experience increase the awareness of a partner's activities and plans, and therefore increases mutual trust in the relationship.

CLARO (2004) refers to joint action as an issue that allows one to combine the joint planning process and joint problem-solving activities. According to HEIDE/JOHN (1990), joint planning refers to collaborative activities and implies that future responsibilities are defined ex-ante. Activities such as joint product design and development, value analyses and cost targeting, design of quality control and delivery systems (including long-term planning) belong to the wide set of joint planning actions. Joint planning provides important support for joint decision and goal-formulation. Joint problem solving refers to ex-post actions and implies activities aimed to reduce and resolve disagreements, consequences of technical failures, or some other unexpected events (CLARO, 2004). The important benefits of the joint action in the buyer-supplier relationship can be summarized as follows: Thus, as the joint action is seen as a specific mode of governance, the transaction-specific investments are expected to positively affect the extent of joint action. Joint action provides the manufacturer with control over the suppliers' activities; in this way, such notable benefits as a shortened product development cycle, reduced procurement costs, improved supplier quality, as well as continuous cost improvements can be achieved (JOSHI/STUMP, 1999). Jointly developed management processes in the buyer-supplier relationships influence the level of trust between the interacting parties (ZAHEER et al., 1998). Jointly elaborated management practices that remain stable over time support the development of the common expectations from the relationship, especially concerning the issue of appropriate and fair behavior by cooperating partners (ZAHEER et al., 1998).

4.1.3 The resource-based view

The resource-based view perceives a firm as a bundle of resources. Therefore, the firm's advantages are considered to be directly dependent on the quality and uniqueness of available resources and their combination within the single firm. The basic ideas behind the resource-based view of competitive advantage originate from the studies of PENROSE (1959), WERNERFELT (1984) and BARNEY (1991). As Wernerfelt states, "For the firm, resources and products are two sides of the same coin," (WERNERFELT, 1984, p. 171). Resources are defined as "anything which could be thought of as a strength or weakness of a given firm," (WERNERFELT, 1984, p.172) or "those assets that are tied semi-permanently to the firm," (COMBS and KETCHEN, 1999, p.868; WERNERFELT, 1984). Firm resources have been classified into the following categories:

- Tangible and intangible resources (WERNERFELT, 1984);
- Physical capital resources, human capital resources and organizational capital resources (BARNEY, 1991);
- Physical, intangible and financial resources (CHATTERJEE/WERNERFELT, 1991, based on TEECE, 1982; MACDONALD, 1984; MONTGOMERY/ HARIHARAN, 1991).

The following characteristics of the resource types have been identified in the literature:

- Physical resources include a firm's resources such as plant and equipment (CHATTERJEE/WERNERFELT, 1991), physical technology used in a firm, its geographic location and access to raw materials (BARNEY, 1991). Physical resources are characterized by fixed capacity (CHATTERJEE/WERNERFELT, 1991).
- Human resources include the training, experience, judgment, intelligence, relationships, and insight of individual managers and workers (BARNEY, 1991). Already developed managerial resources accelerate the firm's growth compared to new managers placed into production (PENROSE, 1959; COMBS/KETCHEN, 1999).
- Organizational resources include reporting structure, formal and informal planning, controlling and coordination systems, informal relations among groups within and between the firm, as well as other firms in its environment (BARNEY, 1991).
- Intangible resources include brand names or innovative capability (CHATTERJEE/WERNERFELT, 1991), in-house knowledge of technology (WERNERFELT, 1984), reputation, patents, trademarks, etc. Compared to physical assets intangible resources are characterized by softer capacity constraints but are still relatively inflexible (CHATTERJEE/WERNERFELT, 1991).

- Financial resources are considered the most flexible, as they can be used to purchase all types of resources (CHATTERJEE/WERNERFELT, 1991). Financial resources can be divided into internal (liquidity at hand and unused debt capacity) and external funds (new equity and possibly high-risk debts). If only a few firms have enough financial support to acquire the resources needed to implement a market strategy, it causes competitive imperfection on the strategic factor market. This can lead to obtaining above average returns using acquired strategic resources to implement a strategy (BARNEY, 1986b). According to Barney, a "Firm's ability to attract financial backing is a reflection of its unique portfolio of strategically valuable assets and resources, resources not controlled by low return potential firms," (BARNEY, 1986b, p.1237).

Further, there are resource differences that allow the firms to implement strategies "that alter an industry's structure in ways that uniquely benefit these firms," (BARNEY, 1986a, p.793). The firm's resources are considered strategic if they enable the implementation of value-creating strategies, which in turn offers a source of sustained competitive advantage for the implementing firm (WERNERFELT, 1984; BARNEY, 1991). The company achieves a competitive advantage if it implements a value-creating strategy that cannot be implemented by other firms immediately and if the benefits of this strategy cannot be duplicated by other firms[49] (BARNEY, 1991).

Two important assumptions are examined by the resource-based theory. According to BARNEY (1991, p.101), the first assumption is that the firms are "heterogeneous with the respect to the strategic resources they control"; the second assumption is that "these resources may not be perfectly mobile across the firms, and thus heterogeneity can be long lasting." Here, heterogeneity refers to the presence of "superior productive factors which are in limited supply," (PETERAF, 1993, p.180) such as fixed assets or quasi-fixed assets that cannot be expanded (rapidly), or are scarce and thus unable to satisfy demand for their services. Unique capabilities such as technical know-how and managerial ability are important sources of heterogeneity that can be a source of sustained competitive advantage for the firm (MAHONEY/PANDIAN, 1992). In an industry where all firms possess the same resources and therefore implement the same strategies, no sustained competitive advantage can be achieved. In such a situation the firms improve their efficiency in the same way (BARNEY, 1991). According to PENROSE (1959, p. 75), "It is the heterogeneity… of the productive

[49] It is not meant that a firm will enjoy sustained competitive advantage from using some resources forever. So long as the competitors are unable to duplicate the strategy, competitive advantage is considered sustainable. Changes in the industry structure can lead, for example, to the nullifying of competitive advantages, redefining which of a firm's resources are still a source of competitive advantage and which are not (see Barney 1986a, 1991).

services available or potentially available from its resources that gives each firm its unique character." Heterogeneity is the most basic and necessary (but still not sufficient) condition for sustained competitive advantage (PETERAF, 1993).

Resource immobility refers to the necessity of creating entry or mobility barriers to disable other firms from acquiring the resources needed to implement the protected strategy. If the resources are acquired by other firms, the strategy is implemented in the same way and thus is no longer a source of sustained competitive advantage (BARNEY, 1991). PETERAF (1993) discusses the immobility of resources under two perspectives: there are perfectly immobile resources and imperfectly mobile resources. Perfectly immobile resources are those which cannot be bought or sold. DIERICKX and COOL (1989) provide a good example of the assets that are "non-appropriable" due to the absence of property rights or "bookkeeping feasibility" problems. Further, such "non-tradable" assets as loyalty, reputation or trust cannot be bought, but only cultivated, earned and accumulated within the firm. Imperfectly mobile resources can be traded instead, but they have more value within the firm currently employing them compared with being employed by other firms (PETERAF, 1993, WILLIAMSON, 1985[50]).

Although heterogeneity underlies the conditions of imperfect mobility, there is no need for heterogeneous resources to be imperfectly mobile. However, immobile resources of an idiosyncratic or firm-specific nature are certainly heterogeneous (PETERAF, 1993). BARNEY (1991) defines four attributes that a firm resource must have to provide the potential of sustained competitive advantages. That is, the resource must:

- be valuable. Only if a firm's attributes exploit opportunities and/or neutralize threats in a firm's environment can they be classified as "resources" and therefore be sources of competitive advantage.
- be rare among a firm's current and potential competition. If a certain bundle of valuable resources is required to implement a value-creating strategy, this may not be possessed by a large number of firms. If more firms have access to the same bundle of resources, they cannot be a source of sustained competitive advantage for a particular firm.
- be imperfectly imitable. As long as the other firms are not able to duplicate a particular resource or bundle of resources, a particular firm will enjoy the advantages of the value-creating strategy.

[50] Transaction- or firm-specific assets are of limited mobility, as they may have no or little alternative use, or the transaction costs for their transfer are high (see asset specificity, Williamson, 1975; 1985). Resource transfer between the firms can cause certain costs (Barney, 1991).

- not have any strategically equivalent substitutes. Otherwise this resource is valuable, but neither rare nor imperfectly imitable.

The ability of a resource to support resource position barriers is a necessary but not sufficient condition for the firm to be interested in this particular resource (WERNERFLET, 1984). To obtain above normal returns from acquiring the resources and implementing the competitive strategy, firms must have accurate expectations about the future value of the strategy. Resources may be valued differently by the firms, and if the potential return of the strategy is overestimated by particular firms, it leads these firms to acquire resources at higher price than their actual value. In this case, well-informed firms may avoid economic losses by not entering the strategic factor markets. In another case, if the return of a strategy is underestimated by ill-informed firms, the resource price would be under its actual value; thus, well-informed firms could acquire resources at the same price as the ill-informed firms. After the strategy is implemented, both well-informed and ill-informed firms receive above normal returns. A firm can gather information advantages by referring to two alternative sources: the analyses of a competitive environment and analyses of capabilities and skills already controlled by a firm (BARNEY, 1986b). To achieve a competitive position, a firm should acquire new resources that could be well combined with already available resources, and thus could sustain a resource barrier (WERNERFELT, 1984). Having some valuable resources for a particular market firm could extend its potential by entering similar markets, where the use of available resources could bring competitive advantages over other competitors.

The effective management of resource allocation crafts the strategy of the firm (BOWER/GILBERT, 2006) and therefore is a central issue of strategic management (GIBBONS et al., 2008). Since a firm is seen as a broader set of resources (PENROSE, 1959; WERNERFELT, 1984), its competitive advantage is built upon the combination of valuable resources and relationships; the core task of management is to adjust and renew these resources and relationships, as they can lose their value over time through changes in consumer behavior and in competition (RUMELT, 1984). The firm strategy "involves striking a balance between the exploitation of existing resources and the development of new ones," (WERNERFELT, 1984, p. 172). The successful combination and use of available resources allow firms to develop and implement new strategies (BARNEY/ARIKAN, 2001). An example of such resource combination is the idea of a multi-product firm that benefits from such non-financial linkage as the joint costs for several products (WERNERFELT, 1984).

The concept of "resource position barriers" introduced by WERNERFELT (1984) refers to the situation when a firm that owns some attractive resources benefits from maintaining a higher relative position over its competitors. A resource position barrier can be partially compared with an entry barrier, and indicates

potentially higher returns for the holder of a particular resource if the resource barrier is transferred to the entry barrier in at least one market. Firms that have acquired a leading position in a particular market may use the resource barriers to make it difficult for other firms to come up. Resources that were developed over time and are interconnected with a particular firm's culture are difficult (or expensive) to imitate, and include customer loyalty, production experience, and technological leads (connected with high expenses for R&D). As some resources (financial, management skills) can be used for producing several products, an existing resource barrier will also have consequences for all the products that this particular resource is used in.

An important incentive for further development of the firm according to the resource-based view of the firm is intra-firm cooperation, which allows other firms' resources to become available for the partner (COMBS/KETCHEN, 1999). If some services and products can only be produced in cooperation, resource sharing becomes one of the basic explanations of intra-firm cooperation (HAMEL, 1991; COMBS/KETCHEN, 1999). Thus, firms are supposed to use alliances to gain access to other firm's valuable resources (DAS/TENG, 2000). On the one hand, the level and the characteristics of the resources available to the company dictate the cooperation strategy the company is going to choose. On the other hand, in a mutual relationship with the trading partners (as in the frame of the vertical coordination), pooling together the available resources increases the value-creation potential for the firm (DAS/TENG, 2000). In this way, the resource-based view of the firm provides a complementary explanation for the company's decision to develop closer relationships with the trading partners. In addition to frequency considerations, uncertainty and asset specificity, all of which are mentioned in transaction cost theory, the resource-based view considers the different set of resources available to the firm (or achieved through alliances) as an additional driving factor for the firm's cooperation strategies.

4.1.4 The quality management perspective

In recent years the quality of products and production processes have become more important to agricultural and food processing companies. Since modern consumers are much more informed and concerned about qualitative and healthy nutrition, companies often compete with each other purely on their qualitative differences. Higher product quality enables higher market share and revenues, and can reduce risk through linkages between product quality, market share, and direct costs (KROLL et al., 1999). Therefore, the companies attempt to fulfill the high consumer expectations of product quality. Often the reason for quality improvement is to make a product more attractive to consumers. Both design and adjustment of further quality attributes used by consumers in their evaluation of a company and its products are combined in the term "quality management" (BANKER et al., 1998). Under quality management, one understands the organizational measurements that aim to improve products and

services. LUNING et al. (2002) defines five functions of quality management (see table 4.3).

Table 4.3: The main functions of quality management

Function	Implications
Strategy and policy	Decisions about goals Quality level of products and resources Choice of quality system
Design	Specifications of products and materials Process requirements
Quality control	Quality of product and materials Quality of production processes Quality of resources
Quality improvement	Changes in product and material specifications Changes in production process and quality of resources
Quality assurance	Requirements and performance Necessary changes in quality systems related to existing organization and technology

Source: Adapted from LUNING et al., 2002.

Total quality management is understood as a business strategy or set of management practices used to secure the quality of all organizational processes: ROSS (1993) defines total quality management as "an integrated management philosophy and set of practices that emphasizes, among other things, continuous improvement, meeting customer requirements, reducing rework, long-range thinking, increased employee involvement and teamwork, process redesign, competitive benchmarking, team-based problem-solving, constant measurement of results, and closer relationships with suppliers." Thus, managers can implement total quality management practices in "any organization-manufacturing, service, nonprofit, or government-and that it generates improved products and services, reduced costs, more satisfied customers and employees, and improved bottom line financial performance," (WALTON, 1986).

Various food quality and safety standards and norms have been developed in the food processing industry. These are implemented as the main guidelines for developing quality systems that serve to secure the quality requirements set by law. Diverse public and private quality standards are used to provide the safety of food products internationally in the best possible way. The development of the standards has been influenced by increasing globalization, trade internationalization and the agreements with WTO. Both public and private standards lead to increased transparency and consumer protection. Though, the private food quality standards seem to be more flexible and responsive regarding the consumer preferences for food quality (SMITH, 2009). For instance, the Codex Alimentarius Commission is the official advisory board of the Food and Agriculture Organization of the United Nations (FAO) and the World Health Organization (WHO). This commission elaborates the standards, guidelines and recommendations for the safety of food products. Typical quality assurance

systems in the food processing industry are Good Practices (e.g. Good Manufacturing Practice (GMP), Good Hygienic Practice (GHP), Good Agricultural Practice (GAP), etc); Hazard Analysis Critical Control Points (HACCP), the International Standard Organisation (ISO), the British Retail Consortium (BRC) and its German equivalent, International Food Standard (IFC); and the Bio-Label (complies with the criteria of the EU Bio Guidelines). These systems differ in their focus: e.g. GMP and HACCP oversee technological requirements, and ISO focuses on management.

Generally, an increased transition of responsibility towards the private sector can be observed: the competition between the food producers and sellers takes place based on the food quality attributes designed to meet the consumer expectations. The consolidation in the food sector leads to a decreasing number of (multi)national food retail chains. Increasing bargaining power allows them to enforce their standards towards producers and set up own private brands (SMITH, 2009; HENSON, 2008).

Implementing internationally-accepted quality standards leads to a reduction of information asymmetry and quality uncertainty on international markets, as consumers desire increasingly high levels of food safety and quality. The issues of food origin and food production have become important competitive factors, especially after recent food crises such as salmonella outbreaks, Bovine Spongiform Encephalopathy (BSE), and the Dioxin scandal. Due to a growing inability to recognize food safety risks using traditional methods such as smell, taste and other physical quality attributes, the need for food production traceability is becoming increasingly important (LOBB et al., 2007). Thus, both consumers and food companies enter a win-win situation: As the choice among various producers and products becomes easier for the consumers, the competitive advantage for the processing companies that possess quality certificates increases. The quality of inputs, the quality of own production, and the quality management meta-systems[51] (e.g. ISO, HACCP) used along the supply chain affect the firms' transaction costs. Various quality management meta-systems can potentially reduce transaction costs for the firms and their trading partners (suppliers and consumers) in the following ways: reducing the sample of products required for the control of the defects or deviations from the contracted quality; reducing the control costs by using jointly-controlled

[51] There are Mandatory Quality Control Meta-systems (HACCP approach to assuring food safety is considered to be one); Voluntary Quality Control Meta-system (e.g. ISO), and Quasi-Voluntary Meta-systems: a supplier can choose not to comply and simply not do business with the buyer. However, if they are widely used or are used by important buyers, suppliers may have little choice over whether to produce to the specifications. The effects of quality control meta-systems depend on how they affect production, processing, transaction, and compliance costs and broader measures of system efficiency, competitiveness, and consumer satisfaction (CASWELL et al., 1998, p.555).

laboratories; reducing the number of required audits and time to develop new products (CASWELL E.AL., 1998).

Furthermore, securing the quality of food products along the food supply chain allows companies to establish trustful relationships with their consumers and suppliers. Better access to information about quality and food safety allows for a decrease in the uncertainty of buying low-quality products for the consumers. Furthermore, this allows an increase in the value and reliability of company brands and products. ACKERLOF (1979) was one of the first scholars who engaged in the problem of information asymmetry and argued that market failure occurs if the product quality characteristics are not available to consumers. To avoid market inefficiencies, every quality feature should be included into the information flow accompanying the traded goods. The substantial importance of product quality for the firm's performance was shown by BANKER et al. (1998), based on comparative analyses of U.S. and Japanese companies in several branches (automobile, consumer electronics, etc.) performed by HAYES et al. (1988). A significant increase of the market share achieved by Japanese companies was primarily caused by "the superior quality and reliability of their products" (BANKER et al., 1998). To improve the quality of the products and to reduce the costs of quality control at every stage of production and processing, the companies establish tighter forms of vertical coordination with their suppliers. BANKER et al. (1998) argue that the companies achieve higher product results if they cooperate rather than compete; this occurs if cooperative arrangements reduce the fixed costs of quality improvement and the demand function has high relative quality responsiveness.

Table 4.4 presents a review of the theoretical and empirical literature. The results of various studies confirm the positive impact of the contract incentives on the quality of the agricultural products. According to CURTIS/MCCLUSKEY (2003), vertical coordination should solve two problems: low level of raw material supply and non-fulfillment of quality requirements. In their study on the potato industry, CURTIS/MCCLUSKEY (2003) show that production contracts implemented by the processing industry have a positive impact on quality improvement in potato production. If processing companies motivate the producers in the context of vertical coordination, higher quality is achieved compared to the quality achieved through the spot market. These conclusions are additionally confirmed by the results of the study done by ALEXANDER et al. (2006) on the impact of the incentive contracts on supplier behavior in tomato production and processing. The quality of tomatoes delivered under incentive contracts with specific premiums for multiple quality attributes is compared with the quality of tomatoes delivered under contract with an established fixed price per ton. ALEXANDER et al. (2006) empirically prove that quality is improved by the tomato producers in response to the implemented incentive contracts.

Table 4.4: Quality management and governance structure of transactions

Author	Year	Research topic	Target group (industry or country)
ACKERLOF	1979	Information asymmetry and quality attributes	Automobile branch
BANKER/KHOSLA/ SINHA	1998	Quality competition	U.S. companies
HAYES/ WHEELWRIGHT/CLARK	1988	Quality and firm performance	Automobile branch, consumer electronics
BENSON/SARAPH/SCHROEDER	1991	Relationship between organizational context and quality management	Manufacturing and serving companies
CURTIS/MCCLUSKEY	2003	Vertical coordination, quality improvement	Potato industry
ALEXANDER/GOODHUE/RAUSSER	2006	Incentive contracts, quality improvement	Tomato industry
HENNESY/LAWRENCE	1999	Contracts, control, quality	Hog sector
DRIES/ SWINNEN	2005	Vertical coordination, quality management	Dairy industry
MARTINEZ/ZERING	2004	Market organization, quality	Pork industry
SWINNEN/GOW	2001	Contract enforcement	Transition countries
SWINNEN	2005	Food supply chain, vertical coordination	Agri-Food industry
BARKEMA/COOK	1993	Contracting, integration, quality requirements	Pork industry
HAN/TRIENEKENS/TAN/OMTA/WANG	2006	Quality, vertical coordination, performance	Pork processing industry

Source: Literature review.

Quality attributes of the supplies play a key role in the decision of vertical coordination between firms. In their analyses of the U.S. pork industry, BARKEMA/COOK (1993) show that three important factors determine the tighter forms of organizational structure between the hog producers and the processing industry. First, consumer concerns about nutrition and changes in lifestyle require particular changes in product design from the companies. Second, new available technologies allow better adjustment of the product quality and design to changed consumer needs. And third, information exchange between the producers and the processing industry improve by using closer forms of vertical

coordination. These changes also allow rapid product design development (such as leaner meat, less time required to prepare a meal, etc.).

Especially in those agricultural branches where input supplies are highly perishable (milk production, sugarcane production, etc.) rapid delivery to the processing industry is a key factor for efficient production and high output quality. A lack of high quality supplies, which is typical for transition countries, stimulates vertical coordination and spill-over effects followed by quality improvement of agricultural products (SWINNEN, 2005). A breakdown of the relationships between input suppliers, producers and output markets causes serious constraints in assessing the markets for capital and inputs for the agricultural producers. Low-quality supplies disable the production of high quality output at the next processing stage even if the best technology and equipment are available. Milk processing companies are expected to implement different support programs and contractual arrangements in the context of vertical coordination to secure high quality supplies for own production. The empirical papers of SWINNEN (2005), VAN BERKUM (2004), and DRIES/SWINNEN (2005) confirm the positive impact of implemented coordination mechanisms on quality improvement of supplies and reliability of partners in transition countries. Also, a study by DRIES/SWINNEN (2005) analyzed vertical relationships in the dairy sector of Poland, Bulgaria and Slovakia, and showed that assistance offered by food companies to milk producers played a significant role for the quality and performance improvement of agricultural producers.

4.1.5 The trust perspective

The role of contracts for coordinating trading partners is crucial, but contracts still remain incomplete and are subject to opportunism (MENARD, 2004; HART, 1988). Therefore, contract performance should meet an optimal trade-off between stronger incentives and reduced opportunism (WILLIAMSON, 1991a; 1991b). If the benefits of a contract breach are higher compared to the costs for one party, the incentive for a hold-up situation increases. The transaction cost theory and contract theory emphasize that bounded rationality and uncertainty hinder the trading parties from writing detailed and complete contracts that could deal with all possible contingencies (HART, 1988; GROSSMAN/HART, 1986). Therefore, relational attributes of the exchange complement the formal contracts, and play an important role in enforcing incomplete contracts (GOO/NAM, 2007). Whereas MENARD (2004) refers to formal complementary safeguards such as guaranteed by contract (e.g. financial hostages) or by specialized investments (e.g. mutual commitments), he also categorizes trust as one of the informal complementary safeguards against incomplete contracts.

Broadly, trust is defined by RING/VAN DE VEN (2005, p.146) “as confidence in the goodwill of others not to harm your interests when you are vulnerable to them.” LUHMANN (1979) distinguishes between two basic types of trust:

impersonal and personal. Concerning the rational reasons for trust, NOOTEBOOM (2007) identifies the following sources of reliability at the macro level (generalized and impersonal) and micro level (arising from specific relations and therefore personalized). The macro level refers to institution-based trust that results from laws, norms, values, and standards, as well as the agencies that enforce them.

Trust at the micro level refers to empathy-based, identification-based, and routine-based trust:

- Empathy-based trust applies to understanding the thoughts and feelings of a partner.
- Identification-based trust goes further in its assumption that people have the same thoughts and feelings, while sharing the same views of the world and behavioral norms. Identification-based trust may lead to the following two types of trust: affect-based trust and friendship-based trust.
- Routine-based trust results from the relationship that was satisfactory for some period of time, where both partners were and are aware of the opportunistic options but never used them.

Operationalizing the term trust NOOTEBOOM (2007) refers to the following two approaches: trust based on control (self-interested behavior) and trust going beyond control (going beyond one's narrow self-interest). The question posed by NOOTEBOOM is if trustworthiness can go beyond self- interest. This refers to the situation where somebody believes that the partner follows the agreement only because a contract or hierarchy binds them to do so. Or whether the relation can be called trust if the partner has an opportunity and an incentive to shirk but nevertheless follows the agreement. NOOTEBOOM (2007) identifies such objects of trust as material objects, laws of nature, people, authorities, organizations, institutions and higher powers.

Trust in people and in organizations is defined as behavioral trust, which has the following aspects (NOOTEBOOM, 2007):

- Trust in competence (competence trust) such as technical, cognitive, and communicative competencies and technological, innovative, commercial, organizational and managerial competencies on the firm level.
- Trust in intentions of a partner towards the relationship, also called intentional trust, refers particularly to the presence of opportunisms.
- Trust in honesty or truthfulness; resource availability; and robustness that implies resistance to outside disturbances.

Interpersonal trust arises based on previous interaction experience or membership in definite social groups. Inter-organizational trust results from trusting the behavior of corporate units, i.e. firms possessing a strong corporate

identity and high-trust culture. Both interpersonal and inter-organizational trust can be mutually dependent. Trust in individuals can be based on characteristics of the organization they belong to, such as positive reputation or brand name. Trust in organizations can also occur from positive experiences of working with its managers and personnel. Global changes in the business environment, an increase in inter-organizational exchange relations and an implementation of knowledge-intensive technologies made trust a highly desirable property (LANE/BACHMANN, 2000). Relying on trust in a relationship with institutions, organizations, and individuals can provide security and permit one to tolerate uncertainties and unintelligible situations that cannot be controlled but still make one vulnerable (VAN DE VEN/RING, 2005). Both institutional and personal trust can evolve, and thus provide greater stress resistance and adaptability to the relationships (WILLIAMSON, 1979).

Considerable empirical research on the role of trust in buyer-supplier relationships was carried out by scholars over the last two decades (BARNEY/HANSEN, 1994; DYER/CHU, 1997; HANSEN et al., 2001; JAMES/SYKUTA, 2005 etc.). HANSEN et al. (2001) emphasize two main research agendas on the issue of trust. First, trust has been empirically proven to reduce the costs of transactions by reducing negotiating and contracting costs (DYER, 1997; GULATI, 1995). Furthermore, trust is considered by strategic management scholars to enhance revenues for alliances through better collaboration and more advanced usage of resources (BARNEY/HANSEN, 1994; DYER/SINGH, 1998). HANSEN et al. (2001) conducted empirical analyses comparing the impact of affective (emotional) and cognitive (reasonable) trust among coop members themselves, as well as trust between coop members and management. The study emphasizes the impact of trust on the performance of agricultural marketing cooperatives, and empirically proves that both affective and cognitive trust has a positive impact on performance at all levels.

Furthermore, BARNEY/HANSEN (1994) define three different forms of trust (weak, semi-strong and strong) and argue that each form has different potential to be a source of competitive advantage for the particular relationship. According to BARNEY/HANSEN (1994), the weak form of trust refers to a situation where only limited chances for opportunism are available to the parties. As there are no or low vulnerabilities from adverse selection, moral hazard or hold-up, trustworthiness on the part of the parties is expected to be high. The semi-strong form of trust is guaranteed through governance devices that make the costs of opportunistic behavior higher than its benefits. However, the semi-strong form of trust is still a matter of significant vulnerabilities. The strong form of trust emerges even in the case of strong potential vulnerabilities and independently of the social and economic governance mechanisms used in the transaction. This kind of trust refers to the high moral principles and standards of the exchange partners. Since all these forms of trust can be found in economic

relations, they do not have the equal ability to be a source of competitive advantage. Weak trust can be found in highly competitive markets and usually brings no competitive advantage to any of exchange partners. Only if heterogenic-appropriate governance mechanisms are implemented and well-managed by exchange parties can semi-strong trust emerge and be a source of competitive advantage. Strong trust can only be a source of competitive advantage for the exchange parties if all partners are highly (strong form) trustworthy. In the case of opportunistic behavior by at least one of the exchange partners, the necessity of introducing a governance mechanism will bring this transaction to the level of semi-strong trust. By introducing these different forms of trust, BARNEY/HANSEN (1994) emphasize the importance of heterogeneity for the parties by implementing governance mechanisms to create a source of competitive advantage through the emergence of semi-strong trust (see also BARNEY, 1991).

According to NOOTEBOOM (2007), trust should be considered not as a static but rather a relation-specific process. As an important element of the buyer-supplier relationship, trust is both required for a relationship and is also shaped by it. Just as relationships can develop over a period of time, the aspects of trust can also develop and grow. It is possible that over time, relational forms evolve from using economic safeguards to protect specific assets to employing trust in this way (RING/VAN DE VEN, 1992). GOO/NAM (2007) argue that contracts and relational governance complement each other and emphasize that relationship commitment and trust work as the key attributes of relational governance, thus impacting inter-organizational performance.

A number of conceptual and empirical papers argue the impact of cooperative behavior on the rise of information sharing and trust between trading partners. GALIZZI/ VENTURINI (2000) argue that cooperative planning allows information sharing between the partners in advance, and therefore leads to the development of estimating demand patterns. HANF/DAUTZENBERG (2008) emphasize that supply chain alignment include the processes of information and product flow, which help to reduce information asymmetry and possible hold-up problems by self-interested, opportunistic parties (BARRY, 1993). In particular, the pyramidal structure of food supply chains should be considered in this context, as due to a high number of suppliers, especially the small milk producers stay anonymous to the processing companies and later on to retail chains. Without elaboration of the trustful cooperation with the milk producers, the transparency and traceability of the milk deliveries and milk products cannot be achieved.

Tighter vertical coordination between producers and the processing industry can lighten access to information about quality requirements and in this way improve the information flow along the supply chain (BARRY et al., 1992). BAHLMANN et al. (2007) discusses the increase of trust along the continuums and argues that conflict and opportunism are the attributes of the open market, and

trustful cooperation evolves while moving to the more coordinated end of the continuum. In a more trustful relationship, both partners gain advantages from advanced planning and collective actions. Firms that trust their partners are expected to engage in bilateral cooperation and are ready to meet requirements and provide timely and accurate information about the production process. Trust provides a long-term basis for recurrent efficient cooperation, which offers mutual benefits for all partners of a relationship. Vertical coordination, which leads to tighter cooperation between the producers and buyers, and to better adjustments of mutual interests, helps to reduce costs and improve control facilities (HENNESY, 1996).

A strong example of how private enforcement mechanisms and increasing interpersonal trust have supplemented or even substituted for the legal system over a definite period of time can be found in transition countries. After transition began, buyer-supplier relationships were not determined by state governance, and the central system was not able to enforce contracts or control the rights over assets any longer. Firms were confronted with high information asymmetry and environmental uncertainty while searching for new mechanisms to establish relationships with partners. The early stage of transition was characterized by a lack of trust between market actors. Especially large firms often suffered under hold-up problems at the beginning of transition (MURRELL, 2003). GOW et al. (2000) emphasize the significance of private enforcement mechanisms (such as losses resulting from contract termination or non-renewal and damage of reputation) during the transition process, which was characterized by a lack of institutional and organizational trust. Firms that suffer most under the absence of supportive institutions showed the greatest tendency towards membership in different business associations and unions, which slowed production decreases (MURRELL, 2003). A survey conducted in five transition countries showed that contracting was significantly affected by the courts: those entrepreneurs who stated that they believed the courts function well behaved differently than entrepreneurs who did not believe that the courts worked (MURRELL, 2003, based on JOHNSON et al., 2002). The following percentage of firms believed that the respective court systems can enforce contracts: Poland 72.9%; Slovakia – 67.9%; Romania – 86.9%; Russia – 55.8%; Ukraine – 54.6%. The low percentage of firms that rely on legal enforcement mechanisms in Ukraine can be explained by contracts that were not optimal designed, or even missing contracts between the parties, as well as inefficient Ukrainian legislation; this often makes contract enforcement a long and difficult process. GOW et al. (2000, p. 254) argue that high litigation costs, ineffective contract law, poor third party verifiability, etc., make it "sometimes not viable to use legal dispute mechanism." This assumption was confirmed by results of the explorative case studies. Thus, in most cases Ukrainian milk processing companies were unwilling to utilize legal institutions after a milk supplier broke a contract because they were not willing to negatively impact their own

reputation in front of other suppliers. The interviewed companies would prefer private enforcement mechanisms to official legislative institutions: The majority of the interviewed managers emphasized the crucial importance of interpersonal relationships with their trading partners for the performance of any business relationship. In their study, DYER/CHU (1997) empirically confirmed that trust emerges after the following two preconditions are met: the implementation of assistance given the routines for supplier improvement, and continuing exchange relationships with suppliers.

Trust in the buyer-supplier relationship is expected to be positively influenced by vertical coordination in two different ways. First is the impact of better quality control and traceability on higher consumer trust in food industry companies, which is beyond the scope of this research. Second, which the present thesis is focused on, is a positive impact of tighter forms of vertical coordination on the development of trust between trading partners: the buyers (the processing companies) and the milk suppliers in the Ukrainian dairy industry. While offering different support programs for milk producers in the context of vertical coordination, the processing companies make the first steps to establishing long-term trustful relationships with their suppliers. Closer vertical relationships allow information sharing through, e.g., extension services in the context of primary producer support (SWINNEN, 2005; VAN BERKUM, 2004). In this way, information sharing between the trading partners improves, and a trustful relationship evolves based on experience and mutual knowledge. In their turn, trust and tighter forms of contractual governance show a positive impact on quality and price satisfaction, as well as the profitability of the companies (LU, 2007). When formal safeguards forms are well-established and show themselves to be efficient, a positive impact on long-term relationships and the implementation of informal forms of control can be expected.

4.1.6 The firm performance perspective

Though considerable research has been done in the area of firm performance (O´DONNELL/DUFFY, 2001), there is still a clash of opinions among scientists working in this field. According to KRAUSE (2005), until now there has been no coherent definition of comprehension on the issue of performance. Rephrasing O´DONNELL/DUFFY (2001) one can speak of massive disagreement on the term and the issue of performance, which led to a "paradox of performance." In this case the organization maintains control of the effectiveness of its activities without possessing exact knowledge of what performance actually is.

Based on the reviewed literature, KRAUSE (2005, p.18) offers a multitude of options for defining performance: "execution, fulfillment, working out of anything ordered," "value development of an investment fond due to a management performance," (based on DIETL, 1998), "a complex interrelationship between seven criteria: effectiveness, efficiency, quality,

productivity, quality of work-life, innovation, profitability," (based on ROLSTADAS, 1998), "level of attainment achieved by an individual, team, organisation or process," (based on EFQM, 2003), "level to which a goal is attained," (based on DWIGHT, 1999). Though there are various studies that elaborate numerous definitions and measure indicators, relatively few of them are widely used (LU, 2007). The significant difficulty of the performance definition and performance measurement is based on the fact that companies often set completely different objectives and expectations regarding their attainment.

The reviewed literature focuses on three main ways to approach the firm's performance: financial, organizational and strategic (HAN et al., 2006). Additionally, organizational theory suggests three concepts to measure performance: goal-based, system and multiple-constituency approach (MURPHY et al., 1996). The goal-based approach refers to the extent to which the organization attains its goals. The system approach used to evaluate firm performance compensates the weaknesses of the goal-based approach and accounts for the simultaneous attainment of multiple performance objectives (CLARO, 2004). Finally, the multiple-constituency approach considers the stakeholder perspective and evaluates firm performance based on the extent to which the various stakeholder needs have been satisfied (MURPHY et al., 1996; CLARO, 2004). Comparing different indicators of performance measurement (in other words organizational effectiveness), MURPHY et al. (1996) recognize the importance of capturing the different sides of organizational performance, and suggests considering multiple dimensions, including both financial and non-financial indicators. Financial indicators such as the sales growth rate and profitability (return on sales or investments) are most widely used to capture performance (MURPHY et al., 1996). However, it is often unrealistic to measure the firm's performance based only on financial indicators. Considering the strategic objective set by a firm, it is important to also apply non-financial performance indicators such as product quality, customer/supplier satisfaction, the introduction of new products and increasing market share (HAN et al., 2006).

Numerous publications exist on performance measurement in buyer-supplier relationships (O´DONNELL/DUFFY, 2002; HAN et al., 2006; CLARO, 2004; LU, 2007; PAIVA et al., 2008). Still, it is difficult to unambiguously measure the performance of the buyer-supplier relationship since the actors often define the strategic objectives, which can often conflict (LU, 2007). Based on this assumption, different authors apply various conceptual models to capture the main factors in the buyer-supplier relationship affecting the performance. In the following, the overview of the reviewed literature with the relevant empirical findings is presented.

CLARO (2004) argues that the involvement of firms in a bilateral relationship has a positive impact on firm performance. Mainly through joint actions and the

solving the cooperative problem, the firms achieve higher efficiency in the buyer-supplier relationship. The firms engaged in joint action are able to share responsibilities and plan future objectives ex-ante. Therefore, the demand for time and necessary resources (especially for resolving of potential conflicts) will be optimized. HAN et al. (2006) test the impact of the degree of vertical coordination and quality management practices on the firm performance in the buyer-supplier relationship, based on 140 valid questionnaires collected in the Chinese pork processing industry. Though the hypothesis of the positive relationship between the degree of vertical coordination and performance is rejected in this research, the positive relationship between quality management practices and performance is confirmed. This result corresponds to the results of the case study interviews and supports the assumption of the present thesis. Further, LU (2007) evaluates the impact of contractual governance and trust on market performance (captured as the compliance with delivery requirements) in Chinese vegetable supply chains. The hypotheses tested on the buyer sample confirm that trust and closer forms of contractual governance positively affect market performance. These results partly correspond to those achieved by PAIVA et al. (2008), who analyzed the impact of the buyer-supplier relationship on the service performance of a company. The authors defined three basic aspects related to the buyer-supplier interaction: level of communication, perceived security, and dependability of exchange partners. MENTZER et al. (2001) refer to mutual information exchange and trust between the cooperation partners as essential factors for the success of supply chain management.

In the present research, the author expects tighter forms of vertical coordination to have an indirect positive impact (through the improvement of quality management and trust) on the performance of the processing companies. Being involved in vertical coordination, the processing companies are expected to improve the quality of their milk supplies and build trustful relationships with their suppliers. These factors are also expected to positively affect company performance. Based on the reviewed literature, the multidimensional measurement indicators are applied: financial indicators (such as an increase of profitability), as well as operational (non-financial) indicators will be used to assess performance (further information on the indicators of the model is presented in Chapter 5).

4.2 Conceptual framework

4.2.1 Motives of vertical coordination

Given the presence of opportunism, transaction-specific investments in physical and human capital (referred to as idiosyncratic) could lead to a so-called locked-in situation, and the specific identity of the parties can have important cost-bearing consequences. This evidently requires governance structures that would be able to decrease opportunism and favor inter-relational confidence. In the

frame of this research, it is assumed that the higher the level of asset specificity experienced by processing companies investing in their relationship with milk producers, the tighter are the forms of contractual governance that will be applied to secure the investments.

Hypothesis 1: A high level of asset specificity has a positive impact on tighter forms of contractual governance in the buyer-supplier relationship.

Political and economic structural changes in Ukraine during the transition process had significant impact on agricultural production and the structure of agribusiness. An annual decrease of milk production, as well as strong seasonal fluctuations of production cause a lack of raw milk for the processing industry, and lead to significant price changes on the milk market. Currently, the Ukrainian dairy sector is characterized by a low supply of high quality milk and dispersed, mostly small milk producers, which together cause high search, negotiation, transport and control costs for the processing companies. Uncertainty of the important input supplies (milk quantity and quality) and behavioral uncertainty of the milk suppliers (e.g. delivery planning) plays a significant role for the organization and level of production of the Ukrainian processing industry. In this situation, also called "thinness in the supply market" (BENSAOU/ANDERSON, 1999) the author assumes that the processing companies (buyers) implement tighter vertical relationships with the milk producers (suppliers).

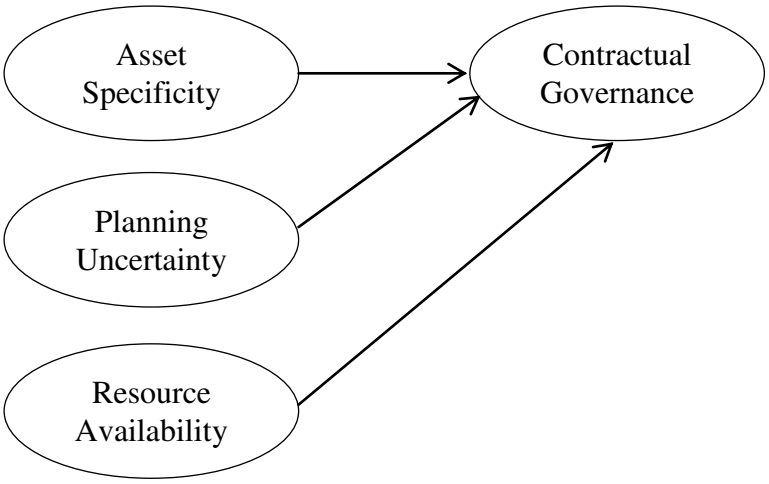
Hypothesis 2: High level of planning uncertainty has a positive impact on the tighter forms of contractual governance in the buyer-supplier relationship.

The resource-based view of the firm offers a complementary approach to the transaction cost theory and explains the boundaries of the firm through the lens of resources available to the company. The milk processing companies interviewed within the case study approach confirmed their willingness to implement or further extend the existing support programs for their milk suppliers. However, for many of those companies the availability of necessary resources appeared to be the limiting factor for the choice of assistance programs and the form of vertical coordination.[52] To empirically prove the impact of the availability of specific resources in the frame of this research, the author introduces additional variables to the conceptual model and assumes that the resource availability positively affects the introduction of the tighter form of contractual governance.

Hypothesis 3: Availability of resources has a positive impact on the tighter forms of contractual governance in the buyer-supplier relationship.

[52] Results of the case study interviews conducted in Ukraine in 2008/2009.

Figure 4.1: Conceptual framework: motives of vertical coordination



Source: Own research.

Based on the considerations derived from the transaction cost theory and the results of the empirical studies (HEIDE/JOHN, 1999; JOSHI/STUMP, 1999; CLARO, 2004; ZAHEER et al., 1998) the author assumes that the high level of asset specificity experienced by the processing companies in Ukraine will increase their involvement in joint actions with the milk suppliers. In this way, joint action is considered as the non-equity type of governance, which improves the mutual cooperation of both trading partners and serves as a safeguard mechanism for specific investments (based on HEIDE/JOHN, 1990 and JOSHI/STUMP, 1999).

Hypothesis 4: High level of asset specificity has a positive impact on the level of joint action in the buyer-supplier relationship.

Additionally, the level of uncertainty is considered to be an important factor that positively influences the extent of joint action in the buyer-supplier relationship. To reduce the uncertainty of milk supplies and the behavioral uncertainty of the suppliers, the processing companies are expected to be involved with joint action and joint planning with the milk producers. For example, while involving the suppliers into the production planning for the next season, the processing company indicates its interest for further deliveries and acquires additional information about the production process of the given suppliers. The positive impact of uncertainty on the extent of the joint action has been empirically proven by JOSHI/STUMP (1999, p.294), who argued that uncertainty "has a stronger effect on governance than originally posited by transaction cost theory." Also, in the frame of this research the author assumes that a high level of planning uncertainty has a positive impact on joint action in the exchange relationship between the processing companies and milk suppliers in Ukraine.

Hypothesis 5: High level of planning uncertainty has a positive impact on the tighter forms of joint action in the buyer-supplier relationship.

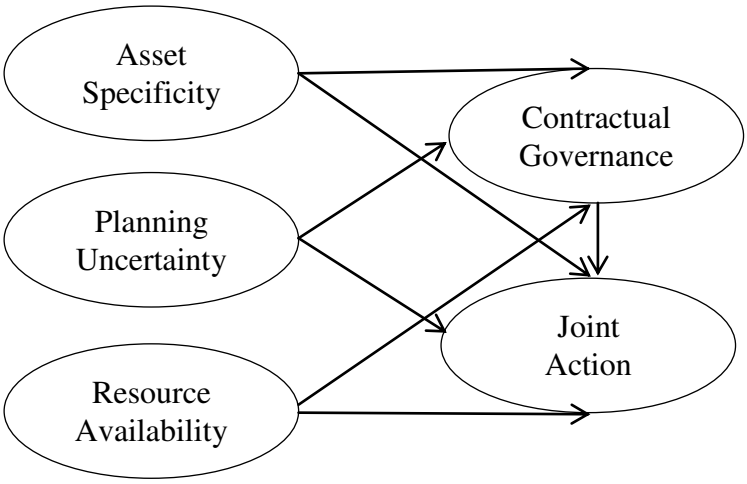
During the case study interviews the managers of the processing companies confirmed their involvement and interest in further expanding joint activities and support for the milk suppliers. Also, the managers emphasized the dependence of such activities upon the available resources. And while some forms of joint action can be organized with a low investment level, other forms of joint action require the availability of particular resources: implementing joint activities requires considerable investments of time, capital and human resources for both parties involved in the exchange relationship (JOSHI/STUMP, 1999). For a better understanding of the decision about particular forms and the extent of joint action, the author considers the resources (such as time, capital, know-how, management and human capital) available to companies. Furthermore, the author assumes a positive impact of the resource availability on the level of joint action between the processing companies and milk suppliers.

Hypothesis 6: Availability of resources has a positive impact on the level of the joint action in the buyer-supplier relationship.

According to WILLIAMSON (1985), contractual governance serves as the safeguard mechanism against opportunistic behavior by the transaction party. Formal contractual arrangements (in the form of contracts, financial shareholding and vertical integration) are expected to provide a higher level of security for the relationship, as well as efficient outcomes. If the interacting parties develop closer cooperation, they start carrying out their main activities in a more coordinated way (HEIDE/JOHN, 1990). Especially in terms of the post-transitional negative experience of contract breach, and delayed or missed payment for deliveries, the importance of the contractual form providing the maximal security for the relationship is considered crucial in the Ukrainian dairy industry. The author assumes that introducing tighter forms of contractual governance will lead to the higher mutual interlacing of actions between the processing companies and milk suppliers. In this way the level of joint action is expected to increase with the implementation of tighter contractual forms: the milk suppliers will get involved into the traditional buyers' activities of the processing companies, and later integrate into the milk suppliers' activities.

Hypothesis 7: Tighter forms of contractual governance in the buyer-supplier relationship have a positive impact on the level of the joint action in the buyer-supplier relationship.

Figure 4.2: Conceptual framework: vertical coordination



Source: Own research.

4.2.2 Outcomes of vertical coordination

The results of the case study interviews revealed the link between the schemes of the vertical coordination implemented by the interviewed processing companies and the managers' expectations for the outcomes of vertical coordination. The processing companies implemented various support programs and contractual arrangements in the context of vertical coordination to secure the high quality supplies for own production. Also, the analyzed empirical studies confirm the dependence of the various contractual agreements and the level of product quality achieved in such relationships (e.g. CURTIS/MCCLUSKEY, 2003; ALEXANDER et al., 2006; also see section 4.1.3 of this manuscript). Based on experience during transition, as many buyer-supplier relationships broke up and the agreements were not held by the contract parties, the secured agreements play a significant role for the trading parties in Ukraine. Corresponding to hypothesis 2 about the impact of planning uncertainty on tighter forms of contractual governance, the author expects tighter forms of contractual governance to have a positive impact on quality improvement of milk suppliers. The contractual agreements between processing companies and milk suppliers contain information about the expected milk quality, the level of payments according to the milk quality grade, and consequences for late and/or non-delivery of negotiated milk quality and quantity. Since they are signed by both parties, such agreements are expected to improve information exchange and serve as a guarantee that milk suppliers will increase their interest in delivering high quality milk.

Hypothesis 8: Tighter forms of contractual governance in the buyer-supplier relationship have a positive impact on quality improvement of milk supplies.

Along with tighter forms of contractual governance, the interviewed processing companies implement additional joint activities with the milk suppliers. For example, by jointly planning the production process, both the processing

company and the milk supplier achieve a better understanding of mutual needs and capabilities. A high degree of joint action allows the processing companies and the milk suppliers to recognize existing opportunities and possible risks, as well as to elaborate the plan of future actions. In the present research, the level of joint action (such as information sharing about milk quality, milk demand for the coming season, and the partners' requirements) is expected to positively influence quality improvement in the buyer-supplier relationships.

Hypothesis 9: Level of joint action in the buyer-supplier relationship has a positive impact on quality improvement in the buyer-supplier relationship.

Results of the case study interviews reveal that interviewed processing companies experience problems with missing governmental control mechanisms and actively search for optimal governance structures for cooperating with milk producers. The processing companies expect to increase mutual interest and interdependencies by developing vertical coordination with their suppliers. Better access to information, positive experience with contract fulfillment and agreed-upon workflows are expected to increase trust in the buyer-supplier relationship.

Hypothesis 10: Tighter forms of contractual governance in the buyer-supplier relationship have a positive impact on developing trust in the buyer-supplier relationship.

To safeguard the buyer-supplier relationship and coordinate the information and workflow between the partners, joint action is applied by the processing companies and the milk suppliers. Joint action undertaken by the companies in a buyer-supplier relationship is expected to provide both trading parties with a better understanding of mutual expectations and needs, and to serve as a basis for a positive working experience in the long term. Better problem solving, effective planning and efficient production between the processing companies and the milk producers are the expected results of the joint activities in the buyer-supplier relationships. Information sharing and cooperation experience that evolve as a result of the joint action are expected to increase the awareness of the partners' activities and, therefore, to increase trust in the given relationships.

Hypothesis 11: Level of joint action in the buyer-supplier relationship has a positive impact on trust development in the buyer-supplier relationship.

The interviewed managers of the milk processing companies emphasized the role of trust in the buyer-supplier relationships in Ukraine. Inter-personal trust based on long-term working experience with milk producers was one of the decisive factors for the processing companies to prolong a cooperation and to provide further support for the given suppliers. On the other side, the managers of the processing companies emphasized that transparent working conditions, clearly communicated requirements and timely payments for the delivered milk were important motivating factors for the milk suppliers to comply with the

quality requirements of processing companies. Based on these observations, and on the empirical evidence from the analyzed studies (e.g. SWINNEN, 2005; LU, 2007), the author assumes that trust between the milk producers and the processing companies will positively influence the quality of milk that suppliers furnish in the analyzed relationships.

Hypothesis 12: Development of trust between the buyers and suppliers has a positive impact on quality improvement of milk supplies.

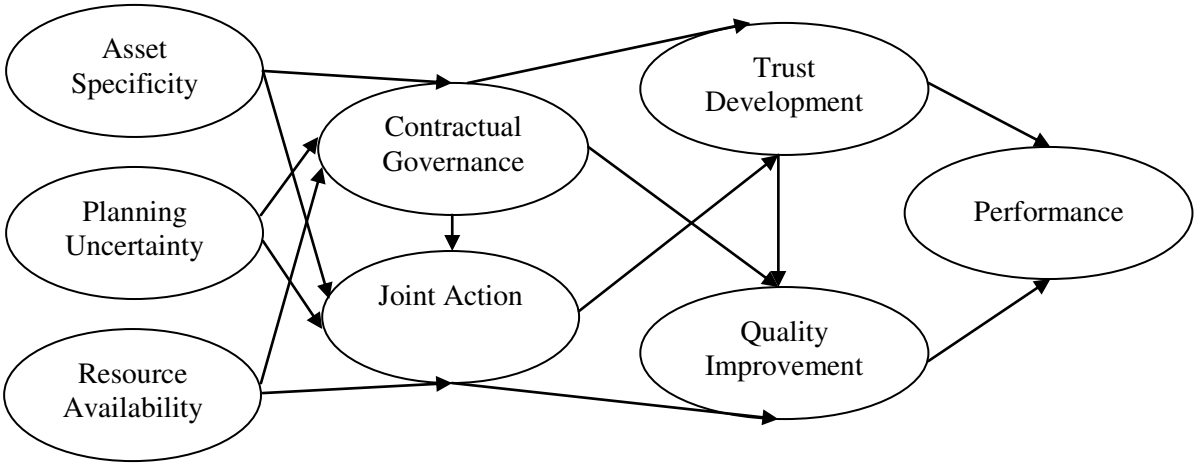
The study done by BANKER et al. (1998) confirms that cooperating rather than competing with each other allows the companies to achieve higher production results. Developing bilateral relationships allows the firms to achieve higher performance and efficiency in the buyer-supplier relationships (CLARO, 2004). The results of the case study interviews with the processing companies confirm the experience of the transition period (see e.g. SWINNEN, 2005): trust is considered to play an increasingly important role in the buyer-supplier relationships in Ukraine. In particular, trust originating from positive working experience is expected to positively influence the fulfillment of agreements and compliance with the partner's requirements. Trust is thus expected to reduce the negotiation and control costs in an established buyer-supplier relationship, and to positively influence the performance of the trading partners. In this research thesis, the author assumes that the development of trust between the processing companies and milk suppliers has a positive impact on the performance of processing companies.

Hypothesis 13: Development of trust between the buyers and suppliers has a positive impact on the performance of processing companies.

Quality improvements by the milk suppliers are expected to positively influence the performance of the processing companies. The impact of the quality management improvement on firm performance has been empirically confirmed by HAN et al. (2006) in the study on buyer-supplier relationships in the hog sector. Corresponding with hypothesis 2 and hypothesis 5, planning uncertainty is assumed to be one of the main drivers of tighter vertical coordination with milk suppliers for the milk processing companies in Ukraine. Securing milk deliveries enables the production of high quality milk products, which represents the main profit-generating activity of the milk processing companies. The managers of the processing companies emphasized that improving milk quality should bring additional advantages to the milk processing companies: To achieve good prices and constantly high orders from the supermarkets and (foreign) trading partners, the quality of milk products should be in line with the partners' requirements.

Hypothesis 14: Quality improvement of milk supplies has a positive impact on the performance of processing companies.

Figure 4.3: Conceptual framework: outcomes of vertical coordination



Source: Own research.

4.3 Conclusions

This chapter presents the conceptual framework and the main hypotheses for the empirical analyses of vertical coordination in the Ukrainian dairy industry. To elaborate the present conceptual framework, a combination of theories (transaction cost theory and resource-based view) and concepts (quality management, trust and firm performance) has been applied. This eclectic approach has been chosen to cover the specific features of the Ukrainian dairy industry, such as high transaction costs, opportunistic behavior of the suppliers, lack of trust between the trading partners, and uncertainty of milk deliveries. Transaction cost theory offers an appropriate approach for explaining the impact of planning uncertainty and transaction-specific investments on the various forms of contractual governance and joint action implemented by Ukrainian milk processing companies. Additionally, the importance of the available resources emphasized by the interviewed managers and their role in vertical coordination has been analyzed through the lens of the resource-based view of the firm. Based on the literature review and the results of the interviews with the company managers, trust development, increased milk quality and improved performance have been defined as the main outcomes of vertical coordination in the Ukrainian dairy industry. Therefore, the concepts of quality management, trust and firm performance have been applied to understand the complexity and interrelation of these aspects in the relationship between the milk processing companies and the milk suppliers in Ukraine. The combination of the presented theories and concepts enables the various elaborated aspects to be combined into a complex conceptual framework. The chosen approach provides deeper insights into the motives and outcomes of vertical coordination and allows a better understanding of inter-firm cooperation and alternative governance forms in Ukraine.

A total of fourteen hypotheses form the present conceptual framework. Based on the assumptions of the transaction cost theory and the resource-based view of firm, the issues of asset specificity, planning uncertainty and resource availability are assumed to have a positive impact on contractual governance and joint action between the processing companies and their milk suppliers. The tighter forms of contractual governance are expected to positively influence the extent of the joint action in the buyer-supplier relationships. Both contractual governance and joint action are expected to have a positive impact on quality improvement and trust between the processing companies and the milk suppliers. Trust evolving in the buyer-supplier relationships is assumed to have a positive impact on the quality improvement of the milk suppliers. Finally, trust development and quality improvement are expected to have a positive impact on the performance of the processing companies.

SECTION III EMPIRICAL RESULTS

5. RESEARCH DESIGN

This chapter presents the survey design and data analysis method (partial least squares - PLS) used to evaluate the research model. Subchapter 5.1 provides the questionnaire design and presents the data population. Subchapter 5.2 then explains the model specification and the reliability and validity criteria used for the model validation. Additionally, subchapter 5.2 provides an overview of the main advantages and shortcomings of the applied PLS approach in general, and the research model in particular. Subchapter 5.3 presents the constructs of the research model and 5.4 contains concluding remarks.

5.1 Questionnaire design and study population

To empirically test the hypotheses elaborated in Section II, a questionnaire was designed (see APPENDIX 3) and the top-managers of processing companies who are responsible for cooperating with milk suppliers were interviewed. This particular target group was chosen due to the managerial knowledge available through the respondents and their ability to estimate buyer-supplier relationships. It was necessary to collect primary data on vertical coordination in the Ukrainian dairy industry through personal interviews, as no sufficient information could be obtained from the secondary data sources. The questionnaire consisted of five information blocks including general company information and personal information of the interviewed managers, data on production and sales, information about the cooperation with the milk producers, applied support programs and the company's strategic advantages, including quality management and trust improvement. Both open and closed questions were used in the questionnaire. Open questions were mostly used in the first two sections of the questionnaire to collect company data about organizational form, sales and profits, number of employees, etc. Most questions were measured with multiple 5-item scales that ranged from 1 – not important (do not agree), to 5 – very important (fully agree). The measurement scales used in the questionnaire were elaborated by considering the validated items and scales applied in the existing empirical studies. After final corrections the questionnaire was sent to colleagues inside the IAMO Institute, as well as to the dairy market specialists of the Association Ukrainian Agribusiness Club in Kiev to approve the content's validity and its appropriateness to the business language in Ukraine.

The survey was conducted from May to July 2009 in different regions of Ukraine. The study sample included data from 38 milk processing companies, the names of which were omitted due to privacy concerns. The survey involved milk processing companies from 14 different Ukrainian regions, which are

shown in dark grey in figure 5.1. The numbers on the map show the number of the interviewed companies in each region.

Figure 5.1: Regional allocation of the interviewed companies, n=38

Source: Own survey.

The regional coverage of the survey (including 14 Ukrainian regions) was primarily aimed at covering the contingent regional differences that could have had an impact on the vertical coordination strategy implemented by the processing companies. Thus, the survey is thought to examine such differences as the different level of milk production in different regions, the different competitive situation on markets for raw milk and milk products, and various other concerns. The willingness of the companies to participate in the survey and the availability of direct contacts to the companies' top managers also played an important role in the choice of companies.

The survey was conducted in three steps. First, the initial database of milk processing companies was prepared. For this, the list of companies set up by the Dairy Industry Journal, in cooperation with the largest Ukrainian dairy processing companies, was used as a starting point (UKRAINIAN DAIRY INDUSTRY, 2003). This list contained information about 354 Ukrainian dairy companies. Since this database of companies was already several years old, the list of companies was refined: updated information on addresses, organizational forms, financial existence and personal contacts was added with the support of experts from the Ukrainian Agribusiness Club. Moreover, several professional organizations and unions in the Ukrainian dairy industry were contacted to request both their support and contact to their members. These partners included the Ministry of Agrarian Policy of Ukraine, the union of milk processing companies, the union of ice-cream producers, and the Dutch-Ukrainian dairy sector project "Infomoloko". An official letter from IAMO was sent to these organizations in March/April 2009 to request additional contacts to the

processing companies. A total of 120 processing companies with updated addresses and contacts were defined. These also included the largest and more or less centrally-located milk processing companies in Ukraine. The smallest and least important processing companies, which were characterized by a narrow range of products, low processing volumes and focus on the local consumers, could not be reached in most cases, and therefore were excluded from the survey. The results of the case study interviews also confirmed that this kind of company was very unlikely involved in vertical coordination with their suppliers, and therefore did not belong to the target group of the study.

In the second step the companies were contacted to determine whether they introduced the support programs for their suppliers in the context of vertical coordination, and if the management of the companies would participate in the survey. The managers of the companies who were responsible for milk collection and collaboration with the milk suppliers were contacted per telephone or per email. If they agreed to participate in the interviews, a further appointment was set for May, June or July 2009. The final choice of processing companies was primarily based on the scope of vertical boundaries established with their suppliers. Only companies that affirmatively replied to the question about implemented support programs for suppliers were involved in the survey. Of the 120 companies potentially available for the survey, 34 neither replied to the first or second attempts to establish contact, nor agreed to participate in the survey. A total of 39 companies replied that they do not introduce any kind of support programs for their suppliers. These companies were excluded from the survey mainly due to the fact that they would not be able to answer the question about the outcomes of vertical coordination and its impact on firm performance. And, consequently, the conceptual model could not be run with this data. Lastly, 3 companies no longer produced milk products and 6 companies did not respond until after the survey in Ukraine was completed. Though they received the questionnaires and sent them back by email, these questionnaires were incomplete and thus could not be included into the survey.

In the third step the managers of the companies who agreed to participate in the survey were contacted and personally interviewed by the author. The questionnaire and the introduction letter to the survey were sent to the managers beforehand to give them time to prepare particular information required for the interview (e.g. volume of production, profit, number of employees, etc.). The final number of processing companies interviewed was 38. Table 5.1 shows the number and the structure of the potentially available companies, as well as those that actually participated in the interviews.

Table 5.1: Structure of the milk processing companies, n=38

Company availability	Initial database "Ukrainian dairy industry"	Number of companies with actual contacts	Companies that did not agree to participate in the survey	Companies without implemented vertical coordination	Total number of companies participated in the survey
Number of companies	354	120	34	39	**38**

Source: Own survey.

Since there was no available information on how many of the existing milk processing companies introduced support programs for their suppliers, it was difficult to determine the percentage of the interviewed companies in the total population of milk processing companies in Ukraine. According to the results of the case studies, the large (annual sales volume over 20 mil USD and an annual volume of processed milk over 55,000 tons, see table 3.1) and often multinational companies more likely to introduce support programs in the context of vertical coordination than smaller companies. The amount of milk processed by companies involved in the survey was 3,072,500 tons in 2009. This made up 64.8% of the total volume of milk delivered to the processing industry in Ukraine (milk delivery to processing industry in 2009 was 4,742,000 tons, see table 2.10). Thus, 64.8% of the Ukrainian milk processing market was covered by the survey.

5.2 Data analysis method: partial least squares

This subchapter presents the method for data evaluation used in this study. Section 5.2.1 presents the model specification, section 5.2.2 gives an overview of the reliability and validity criteria of the reflective constructs, and section 5.2.3 presents the criteria for evaluating the structural model. Finally, section 5.2.4 provides an overview of the advantages and limitations of the PLS approach, particularly the research model.

To empirically evaluate the 38 company questionnaires, the PLS approach was used. Partial least squares Path Modeling is a statistical approach that allows the modeling of complex multivariable relationships between observed and latent variables. This approach also allows the estimation of theoretical causal relationships presented by linkages between the latent (not directly observable) complex concepts, which are measured by means of observable indicators covered by the questionnaire (VINZI et al., 2010).

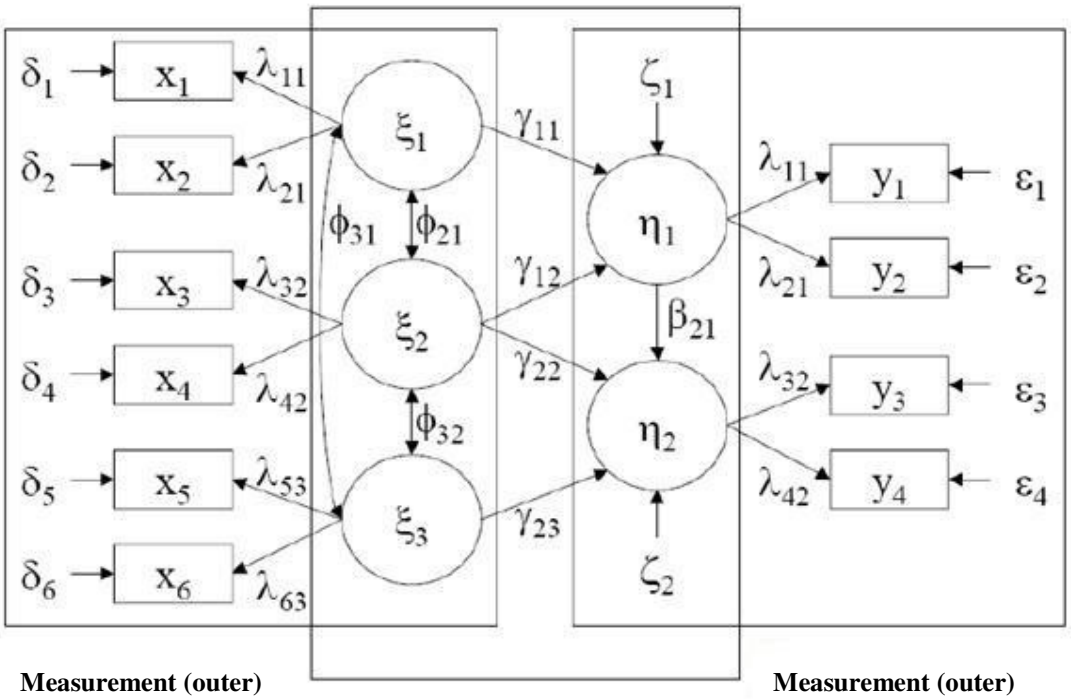
Partial least squares method is considered as an alternative to the prevalent covariance-based approaches and constitutes a component-based method whereby causality is formulated by linear conditional expectation. Developed by

WOLD (1980; 1982; 1985) as a soft modeling technique, this approach offers greater flexibility for solving various modeling problems in the case when the hard assumptions of traditional multivariate statistics cannot be fulfilled. Partial least squares is a prediction-oriented approach which purposes such goals as the explorative development of a causal model for the dependent and independent latent variables and prediction of the dependent variables in the structural and measurement equations (VINZI et al., 2010). This approach seeks optimal linear predictive relationships and can handle multiple independent variables even with a high level of multicollinearity, as well as relate the sets of independent variables and sets of multiple dependent variables (LU, 2007; VINZI et al., 2010). Partial least squares path modeling was carried out with the software application SmartPLS 2 developed at the University of Hamburg (Germany), School of Business.

5.2.1 Model specification

Partial least squares includes two sets of linear equations: (1) the inner model and (2) the outer model (RINGLE, 2004; BLIEMEL et al., 2005). The inner model (also called the structural model) specifies the relationships between the latent variables and therefore operationalizes the theoretically presumed relationships between the hypothetical constructs. The outer model (also called the measurement model) specifies the relationship between latent and manifest (or observed) variables (manifest variables are also called indicators).

Figure 5.2: Illustration of a complete causal model



Source: Adapted from RINGLE (2004).

To maintain generality, it is assumed that latent and manifest variables are scaled to the zero means so that constant parameters can be eliminated in the following equations (RINGLE, 2004). Specifying the causal model provided in the following sections and the formula from 5.1 until 5.5 are based on MARCOULIDES (1998). The inner (structural) model for relationships between the latent variables can be specified as:

$$\boldsymbol{\eta} = \boldsymbol{\beta 0} + \boldsymbol{\beta\eta} + \boldsymbol{\Gamma\xi} + \boldsymbol{\zeta} \qquad (5.1)$$

where η represents the vector of latent endogenous (dependent) variables, ξ represents the vector of latent exogenous (independent) variables, and ζ is the vector for residuals of the latent endogenous variables (unexplained variance). Coefficient matrix β represents the direct relationships between the latent endogenous variables and Γ is the coefficient matrix of direct relationships between the latent exogenous and latent endogenous variables. Assumed relationships between the latent variables in the structural model are represented graphically by means of a path diagram and tested by means of path analyses (MARCOULIDES, 1998, p. 311).

Theoretically-assumed relationships between the latent variables and related manifest variables are represented through covariance structural analyses with factor analysis models. The latent variables are determined through the measurement model by means of the main component analyses. The correlation between observed indicator variables can be traced back to the influence of latent variables; therefore, latent variables represent the construct that causes the observable value of related indicators. This causal relationship is called the reflective measurement model of latent variables; in this case the latent variables cause the related indicators. Formally, measurement models can be defined through the following equations. Outer (measurement) model with reflective indicators:

$$\boldsymbol{x} = \boldsymbol{\Lambda x\xi} + \boldsymbol{\varepsilon x} \text{ outer model of latent exogenous variables} \qquad (5.2)$$

$$\boldsymbol{y} = \boldsymbol{\Lambda y\eta} + \boldsymbol{\varepsilon y} \text{ outer model of latent endogenous variables} \qquad (5.3)$$

where Λx and Λy are the matrices of path coefficients (factor loadings of indicator variables on the latent exogenous or latent endogenous variables), and ε is the residual vector (measurement error of a particular indicator variable).

For the outer model with formative indicators, the equation can be defined as:

$$\boldsymbol{\xi} = \boldsymbol{\Pi\xi x} + \boldsymbol{\delta\xi} \qquad (5.4)$$

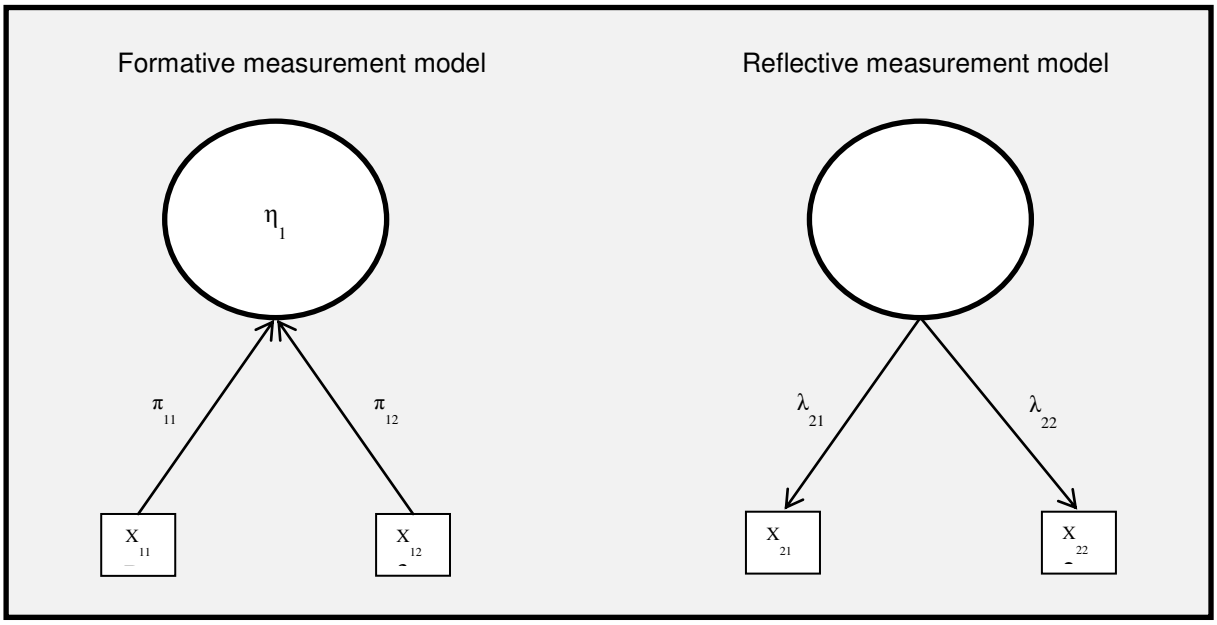
$$\boldsymbol{\eta} = \boldsymbol{\Pi\eta y} + \boldsymbol{\delta\eta} \qquad (5.5)$$

where ξ represents the vector of the latent exogenous (independent) variable and η represents the vector of latent endogenous (dependent) variable. Coefficients Πξ and Πη represent the multiple regression coefficients for the latent variables

on related set of indicators, and δξ and δη represent the corresponding residuals (MARCOULIDES, 1998, p. 312).

As mentioned above, constructs are defined as reflective or formative. In a reflective measurement model the direction of the causal relationship is determined by the corresponding rules from the theoretical level to the level of observations. In this case it is assumed that the latent variables cause the related indicators. In a formative measurement model the causal relationship is defined as moving from the observation level to the theoretical level. In the formative model the indicators cause the latent variable. When one of the related indicators changes, so does the value of the latent variable, while the values of all other indicators can stay the same (BLIEMEL et al., 2005).

Figure 5.3: Presentation of reflective and formative measurement models



Source: FRANKE (2005).

In the formative measurement model, $\eta_1$is a latent variable, x_{11} and x_{12} are the indicators (or observed/manifest variables), and π_{11} and π_{12} are factor loadings. The same principle works for the reflective measurement model presented in the right side of the graph. The causal relationship between the indicators and the latent variable in the measurement model determines the decision whether to use formative or reflective indicators for a construct (BOLLEN, 1989). The choice between the reflective and formative model is based upon two main conceptual assumptions: 1) If the theoretical construct causes the observed variables, the reflective model should be applied; and 2) If the theoretical concept appears as a result of the related observed variables, the formative model should be applied (BLIEMEL et al., 2005). The decision between the formative and the reflective models is determined by the formulation of the indicators. In the reflective model the observed variables indicate the direction from the theoretical

construct towards the manifest variables; in the formative model, the observed variables form and define the theoretical constructs.

JARVIS et al. (2003) elaborates a more detailed procedure and refers to the following features while characterizing the reflective model constructs:

- Causality direction goes from construct to items.
- Indicators are manifestations of the construct.
- Indicator changes do not cause changes in the construct.
- Construct changes cause changes in the indicators.
- Indicators should be interchangeable and have the same or similar content/share the common theme.
- Dropping any particular indicator does not change the conceptual domain of the construct.
- Indicators covariate with each other.
- Change in one of the indicators is associated with change of others.
- Indicators have the same nomological net and the same antecedents and consequences.

In this study the formulation of the manifest variables (items in the questionnaire) indicated the reflective form of the causal model. Due to the explorative nature of this research, the questions in the survey questionnaire were formulated to indicate particular concepts (e.g. asset specificity, uncertainty, resource availability, governance structure). This research innovatively combines two theoretical approaches for the analysis of vertical coordination in the Ukrainian dairy sector and therefore partially implicates the elaboration of the indicators that should be first empirically tested. Though this study is based on solid analyses of foregoing conceptual and empirical research, the elaboration of the questionnaire was partially explorative. This also implied the elaboration of empirical indicators for applied theoretical constructs.

One of the advantages of reflective measurement models is that through the higher number of indicators related to the reflective latent variable, the measurement errors in the single indicators can be minimized (HOMBURG/DOBRATZ, 1998). There is also a high level of choice freedom for the generation of the indicators for the reflective measurement models. Thus, researchers can choose from all possible indicators from the basic population randomly (DEVELLIS, 1991), or rely upon particular choice criteria (BLIEMEL et al., 2005). Indicators of the reflective measurement model should have a strong correlation to each other since they represent the replaceable measurements of the latent variable. The level of correlation can be used as an extent for the goodness of the reflective model (BLIEMEL et al., 2005). Since the indicators of the reflective latent variable are generally replaceable, there is no problem with

eliminating some indicators from the measurement and theoretical point of view. This simplifies the choice of the indicators for the reflective models. The construct measurement of the reflective measurement models is presented in the following subchapter.

5.2.2 Reliability and validity of reflective constructs

Since only reflective constructs were used in this study, we omit the description of the validation of formative constructs. Rather, this section presents the validation of reflective constructs, which include such important validating criteria as content validity, convergent validity, discriminant validity, nomological validity and reliability.

Content validity: The content validity of the constructs represents the grade to which the variables of the measurement model belong to the content-semantic construct block (BOHRNSTEDT, 1970). The important steps in defining the concept of the research were reviewing the literature and pre-testing the items in the field case studies. Examining the literature represents an important step in the definition of the constructs and the choice of related indicators. Though the reflective measurement model is considered less abstract and ambiguous than the formative model (see BAGOZZI, 1994), it was important to study the existing research on the topic of vertical coordination to define the indicators of the research model. Due to the explorative nature of this study, it was important to conduct the case studies in addition to the literature review to determine how well the measures used in the questionnaire apply to the research hypotheses.

Convergent validity: Important methods for testing convergent validity are generally based on item total correlation, explained variance and factor loadings. The item total correlation represents the extent to which the particular indicators correlates with the items used in the same construct. This study primarily refers to indicator reliability (including explained variance and factor loadings), which shows the share of the explained variance of a particular indicator that can be led back to the latent variable. More than 50% of the variance should generally lead back to the latent variable; this means that the factor loadings for the indicators with values higher than 0.7 should be accepted (CARMINES/ZELLER, 1979). If necessary, the number of indicators can be reduced to those with the highest factor loading. However, lower factors loadings could appear if newly developed scales are used in empirical research (HULLAND, 1999). Generally, the reflective indicators with the factor loadings lower than 0.4 should be eliminated from the measurement model (HULLAND, 1999; BLIEMEL et al., 2005).

Nomological validity: Nomological (or criterion) validity is a form of construct validity and refers to the degree to which a particular construct behaves as assumed in the joint system of related constructs (nomological system). This validity is checked with empirical data. Nomological validity refers to the

testing of the hypotheses about relations between the constructs used in research (STEENKAMP/VAN TRIJP, 1991). The acceptance of several hypotheses proves the nomological validity of the model.

Construct reliability: The reliability of the reflective constructs represents the goodness estimation at the construct level and refers to the extent to which the indicators consistently relate to the same construct. Construct reliability or internal consistency shows the extent to which the construct is measured by the related indicators. Internal consistency of the reflective measurement model can be defined as follows (FORNELL/LARCKER, 1981):

$$\text{Internal consistency} = \frac{(\sum_i \lambda ij)^2}{(\sum_i \lambda ij)^2 + \sum_i \text{var}(\epsilon ij)} \quad (5.6)$$

where λ_i is the loading of the indicator variable i of the latent variable, ϵ_i is the measurement error of the indicator variable i, and j is the index of all reflective measurement models.

For the construct reliability measures such as Cronbach's alpha, composite reliability, and average variance extracted (AVE) were applied in this empirical research.

Cronbach*'s alpha (α)* developed by CRONBACH (1951) is a statistic measure of the internal consistency or reliability of a construct. Cronbach's alpha is defined as:

$$\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K} \sigma_{Yi}^2}{\sigma_X^2}\right) \quad (5.7)$$

where K represents a number of components, σ_X^2 is the variance of the observed total test scores for the number of items, and σ_{Yi}^2 is the variance of component i for the sample of items.

Composite reliability (CR) implies the strong interrelation between the indicators related to the same construct. Composite reliability was developed by WERTS et al. (1974), and if used in the partial least square equation can be defined as:

$$\rho c = \frac{(\sum \lambda i)^2}{(\sum \lambda i)^2 + \sum \epsilon i} \quad (5.8)$$

where λ_i is the standardized loading coefficient of the path from the manifest (observed) variables to the latent variable, and ϵ_i is an error term defined as 1-λ_i^2.

Compared to Cronbach's alpha, the following implications can be applied to the composite reliability of constructs: CR does not assume equivalency among the measures with the assumption that all indicators are equally weighted. Cronbach's alpha can be considered as a lower estimation bound of the construct

reliability. The measure of composite reliability provides a closer approximation under the assumption of the accurate estimation of the parameters (CHIN, 1998). According to the empirical recommendations of the literature, the value of composite reliability of 0.7 or greater is reasonable (acceptable) for explorative research (NUNNALLY, 1988).

In the estimation of the research model, both measures of internal consistency are considered to test the reliability of the model (Cronbach's alpha and composite reliability). According to the information given above, composite reliability is considered as a superior (upper) measure to Cronbach's alpha when deciding whether the construct can be considered as reasonable. Cronbach's alpha refers to the lower level of consistency and is expected to take a lower value in comparison with CR. A value of 0.6 or greater is considered acceptable for explorative research (CHIN, 1998).

Average variance extracted (AVE) is used to measure the share of the variance that a latent variable receives from the related indicators compared to the measurement error. The recommended value of this measure is 0.5: in this case 50% or more of the variance is explained through the construct and not by measurement error. FORNELL/LACKER (1981) also interpreted this measure as an opportunity to test the construct reliability of the reflective constructs, along with alpha and composite reliability. Moreover, they argued that this measure tends to be more conservative compared to the composite reliability (FORNELL/LACKER, 1981). Average variance extracted is calculated as the sum of the squared standardized indicators loadings on the latent variable divided through this sum, plus the sum of the item error, and can be defined as follows:

$$\text{AVE} = \frac{\sum_i \lambda i^2}{\sum_i \lambda i^2 + \sum_i \text{var}(\epsilon i)} \qquad (5.9)$$

where λ_i is the component loading to an indicator and $\text{Var}(\epsilon_i)$ is the error measurement that = $1 - \lambda_i^2$ in the case of standardized indicators.

Discriminant validity: Along with indicator and construct reliability, discriminant validity should be assessed to fulfill the model's validation process. In general, discriminant validity refers to the difference in measurement between the model constructed with the same measurement instrument (BLIEMEL et al., 2005). Criteria of the discriminant validity used in the PLS approach applies to the assumption that the variance of the latent variable and its indicators are higher than the joint variance with all other latent variables. FORNELL/LARCKER (1981) implemented an alternative factor-based procedure to assess discriminant validity of the constructs. The FORNELL/LARCKER criterion (1981) implies that the square root of the average variance extracted (AVE) for a particular construct should be greater than the absolute correlation of the given construct with any other constructs of the model.

Another procedure that allows one to test the discriminant validity of the model is the check of the cross-loadings of the indicator items. Every indicator should have a higher correlation with its own latent variable compared to all other constructs. If there is a higher correlation of an indicator with another latent variable than with its respective latent variable, the model should be reconsidered for its appropriateness.

Table 5.2 summarizes all significant measures of reliability and validity of the reflective constructs that are further used to evaluate the research model.

Table 5.2: Validation criteria for reflective measurement model

Criterion	Description
Indicator reliability	More than 50% of the variance should generally lead back to the latent variable. Factor loadings for the indicators with value higher than 0.7; factor loadings with value under 0.4 should be eliminated.
Composite reliability	Composite reliability is a measure of internal consistency and must not be lower than 0.7. $\rho c = \frac{(\sum \lambda i)^2}{(\sum \lambda i)^2 + \sum \epsilon i}$
Cronbach's alpha	Cronbach*'s alpha (α)* developed by Cronbach (1951) is a statistic measure of the internal consistency or reliability of a construct. Lower bound of reliability and must be not lower 0.6. $\alpha = \frac{K}{K-1}\left(1 - \frac{\sum_{i=1}^{K} \sigma_{Yi}^2}{\sigma_X^2}\right)$
Average variance extracted	Average variance extracted (AVE) measures the share of the variance that a latent variable receives from the related indicators compared to the measurement error. The recommended minimal value of this measure is 0.5. AVE = $\frac{\sum_i \lambda i^2}{\sum_i \lambda i^2 + \sum_i var(\epsilon i)}$
Fornell & Lacker criterion	FORNELL & LARCKER criterion (1981) implies that the square root of the average variance extracted (AVE) for a particular construct should be greater than the absolute correlation of the given construct with any other constructs of the model.
Cross-loadings	Indicators should have a higher correlation with its own latent variable compared to all other constructs. If there is a higher correlation of an indicator with another latent variable than with its respective latent variable, the model should be reconsidered for its appropriateness.

Source: BLIEMEL et al. (2005), FORNELL/LARCKER (1981), CHIN (1998), NUNNALLY (1988).

5.2.3 Evaluation of the structural model

Reliability and validity estimation of the outer (measurement) model permits further evaluation of the inner path (structural) model. Since there is no global goodness of fit index that applies for the PLS structural modeling, different indicators should be tested to evaluate the model (BLIEMEL et al., 2005; BACKHAUS et al., 2003). The important criteria for estimating the structural

model applied in this research are R^2, path coefficients and the bootstrapping procedure.

The coefficient of determination of endogenous latent variables, R^2, usually provides some information about the goodness of fit of the model (BACKHAUS et al., 2003). For example, coefficient of determination can be defined as the proportion of response variation, which is explained by the explanatory variables of the model; R^2 takes the value range from 0 to 1. Generally, the higher the share of explained variance, the higher is the coefficient of determination (BLIEMEL et al., 2005). For example, R^2 being equal to 0.8 means that 80% of the variation of the dependent variable can be explained through the related explanatory variable, and the rest is assumed to be explained by unknown variables or inherent variability. CHIN (1998) defines the R^2 values applied to the PLS approach as 0.67 – substantial; 0.33 – moderate; and 0.19 – weak. HENSELER et al. (2009) add that if the endogenous latent variable is based upon several latent variables, then the R^2 value should exceed the substantial level of 0.67. However, if the model structure only includes one or two exogenous latent variables, then the moderate level of R^2 can be accepted (HENSELER et al., 2009).

The individual path coefficients of the PLS structural equation model can be interpreted as the standardized β – coefficients of ordinary least squares regression method (HENSELER et al., 2009; BLIEMEL et al., 2005). Path coefficients are used to examine the possible causal relationships between the latent variables in the structural equation models. The estimated values of the path-loading coefficients should be evaluated in terms of sign, magnitude and significance. If the path coefficients keep the assumed algebraic sign, then the empirical validation of the theoretically assumed relationship between the latent variables is provided. However, if the sign of the path coefficient is different from the expected one, the previously formed hypotheses are not supported. The hypotheses can be accepted if the values of the path coefficients are above the threshold of 0.1 according to LOHMφLLER (1989). CHIN (1998) applies a slightly stricter criterion, and defines the path coefficients with the value of 0.2 as significant. Furthermore, the significance level of the path coefficients is estimated by means of a bootstrapping procedure.

Bootstrapping is a resampling technique that can be used to determine the confidence intervals for the path coefficients, thereby providing the basis for statistical inference. This method represents a nonparametric approach for estimating the precision of the PLS values and provides an estimate of the shape, spread and bias of the sampling distribution. The observed sample is treated as if it would represent the basic population (HENSELER et al., 2009). To estimate the parameters in the PLS model, N number of sample sets are created to obtain N estimates for each parameter. Each bootstrap sample should include the same number of cases as the original sample. Step-wise, each sample is obtained by

randomly drawing cases with replacements from the original sample set (MARCOULIDES, 1998). The path model will be estimated for each bootstrap sample. The coefficients of the obtained path model build a bootstrap distribution, which is the approximation of the sampling distribution. The bootstrapping procedure provides the statistical testing of the hypothesis H0: w=0, where w is any parameter estimated by PLS against the hypothesis H1: w $\neq$ 0 at m + n – 2. Here, m is the number of PLS estimates for w in the original sample, equal to 1, and n is the number of bootstrap estimates for w. The bootstrapping procedure provides the significance level of factor loadings, path coefficients, as well as mean values, standards errors and t-values for each path coefficient (t-value >1.65 is significant at the 0.05 level, t-value > 2 is significant at the 0.01 level) (HENSELER et al., 2009; MARTINEZ-RUIZ et al., 2009).

5.2.4 Advantages and limitations of the PLS approach

The main characteristics of the PLS path modeling approach are summarized by HENSELER et al. (2009) as follows: the PLS approach estimates the variable scores that are measured by at least one or more manifest variables (indicators). One of the important advantages of the partial least squares method is that it does not have problems with small size samples, and therefore can also be applied in those cases where other methods cannot be used (e.g. hard modeling techniques like LISREL). This allows the data sample of only 38 units available in the context of this study to be evaluated. Since only a low number of processing companies implement additional coordination mechanisms and support programs for their suppliers, it was difficult to collect a higher number of respondents in Ukraine. There are several guidelines suggesting the optimal size for the given structural model. CHIN et al. (1996, p. 39) argues that the research sample should be equal to or larger than "ten times the largest number of structural paths directed at a particular construct in the model." Further, CHIN et al. (1996) also refers to TABACHNIK/FIDELL (1989), who in turn suggest the same rule of thumb but multiplied by five instead of ten times. WOLD (1989) gives an example of analyzing a data set that consists of ten cases; the model has two latent constructs and 27 variables.

Still, there are some limitations connected with the sample size and the number of indicators reflecting the latent variables. Though the PLS approach is also able to deal with smaller sample sizes, some of the less significant effects could be left out in this research due to a low number of cases. Joint conditions of consistency that refer to a large sample size and consistency at large – increasing number of indicators for latent variables are required for the estimates to be asymptotically correct (CHIN et al., 1996). Otherwise, this can cause the overestimation of the loadings to the constructs and underestimation of the structural paths between the constructs. But since sufficiently high values of reliability and validity of reflective indicator constructs were obtained for the

research model, its results can be considered reliable and solid for the explorative purpose of the present research. This has also been confirmed by the reviewed literature (CHIN et al., 1996; TABACHNIK/FIDELL,1989; LOHMφLLER, 1989), which analyzes the application of the PLS approach for the studies with a low number of cases. Based on these considerations the results of this study are considered valid and reliable.

Another advantage of the PLS path modeling is the ability to estimate models with a high number of latent and manifest variables. This is possible because every construct is calculated separately. Since the conceptual model in this research includes eight latent variables and their complex interrelations (which represent hypotheses) the PLS offers the only possible solution for evaluating the model as a whole system.[53] Partial least squares also allows flexible numbers of the indicators used to reflect each of the latent variables: To reflect a latent variable at least one indicator is sufficient. There are also not such restrictive assumptions about the error terms and the distribution of the variables. To sum up, the PLS approach is a significant method of analysis because of its minimal demands on measurement scales, sample size and residual distribution.

Furthermore, this method can be used not only to confirm the known theoretical relationships but also to determine whether some other relationships exist. This characteristic allows further propositions to be elaborated on for future research (LU, 2007). GEFEN et al. (2000) describes PLS as the prediction-oriented method, which does not require strong theory and can also be used as a theory building method. JÖRESKOG/WOLD (1982, p. 270) suggest that "PLS is primarily intended for causal-predictive analysis in situations of high complexity but low theoretical information." This fact plays an important role for the present research, which to a great extent is of an explorative nature. Though the theoretical assumptions taken into considerations in terms of this research are well-established and broadly known, the combination of theories and the research hypotheses represents a quite new field and barely find analogues in the existing empirical literature. The PLS method offers enough flexibility and explorative power to empirically test the posed hypotheses.

Still, some limitations of the PLS approach can be found in the literature. FORNELL/CHA (1994) refer to several shortcomings in the properties of the PLS estimators. These authors argue that the estimate of the latent variables in PLS is inconsistent since their case values are estimated as weighted aggregates of the corresponding blocks of indicators; these values are inconsistent with measurement errors (WOLD, 1982; 1985). DIJKSTRA (1983) refers to the estimates of loadings and structural coefficients, and argues that the

[53] Although, first trials to evaluate the sample by means of statistical functions offered by SPSS (e.g. descriptive statistics, regression, cluster analysis) gave important initial information about the general tendencies and trends, they failed to analyze the complex system of interactive constructs and research hypotheses.

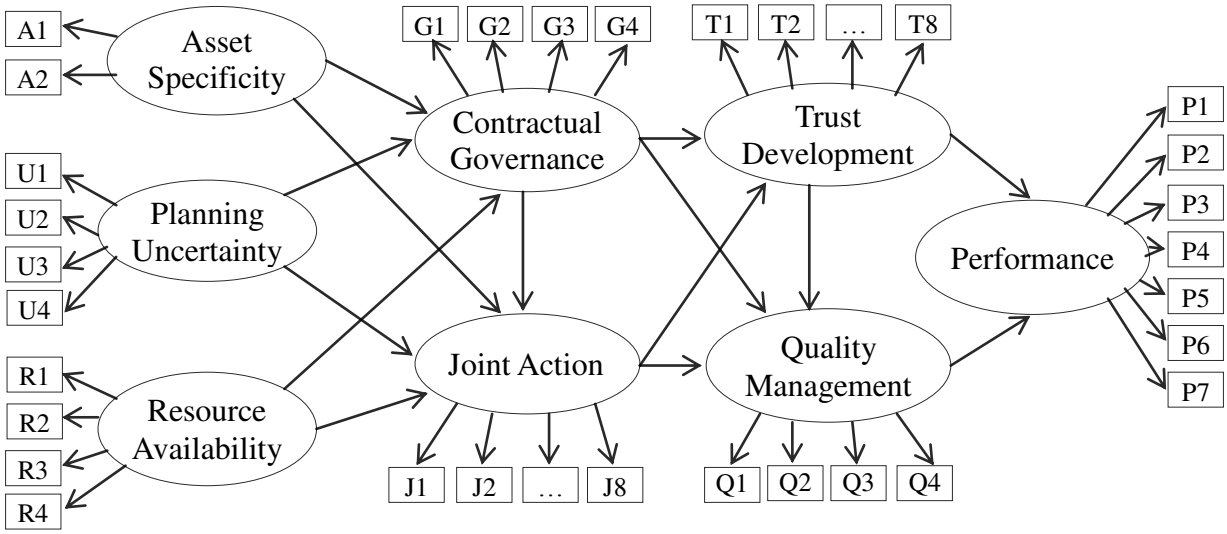
relationships between the latent variables are biased, over or respectively underestimated. However, the bias factors of the factor coefficients and the correlations can be reduced through a higher number of observed (manifest) variables (FORNELL/CHA, 1994). A general recommendation is that the increasing number of observed variables and the number of cases in the sample can reduce the shortcomings of the PLS approach. CHIN (2010) makes a distinction in a predictive nature of the PLS estimation. Though the PLS path modeling is a method that provides scores for predictive purposes, the models with significant bootstrap parameter estimates may still be invalid in a predictive sense and can be considered significant only for a given sample of data. Only after the verification of the model is done by estimating the new data for the same underlying population can the model be considered as predictive. In this study the possible limitations caused by a low number of observed variables could mean that the results of the survey are only significant for a given sample of data and cannot be seen as predictive for a full population group. In other words, should this limitation argued in the literature turn out to be true, the results of this study would still explain the motives and the outcomes of the vertical coordination in the Ukrainian dairy industry. Though to test the conceptual model for its predictive ability, the larger sample should be used.

The PLS approach enables the evaluation of the complex interrelationships within the conceptual model. However, existing restrictions (low sample size and choice of the indicators reflecting the constructs of the model) could have implications on the model and the final results. The presence and thus the dimension of these implications, however, cannot be measured precisely in terms of the present research. As recommended above, running the model with a larger sample might provide additional information about the model's predictive nature. Though the choice of the indicators for the model's constructs was done based on the solid previous analyses of existing theoretical and empirical studies, some constructs could still be optimized or extended by additional indicators. The author would recommend additional evaluation of the elaborated conceptual model while using new survey data, and where necessary additional indicators for the model's constructs.

5.3 Constructs used to define the research model

This section presents the operational structure of the conceptual framework. To test the underlying set of hypotheses with PLS, the theoretical constructs have been translated into the PLS system. As outlined, the PLS model consists of eight constructs: planning uncertainty, asset specificity, resource availability, contractual governance, joint action, quality management, trust development and performance (figure 5.4).

Figure 5.4: The PLS model



Source: Own research.

The eight theoretical constructs form the latent (not directly observed) variables in the PLS model. Each latent variable is measured by a set of indicators (items from the questionnaire). According to the chosen reflective measurement approach it is assumed that the latent variables cause the related indicators. The following sections outline how the latent variables have been operationalized in the quantitative survey.

5.3.1 Planning uncertainty

Referring to the theoretical assumptions of transaction cost theory applied in this study, uncertainty is defined as dimension characterizing transactions that results from difficulties of gathering and processing information, and therefore increases transaction costs (SCHLEINITZ, 1998). Two different types of uncertainty are provided in the related literature: environmental and behavioral. Environmental uncertainty refers to the lack of knowledge about exogenous factors (e.g. change of consumer preferences, implementation of standards, etc.) and therefore cannot be influenced by the actors and requires their adjustments. Behavioral uncertainty instead refers to the difficulties of forecasting the behavior and future actions of economic actors, especially under the assumption of potential opportunistic behavior (SUTCLIFFE/ZAHHER, 1998). Behavioral uncertainty is considered to be the most important in the context of transactions (WILLIAMSON, 1985) since this uncertainty affects the decision of the firm on different organizational forms of business relationship.

To operationalize the construct planning uncertainty in the PLS model, four items were selected from the questionnaire (see table 5.3). The indicator U1 refers to the stability of production planning according to milk delivery, and therefore represents environmental uncertainty. Since such a situation cannot be

directly influenced by the processing companies, they have to adjust to the given conditions. The indicator measuring the stability of supplies was used for the construct uncertainty by HAN et al. (2006) in his study on the Chinese pork processing industry. Additionally, the indicators U2, U3 and U4 were used to define the construct planning uncertainty in this research. These indicators represent behavioral uncertainty and refer to supplier behavior. The indicator U2 represents the processor's view on the behavior of the milk suppliers that deliver milk to the companies and refers to such terms as being honest and reliable. Due to the specifics of this study (or more due to the specifics of the Ukrainian business environment), it was important to test the reliability of the relationships organized by oral agreements and those based on written contracts: These two approaches are both broadly used in the buyer-suppliers relationships in the Ukrainian dairy industry. Therefore, the indicator U3 measures the stability of a buyer-supplier relationship secured through the written contract, and the indicator U4 measures the stability of the relationship based upon the oral agreement.

Table 5.3: Indicators of the construct planning uncertainty

Nr.	Indicator	Questionnaire	Measurement scale
U1	prod_stable	Production planning is stable according to milk delivery: we can always rely on getting the required milk quantity and quality.	1 (do not agree) – 5 (fully agree)
U2	suppliers_honest	Our suppliers behave honestly and reliably towards the company.	1 (do not agree) – 5 (fully agree)
U3	suppliers_fulfill_contract	Milk producers always fulfill the terms of the contract.	1 (do not agree) – 5 (fully agree)
U4	suppliers_fufill_agreem	Even without written contracts between the company and milk suppliers, the agreements are always fulfilled.	1 (do not agree) – 5 (fully agree)

Source: Own survey.

5.3.2 Asset specificity

Asset specificity is the construct used in the PLS model to explain the decision of the processing companies to implement vertical coordination. The term "asset specificity" is related to the extent to which investments are specific for a given transaction (transaction specific investments) and have little or no alternative value (WILLIAMSON, 1979). In the case of opportunistic behavior by the cooperation partner, the company that already made some investments into the cooperation turns out to be in a less advantageous position. To avoid such a situation, the investor (in this case the milk processing company) will try to secure its position and investments through tighter contractual agreements.

To operationalize the construct of asset specificity, two indicators were selected from the questionnaire: indicator A1, which refers to physical specificity, and

indicator A2, which refers to human specificity (see table 5.4). The first indicator (A1) refers to the extent to which the processing companies believe they would lose their investment (mainly into hard assets such as machinery and equipment) if they lose their suppliers. The second indicator (A2) refers to the possibility of finding new milk suppliers if the processing company would change or lose its actual suppliers. These two indicators were elaborated based on similar indicators that were applied by HAN et al. (2006) in his study on the Chinese pork processing industry.

Table 5.4: Indicators of the construct asset specificity

Nr.	Indicator	Corresponding question from the survey questionnaire	Measurement scale
A1	change_loose	If we change/lose our main suppliers, we will lose what we invested in them.	1 (do not agree) – 5 (fully agree)
A2	change_find	If we change/lose our main suppliers, it will be difficult to find a new one.	1 (do not agree) – 5 (fully agree)

Source: Own survey.

5.3.3 Resource availability

Whereas transaction cost economics focuses on the choice of efficient governmental structure to reduce the costs of transaction, the resource-based view emphasizes the role of resource combination for implemented firm strategy and competitive advantage. A distinctive feature of the resource-based view compared to transaction cost economics is the rationale to maximize value using the firm's valuable resources (DAS/TENG, 2000). The resource-based view allows the analysis of vertical coordination from a strategic management perspective. In this context, inter-firm coordination is understood to be an opportunity for resource sharing and overcoming resource-based growth constraints (HAMEL, 1991). Thus, the focus is shifted away from a cost minimization perspective and the importance of the firms' individual skills, capabilities, and knowledge is highlighted (MADHOK, 2002).

Four indicators define the construct resource availability (see table 5.5): availability of managerial and organizational knowledge (R1), educational level of employees (R2), availability of consultancy support (R3), and cooperation with scientific institutions (R4). In this study it is assumed that the availability of these particular resources to the processing company has a positive impact on the company's decision to implement closer forms of vertical coordination, and furthermore offers strategic advantages for this particular company over its competitors. Though there are several theoretical papers that combine transaction cost economics with the resource-based view to understand inter-firm relationships, this research innovatively applies this conceptual framework for explorative empirical analyses of vertical coordination in the Ukrainian dairy industry.

Table 5.5: Indicators of the construct resource availability

Nr.	Indicator	Questionnaire	Measurement scale
		What role did the following factors play for your decision to implement support programs for the milk producers?	
R1	manag_kn	Managerial and organizational knowledge	1 (not important) – 5 (very important)
R2	educ_level	Educational level of employees	1 (not important) – 5 (very important)
R3	consult_support	Available consulting support for the company	1 (not important) – 5 (very important)
R4	scien_coop	Cooperation with scientific institutions	1 (not important) – 5 (very important)
~~R*~~	~~financial_res~~	~~Available financial resources~~	~~1 (not important) – 5 (very important)~~

Source: Own survey.

Initially, the construct resource availability included an indicator for financial resources (R*). However, due to a very low loading value (below 0.4), this indicator was eliminated from the construct in accordance with the rules of PLS path modeling. For more information on convergent validity, see section 5.2.2. For a discussion of the model's results, and the role of financial resources in particular, see Chapter 6.

5.3.4 Contractual governance

According to transaction cost economics in the presence of opportunism, transaction-specific investments made by one party cause an incentive for another party to make use of this dependence, and cause additional costs for the first party. This evidently requires governance structures that would be able to decrease opportunism and favor inter-relational confidence (WILLIAMSON, 1979; 1985). As the milk quality attributes are difficult to measure due to the high number of producers, small-scale production and large number of low-volume deliveries, the milk producers can easily engage in opportunistic behavior to skew the information. The appropriate form of contractual governance serves as the safeguard mechanism against the opportunistic behavior of the transaction party. Using formal contractual arrangements (in the form of contracts, financial shareholding and vertical integration) that provide higher security into a relationship is supposed to serve for efficient outcomes. The availability of resources also plays a significant role when deciding whether or not to implement contractual arrangements of various form and extent in the buyer-supplier relationship. Having secure collaboration contracts and long-term experience with contract fulfillment should increase the mutual trust level and engagement in joint activities. Especially in terms of post-transitional negative experience of contract breach, or delayed or missing payment for deliveries, the

importance of an applied contractual form to provide maximum security into the relationship is crucial.

In this study four indicators define the construct contractual governance (see table 5.6): the extent of vertical coordination (G1), design of the contracts (G2), the duration of the written contracts (G3), and the vertical integration of production stage (G4). These four indicators define the form and extent of contractual governance applied in the relationship between the processing company and its milk suppliers. The first indicator (G1) represents the extent of vertical coordination applied by the processing company. This indicator measures what share of the milk suppliers are involved in the tighter form of vertical coordination (this is measured in percentage of milk deliveries coming from the suppliers). This indicator applies to both types of suppliers: corporate farms and semi-subsistence farms. The second indicator (G2) represents the design of the contract where one of the cooperating parties was forced (or forced another) to sign a contract, or the contract elaboration succeeded jointly under consideration of mutual interests. The third indicator (G3) refers to the duration of the written contracts (mainly signed with the corporate farms), and in this way measures the length of the cooperation between the processing companies and their milk suppliers. In this way, short-term contracts are considered to be a less advanced form of contractual governance compared to long-term contracts. Finally, the fourth indicator (G4) refers to the involvement of processing companies in milk production and the integration of milk farms as representing the most advanced form of contractual governance in the buyer-supplier relationship. The idea of the indicators used in this construct partially originates from the study done by HAN et al. (2006) on the Chinese pork processing industry. In his research HAN et al. (2006) used three indicators to determine the extent of vertical coordination in the buyer-supplier relationship; these indicators captured whether the cooperation between trading partners was based on the spot market or contracts, and whether the companies invested to establish their own farms in order to ensure the quality of supply.

Table 5.6: Indicators of the construct contractual governance

Nr.	Indicator	Questionnaire	Measurement scale
G1	VC_share	What share of milk deliveries is obtained from those producers who receive support programs from the company?	1 (under 20%) 2 (20-40%) 3 (40-60%) 4 (60-80%) 5 (over 80%)
G2	contract_design	Who was the initiator of the contract elaboration: the company alone or both parties together?	1 (company) 2 (company and milk producer)
G3	contract_duration	For which period are the written contracts signed between the processor and milk producer?	1 (one supply only) 2 (one year and less) 3 (more than 1 year)
G4	vert_integration	Does the company implement some of the following or other producer's support programs? Shareholding and integration of milk production	0 (no) 1 (yes)

Source: Own survey.

5.3.5 Joint action

Joint action by the transaction parties represents the extent of joint planning and activities, and can also be seen as an additional mechanism to protect against opportunistic behavior by the partner. In the buyer-supplier relationship, the parties can increase their mutual interest and interdependences by developing bilateral cooperation. Joint actions undertaken by partners in a relationship provide better access to knowledge and working experience, and therefore allow better problem solving, more effective planning and efficient production. Information sharing and joint working experience increase the awareness of a partner's activities and plans, and increase trust in the relationship.

The construct joint action includes 8 indicators (see table 5.7). The first two indicators (J1 and J2) represent the perception of the processing companies about the extent of joint planning of milk demand with corporate farms (J1) and semi-subsistence farms (J2). The indicators J3 and J4 represent how far the processing companies reported compliance with the requirements by corporate farms (J3) and semi-subsistence farms (J4). The indicators J5, J6, J7 and J8 represent the extent of information sharing by corporate and semi-subsistence farms. The indicators composing the construct joint action were chosen based on the theoretical considerations determining the phenomena of the joint action in the buyer-supplier relationships, as well as the knowledge collected directly from the managers of the milk processing companies in Ukraine. Empirical evidence of the positive impact of the level of joint action in the buyer–supplier

relationship is presented by ZAHEER et al. (1998). When involving the suppliers into the planning of the production process for the next period, the processing company indicates its interest for further deliveries and also acquires additional information on the supplier's production process. Thus, joint action not only safeguards the buyer-supplier relationship but also coordinates the allocation of resources and activities between the partners.

Table 5.7: Indicators of the construct joint action

Nr.	Indicator	Questionnaire	Measurement scale
J1	plan_demand_f	We plan our milk demand for the next season together with the producers: corporate farms.	1 (do not agree) – 5 (fully agree)
J2	plan_demand_h	We plan our milk demand for the next season together with the producers: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)
J3	suppl_improve_f	Our suppliers seek to meet our requirements and to improve the cooperation: corporate farms.	1 (do not agree) – 5 (fully agree)
J4	suppl_improve_h	Our suppliers seek to meet our requirements and to improve the cooperation: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)
J5	suppl_info_organize_f	Our suppliers regularly provide us information, which allow us to optimally organize the milk deliveries: corporate farms.	1 (do not agree) – 5 (fully agree)
J6	suppl_info_organize_h	Our suppliers regularly provide us information, which allow us to optimally organize the milk deliveries: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)
J7	suppl_info_quality_f	Our suppliers regularly provide us information, which allow us to determine the quality of milk we buy: corporate farms.	1 (do not agree) – 5 (fully agree)
J8	suppl_info_quality_h	Our suppliers regularly provide us information, which allow us to determine the quality of milk we buy: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)

Source: Own survey.

5.3.6 Quality management

The term quality management refers to both product design and adjustment of the attributes which are used by the consumers during their evaluation of the company and its products (BANKER et al., 1998). To improve product quality and reduce the costs of quality control at every stage of production and processing, the companies establish tighter forms of vertical coordination with their suppliers. BANKER et al. (1998) argue that companies achieve higher results

in quality management if they cooperate rather than compete; this occurs under conditions when cooperative arrangements reduce the fixed costs of quality improvement, and when there is high relative quality responsiveness of the demand function. A number of theoretical and empirical papers confirm the predictions of the theory about the positive impact of contract incentives as a measure of vertical coordination on the quality of agricultural products. According to CURTIS/MCCLUSKEY (2003), vertical coordination should solve two problems: a low level of raw material supply and non-fulfillment of quality requirements. The substantial importance of the product quality for the firm performance was also shown by BANKER et al. (1998).

The construct quality management aims to capture improvements in the quality practices at milk farms as a result of introducing tighter forms of contractual governance and joint cooperation activities between the processing company and milk suppliers. To define the construct quality management in the research model, four indicators (see table 5.8) were used: better fulfillment of hygienic norms by corporate farms (Q1) and semi-subsistence farms (Q2), as well as the quality increase of the milk supply by corporate farms (Q3) and semi-subsistence farms (Q4) after implementing tighter coordination mechanisms by the milk processing companies. The applied indicators determine the improvement of the milk quality in two different ways, both of which are considered very important by the milk processing companies. Improving hygienic practices decreases the direct contamination (e.g. dirt or foreign particles) of milk, and the quality increase refers to improvements in milk content such as fat and protein content (e.g. due to better feeding rations).

Table 5.8: Indicators of the construct quality management

Nr.	Indicator	Questionnaire	Measurement scale
		After implementation of support programs:	
Q1	fulfill_hyg_norms_f	Milk producers fulfill the hygienic norms: corporate farms.	1 (do not agree) – 5 (fully agree)
Q2	fulfill_hyg_norms_h	Milk producers fulfill the hygienic norms: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)
Q3	Quality_increase_f	The quality of milk deliveries from producers increased: corporate farms.	1 (do not agree) – 5 (fully agree)
Q4	Quality_increase_h	The quality of milk deliveries from producers increased: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)

Source: Own survey.

5.3.7 Trust development

The role of trust in buyer-supplier relationships receives much attention in the literature, and mainly emphasizes two issues (HANSEN et al., 2001). First, trust has been empirically found to reduce the cost of transactions by reducing both negotiating and contracting costs (DYER, 1997; GULATI, 1995). Second, trust is

considered by strategic management scholars to enhance revenues for alliances through better collaboration and more advanced resource usage (BARNEY/HANSEN, 1994; DYER/SINGH, 1997; HANSEN et al., 2001). It is expected that implementing vertical coordination positively facilitates the development of trust among actors in the processing and production stages. Both types of trust (interpersonal and inter-organizational) can evolve during a business relationship and can improve the stress resistance and resilience of a relationship. Interpersonal trust arises from previous interaction experiences or memberships in definite social groups, while inter-organizational trust results from the embedded trust behavior of corporate units, i.e. firms with a strong corporate identity and high-trust culture (WILLIAMSON, 1979). In a more trustful relationship, both partners gain advantages from advanced planning and collective actions. Firms who can trust their partners are more willing to engage in bilateral cooperation and are ready to meet requirements and provide timely and accurate information about the production process. Indeed, trust provides a long-term basis for recurring efficient cooperation that offers mutual benefits for all partners.

The construct trust development includes a pool of eight indicators (see table 5.9) that explicitly distinguish the supply chain after implementing vertical coordination mechanisms with the milk suppliers. This is done to differentiate the behavior of suppliers after implementing the support mechanisms and therefore analyzes the dynamic development of trust in the buyer-supplier relationship. These indicators capture: the interest levels of milk suppliers in providing information on milk production and quality (T1 - corporate farms and T2 - semi-subsistence farms); whether the contracts and oral agreements are broken less frequently by the corporate farms (T3) and the semi-subsistence farms (T4); the transformation of the one-time delivery and short-term contracts into the long-term cooperation by the corporate farms (T5) and the semi-subsistence farms (T6). Finally, the last two indicators represent whether the company can better rely on corporate farms (T7) and semi-subsistence farms (T8) after implementing support programs.

Table 5.9: Indicators of the construct trust development

Nr.	Indicator	Questionnaire	Measurement scale
		After implementation of support programs:	
T1	suppl_more_f	Milk producers are more interested to provide information on milk production and quality: corporate farms.	1 (do not agree) – 5 (fully agree)
T2	suppl_more_h	Milk producers are more interested to provide information on milk production and quality: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)
T3	suppl_less_f	Milk producers break contract terms and oral agreements less frequently: corporate farms.	1 (do not agree) – 5 (fully agree)
T4	suppl_less_h	Milk producers break contract terms and oral agreements less frequently: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)
T5	suppl_long_f	One-delivery and short-term contracts transform into long-term cooperation: corporate farms.	1 (do not agree) – 5 (fully agree)
T6	suppl_long_h	One-delivery and short-term contracts transform into long-term cooperation: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)
T7	suppl_better_f	We can better rely on milk producers in matters of quality and milk deliveries: corporate farms.	1 (do not agree) – 5 (fully agree)
T8	suppl_better_h	We can better rely on milk producers in matters of quality and milk deliveries: semi-subsistence farms.	1 (do not agree) – 5 (fully agree)

Source: Own survey.

5.3.8 Performance

One of the numerous definitions of firm performance considered in this research is the "level to which a goal is attained", based on DWIGHT (1999). The reviewed literature focuses on three main ways to approach firm performance: financial, organizational, and strategic (HAN et al., 2006). Financial indicators such as sales growth rate and profitability (return on sales or investments) are most widely used to capture performance (MURPHY et al., 1996). However, it is often unrealistic to measure firm performance based only on financial indicators. Considering the strategic objective set by a firm, it is important to also apply non-financial performance indicators such as product quality, customer and supplier satisfaction, introduction of new products, and increasing market share (HAN et al., 2006).

The construct performance in the model includes eight indicators that determine whether the companies' goals are achieved after implementing tighter coordination mechanisms for their suppliers (see table 5.10). Two financial indicators are used: own production increase (P5) and profits increase (P6). Further operational (non-financial) indicators are also applied: strengthening of

the raw milk basis (P1), increasing the market share (P2), implementing new products (P3), accessing new markets (P4), and implementing new technologies and processes (P7). The combination of the financial and operational indicators enables a multidimensional approach to firm performance. The indicators reflecting construct performance were chosen based on the solid analyses of existing theoretical and empirical research. The author primarily refers to the work of HAN et al. (2006), LU (2007) and O´DONNELL/DUFFY (2002).

Table 5.10: Indicators of the construct performance

Nr.	Indicator	Questionnaire	Measurement scale
		The implementation of support programs for milk producers provides the following advantages to the company:	
P1	raw_basis	Strengthening of the raw milk basis as a strategic advantage over competitors.	1 (do not agree) – 5 (fully agree)
P2	market_share	Increase in market share.	1 (do not agree) – 5 (fully agree)
P3	new_prod	Implementation of new products.	1 (do not agree) – 5 (fully agree)
P4	new_markets	Accessing new markets.	1 (do not agree) – 5 (fully agree)
P5	prod_increase	Production output increase.	1 (do not agree) – 5 (fully agree)
P6	profit_increase	Increase in profits.	1 (do not agree) – 5 (fully agree)
P7	new_techn	New technologies and processes (in production and management), which are not available to the competitors and are strategic advantages (please specify):	1 (do not agree) – 5 (fully agree)

Source: Own survey.

6. SURVEY RESULTS

This chapter presents the results of the survey on vertical coordination in buyer-supplier relationships in the Ukrainian dairy industry, and empirically tests the main hypotheses of the study. The main drivers (asset specificity, uncertainty and resource availability), and the outcomes of vertical coordination (quality improvement, development of trust and performance) are evaluated using the PLS path modeling approach. The chapter is organized as follows: section 6.1 introduces the study sample and the main data of the milk processing companies involved in the survey. Section 6.2 presents the model estimation results and the reliability and validity of reflective indicators used in the model. Finally, section 6.3 contains concluding remarks.

6.1 Introduction of the sample

In total, thirty eight (38) milk processing companies were examined, the majority of which (28) are joint stock companies (JSC).[54] Thereof, seventeen (17) companies are public and ten (10) companies are private joint stock companies. Four (4) companies are limited liability companies (LLC)[55] and seven (7) companies are subsidiaries[56] of the holdings. More information on the business structure of the companies and the affiliation with the holdings is presented in the table 6.1.

[54] A joint stock company (JSC) is a type of business entity (corporation or partnership) that involves two or more legal persons. Stocks are the certificates of ownership that are issued by the company in return for each financial contribution. Private and public companies are two kinds of joint stock company. The shares of a public company are sold on the open market and those of a private company are only held by the directors and company secretary (www.investopedia.com).

[55] A limited liability company (LLC) is a form of a business company that includes the elements of partnership and corporate structures and provides limited liability features (www.investopedia.com).

[56] Affiliate, associate and subsidiary are types of business relationships and refer to the degree of ownership that a parent company holds in another company. The terms affiliate and associate companies are usually used in the case when parent company only possesses a minority stake in the ownership of the company. Subsidiary is a business entity that is majority controlled by the parent company. But still, a parent company and a subsidiary are separate entities and it is entirely possible for one of them to be involved in legal proceedings, bankruptcy, tax delinquency, etc., while the other is not (www.investopedia.com).

Table 6.1: Companies by organizational form and affiliation, n=38

Organizational form	Total	in %	Production entity of a larger holding	Processing company with local dairies	Single processing company
Public JSC	17	42,1	9	1*	8
Private JSC	10	31,6	3		7
Subsidiary	7	15,8	7		0
LLC	4	10,5	3		1
Total	38	100	22	1	16

Source: Own survey.

Note: An asterisk * denotes multiply entry – the company is a production entity of a larger holding.

Of 38 interviewed processing companies, 22 companies (57.8 %) are affiliated with holdings. These results confirm the high level of horizontal integration that exists in the Ukrainian milk processing industry (as shown by PEREKHOZHUK, 2007). Fourteen interviewed companies are independent business units not affiliated with any holding. Two companies are involved in a bilateral relationship (one of which is a central dairy and the second is a dependent dairy responsible for milk collection and production of a limited number of milk products). In the following, these types of organizational structure are presented in more detail.

The first type of organizational structure found in this study refers to a company affiliated with a holding or business group; a holding or business group controls several processing (subsidiary) companies in different regions of Ukraine. The main office of the parent company is located in Kiev (for central and eastern regions), or in one of the large cities in western and southern Ukraine. The main office usually does not engage in production processes, but coordinates the work of all subsidiary companies in terms of planning and control of the financial and marketing activities. Management reports are regularly sent to the main office, and budget planning and investment projects are coordinated centrally. In two cases the main office of the holding shared the office of the largest processing company located in Kiev. Though the parent-subsidiary relationship implies various legal and financial impacts for affiliated units, each processing company is regarded as an independent business unit with its own production planning and supplier management.

The second type of organizational structure refers to an independent processing company that is not affiliated with any holding or business group. Fourteen companies operate as independent business units. The majority of these companies sold their products on the local regional markets; one company was among the market leaders in yoghurt production and delivered its products to different regions of Ukraine.

Two interviewed companies represent another sub-type of the organizational structure, namely a bilateral relationship. One of the companies (central dairy) signed a contract with the second company, which had a local presence in a strategic region (the interviewed managers called it also "lower dairy"). The "lower dairy" interviewed for the study was a smaller dairy acquired by the larger milk processing company. The "lower dairy" is used for milk collection and delivery to the parent company without any further processing process. According to the results of the interviews, the smaller regional company can also be a production sub-unit for a limited number of dairy products. Acquiring regional processing companies is a strategic decision: purchasing such companies helps a parent company to strengthen their regional position and discourages competitors from entering the regional market.

Furthermore, three different sources of capital were found among the interviewed companies. Twenty eight companies were financed by national capital coming from Ukrainian agricultural and non-agricultural companies and holdings. Ten companies were financed through foreign direct investment from the international dairy companies (see table 6.2).

Table 6.2: Source of capital in the Ukrainian dairy business, n=38

Source of capital	National agricultural sector	Other national sectors	FDI
Interviewed companies	26	2	10
Main business of parent company	Dairy business	High-tech, home equipment	Dairy business

Source: Own survey.

In total, twenty six (26) processing companies involved in the survey were financed with national capital from the milk processing industry. Another two companies were affiliated with two non-agricultural holdings with investments in the dairy business. These companies invest in the dairy business as an attractive market niche to diversify their business. Later on, additional business units might grow and gain a higher share in the company's business. Two Ukrainian holdings initially started their business with capital coming from non-agricultural production. Ten processing companies sourced their capital from international dairy companies.

Regarding the number of employees, the average volume of processed milk and annual sales, the interviewed companies were divided into four groups (see table 6.3). The first group consists of seven companies with the lowest number of employees, (up to 200), and displays the lowest average values of annually processed milk and sales. Groups 2 and 3 include the highest number of the interviewed companies, and display the middle average values of milk volume processed and sales volume. Group 4 includes three companies with the highest

number of employers and displays the highest average values of milk volume processed and annual sales compared to all other groups.

Table 6.3: Number of employees, average milk and sales volumes of companies, n=38

Group	Number of employees	Number of companies	In %	Average milk volume in the group, thousand tons	Average sales volume in the group, million UAH
Group 1	26 – 200	7	18.4	28.1	54.2
Group 2	201 – 500	17	44.8	78.2	142.7
Group 3	501 – 900	11	28.9	101.8	298.3
Group 4	901 – 1260	3	7.9	357.4	452.4

Source: Own survey.

All interviewed companies were characterized by a high level of product diversification. The wide presence of the interviewed companies in the main market segments (production of whole milk products, cheese and butter) reflects the actual situation at the Ukrainian dairy market. An important observation from this study applies to the considerable decrease in casein production to the benefit of the mentioned production segments. Casein used to be one of the main export goods in the dairy industry. At present, whole milk products are considered the most important staple commodity sold on the domestic market, and the production of cheese and butter also belong to the strategic segments of production; these are also characterized by a strong demand for high quality raw milk. These results signify a new orientation of the Ukrainian dairy business toward fresh and high quality dairy products. To overcome the high seasonality of the Ukrainian milk production, the interviewed companies have increased the production of dry milk during the summer months. This solution allows the companies to save their excess raw milk and not lose their suppliers. Dry milk is exported or used in production during the winter time to overcome the shortcoming of fresh milk.

In addition, some of the interviewed companies engage in specific production segments such as baby food, premium class products and pro-biotic milk products. Of the thirty eight interviewed companies, twenty six are involved in one or more of these production segments. Six interviewed companies produce baby food; this accounts for 2.5% of the annual sales in the total sample of interviewed companies. Producing premium products has a share of 2.5% in the total volume of annual sales, and is implemented in eleven (11) companies. The biggest share of the interviewed companies (21) tends to implement a pro-biotic[57] product segment into their production process (4% in the total volume of

[57] There is one important distinction regarding the definition of pro-biotic milk products in Ukraine. The name "bio" that is used to mark these products applies to pro-biotic culture of the products, and does not mean organic production. The name "bio" is used for products

annual sales). The production of baby food requires the fulfillment of strict quality requirements such as the use of high quality raw milk and special investment in quality control. Premium milk products represent a relatively new segment of supreme quality products. These products belong to the higher price market segment and are developed for more discerning customers; this premium segment was implemented in recent years based on consumer demand. The premium products are usually produced under strict control and with high quality components. Often the companies tend to implement new technologies originating from western or southern European countries (for example, production of Mozzarella or Feta cheese). Customers also show high interest in pro-biotic milk products (which are often recommended as preventive, and for improving products for digestion and the immune system). Therefore, the processing companies try to apply this "healthy concept" into their production and marketing strategies. In general, these trends signify the increased need of the processing companies to meet the growing customer demand for high quality and premium class dairy products. The companies involved in specific production segments are presented in groups (see table 6.4).

Table 6.4: Specific production segments, n = 38

Group	Baby food: number of companies (% to companies in the group)	Premium products: number of companies (% to companies in the group)	Pro-biotic products: number of companies (% to companies in the group)
Group 1	0 (0%)	1 (14.3%)	2 (28.6%)
Group 2	2 (11.8%)	6 (35.3%)	10 (58.8%)
Group 3	3 (27.3%)	3 (27.3%)	6 (54.5%)
Group 4	1 (33.3%)	1 (33.3%)	3 (100%)

Source: Own survey.

The first group of companies shows no involvement in the production of baby food, and low involvement in the segments of premium (with 14.3%) and pro-biotic (with 28.6%) products compared to the companies from other groups. The production level in specific product categories increases with the size of the companies in the group: thus, the fourth group shows the highest level of involvement in the production of specific products. One-third of the companies in the fourth group are engaged in baby food and premium segments, and all companies in this group are engaged in the pro-biotic production segment.

These results illustrate that companies with higher levels of production and sales volumes are more likely to diversify their production and to invest into the production process and product development. The high involvement of the interviewed companies in the premium market segments signifies the increasing

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that contain lacto bacteria or bifida bacteria in the percentage no less than determined by official regulations.

demand for high quality raw milk. To enter the high quality market segment, a processing company should be able to maintain the necessary quality level and compete with others. The majority of the processing companies involved in the survey support this assumption and confirm that they have invested in production facilities and quality control mechanisms in the last three years. Thirty six (36) companies invested in improving quality management and quality control systems during the previous three years. Twenty five (25) companies invested in new processing lines, and twenty three (23) companies installed new packing lines. In spite of the high level of cooperation with supermarkets, the companies involved in the survey also stated their interest in developing their own distribution system. In the previous three years, seventeen (17) companies invested in developing the distribution system in the form of factory stores, small specialized shops and wholesale service.

An increasing demand for high quality milk from the side of the interviewed companies supports the implementation of national and international quality standards. Implementing such quality standards and systems occurs voluntary and is financed by the company. Various quality systems and standards implemented by the interviewed companies are presented in table 6.5. International quality standards and systems of quality control such as ISO and HACCP have become more popular in Ukraine. In addition to the Ukrainian DSTU (State Quality Standard of Ukraine), many of the milk processing companies also implement the HACCP and ISO (and in some cases instead of the DSTU). The interviewed managers believe that international quality certificates allow access to international markets, while national Ukrainian standards still require additional controls and examinations by international partners. The interviewed managers state that international quality standards simplify the cooperation with international partners and play an important role in presenting the company to new and potential clients.

Table 6.5: National and international standards used by the interviewed companies

Quality standards/systems	DSTU	HACCP	ISO	Others
Number of companies	35	12	25	3

Source: Own survey.

The quality systems most widely implemented by the interviewed companies are DSTU, HACCP and ISO. Of the 38 interviewed companies, the majority (35 companies) traditionally used DSTU (for more information about this quality system, see Chapters 2 and 3). Three companies do not apply DSTU, and use the combinations of HACCP, ISO and company internal standards instead.

A high level of engagement by the companies in high value production segments (baby food, premium and pro-biotic products), and strong interest in international markets increase these companies' demand for high quality raw

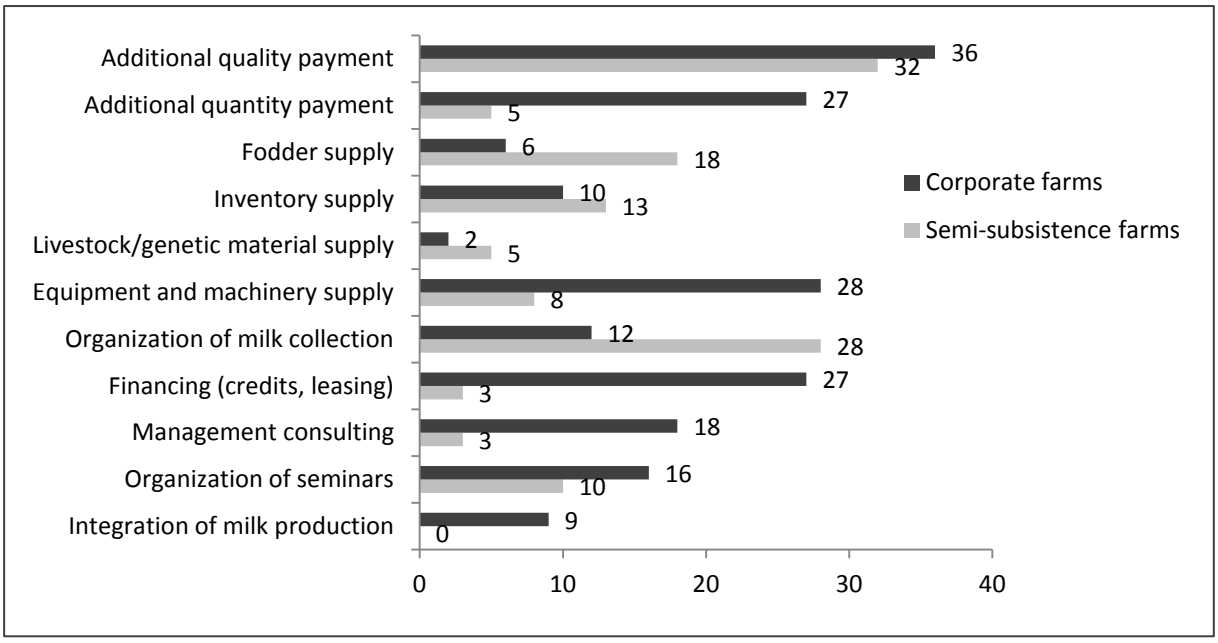
milk. On the one hand, this necessitates the implementation of modern international quality standards. On the other hand, missing production technologies and low milk quality provided by a majority of milk producers complicates the milk collection process for the processors. Therefore, securing the delivery of high quality milk is one of the strategic reasons for the processing companies to look for more efficient ways of cooperation with their suppliers.

The majority of the interviewed companies prefer to source their milk from corporate farms due to their better milk quality, higher supply volumes and logistic advantages. Only one company emphasizes its interest in cooperating with semi-subsistence farms based on a well-established long-term relationship. In general, as they are unable to collect the necessary production volumes exclusively from corporate farms, processing companies are forced to source an essential part of their milk supplies from semi-subsistence farms. Deliveries from corporate farms and semi-subsistence farms constitute an average of almost equal shares in the supply structure of the interviewed processing companies. Corporate farms delivered an average of 47.5%, and semi-subsistence farms 48.8% of the milk to the interviewed processing companies in 2009.[58] Although semi-subsistence farms play a key role in the country's milk supply, their comparatively low bargaining power weakens their position in the processing industry. The exchange relationship between processing companies and corporate farms is usually formalized through written contracts. In contrast, only 65% of the processing companies use written contracts in their cooperation with semi-subsistence farms. The rest of the companies rely on oral agreements or general agreements that have been negotiated between the village municipals and processors.

All interviewed companies introduced tighter forms of vertical coordination and offered a variety of support programs for their milk suppliers. Although the form and extent of the support programs differed, some typical patterns could be observed within the study sample. In general, processing companies implement one or more vertical coordination measures (figure 6.1). More detailed information about the support programs implemented by the companies can be found in APPENDIX 4.

[58] Some processors use intermediary firms to collect milk from semi-subsistence farms in remote regions to simplify the logistics planning. The share of intermediary suppliers constituted only 3.7% of the study sample.

Figure 6.1: Support programs offered to milk producers by number of companies*, n = 38



Source: Own survey.

Note: Asterisk * denotes multiple possible answers.

To estimate the extent of vertical coordination and support programs offered to the suppliers, the company managers were asked to indicate the share of milk deliveries obtained from milk producers engaged in vertical coordination schemes. To better analyze the extent of the support programs in each group of companies, the relative numbers were transformed in absolute values by multiplying them with the total volume of milk delivered to the company. As expected, the absolute volume of milk delivered to the company from the milk producers to which support programs are applied increases in every group (see table 6.6).

Table 6.6: Extent of support programs along the processing companies, n=38

Group	Average milk volume, thousand tons	Extent of support programs, %	Milk volume in context of support programs, thousand tons
Group 1	28.11	27 - 47	7.7 – 13.2
Group 2	78.21	18 - 38	14.2 – 29.6
Group 3	101.77	42 - 62	43.1 – 63.3
Group 4	357.44	39 - 58	55.9 – 83.8

Source: Own survey.

When comparing the share of support programs offered by the companies in different groups, the following conclusions could be made. In contrast to the author's expectations, the relative share of applied assistance programs did not

increase constantly with the average size of the companies in each group. The average percentage of the assistance programs offered to milk suppliers was higher in the first group of companies compared to the second group. The same tendency could be observed in the third group compared to the fourth group (which represented the largest companies of the sample). The results of the PLS research model will be presented and analyzed in the next subchapter to determine the impact of various factors on the company's decision to implement different levels of vertical coordination.

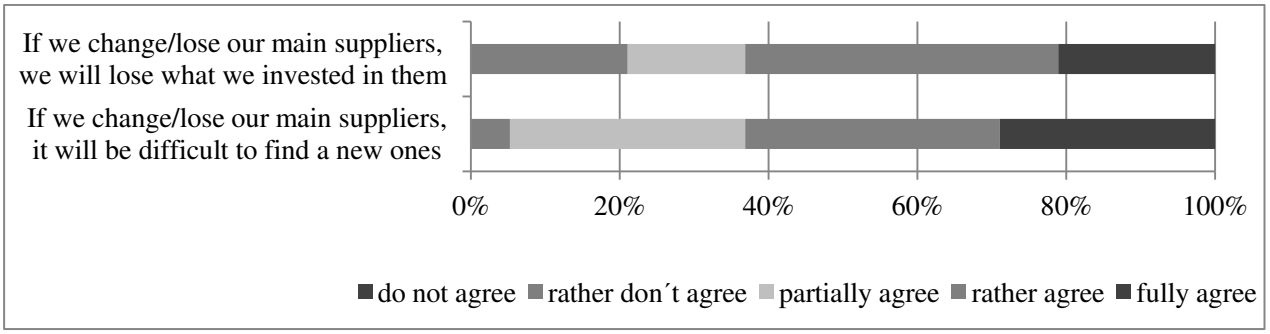
6.2 Descriptive statistics of the data sample

This subchapter presents the descriptive statistics of the indicators applied in the research model. In this way, this subchapter additionally supports the main results and findings of this study by quantitatively describing the sample of the data used in the research model. In the following, the distribution of the managers' answers is presented for all indicators which apply to each of the eight constructs of the research model.

6.2.1 Asset specificity

Majority of the interviewed managers stated that if they would change or lose their main suppliers, they would lose their investments and also experience difficulties finding new suppliers. The given distribution of the answers and relatively high percentage of disagreements with the first statement can be explained by a high level of semi-subsistence farms within the supplier base. As visible from the results of the case studies (see chapter 3) the milk processing companies do not invest much in their cooperation with semi-subsistence farms, which though often represent around 50% of the milk deliveries to the companies.

Figure 6.2: Descriptive analyses of the construct asset specificity



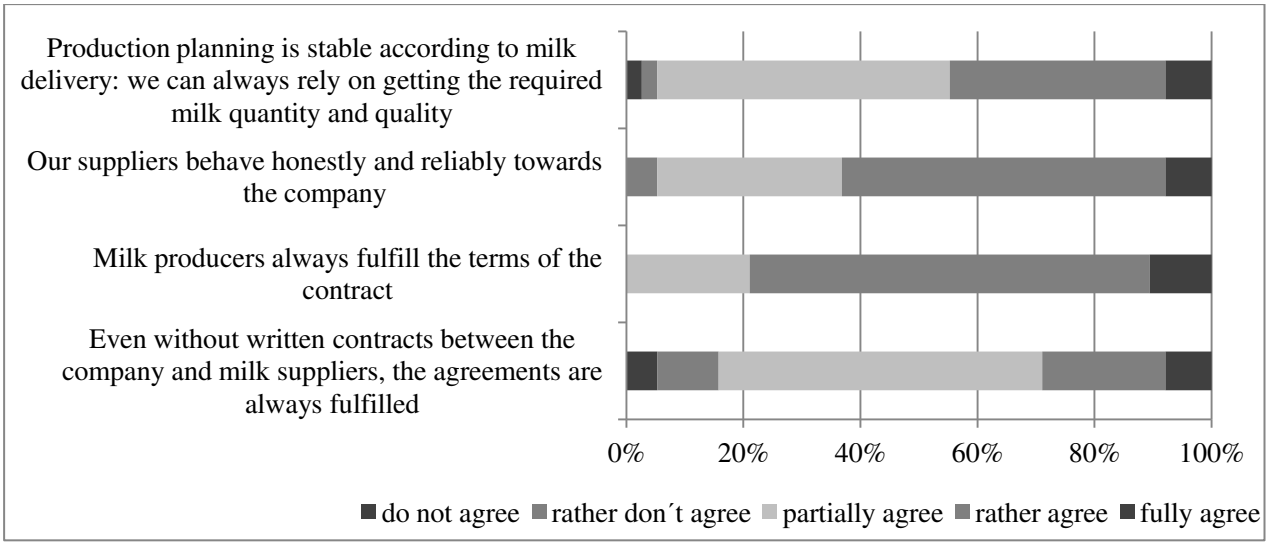
Source: Own survey.

6.2.2 Planning uncertainty

More than 50% of the interviewed managers did not perceive the production planning as stable and stated that they could not always rely on getting required milk quantity and quality from their milk suppliers. 37% of the managers confirmed that the production planning was stable and they could always rely on

getting the required milk quantity and quality. Though, more than 60% of the managers agreed with the statement that the suppliers behaved honestly and reliable towards the company, around 40% of the interviewed managers disagreed with this statement. Almost 80% of the managers confirmed that milk producers always fulfilled the terms of the contracts, but less than 30% of the managers agreed that the milk suppliers also fulfilled the oral agreements. In this way, the results of the managers' survey support the findings of the dairy industry analyses and the case studies presented in chapter 2 and 3 of this thesis. The difficulties with milk deliveries are not always caused by supplier behavior: high share of milk delivered by semi-subsistence farms as well as lack of technologies and obsolete equipment in corporate farms are important obstacles for milk production and processing industry (see chapter 2). As the written contracts applied for corporate farms in most cases, it can be assumed, that the processing companies often experienced difficulties with semi-subsistence farms which do not always fulfill the agreements. And still, more than 20% of the interviewed managers only partially agreed with the statement that the milk producers always fulfill the terms contract. This fact signifies high level of uncertainty for processing companies.

Figure 6.3: Descriptive analyses of the construct planning uncertainty



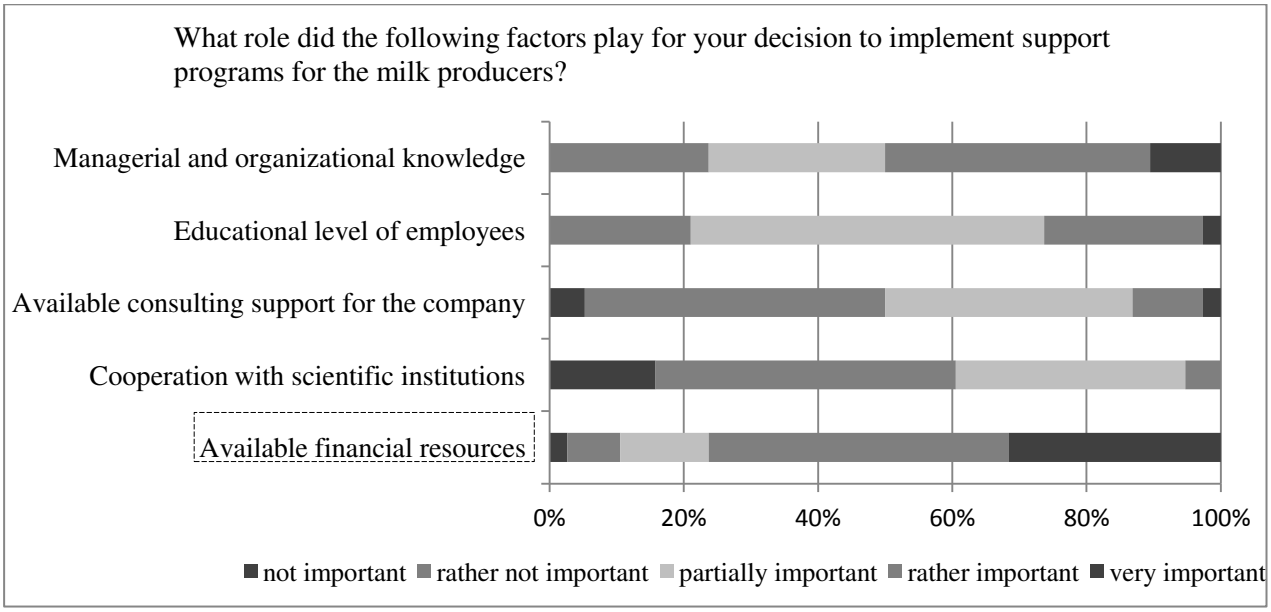
Source: Own survey.

6.2.3 Resource availability

The managers of the milk processing companies were asked about the role of different resources for their decision to implement support programs for milk producers. The majority of the interviewed managers (76%) considered financial resources as important factor for implementing vertical coordination. Managerial and organizational knowledge was considered the second important: 50% of the interviewed managers considered these resources important. Educational level of employees was considered important by 26% of the interviewed managers. Available consulting support and cooperation with

scientific institutions was considered important by 18% of the interviewed managers. As the results of the model evaluation show, the availability of financial resources did not have any significant impact on the construct resource availability and was deleted from the model according to the methodological guidelines (see chapter 5 for more information on reflective constructs). The availability of financial resources appears to be an entry barrier for the implementation of the support programs and tighter coordination mechanisms with the milk producers. Therefore, these resources are considered important by the majority of the interviewed processing companies. However, all these companies had enough financial resources to implement vertical coordination and, in this way, did not possess required resource differences that allow the company to define and implement a unique coordination strategy with its suppliers. In this way the results of the study show that financial resources no longer offer a competitive advantage for a particular company in a survey sample.

Figure 6.4: Descriptive analyses of the construct resource availability



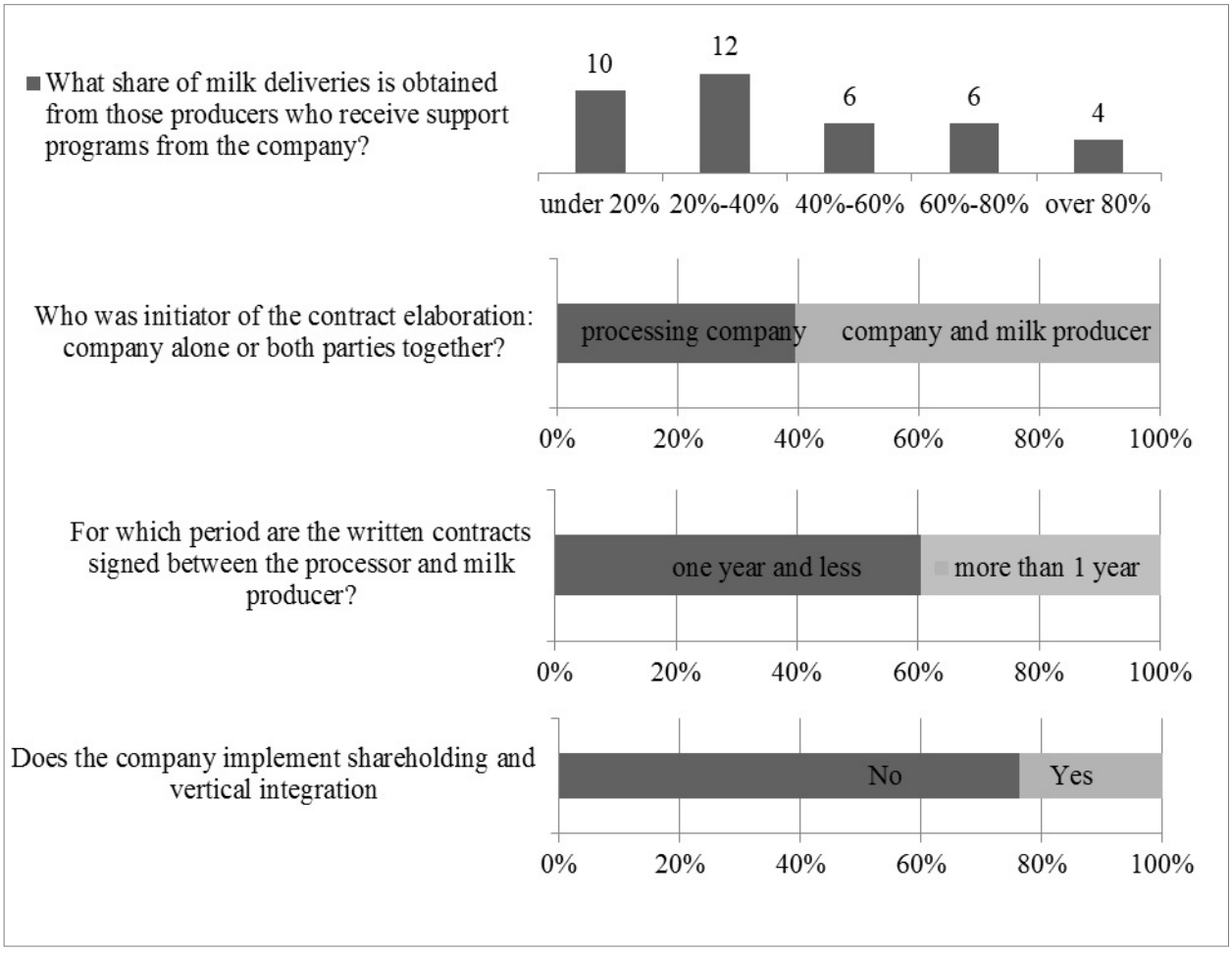
Source: Own survey.

6.2.4 Contractual governance

Though all interviewed companies implemented tighter forms of vertical coordination and offered support programs for their suppliers, the share of milk deliveries obtained from the milk producers with support programs differed among the interviewed companies. Only 4 companies (or 10% of the sample) confirmed to source more than 80% of the milk from the milk suppliers involved into tighter coordination schemes. 6 interviewed companies (16%) confirmed to source 60% to 80% of their milk from the suppliers with support programs. Another 6 companies confirmed sourcing 40% to 60% of their milk from the supported suppliers. The biggest number of the interviewed companies: 12

(32%) and 10 (26%) source 20% to 40% and less than 20% from suppliers involved in the vertical coordination. In almost 40% the processing companies initiated the elaboration of the contract and in 61% the contract elaboration was initiated jointly by processors and milk suppliers. More than 60% of the written contracts were valid for one year and less, and less than 40% of the contracts were signed for more than one year. Less than a quarter of all interviewed companies (24%) implemented shareholding and/or vertical integration for their milk suppliers.

Figure 6.5: Descriptive analyses of the construct contractual governance



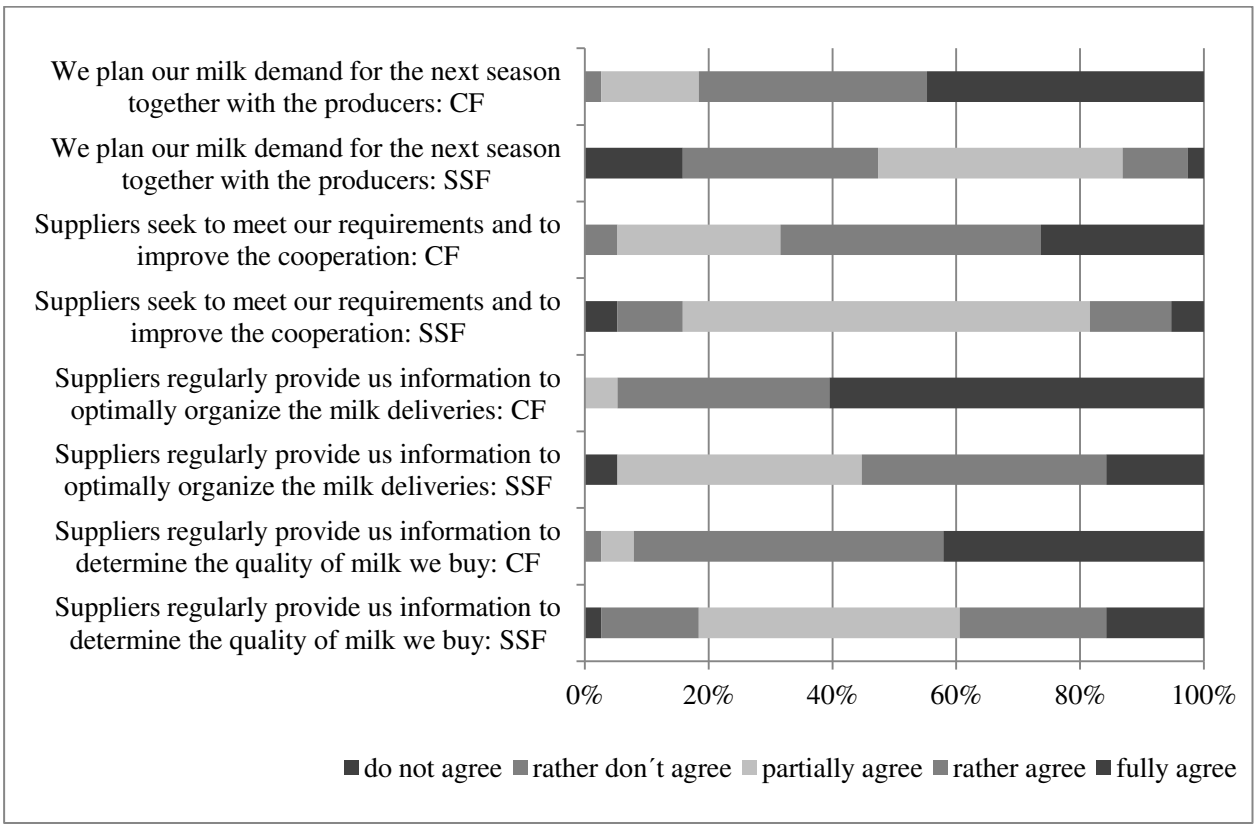
Source: Own survey.

6.2.5 Joint action

As the results of the managers' survey show the cooperation with the corporate farms was more developed compared to the cooperation with the semi-subsistence farms: more than 80% of the interviewed managers confirmed to have planned their milk demand for the next season with the corporate farms and only around 13% of managers confirmed to have planned their milk demand with the semi-subsistence farms. Corresponding results have been achieved for the question about the attitude of the milk suppliers. 68% of the interviewed managers agreed with the statement that corporate farms sought to meet the

requirements and improve the cooperation, and only 18% of the managers agreed with this statement regarding the semi-subsistence farms. 95% of the managers agreed with the statement that corporate farms regularly provided information to optimally organize the milk deliveries, and 55% of the managers confirmed this statement with regard to the semi-subsistence farms. 92% of the interviewed managers confirmed that the corporate farms regularly provided information to determine the quality of milk, and only 40% of the interviewed managers agreed with this statement regarding the semi-subsistence farms.

Figure 6.6: Descriptive analyses of the construct joint action



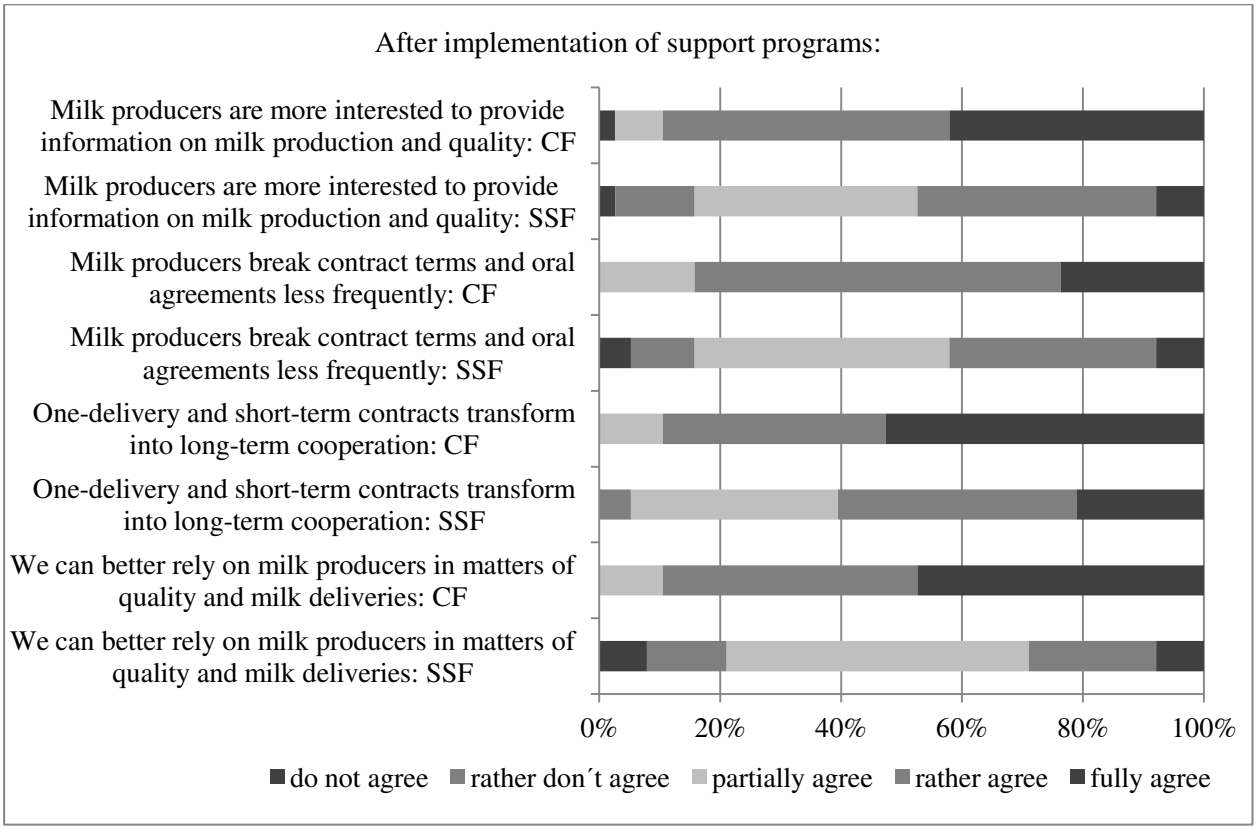
Source: Own survey.

6.2.6 Trust development

After the implementation of support programs for milk suppliers, the corporate farms appear to show higher response regarding the trust development in the buyer-supplier relationship than the semi-subsistence farms. 90% of the interviewed managers confirmed that the corporate farms were more interested to provide information on milk production and quality after the support programs were implemented. 47% of the interviewed managers confirmed this statement for the semi-subsistence farms. 84% of the interviewed managers agreed with the statement that the corporate farms broke the contract terms and oral agreements less frequently after the implementation of the support programs, 42% of the managers agreed with this statement for the semi-subsistence farms. 90% of the interviewed managers confirmed that short term

contracts with the corporate farms evolved into the long-term cooperation after the support programs were introduced. Also 61% of the interviewed managers confirmed the development of the long-term cooperation with the semi-subsistence farms. 90% of the interviewed managers could better rely on corporate farms in matters of quality and milk deliveries and 29% of the managers confirmed that they could better rely on the semi-subsistence farms after the implementation of the support programs. Lower response of the semi-subsistence farms corresponds with a lower extent of the support programs offered by the processing companies to these milk producers. Though, the findings of this survey show that the cooperation with the semi-subsistence farms can be improved by the implementation of tighter coordination mechanisms and support programs. This is an interesting insight for the company management, regarding the dependence of the processing companies on the milk deliveries from this supplier group in the middle- and long-term period.

Figure 6.7: Descriptive analyses of the construct trust development



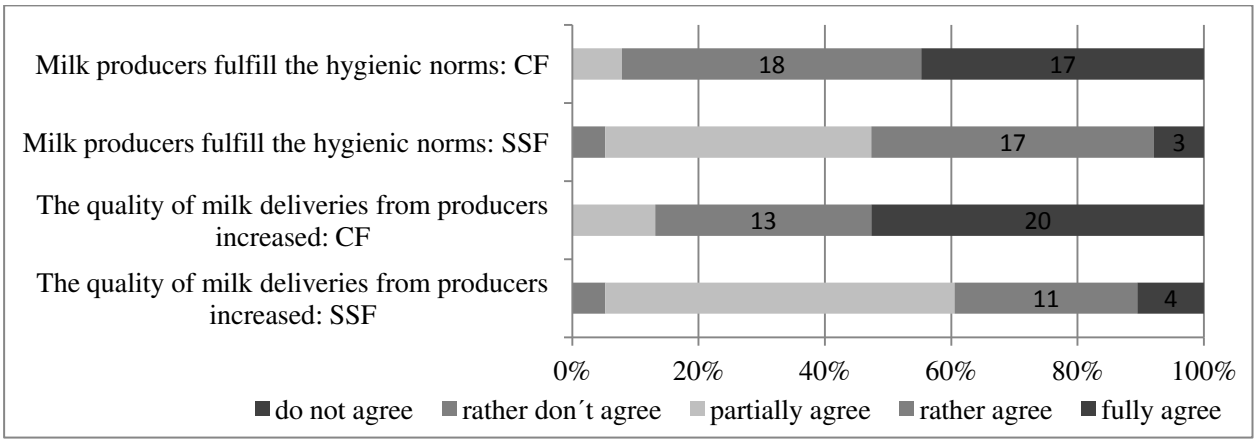
Source: Own survey.

6.2.7 Quality improvement

More than 90% of the interviewed managers confirmed that the corporate farms better fulfilled the hygienic norms after the support programs were implemented, 53% of the managers also confirmed this development for the semi-subsistence farms. Quality increase of milk deliveries from the corporate

farms was perceived by 87% of the interviewed managers; 40% of the managers confirmed the increased quality of milk deliveries from the semi-subsistence farms. Higher increase in the fulfillment of the hygienic norms by corporate farms can be explained by better equipment and technologies available to these producers. Still, semi-subsistence farms show improvement in the fulfillment of hygienic norms after the processing companies implemented the support programs. Lower managers´ response on milk quality increase in the semi-subsistence farms can be explained by the fact, that milk from the semi-subsistence farms can be only qualified as quality type II (see subchapter 2.3.2 for more information on quality standards in the Ukrainian dairy industry). And though milk quality improves after the implementation of the support programs, the quality type cannot be upgraded due to a lack of required technologies in the semi-subsistence farms.

Figure 6.8: Descriptive analyses of the construct quality improvement

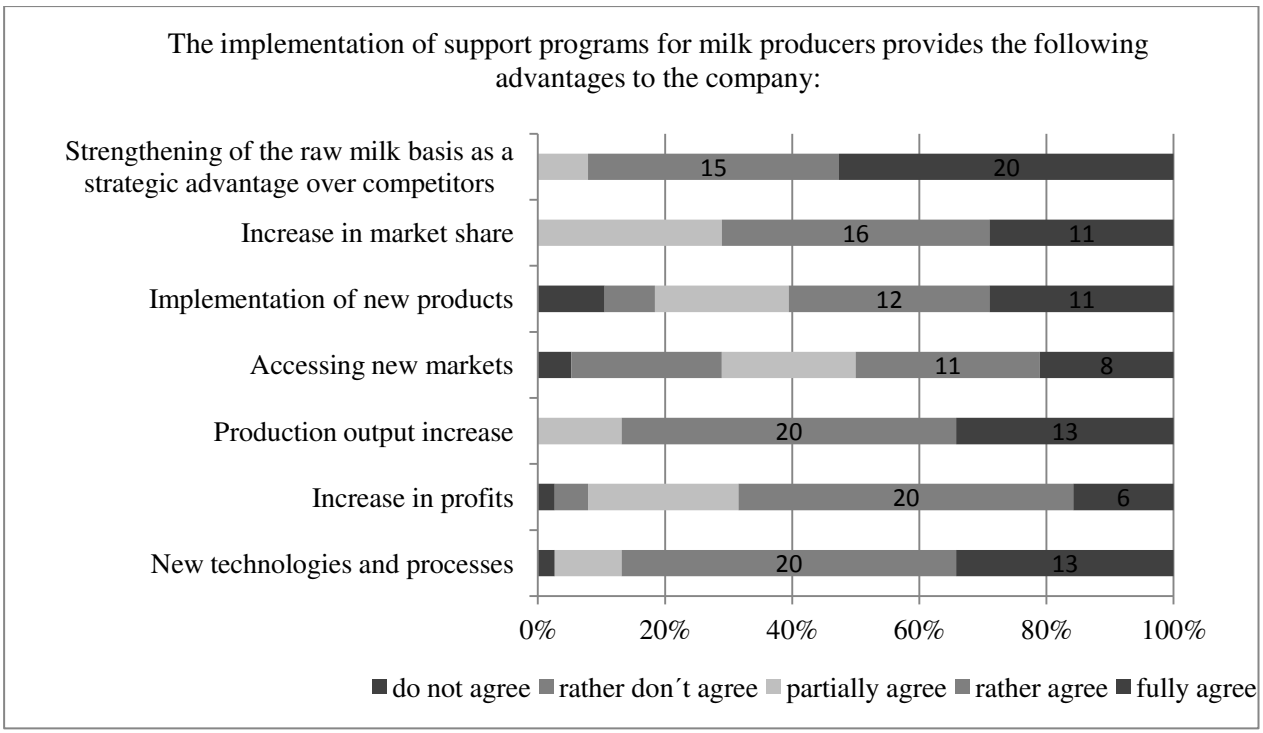


Source: Own survey.

6.2.8 Performance

The interviewed managers confirmed that the implementation of the support programs for the milk producers provided a row of strategic advantages for the processing companies. More than 90% of the managers stated strengthening of the raw milk basis as the result of the implemented vertical coordination. 71% of the interviewed managers confirmed increase in market share of their companies. 61% confirmed implementation of new products and 50% of the managers agreed with the statement about the enabled access to new markets. 87% of the managers stated production output increase and 68% increase in profits. Finally, 87% of the interviewed managers answered that the implementation of the support programs for their milk suppliers enabled the introduction of new technologies and processes in the processing companies. Herewith, the managers considered new technologies in production and management, which were not available to competitors and served as strategic advantages for the company.

Figure 6.9: Descriptive analyses of the construct performance



Source: Own survey.

6.3 Evaluation of the PLS research model

This section presents the results of the path modeling conducted using the PLS approach (see APPENDIX 5). The analysis explores the main drivers of the vertical coordination (contractual governance and joint action) implemented by the interviewed companies to their suppliers. Furthermore, the impact of different forms of contractual governance on quality management, trust development and performance of the processing companies is analyzed. The first part of the chapter, section 6.2.1, presents the estimation of the indicators that reflect the constructs of the research model. Section 6.2.2 presents the evaluation of the structural model, and section 6.2.3 presents the evaluation of the research hypotheses and the discussion of the results. Finally, section 6.3 presents the concluding remarks.

6.3.1 Evaluation of the reflective indicators

In the following, the reliability and validity of reflective indicators that determine the constructs of the research model is presented. The research model consists of eight constructs: asset specificity, planning uncertainty, resource availability, contractual governance, joint action, trust development, quality management, and performance. These constructs are defined through reflective indicators (as presented in Chapter 5, Section 5.2). The procedure used to assess their validity and reliability allows one to evaluate the content, nomological, convergent, and discriminant validity, and also the measurement model's reliability.

The reflective indicators of the research model have been proven for the content and nomological validity as described in Chapter 5 (section 5.2.2). To provide validity, the research model was based on solid theoretical considerations and empirical studies (e.g. transaction cost theory, resource based view, etc). The validity of the constructs was assessed in the theoretical and empirical literature (see Chapter 4). In addition to the literature review, the results of the case study interviews prove sufficient performance of the applied instruments. To prove the nomological validity, the theoretical hypotheses were tested empirically: the significance of the hypotheses (relations between the constructs of the model) signifies the validity of the applied indicators to determine the reflective constructs of the model.

Table 6.7: Factor loadings of the indicators

Construct	Indicator	Factor loading	Construct	Indicator	Factor loading
Asset specificity	change_loose	0.958	Quality management	fulfill_hygienic_f	0.879
	change_find	0.526		fulfill_hygienic_h	0.823
Planning uncertainty	prod_stable	0.844		quality_increase_f	0.617
	suppliers_honest	0.923		quality_increase_h	0.814
	suppliers_fulfill_contract	0.70	Trust development	suppl_more_info_f	0.75
	supplier_fulfill_agreem	0.865		suppl_more_info_h	0.821
Resource availability	manag_know	0.832		suppl_less_break_f	0.756
	educ_level	0.591		suppl_less_break_h	0.755
	consult_support	0.646		suppl_long_coop_f	0.55
	scientif_coop	0.843		suppl_long_coop_h	0.650
Contractual governance	VC_share	0.739		suppl_better_rely_f	0.753
	contract_design	0.785		suppl_better_rely_h	0.694
	contract_duration	0.686	Performance	raw_basis	0.642
	vert_integrate	0.656		market_share	0.781
Joint action	plan_demand_f	0.706		new_products	0.823
	plan_demand_h	0.690		new_markets	0.704
	suppl_improve_f	0.634		prod_increase	0.767
	suppl_improve_h	0.723		profit_increase	0.81
	suppl_info_organize_f	0.854		new_techn	0.782
	suppl_info_organize_h	0.597			
	suppl_info_qual_f	0.770			
	suppl_info_qual_h	0.571			

Source: Own calculation.

The convergent validity of the indicators was proven through the factor loadings presented in table 6.7. Of the 41 applied indicators, the majority (21 indicators) are above the threshold of 0.7.[59] All indicators with factor loadings lower than 0.4 were eliminated from the research model. The lowest value of the factor loading presented in the model is 0.53. The indicators with a value under 0.7

[59] For more information see Chapter 5.

were kept in the model to stabilize the constructs with a lower number of related indicators. Considering the explorative nature of the research model and the fact that the scales were partially newly developed, the high number of indicators with values above or slightly below the threshold of 0.7 confirms the sufficient convergent validity of the reflective constructs.

The reliability reflects the internal consistency of each construct used in the model. Cronbach's alpha, composite reliability and average variance extracted (AVE) were calculated for the measurement model (see table 6.8). For all constructs the composite reliability is greater than 0.7. The average variance extracted (AVE) is above the value of 0.5 for all but one construct (AVE for joint action is slightly under the threshold and constitutes 0.49). Cronbach's alpha is greater than 0.7 for almost all constructs: asset specificity and contractual governance are the only exception with slightly lower values. According to reviewed literature on the PLS approach (see Chapter 5), the composite reliability is considered a superior value to Cronbach's alpha. Composite reliability uses the item loadings obtained within the causal model and neither assumes equivalency among the measures nor implies that all indicators are equally weighted (WERTS et al., 1974; CHIN, 1998). Therefore, given that the values of composite reliability are greater than 0.7 for all reflective constructs, these are considered reliable.

Table 6.8: Indicators of reliability and discriminant validity

Constructs	Cronbach's Alpha	Composite Reliability	AVE	Fornell & Larcker Criterion
Asset specificity	0.4129	0.7321	0.5972	0.7728 > 0.4318*
Planning uncertainty	0.8575	0.902	0.6993	0.7183 > 0.6753*
Resource availability	0.7258	0.8223	0.5422	0.6985 > 0.6753*
Contractual governance	0.6896	0.8092	0.5159	0.7363 > 0.4765*
Joint action	0.8507	0.8824	0.4879	0.7606 > 0.7069*
Performance	0.8773	0.9052	0.5785	0.8362 > 0.6664*
Quality management	0.7936	0.8668	0.6231	0.7894 > 0.7065*
Trust development	0.8666	0.895	0.5187	0.7202 > 0.7069*

Source: Own calculation.

Asterisk denotes * the next highest correlation value with another construct.

To measure the discriminant validity of the measurement model, two different procedures were applied in this study. According to the FORNELL/LARCKER criterion (1981) the square root of the average variance extracted (AVE) was compared with the correlations of the constructs. To achieve the necessary level of the discriminant validity, the value of the square root of AVE has to be greater than the correlation of this particular construct with all others constructs of the model. In the present research model, all diagonal values (square root of AVE) are greater than the values presenting the correlations of the constructs (see table 6.8). Another procedure that allows one to test the discriminant

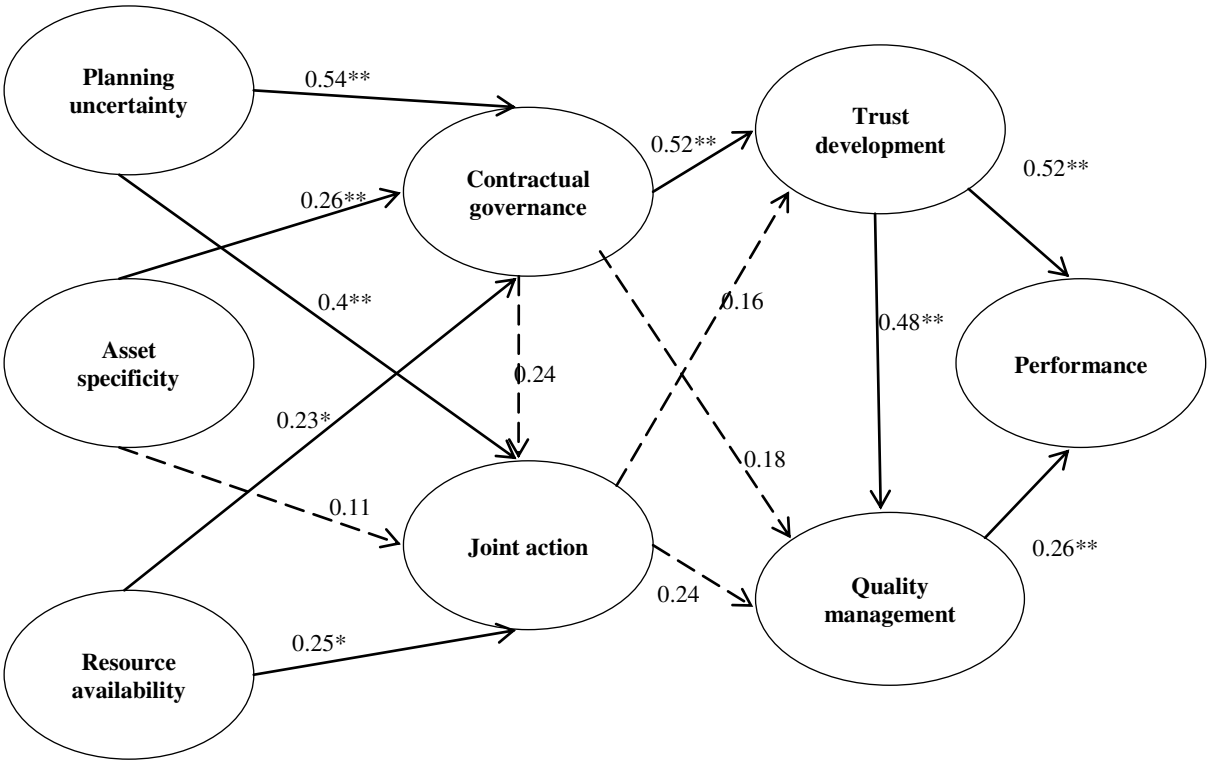
validity of the model is to check the cross-loadings of the indicators on the latent variables. Every indicator used in the model shows a higher correlation with its own latent variable than with any of the other constructs (see APPENDIX 6). As both of the applied criteria indicate the sufficient level of discriminant validity of the constructs, the analyses proceed with evaluating the structural model and path coefficients to test the research hypotheses.

6.3.2 Evaluation of the structural model

This section presents the estimation of the structural model and the interpretation of the research hypotheses using the PLS approach. In the following, both the coefficient of determination and the significance level of the path coefficients are estimated. Additionally, to prove the multicollinearity of the constructs, the correlation matrix is presented.

The constructs (also called latent variables, see Chapter 5) represent the conceptual nature of the model and form the basis for the empirical analyses. As shown by figure 6.2 the structural model consists of eight constructs (latent variables), which are represented by the circles. The hypotheses are represented by the arrows that outline the assumed path relationships between the constructs. To test the research hypotheses, the latent variables of the research model are linked and the path coefficients are estimated using a PLS approach. In the following, figure 6.2 represents the structural model with the estimated path coefficients.

Figure 6.10: Path coefficients of the structural model



Source: Own presentation of the PLS results.
Note: Asterisk * denotes p<0.05; ** denotes p<0.01.

The coefficient of determination (R^2) was calculated for the endogenous variables: contractual governance, joint action, trust development, quality management and performance (see table 6.9). The R^2 values of the present model are higher than the moderate values (see Chapter 5), and except for the variable trust development (value of 0.4), are over the threshold of 0.5. These results mean that more than 50% of the variation of the endogenous variables can be explained by the explanatory variables of the research model. Therefore, these values serve as a confirmation for a sufficient goodness of fit of the research model (see CHIN, 1998; BACKHAUS et al., 2003).

Table 6.9: Coefficient of determination and correlation matrix for latent variables

Constructs	R^2	1. AS	2. CG	3. JA	4. RA	5. P	6. PU	7. QM	8. TD
1. Asset specificity (AS)		1.0000							
2. Contractual governance (CG)	0.58	0.4318	1.0000						
3. Joint action (JA)	0.60	0.3665	0.6753	1.0000					
4. Resource availability (RA)		0.275	0.4786	0.525	1.0000				
5. Performance (P)	0.53	0.2454	0.6205	0.4922	0.4323	1.0000			
6. Planning uncertainty (PU)		0.206	0.6664	0.6654	0.3269	0.5280	1.0000		
7. Quality management (QM)	0.59	0.2982	0.6333	0.5985	0.3620	0.6319	0.4828	1.0000	
8. Trust development (TD)	0.40	0.1591	0.6226	0.5062	0.4765	0.7069	0.5077	0.7065	1.0000

Source: Own calculation.

The results of the correlation matrix presented in table 6.9 confirm the positive correlation of the variables asset specificity, planning uncertainty and resource availability with the variable contractual governance. The contractual governance positively correlates with the variables joint action, quality management, trust development and performance. These results support the hypotheses about the positive impact of asset specificity and planning uncertainty on tighter forms of contractual governance and the positive impact of contractual governance and joint action (representing extent of vertical coordination, see Chapter 4) on quality management, trust development and performance.

Additionally, the multicollinearity between the variables in the structural model has been proven. To exclude multicollinearity, HAIR et al. (1998) and MALHOTRA et al. (1999) apply a cut-off value of 0.8 for the correlation coefficients. The highest correlation among the variables in the research model is 0.70 (see table 6.9), which is well below the threshold of 0.8. These results signify the absence of the pairwise collinearity of the constructs, and confirm that all constructs (latent variables) can be retained in the model.

6.3.3 Discussion of the results

This section presents the discussion of the estimated results from the path coefficients used to support the research hypotheses. Table 6.10 presents the results of the path coefficient analyses for the study sample. The estimated model is based on the structural model presented in figure 6.2. Based on the results of the validity and reliability tests, the constructs used in the structural model are considered reliable for interpreting the relationships in the model. To estimate the significance level of the path coefficients, the bootstrapping procedure with 500x re-sampling (suggested by CHIN, 1998) was run.

Table 6.10: Estimation of the path coefficients (hypotheses) in the structural model

Hypotheses[60]	Path relationships	Path coefficient	Standard Error	T - Statistics	Significance level [a]
H1	Asset Specificity → Contractual Governance	0.26	0.12	2.18	**
H2	Planning Uncertainty → Contractual Governance	0.54	0.12	4.63	**
H3	Resource Availability → Contractual Governance	0.23	0.13	1.85	*
H4	Asset Specificity → Joint Action	0.11	0.16	0.70	
H5	Planning Uncertainty → Joint Action	0.40	0.13	2.99	**
H6	Resource Availability → Joint Action	0.25	0.12	1.99	*
H7	Contractual Governance → Joint Action	0.24	0.17	1.44	
H8	Contractual Governance → Quality Management	0.18	0.17	1.04	
H9	Joint Action → Quality Management	0.24	0.21	1.13	
H10	Contractual Governance → Trust Development	0.52	0.19	2.69	**
H11	Joint Action → Trust Development	0.16	0.21	0.76	
H12	Trust Development → Quality Management	0.48	0.12	4.04	**
H13	Trust Development → Performance	0.52	0.16	3.33	**
H14	Quality Management → Performance	0.26	0.13	2.10	**

Source: Own calculation.

Note: Asterisks ** denote $p<0.01$; * denotes $p<0.05$.

Due to the results of the path analyses, all hypotheses retain the expected positive sign, though at different levels of significance. The bootstrapping

[60] Theoretical hypotheses are presented in Chapter 4.

results presented in table 6.10 show that out of 14 coefficients in the research model, 7 path coefficients are significant at the 1% level, and 2 path coefficients are significant at the 5% level. Along with the value of the R^2, the results of the path analyses prove the significance level of the model fit for the study sample.

The following hypotheses have been accepted at the 1% significance level: H1 (impact of high level of asset specificity on contractual governance); H2 (impact of planning uncertainty on contractual governance); H5 (impact of planning uncertainty on joint action); H10 (impact of contractual governance on trust development); H12 (impact of trust development on quality management); H13 (impact of trust development on performance); and H14 (impact of quality management on performance). In addition, the following hypotheses have been accepted at the 5% significance level: H3 (impact of resource availability on contractual governance); and H6 (impact of resource availability on joint action). Further, the hypotheses H4 (impact of asset specificity on joint action), H7 (impact contractual governance on joint action), H8 (impact of contractual governance on quality management), H9 (impact of joint action on quality management) and H11 (impact of joint action on trust development) retained the expected relationship sign (positive impact on the corresponding constructs) but have been accepted at significance levels above 5%. In the following, the analyzed hypotheses are discussed in more detail. To consider the theoretical assumptions and the results of the explorative case studies, the hypotheses are partly regarded in combination with each other.

Hypothesis 1: A high level of asset specificity has a positive impact on tighter forms of contractual governance in the buyer-supplier relationship.

Asset specificity has a significant impact ($p<0.01$) on contractual governance ($\beta = 0.26$). This result accompanies the theoretical assumptions derived from the transaction cost theory (WILLIAMSON, 1979; SCHLEINITZ, 1998; DOLUD, 2004) presented in Chapter 4. The results of the PLS model also confirm the existing results of the case studies (presented in Chapter 3): The interviewed managers of the processing companies confirmed specific investments into the cooperation with their suppliers. The empirical results of the PLS model confirm that the higher the level of asset specificity (and thus the risk of losing the investment), the tighter are forms of contractual governance applied along the companies within the study sample.

Hypothesis 2: A high level of planning uncertainty has a positive impact on the tighter forms of contractual governance in the buyer-supplier relationship.

Hypothesis 5: A high level of planning uncertainty has a positive impact on the tighter forms of joint action in the buyer-supplier relationship.

As already indicated in the previous chapters, the results of the path analyses confirm a significant level of impact of planning uncertainty on the relationships between the processing companies and their milk suppliers. Planning uncertainty

has a significant positive impact on contractual governance (β = 0.54) and on joint action (β = 0.4) in the analyzed buyer-supplier relationships. Both path coefficients are significant at the level of $p<0.01$, which supports the theoretical assumptions (WILLIAMSON, 1979; 1985) and the previous results of the case studies. The results of the path modeling confirm the willingness of the processing companies to secure their relationships with the suppliers through purchasing agreements and additional credit contracts, as well as vertical integration of the suppliers. However, the fact that the processing companies also get involved into joint action and implement support programs for the semi-subsistence farms (also without written contracts) indicates a tendency towards the integration of this specific supplier group into the modern dairy supply chain.

Hypothesis 3: The availability of resources has a positive impact on the tighter forms of contractual governance in the buyer-supplier relationship.

Hypothesis 6: The availability of resources has a positive impact on the level of the joint action in the buyer-supplier relationship.

As expected, resource availability has a positive impact on contractual governance (β = 0.23), as well as on joint action (β = 0.25) at the level of $p<0.05$. These results support the initial assumption that decisions about the coordination form, as well as the extent of the joint action, depends on the resources available to the processing company. Additionally, there is another interesting finding reflecting the role of the available resources for the choice of the coordination form made by the processing companies. The preliminary analyses of the study sample show a high positive response of the companies to the role of financial resources for the choice of the coordination form. The majority of the interviewed managers considered the availability of financial resources to be very important for implementing vertical coordination. On the other hand, the indicator "financial resources" had a very low loading[61] on the construct "Resource availability" in the structural model, and therefore was eliminated from the set of the indicators (see operationalization of the research model in Chapter 5, p.127).

This discrepancy between the descriptive statistics and the results of the research model can be explained as follows. Based on the results of the explorative case studies and descriptive analyses of the survey results, the availability of financial resources is considered a decisive factor for implementing tight vertical coordination schemes by the processing companies (see Chapter 3). However, as the study sample for the survey includes just those companies that are already involved in vertical coordination and offer diverse support programs for their suppliers, the financial resources are available to these companies. Moreover,

[61] See Chapter 5: the indicators with the loadings under 0.4 should be eliminated from the set of indicators reflecting the latent variable (reflective constructs).

these results coincide with the acknowledgment that the majority of the interviewed processing companies are partly or completely financed through the FDI and/or are part of the holdings.

This allows a better transfer of financial resources and human capital, as well as managerial and organizational know-how to the interviewed companies. It can thus be assumed that the weight of financial resources for the companies in the sample was almost equal and therefore did not show much variation and impact of the coordination forms in the latter model. On the contrary, the availability of other resources (such as educational level, consultancy support, etc.) differs among the companies. Due to a higher variation of the answers, the availability of these resources shows a higher loading on a company's own latent variable and a higher impact on the corresponding construct. In other words, as soon as the companies have sufficient financial resources to implement the vertical coordination and support programs, the availability and the combination of managerial knowledge, educational level of employees, consultancy support and cooperation with scientific institutions start to play a decisive role for the choice of the coordination schemes and joint action.

Hypothesis 4: A high level of asset specificity has a positive impact on the level of the joint action in the buyer-supplier relationship.

Surprisingly, the research model ($\beta = 0.11$) could not confirm the impact of asset specificity on joint action at a significant level. Though the relationship between these two constructs is positive as expected, the hypothesis cannot be accepted at a statistically significant level. Thus, the empirical results of the research model neither support the theoretical assumptions presented in the Chapter 4 nor the existing empirical studies. For example, HEIDE/JOHN (1999), JOSHI/STUMP (1999), and CLARO (2004) empirically supported the hypothesis "The higher the transaction specific investments (asset specificity), the higher the extent of the joint action in the buyer-supplier relationship." There are several possible explanations for the results of the structural model in this research.

The first explanation corresponds to a specific situation in the Ukrainian dairy industry. As already presented in Chapter 2 and Chapter 3, the milk processing companies cooperate with two main supplier types (corporate farms and semi-subsistence farms). Both supplier groups receive support programs from the processing companies, but the extent of the support programs for the semi-subsistence farms is much lower in terms of the financial and managerial expenses of the processing companies. Further, whereas cooperation with corporate farms is organized individually through written contracts, mostly verbal agreements or general contracts with the village municipalities are used

for cooperation with semi-subsistence farms[62]. Nevertheless, the processing companies are still interested in cooperation and joint action (such as joint planning, coordination, etc.) with semi-subsistence farms. The comparably low investments in cooperation with semi-subsistence farms also mean low asset specificity for the processing companies. This could explain the absence of dependency between asset specificity and joint action in the buyer-supplier relationships in the Ukrainian dairy industry.

Additionally, the configuration of the model constructs (see table 6.7) could also have influenced the result of the given hypothesis. As presented in Chapter 5 (Research Design), the construct asset specificity refers to the extent of the asset specificity for both groups of suppliers not differentiating between corporate farms or semi-subsistence farms. Whereas the construct joint action includes the cooperation patterns and support programs offered to both corporate farms and the semi-subsistence farms. This could have impacted the results of the path analyses. As a suggestion for further research, the hypotheses could be tested separately for these two groups of suppliers. In order to do this, the data should be collected accordingly, and each construct should differentiate between the situation with corporate farms and semi-subsistence farms. Unfortunately, it is not possible to test the model separately for each group of suppliers due to a given limitations of the applied data. But, based on the results of the conducted sector analyses (Chapter 2) and the case studies (Chapter 3), the author assumes that different results for each of the supplier groups could be achieved. A higher impact of asset specificity on the joint action could arise for the corporate farms. As the processing companies indicated rather lower levels of investments into semi-subsistence farms, a lower impact of asset specificity on joint action could be expected in this sample.

Hypothesis 7: Tighter forms of contractual governance in the buyer-supplier relationship have a positive impact on the level of joint action in the buyer-supplier relationship.

The impact of contractual governance on joint action could not be confirmed at a significant level. Also, in this case the results can be partially explained by the fact that different forms of contractual governance apply to the supplier groups. And whereas written agreements and additional supplements to the contracts are used when cooperating with corporate farms, cooperation with semi-subsistence farms is usually organized by oral agreements or general contracts with the village municipality office. Still, the processing companies cooperate with both supplier groups. Thus, the companies involved in the study implemented support programs and joint action towards the semi-subsistence farms independent of the

[62] As already discussed in the chapter 3 – case study results- the majority of the processing companies prefer the cooperation with the corporate farms. Therefore, their investments and connected risks are also considerable higher for this group of suppliers.

applied contractual governance. Therefore the relationship between the form of contractual governance and the extent of joint action could not be confirmed at the statistically significant level.

Hypothesis 8: Tighter forms of contractual governance in the buyer-supplier relationship have a positive impact on the quality improvement of milk supplies.

Hypothesis 8 could also not be empirically confirmed at the statistically significant level. Here again, one possible explanation relates to different forms of contractual governance applied to different supplier groups. Since mostly no written contracts and no direct agreements are applied with the semi-subsistence farms, the contractual governance form might not be correlated with the quality improvement achieved. Another impact factor (as discussed in Chapters 2 and 3) could be that the semi-subsistence farms are strongly limited in their abilities to increase milk quality. Due to the lack of necessary equipment (such as machine milking) and technologies (appropriate cooling, storage), milk originating from these farms can only be classified as second-grade milk. So even tighter contractual governance implemented with this group of suppliers would probably not change the milk quality.

Hypothesis 9: The level of joint action in the buyer-supplier relationship has a positive impact on quality improvement in the buyer-supplier relationship.

Hypothesis 11: The level of joint action in the buyer-supplier relationship has a positive impact on trust development in the buyer-supplier relationship.

Though these two hypotheses retained the expected positive sign, they could not be accepted at a statistically significant level in this study. The unconfirmed impact of joint action on quality management could possibly be explained by the same factors that were discussed in the case of contractual governance and quality management. There are limitations on both sides of the buyer-supplier relationship. On the one hand, the milk processing companies still "under-invest" in their cooperation with semi-subsistence farms. The majority of the processing companies prefers to cooperate with corporate farms but still depends on deliveries from semi-subsistence farms to fulfill the necessary volume of milk required for their production. Therefore, there are much less cooperation patterns and joint activities offered to the semi-subsistence farms. On the other hand, the semi-subsistence farms also reveal their inherent limitations for increasing milk quality.

Hypothesis 10: Tighter forms of contractual governance in the buyer-supplier relationship have a positive impact on trust development in the buyer-supplier relationship.

According to the path analyses, contractual governance shows a significant impact (at the level of $p<0.01$) on trust development ($\beta = 0.52$) between the processing companies and the milk suppliers. These results empirically confirm

the theoretical assumptions discussed in Chapter 4 of this thesis. According to RING/VAN DE VEN (1992) the economic safeguards and relational forms applied in the buyer-supplier relationship support the development of trust over a definite period of time. As confirmed by the results of the research model, the buyer-supplier relationships formalized through tighter forms of vertical coordination (e.g. written contracts, vertical integration) positively influence the information sharing and fulfillment of requirements between trading partners. The tighter forms of contractual governance set up the framework of the cooperation and define the responsibilities of both partners, and thereby contribute to the development of trust between the processors and the milk suppliers in the Ukrainian dairy sector.

Hypothesis 12: The development of trust between the buyers and suppliers has a positive impact on quality improvement of milk supplies.

Hypothesis 12 has been confirmed at the level of $p<0.01$ in this research: trust development between the processing companies and the milk producers has a significant positive impact on quality management ($\beta = 0.48$). In compliance with the theoretical assumptions presented in Chapter 4, the empirical results confirm that in a trustful relationship, milk suppliers are more willing to fulfill the quality requirements of the processing companies and to deliver milk of a higher quality. These results confirm the preceding conceptual and empirical research done by LU (2007), VAN DE VEN/ RING (2005), etc.

Hypothesis 13: The development of trust between the buyers and suppliers has a positive impact on the performance of processing companies.

Hypothesis 14: The quality improvement of milk supplies has a positive impact on the performance of processing companies.

Both trust development (ß = 0.52) and quality improvement (ß = 0.26) have a significant (at the level of $p<0.01$) impact on the performance of the processing companies. These results confirm the initial assumption that securing high quality milk deliveries represents one of the processing companies' strategic objectives. The present results also coincide with the conceptual work done by GOO/NAM (2007), who emphasize that trust is a key attribute of the relational governance that positively impacts firm performance. The presented empirical results also confirm the assumption that milk producers are more willing to cooperate and comply with the delivery and quality requirements in more trustful relationships. Though cooperation with corporate farms is considered to have a strategic impact on performance by the majority of the interviewed companies, the semi-subsistence farms also showed positive response in terms of trust and quality management. In the perception of company managers, the response of the semi-subsistence farms in terms of trust development and quality management contributes to the performance growth of the processing companies.

6.4 Conclusions

This chapter presented the survey results that supplement and finalize the results of the theoretical review and the explorative case studies presented earlier in this work. In the first part of this chapter the study population and basic information about companies was presented. In the second part the results of the reliability and validity tests for the reflective constructs of the model were shown. Finally, the evaluation of the research hypotheses was undertaken based on the results of the PLS model. To a great extent the results coincide with the theory and the results of the case study interviews. Of the 14 hypotheses, seven were accepted at the level of $p<0.01$ and two at the level of $p<0.05$. In five cases the hypotheses retained the expected relationship sign, but could not be accepted at the statistically significant level (in this study, $p<0.05$). For these hypotheses, further explanation has been provided in accordance with the reviewed theoretical literature and the results of the explorative case studies. In the following chapter, the final conclusions and implications of this study are presented.

SECTION IV CONCLUSIONS

7. CONCLUSIONS

This chapter presents the conclusions, which are based on the theoretical considerations, the results of the sector overview and preliminary case study interviews, as well as the empirical results of the survey provided in the present dissertation. Initially, the most important findings of the study are summarized and the theoretical contribution, applied methodology and management implications for the dairy supply chains in Ukraine are discussed. In the next step, the limitations of the study, which have been partly mentioned in the previous chapters, are summarized and the suggestions for future research are presented.

7.1 The main findings

This study began with the descriptive analysis of the Ukrainian dairy industry, which is characterized by a strong decrease and fundamental shift of milk production from corporate farms to semi-subsistence farms. Suffering from a lack of raw milk supplies, the processing industry had to decrease or in some cases stop the production of the milk products due to low capacity utilization during the transition period. This led the milk processing companies to begin sourcing more milk from semi-subsistence farms. The semi-subsistence farms are characterized by extremely small-scale production and low labor efficiency. Milk collection from the large number of the semi-subsistence farms means higher transport and quality control costs for the processing companies, as well as low milk quality. At present, the efficient organization of the milk supply chain remains a major challenge for the Ukrainian milk processing industry. Implementing vertical coordination and additional support programs for the milk suppliers are ongoing trends in Ukraine.

The main focus of this research is to determine the motives of vertical coordination and its outcomes for the Ukrainian dairy supply chain from the processors´ perspective. The milk processing companies involved in vertical coordination with their suppliers are heterogeneous considering organizational form, origin of capital and offered variety of milk products. Nevertheless, some important common features could be found among the companies in the survey sample. The majority of the processing companies involved in vertical coordination with their suppliers exhibit strong relationships with the national and international companies (being a part of the business group or holding). This fact supports the assumption about the significant role of financial and human capital, managerial knowledge and know-how that comes from the (foreign) mother companies and which influences the implementation of various

coordination schemes. The companies involved in the survey offer a variety of milk products and show a high presence in high quality segments such as baby nutrition, pro-biotic, and premium products. Moreover, having a strong position on the Ukrainian market, the companies expressed a particular interest in entering the international markets. However, the insufficient quality of milk supplies has been indicated as one of the most important limiting factors by the interviewed managers. To deal with this problem, the processing companies invest in vertical coordination and additional support programs for their suppliers.

The first set of hypotheses focused on evaluating the motives of vertical coordination in the Ukrainian dairy sector such as uncertainty, asset specificity and resource availability.

Securing milk deliveries appears to be the main motivation for implementing vertical coordination mechanisms among the interviewed companies. Looking for more influence and control of the milk production process, company managers favor tighter vertical coordination forms to increase the quality of milk deliveries and to engage suppliers in long-term cooperation. The results of the survey confirm that a high level of planning uncertainty drives the processing companies to implement tight forms of contractual governance and joint action with their suppliers.

The processing companies confirm an increasing demand for milk supplies and a high risk of losing key suppliers. Asset specificity resulting from a high level of transaction-specific investments and difficulty with finding new suppliers drives the companies to implement tighter governance structures and long-term cooperation with the milk producers. The empirical results confirm that a high level of asset specificity positively affects the implementation of closer contractual governance (e.g. a high share of vertical coordination schemes and contract duration) in the analyzed buyer-supplier relationships. On the other hand, the impact of asset specificity on the level of joint action has not been confirmed at a statistically significant level in this study. An additional explanation for these results can be derived from the qualitative case study interviews with company managers. Though asset specificity is higher for cooperation with corporate farms (due to higher investment levels), companies extend cooperation and apply joint action to semi-subsistence farms as well. Therefore, no significant impact has been found between asset specificity and joint action.

The availability of resources appears to be of decisive importance when it comes to the decision about the form and extent of vertical coordination. Though the interviewed companies considered financial resources as the most decisive factor for implementing vertical coordination, the quantitative survey results indicate that resources such as managerial knowledge, educational level of the

employees, consultancy support and cooperation with scientific institutions all play particularly decisive roles for the choice of the form and extent of vertical coordination schemes. These findings can be interpreted in the following way: the availability of financial resources appears to be an entry barrier for the processing companies to develop tighter coordination mechanisms with their suppliers. Therefore, the companies consider these resources as the most important for implementing vertical coordination and supplier support. However, as soon as the company overcomes the entry barriers, these are the resource differences that allow the company to define and implement a unique coordination strategy with its suppliers. Though the majority of the interviewed companies stated the importance of the availability of financial resources, the study results show that these resources no longer offer a competitive advantage for a particular company in a survey sample. Such company-specific resources as management skills or educational level of employees, which cannot be immediately imitated by others, offer a source of competitive advantage and define the unique form and extent of inter-firm coordination strategies.

Both formal and informal contractual governance are relevant and intensively used in the relationships between milk suppliers in Ukraine. Formal forms of contractual governance (e.g. written agreements) are applied in cooperation with corporate farms and, less frequently, with semi-subsistence farms. As confirmed by the survey results, the form of contractual governance is not decisive for the extent of joint action with the milk suppliers. Also, an informal agreement with semi-subsistence farms (in some cases a general written agreement with the village municipality) can be sufficient for the processing companies to offer joint action and invest in these relationships (mostly in the form of assistance programs).

The second set of hypotheses focused on evaluating the outcomes of vertical coordination such as quality management, trust development and performance.

From the processor's perspective, both corporate farms and semi-subsistence farms improved their quality management practices after being involved in vertical coordination schemes. However, the hypotheses about the impact of vertical coordination (defined as joint action and governance structure) on quality management could not be accepted at a statistically significant level in this study, even though an expected positive sign was obtained. Although vertical coordination has a positive impact on both supplier groups, corporate farms tend to benefit more from vertical coordination schemes than semi-subsistence farms. The coordination mechanisms and the support programs offered to the semi-subsistence farms are rather small-scaled and less capital-intensive.

It can be assumed that corporate farms might be comparably better able to utilize scale effects and management advantages. Therefore, processing

companies mostly focus on cooperation with corporate farms, although they source an essential share of their milk supplies from semi-subsistence farms. Still, in many cases the processing companies do not consider semi-subsistence farms as a valuable cooperation partner, but rather as a temporary solution (even if there is no other visible solution in a middle- or even long-term perspective). Regarding the existing situation on the Ukrainian dairy market, semi-subsistence farms seem to sustain their milk production and deliveries to the milk processing companies in the short- and middle-term. Some of the semi-subsistence farms might have a chance to develop into family farms as in Western Europe, and can thus strengthen their bargaining position with the milk processors. With the ongoing development of large milk production units, semi-subsistence farms might give up their production in the long-term. However, forming corporate farms requires high financial investments and time to develop, and will be rather a long-lasting process in Ukraine.

Vertical coordination appears to have a positive impact on trust between the processing companies and milk suppliers. Regarding unstable markets and negative past experience, it requires some time to build a long-term relationship based on trust and mutual interest. The results of the study confirm that tighter governance structures and joint action offered by the processing companies play an important role in building a trustful cooperation. Tighter forms of contractual governance positively influence the development of trust between trading partners. If the requirements and consequences are clearly communicated and its fulfillment is guaranteed by additional agreements, the milk suppliers are more likely to exchange information and comply with the expectations of the milk processing companies.

The study results signify that those milk producers who are involved in secured and trustful relationships better comply with the quality requirements and are rather willing to exchange information about production processes. Thus, trustful cooperation between the processing companies and the milk producers supports their mutual interests and allows them to better adjust to the other party's requirements. Crucial findings in terms of managerial impact are the positive dynamics of trust development, and improved quality management after the implementation of vertical coordination. The processing companies involved in the survey stated that they achieved additional advantages due to improved quality management and trustful cooperation with their suppliers. Processors have claimed positive achievements such as strengthening the raw milk supply, own production increases, the implementation of new products, market share increases and profit growth. The results of the survey, combined with the results of the case study interviews, confirm that processing companies perceive significant performance growth associated with being involved in vertical coordination with their suppliers.

7.2 Methodological reflection

A distinctive characteristic of this research is the multi-strategy approach, which refers to the combination of qualitative and quantitative study methods. The first empirical part of the study presents the results of the explorative case study interviews with the managers of processing companies. In addition to the descriptive analyses of the Ukrainian dairy sector based on official statistical data (Chapter 2), qualitative interviews with the company managers provide deeper insight into the managers' perception of the main challenges in the Ukrainian dairy sector. To conduct the explorative interviews with the company managers, a guideline was applied (see APPENDIX 1). Using a flexible guideline instead of the questionnaire with the predefined questions provided a good opportunity for additional clarification questions, and allowed deep information exchange between the interviewer and the respondents. The case study interviews enabled a better understanding of the relationships between the milk processing companies and the milk suppliers in Ukraine, and shed light on the main motives of the processing companies' introduction of various cooperation schemes to their suppliers. A better understanding of the main aspects of vertical coordination (such as growing demand and uncertainty of supplies, trust, governance forms, etc.) and the perception of the company managers could be captured in this way. The case study results offer a solid background for elaborating the research hypotheses and the quantitative part of this research. Due to the rich background information and expert insights, the results derived from this approach play an important supportive role for the final interpretation of the survey results.

To test the conceptual model (Chapter 4) a partial least squares approach (PLS) was applied. This method was chosen due to its ability to analyze the complex interrelations in the conceptual model and to deal with the small survey sample (38 interviews). Reflective indicators used for determining the constructs of the research model allow the estimation of complex causal relationships. The measurement instrument for the survey was developed based on the theoretical literature review and existing empirical studies. The conceptual framework consists of a combination of theories (transaction cost theory and resource-based view) and concepts (quality management, trust and firm performance). This approach was chosen to capture the specific features of Ukrainian dairy industry, which includes high transaction costs, opportunistic behavior by the suppliers, lack of trust between the trading partners, and uncertain milk deliveries. The transaction cost theory offered an appropriate approach to explain the impact of planning uncertainty and asset specificity on different forms of contractual governance and joint action between milk suppliers and Ukrainian milk processing companies. Additionally, the role of the available resources for vertical coordination has been analyzed through the lens of the resource-based perspective. The concepts of quality management, trust and firm performance

have been applied to determine their complexity and interrelation in the buyer-supplier relationship. The combination of presented theories and concepts enabled the unification of the various aspects into the complex conceptual framework. The chosen approach provided deeper insights into the drivers and outcomes of vertical coordination and allowed a better understanding of the inter-firm cooperation and alternative governance forms in Ukraine. The combination of qualitative (explorative case study interviews) and quantitative research (PLS structural model) not only allowed the research hypotheses to be evaluated, but also captured the comments of the managers regarding their decisions and expectations from the applied coordination schemes.

All interviews in this study were conducted by the author face-to-face with the company managers. No secondary data were available to answer the posed research questions. Personal interviews appear to be an efficient way to conduct primary data collection in Ukraine due to the following important advantages. First, personal interviews increase the response rate among the managers compared to contact via email and/or telephone. Eventual misunderstandings of the questionnaire can be reduced through the clarification questions posed during the interview. Additionally, personal interviews provide an opportunity to obtain additional information beyond the standard questions, and to gain important insights into the mind of the managers (their attitudes and perception).

7.3 Managerial implications

The interviewed managers of the processing companies are challenged by the organization of an efficient dairy supply chain. On the one hand, the Ukrainian milk processing industry is characterized by rapid development and growing interest in international markets. On the other hand, the milk producers still experience problems with satisfying the growing demand for high quality milk. To secure milk supplies and to develop reliable cooperation with milk suppliers, the processing companies implement closer forms of vertical coordination. The study results confirm that tighter forms of contractual governance and long-term cooperation with the suppliers positively affect the processing companies' performance. Based on the empirical results of the study the following managerial implications can be drawn.

The interviewed companies that are involved in vertical coordination with their suppliers perceive a performance increase mainly due to better milk quality and trust development on the suppliers' side. The managers confirm increased supplier response and commitment, as well as improved compliance with delivery requirements and quality practices after the support programs were implemented. The empirical results of the study confirm the positive impact of the implemented forms of contractual governance and joint action on suppliers' behavior. The insights provided by this study can serve as a guideline for the

processing companies in Ukraine to better understand the mechanics of vertical coordination and its outcomes.

For the analyzed relationships, trust plays an important role in improving quality management practices and performance. Initially, the implemented formal governance structures contribute to trust development in the buyer-supplier relationship. The company managers interviewed in the survey perceive a significant increase of trust in their cooperation with suppliers who received support programs in connection with vertical coordination. These results are consistent with insights from the sector analyses and case interviews done in this study, as well as the literature on transition countries (e.g. GOW et al., 2000; GOW/SWINNEN, 2001), which found that the relationships between market actors in the Ukrainian dairy industry are still influenced by a lack of trust that originated during the transition period. The study shows that consequent contractual governance and joint action within vertical coordination can reduce the level of uncertainty and mistrust, and thus lead to trustful and mutually beneficial inter-firm relationships. Additionally, a long-term buyer-supplier relationship appears to positively affect inter-organizational trust and the level of information sharing between partners.

Another interesting finding as stated by the interviewed processors refers to the positive response of semi-subsistence farms to applied joint action and contractual governance (such as written contracts, long-term cooperation and support programs within vertical coordination). In the author's opinion, there are still unexploited potentials of closer cooperation with semi-subsistence farms. After the cooperation patterns have been applied to semi-subsistence farms, the interviewed processing companies perceive a positive response and increase of information sharing, improved quality practices and trust development from the side of the involved semi-subsistence farms. Regarding the fact that processing companies depend on milk deliveries from semi-subsistence farms, at least in the middle-term, improving cooperation with these suppliers might represent a significant source of additional performance growth and offer additional advantages to both partners.

According to the study results, the managers of the processing companies underestimate the role of managerial and organizational knowledge (e.g. general organizing skills, planning and time management, project scheduling and coordination) for the successful organization of buyer-supplier relationships. The majority of the processing companies involved in the survey also consider resources like the educational level of the employees and cooperation with scientific institutions as less important for their decision to implement support programs for their suppliers. However, the study results confirm that the availability of such resources is decisive when it comes to the form and extent of vertical coordination. The availability of financial resources might serve as an "entry barrier" for the processing company to begin implementing vertical

coordination and support programs for the suppliers. However, resources such as managerial and organizational knowledge and skills are less easy to imitate, and have the potential to create a unique strategic advantage for the respective firm (assuming adequate human-resource management is provided).

This issue becomes especially important when considering competitors' interest in the implemented vertical coordination strategies, as stated by the interviewed processing companies. The interviewed managers consider implementing new support programs, or extending existing mechanisms for a wider circle of suppliers in the near future. Thus, the implemented forms of vertical coordination could establish a trend for similar developmental paths in the whole industry. However, this represents an additional challenge for the managers of companies already involved in vertical coordination to maintain their competitive advantages. This could be done by individually configured vertical cooperation patterns and efficient relationships with the suppliers, which cannot be easily copied by the competitors. Such vertical coordination strategies would represent a unique strategic advantage for a particular company.

7.4 Limitations of the study and outlook for future research

Due to the explorative nature of this research there are some limitations and areas for future research and improvement to be mentioned.

The new measurement instrument developed in the framework of this study shows high values of validity and reliability according to the test results. However, because this study is based on a low number of cases, this might have led to a higher variance of the correlation coefficients compared to the larger study samples (FIELD, 2005). Therefore, the author recommends further testing of the elaborated conceptual framework on a larger sample of companies. As the interviewed companies involved in the study cover 65% of the total milk deliveries to processing industry in Ukraine, this might be difficult to increase the sample within the Ukrainian dairy industry. Still, some large milk processing companies and a row of middle and smaller sized companies have not been captured by this study and can be potentially interviewed in frame of the future studies. Applying a larger sample would allow further generalization of the results and testing the conceptual framework, also applying to other industries or countries.

Not all theoretical hypotheses could be empirically confirmed for the given study sample. The discussed differences in cooperation between the processing companies and different types of milk suppliers (corporate farms and semi-subsistence farms) might be a possible reason for some deviations between the theoretical assumptions and the results of the study model. Due to the various technology levels and different coordination and support mechanisms offered by the processors, different motives and outcomes of vertical coordination might also be expected from corporate farms and semi-subsistence farms. The fact that

the research model has not differentiated between the two types of supplies is considered as another limitation of this study. In particular, the managers of processing companies have not been asked if they experienced different level of uncertainty and asset specificity while cooperating with corporate farms and semi-subsistence farms. This made it impossible to test whether different motives would play role in establishing vertical coordination with each type of suppliers. Therefore, one of the suggestions for future research would be to test the elaborated conceptual framework separately on two subsamples (coordination between processing companies and corporate farms, as well as the coordination between processing companies and semi-subsistence farms). Since only the processing level has been analyzed in this thesis, another important suggestion would be to extend the study sample and to involve the milk producers in future surveys to fully understand the effects and drivers of vertical coordination, especially regarding the issues of trust, quality management and performance.

Another limitation of this study is caused by the inability of the PLS approach to evaluate the circle interdependencies between the variables in the model. In this study the positive impact of contractual governance on trust development was hypothesized and confirmed empirically. Though, according to the literature, trust also overtakes the role of the economic safeguards used to protect specific assets in a relationship (RING/VAN DE VEN, 1992), it also eases transactions by decreasing the negotiating and contracting costs (DYER, 1997; GULATI, 1995). Furthermore, trust enhances the revenues of alliances through better collaboration and more advanced resource usage (BARNEY/HANSEN, 1994; DYER/SINGH, 1998). In the presented study, only the impact of contractual governance (presented as a latent variable) on trust (presented as a latent variable) could be tested, but not vice versa. Due to the mentioned limitation of the PLS approach, the model could not analyze the backward-impact of trust on contractual governance and joint action, though such an influence could be expected. Proof of such inter-relationships requires a different research approach, which could also provide analyses of the buyer-supplier relationships during a definite period of time.

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APPENDICES

Appendix 1 Case study guideline

1. Information about the company
    a. Organizational and legal form
    b. Ownership structure, shareholding and further forms of financing
    c. Size (turnover, market position)
    d. Number of employees
2. Production
    a. Main products
    b. Production structure
3. Sales channels (market share)
    a. Market share in Ukraine
    b. To which countries are the products exported
    c. Sales share in Ukraine
4. Sales channels
    a1. Own distribution channels
    a2. Supermarkets
    a3. Prefabrication for processing and food industry
    a4. Wholesalers
    b. Long-term sales contracts existing in these channels
5. Product quality
    a. Quality standards implemented in the company
    b. Who decides about the standards: the company or the contracting buyer?
    c. Problems, strengths and weaknesses
    d. Situation changes in the last 5 years
6. Milk suppliers
    a. Semi-subsistence or/and corporate farms (shares of milk delivery)
    b. Contractual governance (oral or written agreements)
    c. How often the suppliers has been changed; due to what reason
    d. With which farms (milk suppliers) does the company prefer to work?
7. Support programs for milk quality improvement
    a. Are there any support programs? If yes, what kind?
    b. Modernization, financial support of the milk farms
    c. Since when the programs have been used
    d. On which farms are the programs implemented?

e. What kind of contractual governance is applied?
f. What is the extent of such programs (e.g. share of milk suppliers)?
g. What impact did these support programs have since their introduction?
h. Quality improvement within the last 5 years
i. What problems appeared, especially in regards to milk quality?

8. Investments
    a. In what production stages did the company invest in the last 5 years?
    b. Investments in quality improvement
    c. Investments in milk suppliers
9. What data could the company provide in the frame of this research: profitability, sales volumes, and main sales channels/regions

Appendix 2 Basic information of the interviewed companies

Main characteristics	**Company 1**	**Company 2**	**Company 3**	**Company 4**	**Company 5**	**Company 6**	**Company 7**
Person(s) interviewed	Deputy of executive director	Executive director for quality management	Main quality manager	Executive director for quality management	Main quality manager	Main quality manager	Executive director for quality management
Legal form	Holding	Holding	Holding	JSC	Holding	Holding	JSC
Number of companies in the holding	6	3 (in Ukraine)	16	1	8	2 (in Ukraine)	1
Sales volume (Mio USD)	114.0	68.5	21.1	22.8	38.4	61.8	97.0
Market share: % Main product	 7.8 Cheese	 20.8 Yoghurt	 6.8 Cheese	 - -	 3.5 Cheese	 14.1 Yoghurt	 14.9 Yoghurt
Main products	Cheese, butter, dry milk	WMP*, cheese	Cheese, WMP*, butter, dry milk	Butter, dry milk, casein	Cheese, butter, WMP, dry milk	WMP	WMP
Source of milk supplies: Corporate farms, % Semi-subsistence farms, %	 30 70	 30 70	 40 60	 30 70	 35 65	 40 60	 35 65
Sales channels inland	Own distribution network, supermarkets, wholesalers	Supermarkets	Supermarkets, wholesalers, processing industry	Supermarkets	Regional distribution network, wholesalers, supermarkets	Own distribution network, wholesalers, supermarkets	Own distribution network

Main characteristics	Company 1	Company 2	Company 3	Company 4	Company 5	Company 6	Company 7
Exports	Russia	No information	Russia, Kazakhstan, Algeria, Japan, EU, Singapore	Saudi Arabia, Arabic Emirates, Syria, Mexico, Israel	Russia, Moldavia, Bulgaria, Romania, Kazakhstan, Azerbaijan, Armenia, Uzbekistan	No information	Belarus
Implemented quality system	ISO, HACCP	ISO (in process)	HACCP, ISO	HACCP (planed)	ISO	No information	No information
Implemented VC strategy	1) extension seminars for corporate farm managers; 2) the technical assistance for the semi-subsistence farms	No support measures *Intermediary used for the cooperation with the semi-subsistence farms	1) financial support for corporate farms: credits and co-financing; 2) integration of corporate farms; 3) seminars for corporate farm; 4) the technical assistance for the semi-subsistence farms	No support programs	1) financial and organizational support for corporate farms 2) the technical assistance for the semi-subsistence farms	1) financial support for corporate farms: credits, delivery of cooling and milking machinery, purchase of feed, fuel, detergents at wholesale price	1) the technical assistance for the semi-subsistence farms; 2) strategic cooperation with the semi-subsistence farms

Source: Based on interviews conducted in Ukraine, 2007.

*WMP - whole milk products include a range of products such as yoghurt, kefir, cottage cheese, etc.

Appendix 3 Survey questionnaire for processing companies

Date: _____ **Interviewer:** _____ **Questionnaire #:** _____

Implementation of support programs for milk producers with the objective of optimization of the milk collection and improvement of the milk quality
Interview with the managers of milk processing companies

I. General information

Company:		Legal form (e.g. corporate group):	
Address (city/region):		Milk processing volume (thousand ton), 2008 A total of corporate group:	
Number of employees, 2008: A total of corporate group:		Annual turnover, 2008: A total of corporate group:	
		Profit, 2008: A total of corporate group:	

II. Personal information

Name: _____
Department: _____
Position: _____

III. Production and sales

1). Specify 5 main products, manufactured by the company:

□ Hard cheese	□ Soft cheese	□ Butter
□ Whole milk	□ Skimmed milk	□ Kefir
□ Yoghurt	□ Sour cream	□ Cottage cheese
□ Condensed milk	□ Dry milk	□ Casein
□ Ice cream	□ Other _____	□ _____

2). Do you have the following product categories? If yes, in what percentage to the whole production (average)?

□ Baby food _____%	□ Premium products _____%	□ Organic products _____%

3). What quality standards/systems are implemented at the company?

□ DSTU (Ukrainian national)	□ HACCP	□ ISO	□ Other _____

4). What products did the company export and in which countries, in 2008 (main directions):

Countries	Products
1.	
2.	
3.	

5). Has the company invested in own production during the last three years?

	Yes	No	I don't know
Processing lines	□	□	□
Control and improvement of raw milk (e.g. Test equipment, filters, standards, etc.)	□	□	□
Packing lines	□	□	□
Own distribution system	□	□	□
Other _____	□	□	□

6). Have some external organizations or natural persons invested in the company during the last three years in one of the following or different forms?

☐ Yes ☐ No ☐☐ I don't know

If yes, in which form…	Country
□ Strategic partnership	
□ Shareholding	
□ Joint venture	
□ Equipment leasing	
□ Licenses for definite products	
□ Credits	
□ Management and know-how transfer	
□ Other (please specify)	

III. Cooperation with milk producers

7). Please specify the structure of suppliers according to milk deliveries:

□ Corporate farms ____ %	□ Semi-subsistence farms ___ %	□ Other (e.g. middleman)_____%

8). For how long does the company usually work with the same suppliers?

Period of time	Corporate farms	Semi-subsistence farms
Under 1 year	□	□□
One to three years	□	□□
More than 3 years	□	□

9). How is cooperation organized between the company and the milk producers: <u>mostly</u> through written contracts or verbal agreements?

Supplier	Written contract:	Verbal agreement:
Corporate farms	□ for one supply only	□ for one supply only
	□ for one year or less	□ for one year or less
	□ for more than one year	□ for more than one year
	□ without contract	□ without any agreement
Semi-subsistence farms	□ for one supply only	□ for one supply only
	□ for one year or less	□ for one year or less
	□ for more than one year	□ for more than one year
	□ without contract	□ without any agreement

10). If the cooperation is organized through written contracts,

…who initiates the contract elaboration?

□ Company	□ Milk producer	□ Together	□ Other

…are the following points indicated in the contract, or what additional points are/can be taken in (please specify)?

□ Milk quality	□ Milk quantity	□ Delivery conditions
□ Price	□	□

11). To what extent do you agree with following statements?

	Do not agree	Rather don't agree	Partially agree	Rather agree	Fully agree	Don't know	n/a
Our suppliers behave honest and reliable toward the company	□□	□□	□□	□□	□□	□□	□□
We regularly control quality of milk delivered by our suppliers	□□	□□	□□	□□	□□	□□	□□
Production planning is stabile according to the milk delivery: we can always rely on getting the required milk quantity and quality	□□	□□	□□	□□	□□	□□	□□
Even without written contracts between the company and milk suppliers, the agreements are always fulfilled	□□	□□	□□	□□	□□	□□	□□

! If cooperation is organized through written contracts

	Do not agree	Rather don't agree	Partially agree	Rather agree	Fully agree	Don't know	n/a
Milk producers always fulfill the terms of the contract	□□	□□	□□	□□	□□	□□	□□
If milk supplier does not fulfill the terms of the contract we can always refer to appropriate instance	□□	□□	□□	□□	□□	□□	□□

12). In your opinion, what are the main reasons for low milk production and low milk quality by milk producers? (you can choose multiple answers)

	Do not agree	Rather don't agree	Partially agree	Rather agree	Fully agree	Don't know	n/a
□ Lack of own capital							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ No easy access to a credit							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ Obsolete equipment							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ Lack of production technologies							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ Low educational level							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ Problems with fodder provision							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ Low milk price							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ Lack of knowledge of hygiene and quality standards							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ Absence of motivation to improvement							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ Poor transport communications							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ High level of own consumption							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
□ Other							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□

13). To what extent do you agree with following statements:

	Do not agree	Rather don't agree	Partially agree	Rather agree	Fully agree	Don't know	n/a
We plan our milk demand for the next season together with the producers:							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
We inform producers at once about necessary modifications and new requirements to production quality							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
Our suppliers seek to meet our requirements and to improve the cooperation							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
Our suppliers regularly provide us information, which allow us to: - set the price and quantity of milk, which we buy from given suppliers							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
- determine the quality of milk we buy							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
- optimally organize the milk deliveries							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□
- forecast the supplier's production							
Corporate farms	□□	□□	□□	□□	□□	□□	□□
Semi-subsistence farms	□□	□□	□□	□□	□□	□□	□□

IV. Support programs for milk producers

14). Does the company implement some of the following or other producer's support programs?

□Yes □ □No, go to #22

Support programs	Corporate farms	Semi-subsistence farms	When is the program introduced (year), once or regularly
Additional payment for quality	□	□	
Additional payment for quantity	□	□	
Supplying with fodder	□	□	
Supplying with inventory	□	□	
Supplying with livestock/genetic material	□	□	
Supplying with equipment and machinery	□	□	
Organization of milk collection stations	□	□	
Financing (credits, leasing)	□	□	
Management consulting	□	□	
Organization of seminars	□	□	
Support of the cooperatives	□	□	
Shareholding and integration of milk production	□	□	
Other_____	□	□	

15). Did the company invest in milk producers during the last three years?

□ Yes □ No □ I don't know

If yes, what kind of investments and to what extent (average)?

□ Agricultural machinery, value _____ UAH	□ Construction and repair of productive facilities, value _____ UAH	□ Milking machines, cleaning systems, Value _____ UAH
□ Cooling tanks, value _____ UAH	□ Other	□

16) What share of milk deliveries is obtained from the producers, who receive some of the support programs from the company?

□ under 20%	□ 20%- 40%	□ 40% - 60%	□ 60% - 80%	□ more than 80 %

17). What role did the following factors play in your decision to implement support programs for the milk producers (which of them were on hand)?

	Not important	Rather not important	Partially important	Rather important	Very important	Don't know	n/a
□ Available financial resources	□	□	□	□	□	□	□
□ Educational level of employees	□	□	□	□	□	□	□
□ Managerial and organizational knowledge	□	□	□	□	□	□	□
□ Milk producers' technologies	□	□	□	□	□	□	□
□ Prior cooperation experience with milk producers	□	□	□	□	□	□	□
□ Location of milk producers	□	□	□	□	□	□	□
□ Size of milk deliveries	□	□	□	□	□	□	□
□ Producers' motivation to cooperation	□	□	□	□	□	□	□
□ Balance and liquidity of milk producers	□	□	□	□	□	□	□
□ Available consulting support for the company	□	□	□	□	□	□	□
□ Cooperation with scientific institutions	□	□	□	□	□	□	□
□ Other (please, specify)	□	□	□	□	□	□	□

18). To what extent do you agree with the following statements?

	Do not agree	Rather don't agree	Partially agree	Rather agree	Fully agree	Don't know	n/a
If we change/lose our main suppliers, we will lose what we invested in them	□	□	□	□	□	□	□
We invested a lot of time to find our main suppliers	□	□	□	□	□	□	□
If we change/lose our main suppliers, it will be difficult to find new ones	□	□	□	□	□	□	□
Without support programs our company cannot obtain enough milk of required quality by the needed time	□	□	□	□	□	□	□

19). What financial resources are available to the company to finance the support programs for producers? (multiple answers possible)

Resources	Shares, %
□ Own capital	
□ Credits	
□ Resources of international projects	
□ Investment (international) from partners	
□ Governmental support	
□ Other	

VI. Strategic advantages and impact on milk quality and partner trust

20). After implementation of support programs …

	Do not agree	Rather don't agree	Partially agree	Rather agree	Fully agree	Don't know	n/a
The quality of milk deliveries from producers increased							
Corporate farms	□	□	□	□	□	□	□
Semi-subsistence farms	□	□	□	□	□	□	□
Milk producers fulfill the hygienic norms							
Corporate farms	□	□	□	□	□	□	□
Semi-subsistence farms	□	□	□	□	□	□	□
Milk producers are more interested to provide the information on milk production and quality							
Corporate farms	□	□	□	□	□	□	□
Semi-subsistence farms	□	□	□	□	□	□	□
Milk producers break the contract terms and oral agreements less frequently							
Corporate farms	□	□	□	□	□	□	□
Semi-subsistence farms	□	□	□	□	□	□	□
One-delivery and short-term contracts transform into long-term cooperation							
Corporate farms	□	□	□	□	□	□	□
Semi-subsistence farms	□	□	□	□	□	□	□
We can better rely on milk producers in matters of quality and milk deliveries							
Corporate farms	□	□	□	□	□	□	□
Semi-subsistence farms	□	□	□	□	□	□	□

21). The implementation of support programs for milk producers provides the following advantages to the company:

	Do not agree	Rather don't agree	Partially agree	Rather agree	Fully agree	Don't know	n/a
Better milk prices	□	□	□	□	□	□	□
Strengthening of the raw milk supply as a strategic advantage over competitors	□	□	□	□	□	□	□
Achievement of strategic company aims, such as: - Increase in market share - Implementation of new products - Accessing the new markets	□	□	□	□	□	□	□
Increase in own production	□	□	□	□	□	□	□
Increase in profits	□	□	□	□	□	□	□
New technologies and processes (in production and management), which are not available to the competitors and are strategic advantages (please specify):	□	□	□	□	□	□	□
Other	□	□	□	□	□	□	□

22). Please specify the main reasons why the company does not implement any support programs for the milk producers:

	Do not agree	Rather don't agree	Partially agree	Rather agree	Fully agree	Don't know	n/a
Lack of financial resources	□	□	□	□	□	□	□
Lack of organizational skills	□	□	□	□	□	□	□
Working through middle-men	□	□	□	□	□	□	□
Other (please, specify)	□	□	□	□	□	□	□

Appendix 4 Support programs for milk suppliers

The main support programs are briefly presented in the chapter titled "Case study findings." This appendix provides additional information on the support programs implemented by the interviewed processing companies in terms of vertical coordination with their milk suppliers. Moreover, this appendix offers more detailed information about the specifics of each of the implemented support programs.

Additional payment for milk quality and quantity

The most widely applied motivational action is additional payment for higher quality milk. Even if this measure still applies more to the marketing strategy than to the issue of vertical coordination, differentiation between milk quality payments (based on the fat or milk protein content and purity of the milk samples) increases the motivation of the milk suppliers to make an effort to produce higher quality milk. This measure is used by almost all interviewed companies.

Some processing companies introduce additional payments for delivering higher volumes of milk. In all, 27 companies implemented this motivation mechanism for the corporate farms to provide an incentive to deliver the whole amount of milk to the company and not distribute it to different companies. Due to the generally lower milk deliveries from the semi-subsistence farms, this payment for additional quantity was offered by only 5 processing companies. The strategic objective was to increase the deliveries from single semi-subsistence farms, which were motivated to supply more milk or combine into one delivery of higher quality milk to the processing company.

Supplying with fodder and inventory

Only six companies supplied fodder to the large farms and 18 processors provided the semi-subsistence farms with fodder. Fodder was not provided for free, but still provided advantages for the producers. For example, processing companies purchased a high volume of fodder at the wholesale price, which therefore reduced the retail price for the producers. Moreover, processing companies delivered fodder using their own transport vehicles, which eliminated the necessity of transportation for milk producers. Processing companies focused their fodder provision program more on small producers. If corporate farms can usually negotiate with the suppliers and look for different sources of supplies, semi-subsistence farms are much less mobile and are usually in a lower bargaining position compared to the input suppliers because of low economies of scale.

A total of 10 and 13 companies provided the large farms and semi-subsistence farms with inventory, respectively. Large farms were provided with necessary

inventories in terms of their cooperation contracts with the processors. Possible contractual patterns were, for example, repayment of all investments with future milk deliveries, or in the case of inventories, just the delivery of higher milk quality. In the case of vertical integration, all necessary inputs were set on the expenses and included into the milk cost price.

In case of the semi-subsistence farms, inventories were provided in terms of the written agreement between the village municipals or directly semi-subsistence farms. Inventories were provided under conditions that semi-subsistence farms will deliver milk to this processing company.

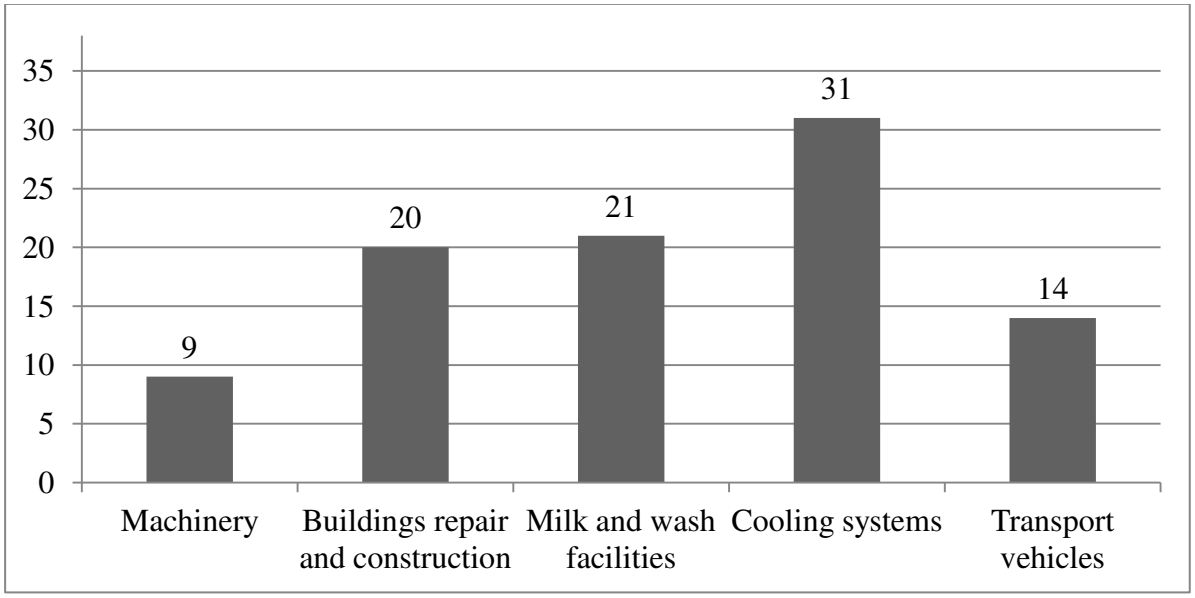
Supplying with livestock/genetic material

Several processing companies offered genetic materials to their suppliers. Two processing companies provided large farms with livestock genetic materials and three companies provided genetic material to semi-subsistence farms. One of the companies provided genetic material samples to both agricultural companies and semi-subsistence farms; this company has an agreement with the section station for the number of supplies. Samples were provided to the milk producers under contractual terms.

Supplying with equipment and machinery

Equipment and machinery supply represents the most substantial part of support programs offered to the large agricultural producers; 28 processing companies involved in the survey provide their large suppliers with various equipment and machinery (including agricultural machinery, milking and cooling equipment, transport vehicles, etc.). Seven of those companies and one additional processor also provide semi-subsistence farms with the necessary equipment, which usually includes small milking machines or cooling tanks installed in the villages under the terms of the contract between the village municipalities and the processing company (see the following chapter for milk collection stations). Milking machines are provided to the semi-subsistence farms that have the minimal number of cows (usually 3 or 4), and accordingly a higher quantity of milk deliveries can be expected after a longer cooperation period.

Investments in the milk producers from the side of processing companies, n=38, multiply entries possible



Source: Own survey.

Two different contractual guidelines for the equipment provision are applied by the interviewed companies. In the first case, there is an additional credit contract between the processing company and its milk supplier, which determines the terms of payment for the provided equipment. This kind of agreement is usually used for corporate farms; the equipment is sold to the milk producer on terms of later payments, usually in the form of milk deliveries. Also, milking machines are provided to the semi-subsistence farms with the use of a credit contract between the processing company and the involved private owners. In the second case, the processing company remains the owner of the equipment and grants the milk producer the right to use it under the contractual conditions. Usually these are milk deliveries of a certain quality and quantity. This kind of agreement is also applied for some corporate farms and in the case of establishing milk collection points. As discussed in the sectoral overview, the lack of equity capital hinders milk producers from modernizing the production equipment. Therefore, the support programs from the processing companies play an important role in this modernization process because they are usually the only source of financial assistantship available to the milk producers.

Financing

A total of 27 companies offered credits and leasing agreements to support the purchase of new equipment and machinery by the corporate farms, and 3 companies offered financial support to the semi-subsistence farms. Because of the high level of risk, credit institutions and banks are often unwilling to work with the agricultural producers. Also, existing credit lines offered by some banks are still unavailable to most agricultural companies. The problem for most

agricultural producers is low (or often also negative) profitability and obsolete technical equipment, which cannot be accepted as a guarantee for the credit. For many agricultural producers cooperating with the processing companies is the only way to finance their modernization and innovation processes.

There are two ways the processing companies can offer financial support for their suppliers. Some companies reported using their own capital or credits taken by the bank for financing their strategic suppliers' investments. Another way was cooperation between the processing company, milk producer and the bank, where processing company was the guarantee for the credit given to the milk producer.

Organization of milk collection stations

The main idea of how the milk collection stations are organized is the simplification of milk collection from the high number of semi-subsistence farms, or from the large remote farms. Organizing the collection station requires the following steps: first, the processing company agrees with the regional or village municipals (or additionally with the semi-subsistence farms) in terms of planning certain milk deliveries in the region. Second, the processor rents an appropriate building, then purchases and installs the necessary equipment (cooling tank, quality control devices, and inventories). To run a station, one or two controllers must be hired to collect the milk, control the quality, record the quantity and pay the producers. Once or twice a day collected and cooled milk is transferred to transport vehicles and delivered to the processing company. A total of 28 processors implemented collection points to collect the milk from the semi-subsistence farms, and 12 companies implemented this strategy to collect milk from big farms.

This alternative form of milk collection requires more initial investments compared to milk collection by the milk tank-lorry driver from the single semi-subsistence farms, but provides long-term advantages to the milk processing company. This measure allows better quality control of the delivered milk and its storage for the several hours it spends in the cooling tanks at the station. The next advantage is the simplification of logistic schemes and the decrease of the transportation cost, as collected and cooled milk can be picked up once or twice a day from the single collection station.

Management-consulting

Management consultation focused on the strategic planning of the production process, including restructuring existing production facilities and implementing modern technologies. A total of 18 companies provided consulting services for their main milk suppliers; usually these were corporate farms (but 3 of these processors also extended these services to semi-subsistence farms). To the greatest extent consulting referred to changes in the management structure of the

company and modernization of its production technologies (new equipment, new feeding technologies and new quality control systems, etc).

Organization of seminars

Most of the interviewed companies offered different seminars and workshops for their suppliers (for both managerial and productive staff). A total of 16 and 10 companies offered seminars in different fields of knowledge for the corporate farms and semi-subsistence farms, respectively. Seminars were offered in subjects such as forage production, animal feeding, milk production and milking systems, quality standards and quality control, and management of milk farms. Seminars often supported the implementation of new equipment or production technologies by the producers (e.g. milking staff was taught to operate new milking machines and cooling tanks, maintain the hygiene level in production, etc).

Vertical integration

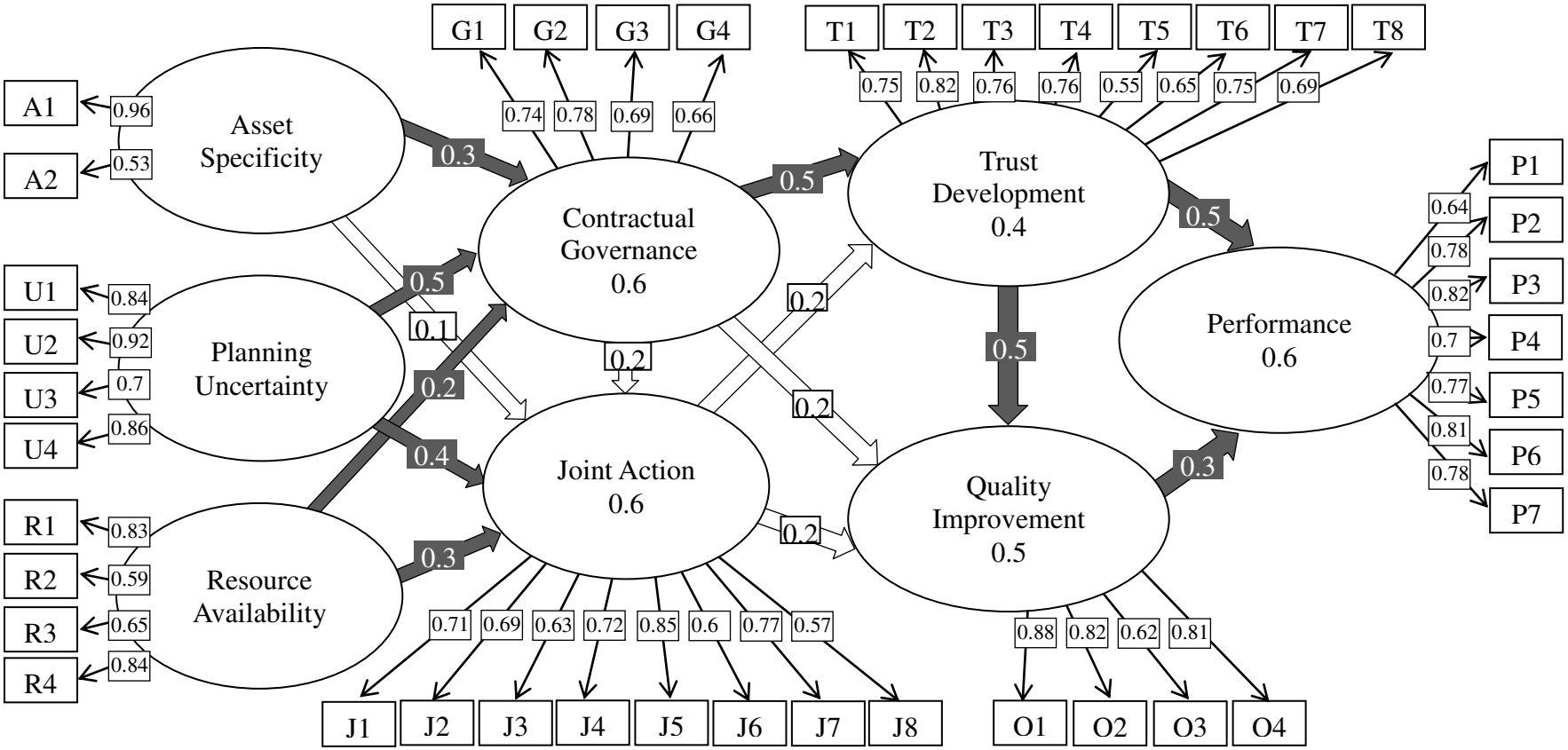
A total of 9 of the interviewed companies integrated the large milk production facilities (corporate farms) in their production process. In several cases processing companies became the single owner of the milk farm and in some cases ownership was shared between the milk processor and the farm owner. Integration with the production unit usually occurs under following scenario: After integration, the processing company implements a new management system (including restructuring and strategic planning), new production technologies and quality systems, and installs modern equipment (milking machines, cooling tanks, and agricultural machinery). Choice and integration of milk farms is a strategic step that allows the processing company to secure milk deliveries to the dairies in the given region. In several cases an initiative for integration was expressed from the side of milk producers that were on the edge of bankruptcy.

The majority of the implemented measures is applied to both producer types. However, some group-specific differentiation can be observed: The equipment and machinery supply represents the most substantial part of the support programs offered to large milk producers. More than 70% of the interviewed processing companies provide equipment and machinery to their corporate farms (e.g., agricultural machinery, milking and cooling equipment, and transport vehicles, etc.). These transactions are organized by additional contracts and the milk producers compensate for the investments with their milk deliveries. Processors offer in addition credits and/or leasing arrangements to support the purchase of new equipment and machinery. In addition, nine processing companies also vertically integrated several corporate farms, which in turn profit from a transfer of technique (e.g. new milking machines, cooling tanks, and agricultural machinery) and know-how. Two different procedures of vertical integration can be observed: either the processing company becomes the

single owner of the milk farm or the ownership is shared between the milk processor and the farm owner. The measures implemented to the semi-subsistence farms are comparatively small-scaled: fodder, inventory and livestock supply, and to lesser extent equipment and financing, refer to the rather basic technical and logistical challenges faced by this supplier group. While support measures offered to the large producers are backed up through additional contracts or contract supplements, the support mechanisms for small-scale producers are often implemented without any formal agreements. Seminar organization, inventory and fodder supply, as well as organizing the milk collection points[63] (equipped with cooling tanks and mobile quality control labs) are the applied measures in this context.

[63] The main idea behind the milk collection stations is to improve sourcing efficiency; this measure requires the highest organizational and financial resources among all support programs offered to semi-subsistence farms.

Appendix 5 The results of the PLS model



Appendix 6 Cross-loadings of the indicators

Indicators	Asset Specificity	Planning Uncertainty	Resource Availability	Contractual governance	Joint action	Quality Management	Trust Development	Performance
change_find	0,5257	-0,0076	0,1342	0,2642	-0,0109	0,0448	0,1451	0,2146
change_loose_invest	0,9581	0,2364	0,267	0,4012	0,4196	0,3235	0,1318	0,2063
prod_stable	0,1255	0,8441	0,3334	0,566	0,6296	0,348	0,3328	0,3032
supplier_fulfill_agreem	0,1462	0,8654	0,4211	0,6442	0,6042	0,4351	0,5581	0,5827
suppliers_fulfill_contract	0,1257	0,696	-0,1166	0,3492	0,2494	0,2901	0,3456	0,3191
suppliers_honest	0,2789	0,9226	0,2727	0,5986	0,6232	0,5086	0,4447	0,5216
consult_support	0,3191	0,2576	0,6458	0,2022	0,3376	-0,003	0,1221	0,1007
educ_level	0,1104	0,0857	0,5908	0,0917	0,2879	0,154	0,2496	0,4589
manag_know	0,2387	0,249	0,8323	0,5587	0,4188	0,4249	0,4799	0,4222
scientif_coop	0,1538	0,3208	0,8426	0,3761	0,474	0,3433	0,4399	0,3149
contract_design	0,2587	0,6698	0,4502	0,7846	0,6022	0,5345	0,5266	0,664
contract_duration_f	0,133	0,366	0,2309	0,6863	0,5067	0,3143	0,2957	0,2963
VC_share	0,2761	0,3697	0,3191	0,7394	0,3405	0,4504	0,5452	0,4381
vert_integrate_f	0,5464	0,4401	0,3294	0,6559	0,4663	0,4783	0,3857	0,3088
plan_demand_f	0,4133	0,3491	0,2649	0,4068	0,7055	0,2751	0,2901	0,3427
plan_demand_h	0,4681	0,3829	0,5999	0,4489	0,6899	0,4169	0,3432	0,147
suppl_improve_f	0,3497	0,5141	0,1639	0,3525	0,6342	0,2533	0,2013	0,0824
suppl_improve_h	0,2228	0,5501	0,2663	0,3553	0,723	0,4685	0,2323	0,2844
suppl_info_organize_f	0,2126	0,5952	0,5129	0,6327	0,8543	0,6478	0,6475	0,6749
suppl_info_organize_h	0,0232	0,501	0,2441	0,4349	0,5966	0,1696	0,1393	0,0961
suppl_info_qual_f	0,2975	0,4873	0,4599	0,6087	0,7701	0,5802	0,4998	0,5829
suppl_info_qual_h	-0,0294	0,3231	0,1991	0,4464	0,5706	0,2277	0,1433	0,1562
fulfill_hygienic_f	0,2601	0,4611	0,3675	0,5628	0,5493	0,8789	0,6516	0,6515
fulfill_hygienic_h	0,14	0,3731	0,334	0,4591	0,4543	0,8227	0,6243	0,4792
quality_increase_f	0,3935	0,4143	0,1114	0,5013	0,4014	0,6173	0,323	0,3159
quality_increase_h	0,2076	0,2924	0,2749	0,4943	0,4751	0,8137	0,5717	0,4889

Indicators	Asset Specificity	Planning Uncertainty	Resource Availability	Contractual governance	Joint action	Quality Management	Trust Development	Performance
suppl_better_rely_f	0,1901	0,3316	0,3537	0,4798	0,3243	0,5707	0,7532	0,625
suppl_better_rely_h	0,0602	0,2378	0,441	0,4032	0,3533	0,4789	0,6935	0,3637
suppl_less_break_f	0,2946	0,4087	0,348	0,5725	0,3778	0,4725	0,7558	0,5328
suppl_less_break_h	0,1661	0,3461	0,328	0,3705	0,3136	0,5079	0,7547	0,6018
suppl_long_coop_f	0,0456	0,2274	0,154	0,2209	0,3774	0,4227	0,5499	0,165
suppl_long_coop_h	0,1052	0,3296	0,2029	0,3094	0,3579	0,2854	0,6503	0,3341
suppl_more_info_f	0,0375	0,4244	0,2678	0,4732	0,3056	0,5884	0,7491	0,6255
suppl_more_info_h	0,0121	0,5319	0,5409	0,6136	0,5292	0,6444	0,8211	0,6098
market_share	0,1929	0,4732	0,1776	0,4558	0,4053	0,4664	0,5395	0,7809
new_markets	0,1498	0,0705	0,4297	0,359	0,2565	0,424	0,5006	0,7041
new_products	0,1733	0,27	0,4578	0,4653	0,3408	0,5155	0,5887	0,8231
new_techn	0,2884	0,4929	0,2409	0,5401	0,3646	0,5811	0,6315	0,7822
prod_increase	0,1205	0,5293	0,1877	0,4629	0,3665	0,4428	0,4472	0,7666
profit_increase	0,1805	0,4653	0,4245	0,4453	0,3675	0,446	0,6014	0,8091
raw_basis	0,1744	0,5241	0,3905	0,5872	0,5565	0,4699	0,4042	0,642

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Konferenzbeiträge

MYKHAYLENKO, M., SCHAFT, F., BALMANN, A. (2011): Overcoming Uncertainty: Challenges for the Dairy Supply Chain in Ukraine. XIIIth EAAE Congress "Change and Uncertainty" 2011, Zurich, Switzerland.

MYKHAYLENKO, M. (2010): Vertical linkages in Ukrainian Agri-Food Business: The role of uncertainty and resource availability for implementation of different coordination mechanisms. The 5th Annual International Symposium on Economic Theory, Policy and Applications, Athens, Greece. Conference proceedings, pp. 62.

MYKHAYLENKO, M. (2008): The impact of vertical relationships on quality management and information accessibility: Empirical study of Ukrainian dairy industry. Transitions towards sustainable agriculture, food chains and peri-urban areas, Wageningen, Netherlands. Conference proceedings, pp. 90-91.

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ERKLÄRUNG

Hiermit erkläre ich, dass ich die Arbeit selbstständig und ohne fremde Hilfe verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe.

Hamburg, den 10. Oktober 2014

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