Studies on the Agricultural and Food Sector
in Central and Eastern Europe

Taras Gagalyuk

Goal Achievement in Supply Chain Networks

A Study of the Ukrainian Agri-Food Business

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LEIBNIZ-INSTITUT FÜR AGRARENTWICKLUNG
IN MITTEL- UND OSTEUROPA

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Edited by
Leibniz Institute of Agricultural Development
in Central and Eastern Europe
IAMO

Volume 64

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2012

Bibliografische Information Der Deutschen Bibliothek
Die Deutsche Bibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://dnb.ddb.de abrufbar.

Bibliographic information published by Die Deutsche Bibliothek
Die Deutsche Bibliothek lists the publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the internet at: http://dnb.ddb.de.

This thesis was accepted as a doctoral dissertation in fulfillment of the requirements for the degree "doctor agriculturarum" by the Faculty of Natural Sciences III at Martin Luther University Halle-Wittenberg on 16.07.2010.

Date of oral examination:	07.02.2011
Supervisor and Reviewer:	Prof. Dr. A. Balmann
Co-Reviewer:	Prof. Dr. habil. Jon H. Hanf
Co-Reviewer:	Prof. Dr. habil. L. Theuvsen

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<*www.iamo.de/dok/sr_vol64.pdf*> heruntergeladen werden.

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Leibniz-Institut für Agrarentwicklung in Mittel- und Osteuropa (IAMO)
Theodor-Lieser-Straße 2
06120 Halle (Saale)
Tel.: 49 (345) 2928-0
Fax: 49 (345) 2928-199
e-mail: iamo@iamo.de
http://www.iamo.de
ISSN 1436-221X
ISBN 978-3-938584-63-7

SUMMARY

Several studies on the effects of foreign direct investments show that the subsidiaries of West-European companies are working hard to raise the level of quality of their suppliers in the agri-food sector of Central and East-European countries. The activities of foreign investors also exert spillover effects on their local competitors who imitate the "imported" business concepts. In particular, local retailers and manufacturers use branding as a strategic instrument. The development of branded products requires sufficient quality of interfirm processes among suppliers, manufacturers and buyers. As a result, vertically cooperating systems or the so-called supply chain networks are established. These supply chain networks involve long-term and close exchange relationships among three and more participants of the supply chain. Foreign investors or local branded companies act as focal firms that strictly coordinate the supply chain network according to their standards, i.e. they exercise chain management.

However, frequent cooperation failures in supply chain networks occur. A number of consulting studies indicate that the reasons of cooperation failures still reside in the way cooperation is planned and managed. Particularly, most cooperation agreements between firms indicate only the firms' contributions to cooperation but do not specify what has to be achieved by working together.

This shortcoming persists also in the related scientific literature. The strategic management research maintains an ongoing discussion on how to manage networks of interfirm relationships successfully. However, most studies that declare their focus on the network success or network performance address the achievement of goals by an *individual firm* participating in a network. At the same time, goals of the *network level*, i.e. collectively pursued outcomes are mainly neglected.

Yet, a sole focus on goals of an individual firm can lead to biased results with respect to management styles that are actually based around self and collective interests, i.e. around the whole supply chain network. Without simultaneous consideration of goals at the firm and network levels, the understanding of how to manage a whole supply chain network will be incomplete. Given this problem, I aim *to develop a framework of goal achievement for management of supply chain networks*.

To fulfill my aim, I conduct both theoretical and empirical analyses. My theoretical analysis involves elaboration on the strategies used to guide supply chain networks and the goals pursued in them. A systematic literature review shows that the management task of the focal firm is not only to coordinate the network members,

i.e. align their actions, but also to motivate them, i.e. align their interests. The strategies for both interest and action alignment are derived from the overall collective strategy of the network. However, the collective strategy is mainly seen as a tool to deal with variation in interfirm relationships and not as a plan of actions to achieve goals of the network. As a result, goals are rarely addressed. Thus, I elaborate theoretically on goals of supply chain networks and show that they include firm-level goals, i.e. the goals single firms want to achieve in a network, and network-level goals that can be achieved only if all network members work together.

In a subsequent step, I develop a model of goal achievement in supply chain networks. Here, I hypothesize that the achievement of both network-level goals and firm-level goals is contingent upon the extent of the alignment of interests and actions and a set of specific characteristics of a network.

To verify my theoretical propositions, I test the model empirically in the Ukrainian agri-food business. Empirical analysis involved three subsequent stages which altogether provided a ground for the development of management implications and the framework of goal achievement in supply chain networks. At the *first stage*, I have tested my empirical setting by means of expert interviews. The results of the interviews support the suitability of the empirical setting. The *second stage* of analysis involved the pretest of my model. I have conducted telephone interviews in the German fish sector and tested a simplified version of the model to check for appropriateness of some hypotheses. The results indicated that the hypothesized signs and directions of effects were found to be reasonable. At the *third stage* of empirical analysis, I have collected data through telephone interviews with branded food manufacturers in Ukraine and tested my model.

The model was evaluated with the Partial Least Squares (PLS) technique. I have chosen PLS due to its suitability for prediction and/or theory building, and the possibility to analyze complex models that involve numerous constructs simultaneously. Given that the constructs included into my model have never been analyzed simultaneously, PLS seems to be a suitable approach.

The results demonstrate that the alignment of interests and the alignment of actions have larger effects on the achievement of network-level goals than on the achievement of firm-level goals. This conclusion contradicts the perceptions of strategic chain management by the majority of top managers who define firm-level goals or the fulfillment of chain management tasks *per se* as the main strategic goals for their supply chains. Additionally, the results show that supply chain networks in the Ukrainian agri-food business require modification of the "imported" chain management concepts due to high volatility of the business environment and the infrastructural problems.

Three general implications for chain management can be derived from my results:

1. Network-level and firm-level goals must be considered simultaneously within a collective strategy. The collective strategy should address not only the alignment of interests of individual network members but also the alignment of network-level and firm-level goals. Moreover, a collective strategy has to be seen as a plan of actions to achieve network-level and firm-level goals simultaneously.
2. The alignment and the achievement of network-level and firm-level goals must be addressed simultaneously because the acceptable degree of goal consensus by itself does not guarantee goal achievement while the concerted action alone may fail due to goal conflict.
3. The resolution of infrastructural problems in the Ukrainian agri-food business must be set as a network-level goal and pursued by all members of the supply chain network together. Furthermore, the way the chain management concepts can be modified in Ukraine is to make a distinction between a) parity and b) advantage chain management. In the case of parity chain management, the aim of the collective strategy is to gain parity with the competing supply chain networks, e.g. a certain level of quality can be regarded as a competitive necessity. Advantage chain management aims to create long-term enduring competitive advantages by adding strategic elements that are higher than the parity standards. It should be much easier to formulate an integrated and consistent management system with this division.

ZUSAMMENFASSUNG

Verschiedene Studien zu den Auswirkungen ausländischer Direktinvestitionen zeigen, dass sich westeuropäische Unternehmen im Lebensmittelsektor Mittel- und Osteuropas sehr darum bemühen, die Qualität ihrer Zulieferer zu verbessern. Darüber hinaus führen die Aktivitäten der ausländischen Investoren zu Spillover-Effekten auf die regionalen Konkurrenten, die die "importierten" Geschäftskonzepte imitieren. Vor allem lokale Einzelhändler und Hersteller nutzen die Etablierung eigener Marken als ein strategisches Instrument. Die Entwicklung von Markenprodukten erfordert eine ausreichende Qualität der zwischenbetrieblichen Prozesse entlang der gesamten Wertschöpfungskette. Aus diesem Grund werden vertikal kooperierende Systeme oder sogenannte Supply Chain Netzwerke etabliert. Diese Netzwerke basieren auf den langfristigen und engen Handelsbeziehungen, die zwischen drei oder mehr Teilnehmern der Wertschöpfungskette bestehen. Dabei agieren ausländische Investoren oder regionale Markenhersteller als fokale Unternehmen, die das Supply Chain Netzwerk strikt an ihren eigenen Standards ausgerichtet koordinieren.

Dennoch kommt es häufiger zum Bruch der Zusammenarbeit innerhalb der Netzwerke. Einige Marktstudien führen dies auf die Art und Weise zurück, wie die Kooperation geplant und gemanagt wird. Zwar legen die meisten zwischenbetrieblichen Kooperationsvereinbarungen fest, welchen Beitrag die einzelnen Kooperationspartner zur Zusammenarbeit zu leisten haben, jedoch nicht, welche Ziele durch die Kooperation erreicht werden sollen.

Auch in der wissenschaftlichen Literatur wurde dieses Problem bisher kaum beachtet. Im Bereich des strategischen Managements besteht eine anhaltende Diskussion darüber, wie Netzwerke bzw. zwischenbetriebliche Geschäftsbeziehungen erfolgreich gemanagt werden sollten. Die meisten Studien, die ihren Fokus auf den Erfolg des Netzwerkes legen, untersuchen jedoch lediglich die Erreichung der Ziele durch ein *einzelnes*, am Netzwerk teilnehmendes Unternehmen. So werden Ziele auf der *Netzwerkebene*, d.h. gemeinsam verfolgte Ziele weitestgehend vernachlässigt. Doch der einseitige Fokus auf die Ziele eines einzelnen Unternehmens kann zu verzerrten Ergebnissen hinsichtlich der Managementstile führen, die an und für sich auf eigenen und kollektiven Interessen, und damit auf den Interessen des gesamten Netzwerkes basieren. Ohne gleichzeitige Berücksichtigung der Ziele sowohl auf Firmen- wie auch auf Netzwerkebene wird es nicht möglich sein, vollständig zu verstehen und zu erklären, wie das Management von Supply Chain Netzwerken, das Chain Management, ausgestaltet sein sollte. Daher ist es das

Ziel dieser Dissertation, *einen Ansatz zur Erreichung von Zielen in Supply Chain Netzwerken zu entwickeln*.

Hierzu wurden sowohl theoretische als auch empirische Analysen durchgeführt. Die theoretische Analyse beinhaltet eine Auseinandersetzung mit den Strategien, die in Supply Chain Netzwerken verfolgt werden und den damit verbundenen Zielsetzungen. Systematische Literaturrecherchen zeigen, dass die Managementaufgabe des fokalen Unternehmens nicht nur darin besteht, die Netzwerkmitglieder zu koordinieren, d.h. ihre Aktionen aneinander anzupassen, sondern auch darin, sie zu motivieren, d.h. ihre Interessen in Einklang zu bringen. Die Strategien, um sowohl Interessen als auch Aktionen anzupassen, werden von der über allem stehenden kollektiven Strategie des Netzwerkes abgeleitet. Diese kollektive Strategie wird jedoch hauptsächlich als ein Mittel angesehen, dass dabei hilft, mit der Vielfalt der zwischenbetrieblichen Beziehungen zurecht zu kommen und nicht als ein Maßnahmenbündel, um Ziele des Netzwerkes zu erreichen. Dies hat zur Folge, dass diese Ziele nur selten in Betracht gezogen werden. Aus diesem Grund konzentriert sich diese Dissertation ausführlich auf die Ziele von Supply Chain Netzwerken und zeigt auf, dass diese auf Firmenebene und Netzwerkebene gesetzte Ziele einschließen.

Im nächsten Schritt wurde ein Modell zur Zielerreichung in Supply Chain Netzwerken entwickelt. Hierbei wurden die Hypothesen aufgestellt, dass das Erreichen von beiden Zielarten, Zielen auf Netzwerk- und Firmenebene, sowohl vom Grad der Anpassung von Interessen und Aktionen als auch von bestimmten Charakteristika des Netzwerkes abhängig ist. Zur Überprüfung der Hypothesen wurde das Modell mit Hilfe empirischer Daten aus der ukrainischen Lebensmittelindustrie getestet.

Die empirische Analyse erfolgte in drei aufeinanderfolgenden Stufen. Im Zuge der *ersten Stufe* wurden Experteninterviews durchgeführt, um die Eignung der ukrainischen Lebensmittelindustrie für die in dieser Dissertation zugrundeliegende Untersuchung zu testen. Die aus den Interviews gewonnenen Erkenntnisse bestätigen, dass sich die Ukraine als Untersuchungsregion gut eignet. Im Rahmen der *zweiten Stufe* der Analyse wurde das Modell einem Testdurchlauf unterzogen. Dazu wurden Telefoninterviews mit Managern des deutschen Fischsektors durchgeführt, und mit Hilfe einer vereinfachten Version des Modells die Angemessenheit der Hypothesen überprüft. Die Ergebnisse ließen erkennen, dass die gewählten Vorzeichen und Richtungen der Effekte als plausibel angesehen werden können. Im Verlauf der *dritten Stufe* wurden Telefoninterviews mit Markenherstellern der ukrainischen Lebensmittelindustrie durchgeführt und mit den gewonnenen Daten das Modell getestet.

Das Modell wurde mit Hilfe der Partial Least Squares (PLS) Methode ausgewertet. Diese wurde gewählt, da sie für Voraussagen und/oder das Aufstellen von Theorien gut geeignet ist, und PLS auch die Möglichkeit bietet, die in komplexen

Modellen zahlreichen, gleichzeitig wirkenden Zusammenhänge zu analysieren. Ausgehend von der Tatsache, dass die einzelnen Teile des in dieser Dissertation entwickelten Modells bisher noch nicht gleichzeitig analysiert wurden, scheint PLS die angemessene Vorgehensweise zu sein.

Die Ergebnisse zeigen, dass die Anpassung von Interessen und Aktionen einen größeren Einfluss auf das Erreichen von Zielen auf der Netzwerkebene als auf das Erreichen von Zielen auf Firmenebene hat. Diese Erkenntnis widerspricht den Empfindungen von mehreren Top-Managern, welche die Ziele der Firmenebene oder das Erfüllen von Aufgaben des Chain Managements *per se* als das strategische Hauptziel für ihre Wertschöpfungsketten ansehen.

Desweiteren zeigen die Ergebnisse, dass es für Netzwerke in der ukrainischen Lebensmittelindustrie notwendig ist, die "importierten" Managementkonzepte zu modifizieren, um sie an die instabilen wirtschaftlichen Rahmenbedingungen und die infrastrukturellen Probleme anzupassen.

Letztendlich können aus den Ergebnissen drei allgemeine Schlussfolgerungen gezogen werden:

1. Für eine kollektive Strategie sollten sowohl die Ziele auf Netzwerk- wie auch auf Firmenebene betrachtet werden. Die kollektive Strategie sollte jedoch nicht nur die gleichzeitige Anpassung der Interessen der einzelnen Netzwerkmitglieder berücksichtigen, sondern auch die Anpassung der Ziele auf Firmen- und Netzwerkebene. Desweiteren sollte die kollektive Strategie als Maßnamenbündel für das gleichzeitige Erreichen von Zielen auf Netzwerk- und Firmenebene angesehen werden.
2. Die Anpassung und die Erreichung von Zielen auf Netzwerk- und Firmenebene muss gleichzeitig angesprochen werden, da Zielkonsens allein nicht ausreicht, um das Erreichen von Zielen zu garantieren, und miteinander abgestimmte Aktionen für sich genommen fehlschlagen können, wenn es Zielkonflikte gibt.
3. Die Lösung der infrastrukturellen Probleme in der ukrainischen Lebensmittelindustrie muss als Ziel der Netzwerkebene verstanden werden und gemeinsam von allen Teilnemern des Supply Chain Netzwerkes verfolgt werden. Darüber hinaus sollten die in die Ukraine "importierten" Managementkonzepte so modifiziert werden, dass zwischen einem auf a) Parität und b) Wettbewerbsvorteile fokussierten Chain Management unterschieden wird. Im Falle des Ersteren ist es das Ziel der kollektiven Strategie, eine gewisse Parität, z.B. ein bestimmtes Qualitätsniveau, zwischen den konkurrierenden Netzwerken zu schaffen. Zweiteres hingegen zielt darauf ab, langfristige Wettbewerbsvorteile zu erlangen, indem zur Strategie Elemente hinzugefügt werden, die über den allgemeinen Standards liegen. Unter Berücksichtigung dieser Unterteilung sollte es wesentlich einfacher sein, ein integriertes und beständiges Managementsystem zu schaffen.

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LIST OF ABBREVIATIONS

AVE	Average variance extracted
BMCL	Benchmarking Cross Reference Checklist
BSE	Bovine Spongiform Encephalopathy
CEEC	Central and East-European countries
CEO	Chief executive officer
CM	Category Management
CPCC	Control Points and Compliance Criteria
CPFR	Collaborative Planning Forecasting and Replenishment
CRP	Continuous Replenishment Program
CSCMP	Council of Supply Chain Management Professionals
ECR	Efficient Consumer Response
EDI	Electronic Data Interchange
EUREP	Euro-Retailer Produce Working Group
FCD	Federation des enterprises du Commerce et de la Distribution
FDI	Foreign direct investments
GFSI	Global Food Safety Initiative
GAP	Good Agricultural Practice
HACCP	Hazard Analysis Critical Control Points
HDE	HDE
IFC	International Finance Corporation
IFS	International Food Standard
IMP	Industrial Marketing and Purchasing
ISO	International Organization for Standardization
IT	Information technology
LISREL	Linear Structural Relationships
PLS	Partial Least Squares
POS	Point-of-sale

QS	Qualität und Sicherheit
R&D	Research and Development
RFID	Radio Frequency Identification
ROI	Returns on investments
SCM	Supply Chain Management
SEM	Structural Equation Modeling
SME	Small- and medium-size enterprises
SSCU	State Statistics Committee of Ukraine
TQM	Total Quality Management
VICS	Voluntary Interindustry Commerce Standards
WTO	World Trade Organization

1 INTRODUCTION

"More than 50 per cent of interorganizational projects in supply chains fail before maturity or achieve far less than expected. Of these, 56 per cent fail due to lack of agreement upon or unclear definition of common goals"

Andreas Brinkhoff and Ulrich Thonemann

Harvard Business Review 2007

1.1 Problem setting

The topic of interfirm cooperation has become increasingly important over the last decades. Many firms establish joint ventures, engage into strategic alliances and participate in different types of interfirm networks. A number of scientific and consulting studies advocate interfirm cooperation as one of the main sources of competitive advantage for firms, both in financial and non-financial terms. Financial benefits from cooperation involve cost and risk reduction, increase in sales and revenues, etc. These benefits are gained through improved access to markets and resources as well as through scale and scope economies interfirm cooperation entails. In alliances and networks, firms get opportunities to concentrate on core competencies, reduce product lifecycles, improve marketing, access new technologies, etc. (PARKHE et al., 2006). Non-financial benefits from cooperation include accelerated information exchange, knowledge sharing, improvement of management skills and capabilities, reputation gains for firms, etc. (SCHREINER et al., 2009). Importantly, interfirm cooperation helps to react effectively on changes in customer needs for quality by providing transparent value chains.

Cooperation is particularly relevant in the context of globalization and internationalization of firms because it is conducive to establishing sound procurement and distribution systems in the host countries. For example, subsidiaries of West-European companies establish close working relationships with their suppliers and buyers in Central and East-European countries (GORTON et al., 2006). This cooperation has positive effects on both foreign investors and the local partners. Foreign companies win substantial market shares, whereas their local partners obtain access to profitable sales markets and significantly improve their quality.

Especially, these improvements are observable in the course of internationalization by western retail companies. In order to establish a sound supply side of their

businesses, international retailers introduce their own global quality requirements that must be met by their suppliers. Additionally, due to the market environment in Western Europe, the "imported" business concepts of retailers are trimmed to efficiency. Thus, not only intra-firm but also interfirm processes are systematically optimized.

The activities of foreign investors exert spillover effects on their local competitors who imitate the "imported" business concepts. In particular, local retailers and manufacturers use strategic instruments such as branding on a wide scale. Market reports from Central and East-European countries indicate that the share of branded products by some local retailers exceeds 30 % in the range of goods on offer. The development of branded products requires sufficient product quality and, consequently, substantial quality of interfirm processes among suppliers, manufacturers and buyers. On account of this, many analysts consider retailers and foreign direct investments as even more powerful sources of structural changes than WTO and trade policy (REARDON et al., 2007). They point to verticalization, i.e. establishment of close cooperation between suppliers, manufacturers and buyers as a major force that drives structural change in the context of retail internationalization. Quality, in particular, can be regarded as the catalyst for this development. Because quality and safety are always considered the highest priority in the food sector, verticalization is especially widespread in the agri-food business (BALMANN et al., 2006).

Several studies demonstrate that vertical coordination in the agri-food business of Central and East-European countries is even more widespread in scope and complexity than in western economies (GORTON et al., 2006; SWINNEN, 2006). Traders, agribusinesses, and food companies contract with farms and provide input and assistance in return for guaranteed and quality supplies. Furthermore, foreign investors and local branded companies establish vertically cooperating systems or the so-called supply chain networks in which they work tightly with suppliers and buyers to bring their products to the market. These supply chain networks involve long-term and close exchange relationships among three and more participants of the supply chain. In supply chain networks, foreign investors or local branded companies act as chain captains (or the so-called focal firms) and strictly coordinate the system according to their standards. They develop and implement management concepts that aim to coordinate the vertical product flow along the whole supply chain, from suppliers to end consumers. In Central and Eastern Europe, companies such as Danone, Metro Cash & Carry, and Nestlé introduce their chain management concepts and illustrate well-established supplier and distribution solutions based on supply chain networks.

One major reason that supply chain networks are established is that private contractual initiatives can be formed to overcome supply disruptions (SWINNEN, 2006). However, business environment in several Central and East-European countries exhibits a high degree of volatility with frequent contract breaches in order to

please short-term pecuniary interests. This leads to supply disruptions and induces costs for the participants of cooperation. Not least of all, these difficulties arise due to unfavorable institutional environment: property rights are weakly protected, contract enforcement is poor, etc.

Frequent cooperation failures occur, however, in western economies too. The results of several studies indicate that the failure rate of strategic alliances and joint ventures exceeds 50 %. The well-known examples of alliance failures include those by IBM and Apple, General Motors and Daewoo, AT&T and Olivetti. To this end, the investigation by consultancy McKinsey & Company (KAPLAN et al., 2010) has shown that only a half of joint ventures yield returns that cover capital costs. This is a real problem because cooperation plays an essential role in business models as well as in budgets of most firms.

In this respect, most consulting studies emphasize that the main reason why interfirm cooperation fails resides in the way it is planned and managed. Particularly, most cooperation agreements between firms specify only the firms' contributions to cooperation but do not define what has to be achieved by working together, i.e. strategic goals of cooperation are rarely defined. At the same time, the major focus by cooperation partners is on operative performance measures which often cannot be aligned with the changes in the economic environment and, therefore, lose their relevance.

Surprisingly, this shortcoming has rarely been addressed in the related scientific literature. There has been an ongoing discussion in the strategic management research on how to manage networks of interfirm relationships successfully, such that the firm's competitive advantage is sustained (JONES et al., 1997; DYER and SINGH, 1998; GULATI et al., 2000). However, this discussion has failed to address exhaustively the "network management – network success – firm success" cause-and-effect chain. Given that success generally means the achievement of goals, the "network success" link has been noticeably understudied because of incomplete consideration of network goals. In fact, most studies that declare their focus on the network success or performance address the achievement of goals by an *individual firm* participating in a network. At the same time, goals of the *network level*, i.e. collectively pursued outcomes are mainly neglected although their presence in cooperation is widely declared.

A similar picture can be observed in the literature on supply chain management that investigates the problematic of supply chain networks. In this vein, the vast majority of studies discuss how chain management can be improved to achieve the goals of a single firm in a supply chain network. The goals of a whole supply chain network are ignored.

However, a sole focus on goals of an individual firm can provide biased results with respect to management styles that are actually based around self and collective interests, i.e. around the whole supply chain network. Potential conflict between

network-level and firm-level goals can go undetected and lead to relationship break off and damage the whole network. Thus, without simultaneous consideration of goals at the firm and network levels, the understanding of how to manage the supply chain network will be incomplete.

1.2 Aim of the thesis

Given that the inconsistency in addressing the goals of different levels can lead to problems for the whole supply chain network, the aim of this thesis is as follows:

> *To develop a framework of goal achievement for the management of supply chain networks*.

For this purpose, I create a model of goal achievement in supply chain networks and test it empirically. In the model, I hypothesize the relationships between the achievement of network-level and firm-level goals and the constructs of chain management and the network characteristics. The framework of goal achievement with respective strategies to achieve goals will be subsequently presented.

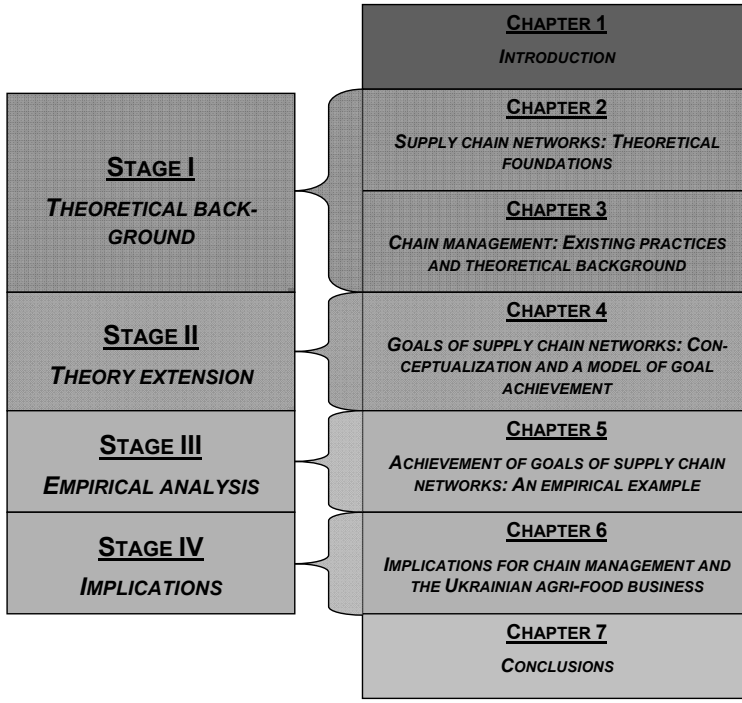
In order to fulfill my aim, I analyze the goals of supply chain networks in greater detail and strive to answer the following main questions:

- What are the goals pursued in supply chain networks?
- What are the strategies to achieve goals?

1.3 Accomplishment of the aim

To accomplish the aim of my thesis and to answer the posed research questions, I realize a number of objectives that can be divided into four general stages: theoretical background, theory extension, empirical analysis, and implications of the study (Figure 1-1).

Figure 1-1: Framework of the thesis



Source: Own performance:

At the stage of *theoretical background*, my objectives include:

- Description of the characteristics of supply chain networks. Understanding of the features of a particular network type enables the understanding of how firms can manage relationships in this type of a network. To fulfill this objective, I first address networks as a form of interfirm cooperation in general and review a number of typologies of interfirm networks. In doing so, I show the ambiguity of existing approaches to address interfirm networks and screen out the characteristics which are not inherent in supply chain networks. I accomplish two tasks thereby. First, I indicate which types of networks are not in the focus of this thesis. Second, I arrive to the actual characteristics of supply chain networks: hierarchically structured and manageable relationships among a finite number of participants that allow classifying them as strategic networks. On account of this, supply chain networks possess a focal firm that coordinates a whole network and exercises chain management to achieve goals of the whole network.

- Description of chain management. I fulfill this objective to address, from practical and scientific points of view, the strategies that are used to guide a supply chain network as a whole. For this purpose, I review the existing chain management practices and the theoretical underpinnings of strategic chain management. In doing so, I first demonstrate that the existing chain management practices aim to make the whole supply chain network act as a single entity. However, very often, these practices are used solely to coordinate the interactions between single firms and neglect the firms' interests, i.e. what firms want to achieve. Additionally, I scrutinize the strategies used to guide supply chain networks from the theoretical perspective. I present the concept that advocates taking both actions and interests of the supply chain network members into account. Yet, I also show that the respective strategies are rarely seen as tools to achieve goals of the whole network, i.e. at both firm and network levels. Thus, goals of the supply chain network as a whole are rarely considered.

The stage of *theory extension* involves accomplishment of the following objective:

- The development of a model of goal achievement in supply chain networks or a so-called "model of supply chain network success." Here, I aim to show that chain management is about achievement of goals of the whole supply chain network. I hypothesize that the achievement of both network-level goals and firm-level goals is contingent upon how chain management is exercised given a set of specific characteristics of a supply chain network. Provided that the research has mainly neglected network-level goals and, thus, it is not clear how to manage with them, I also elaborate theoretically on goals pursued in supply chain networks.

At the stage of *empirical analysis*, the objective is to:

- Test my model empirically in order to verify my hypotheses. I have chosen the Ukrainian agri-food business as an empirical setting of analysis. The reason why my empirical focus is oriented towards Ukraine is that the transition countries in Central and Eastern Europe are increasingly characterized by a wide scope of verticalization practices and the formation of supply chain networks, especially in the agri-food business. I demonstrate these tendencies based on analysis of secondary data. Then, I collect data and test my model.

The *implications* stage fulfils the following objective:

- The development of implications for chain management based on the results of my empirical analysis. Altogether, these implications constitute the framework of goal achievement in supply chain networks. I make conclusions about the extent of theory extension provided by my study and also derive a number of implications for the chain management in the Ukrainian agri-food business.

1.4 Structure of the thesis

The thesis is structured according to the research stages.

Theoretical foundations of supply chain networks are outlined in *Chapter 2*. Specifically, I provide an overview of literature to demonstrate the position of supply chain networks in a wide spectrum of interfirm networks. Chapter 2 accordingly covers the issue of interfirm network typologies to show which types of networks are not in the focus of the current thesis. Then, the main features of supply chain networks are identified and described to gain understanding how to manage supply chain networks. I show that supply chain networks are strategic by their nature. On account of this they involve a focal company as a strategic center that coordinates a whole supply chain network to achieve goals of the whole network.

Chapter 3 continues with theoretical background of this study. It first reviews the existing chain management practices to reveal how supply chain networks are managed in the real world and what are the advantages and shortcomings of these practices. Subsequently, I proceed with the theoretical foundations of strategic chain management by providing an overview of the literature on the problems and mechanisms of coordination and cooperation at the different levels of a supply chain network. Then, I describe strategies used to manage supply chain networks as a whole and demonstrate that they rarely address the achievement of firm-level and network-level goals simultaneously.

In *Chapter 4*, I develop a model of goal achievement in supply chain networks. For this purpose, I first elaborate theoretically on the goals of the whole supply chain network as these goals have been incompletely addressed before. Subsequently, I model the relationships between goal achievement, chain management, and network characteristics.

Chapter 5 provides an empirical example that aims to verify my theoretical propositions. It first addresses characteristics of the industry setting, i.e. agri-food business in Ukraine and describes the expert interviews which I conduct to test for suitability of the empirical setting. Further, I describe the pretest conducted in the German fish supply chain to modify the questionnaire and check for appropriateness of the measures and hypothesized relationships in my model. Then, I describe the Partial Least Squares technique used to evaluate my model and show why this technique is appropriate. Subsequently, I test the model and, finally, discuss the results.

In *Chapter 6*, I develop a framework of goal achievement in supply chain networks, involving implications for the strategic chain management based on my results. This Chapter includes implications for the strategic chain management in general as well as specific implications for the Ukrainian agri-food business.

Conclusions are provided in *Chapter 7*. Here, I elaborate on the contribution of each chapter of the thesis to the results obtained. Additionally, I address the limitations of the study as well as directions for the future research.

The structure of the thesis is presented in Figure 1-1.

2 SUPPLY CHAIN NETWORKS: THEORETICAL FOUNDATIONS

Due to increasing importance of interfirm cooperation, the topic of networks as a form of cooperation has become popular in organizational theory. Different forms of networks have become the subject of inquiry in economics, management, marketing, etc. Within this wide scope of network research, the problematic of supply chain networks attracts particular attention because vertical interfirm cooperation can be conducive to establishing well-functioning supply and distribution systems by firms and can result in substantial quality improvements so that the requirements of end consumers are satisfied. However, researchers still have little consensus on the main characteristics of supply chain networks and often mix them with features of the other types of interfirm networks. This ambiguity can substantially complicate analyses of supply chain networks, including those dealing with the management issues. Understanding of the features of a particular network type enables the understanding of how firms can manage relationships in this type of a network.

Therefore, the aim of this Chapter is to delineate the characteristics of supply chain networks. To fulfill this objective, I first review a number of typologies of interfirm networks. In doing so, I deal with the ambiguity of existing approaches to address interfirm networks and screen out the characteristics which are not inherent in supply chain networks. I realize two tasks thereby. First, I indicate which types of networks with their respective characteristics are not in the focus of this thesis. Second, I arrive to the actual characteristics of supply chain networks: hierarchically structured and manageable relationships that allow classifying them as strategic networks. On account of this, supply chain networks possess a focal firm that coordinates a whole network and exercises chain management to achieve goals of the network.

The Chapter is structured accordingly. First, in section 2.1, I provide a short overview of different network typologies to show the place of supply chain networks in the scope of interfirm networks.

Then, section 2.2 outlines the features of supply chain networks by

- demonstrating their strategic network character (subsection 2.2.1), and
- addressing the role of the focal firm as the core element of a supply chain network (subsection 2.2.2).

Section 2.3 summarizes the contribution of Chapter 2.

2.1 Typologies of interfirm networks

Various morphologies of networks such as social networks, neural networks, computer networks, etc. are under scrutiny in the different fields of science. Scholars from sociology, psychology, information science, etc. investigate networks in their respective frameworks. Although the elaborations of these research strands have made their contribution to our understanding of the network phenomenon, they have also brought about a certain ambiguity which arises if one tries to interprete the features of a specific type of interorganizational networks.

A systematic review of literature on networks in organizational studies reveals that there are various conceptualizations of interorganizational networks too. With regard to interfirm networks, numerous efforts have been exerted to provide an insight into them (Table 2-1).

Table 2-1: Approaches to definition and explanation of interfirm networks

Theoretical school	Interfirm network definition	Explanation of driving forces of network emergence/formation
Strategic management	An organizational actor, implying that strategic management of the network yields benefits to be distributed among the network members (ASTLEY, 1984). Relationships of power and trust through which organizations exchange influence and resources, arrangements between markets and hierarchies (THORELLI, 1986).	Increasing global competition, efforts on overcoming of geographic constraints through advances in technologies, and changes in traditional organizational structures by ongoing experimentation in "management technology" (PARKHE et al., 2006) Need for capabilities that can be gained through communication with partners which possess valuable knowledge (DOZ et al., 2000) Identification of existing environmental interdependence between firms (DOZ et al., 2000)
Relational view of strategic management	A firm's set of relationships, both horizontal and vertical, with other organizations – be they suppliers, customers, competitors, or other entities – including relationships across industries and countries (GULATI et al., 2000).	Costly hierarchical control over partners (JONES et al., 1997; DYER and SINGH, 1998). Access to new inimitable resources that are either unavailable in markets or need much time to be developed (GULATI et al., 2000).
Knowledge-based view of the firm	Neither a market transaction nor a hierarchical governance structure, but a separate, different mode of exchange, one with its own logic (POWELL, 1990). The pattern of relationships among firms and institutions that lead firms to new non-isolated capabilities (KOGUT, 2000).	Demand for speed, know-how, and interfirm trust (POWELL, 1990). Knowledge-intensive activities where knowledge is not limited to a specific task but applicable to a wide range of activities. In networks, these activities become more economically efficient as they are based on know-how rather than on physical assets (POWELL et al., 1996). Search for inimitable resources, new skills and capabilities (KOGUT, 2000).
Evolutionary theory	A set of direct, dyadic ties and the relationships between these ties, with the firm at the centre of the network as the focal actor (HITE and HESTERLY, 2001).	Evolving resource needs; an entrepreneur drawing resources from embedded ties (HITE and HESTERLY, 2001).

Theoretical school	Interfirm network definition	Explanation of driving forces of network emergence/formation
Transaction cost economics	Organization that uses resources and/or governance structures from more than one existing organization (BORYS and JEMISON, 1989). Networks address all questions on inter-organizational relationships of more than two firms (LAZZARINI et al., 2001). Term that covers all arrangements defining recurrent contractual ties among autonomous entities (MÉNARD, 2002). Specific properties of the transaction relationships, typified by relational relationships in which formal and informal sharing and trust building mechanisms are crucial (ZYLBERSZTAJN and FARINA, 1999).	Reduction of transaction costs compared to markets, and a quick response to environmental changes compared to hierarchies (WILLIAMSON, 2000). Elimination of information asymmetries and the hazards of opportunistic behavior caused by relationship-specific investments (LAZZARINI et al., 2001). Complementary abilities of the involved firms and risk reduction (MÉNARD, 2002).
Marketing	A set of two or more connected business relationships, in which each exchange relation is between business firms that are conceptualized as collective actors (ANDERSON et al., 1994).	New opportunities to coordinate interorganizational activities, enter new markets, concentrate on core competencies, improve marketing and reduce risks (NASSIMBENI, 1998).
Supply chain management	The total of actors within one industry and/or between related industries, which can potentially work together to add value to customers (OMTA et al., 2001).	Technological changes, globalization, changing customer needs and fragmented markets, the increasing information intensity and importance of knowledge (NASSIMBENI, 1998).

Source: Own performance.

In this context, several authors (e.g., BORGATTI and FOSTER, 2003; PARKHE et al., 2006) called for systematization of the existing premises to reduce the persisting ambiguity. A number of network typologies have been accordingly developed. Although based on the different criteria, they have enabled some systematization of knowledge about interfirm networks (Table 2-2). I further shed some light on several typologies of interfirm networks.

Table 2-2: Commonalities and differences between the different typologies of interfirm networks

Study	Network type	Intensity of relationships		Duration of relationships		Presence of a broker (focal/hub firm, lead organization)		Network formation	
		low	high	short-term	long-term	without broker	with broker	emergent (organic)	engineered (deliberate)
HITE and HESTERLY (2001)	Path-dependent	●			●	●		●	
	Intentional		●		●		●		●
REHFELD (2006)	Primordial		●	●		●		●	
	Invisible college	●		●		●		●	
	Supply chain		●		●		●		●
	Strategic		●		●	●			●
BURR (1999)	Spontaneous	●		●		●		●	
	Self-organizing		●		●	●		●	
	Project-orientated	●		●			●		●
	Strategic		●		●		●		●
PROVAN and KENIS (2007)	Shared partici-pant-governed		●		●	●		●	
	Lead organiza-tion-governed		●		●		●		●
	Administrative organization		●		●		●	●	

Source: Own performance.

In the strategy research, network analysis considers such criteria as the type of network nodes, the type of relationships between them, and network functional and structural features to classify networks. By taking these aspects into account, REHFELD (2006) distinguishes between primordial networks, invisible college networks, supply chain networks, and strategic networks. According to this typology, *primordial networks* are multifunctional, project-based networks characterized by similarity of nodes and common social identity. Work relationships in such networks are highly embedded, closed and nested in ongoing informal personal relations, prior to activities. *Invisible college networks* are based on common interest between similar and dissimilar nodes with highly fluid informal relationships. They function to get a fast access to information and knowledge. Ties between nodes reinforce the structure of the college in such type of networks. Invisible college networks exhibit low levels of firm embeddedness and calculativeness. Dissimilar nodes and common work identity are inherent in *supply chain networks* typified by close contractual relationships. Based on incremental innovation, supply chain networks provide horizontal or vertical specialization and the division of labor. Their structure can be interpreted as a spider web where the establishment of ties creates the network. Over time, such a network can become a form of social identification as in the case of Toyota supply chain (DYER and NOBEOKA, 2000). Therefore, supply

chain networks can be regarded as highly embedded, calculatively based types of networks. At the same time, *strategic networks* represent a purposive type of networks arranged through active tie creation between similar and dissimilar nodes with different identity. The high level of calculativeness is accompanied by the low level of relational embeddedness within this type of networks. Functions of strategic networks include recombination and division of labor.

A similar approach to network classification has been developed by BURR (1999). He has considered such important managerial characteristics of networks as differences in the intensity of relationships, degree of coordination, duration of the network, and existence of a broker. Based on these criteria, networks can be grouped into the following four types: spontaneous networks, self-organizing networks, project-orientated networks, and strategic networks (Table 2-3). The *spontaneous network* is a polycentric arrangement with a low intensity and short-term, nonrecurring relationships. *Self-organizing networks* are characterized by the long-term, repeatedly coordinated relationships of a medium to high intensity. Short-term, weakly intensive relationships occur in the *project-orientated network* featured by the presence of the broker. In the hierarchically-polycentric *strategic network*, relationships between actors are highly intensive and last over a long period of time. This is the most complex type of networks which represents relatively stable, "engineered", coordinated and managed relationships among actors.

Table 2-3: Interfirm network typology by intensity and duration of relationships, degree of coordination and presence of a broker

	Intensity of relation		
	low	medium to high	
Polycentric without broker	Spontaneous Network	Self-organizing Network	Coordinated
Polycentric with broker	Project-orientated Network	**Strategic Network**	Hierarchical
	Short-term, nonrecurring	Long-term, repeatedly	

Source: BURR (1999).

PROVAN and KENIS (2007) argue about the critical role of management in effective network governance and classify networks by their governance form. According to governance form, networks can be grouped into shared participant-governed networks, lead organization-governed networks, and administrative organization-governed networks. *Shared participant-governed networks* are governed collectively by all organizations that comprise the network. Every organization interacts with every other organization to govern the network, resulting in a dense and highly decentralized form. In *lead organization-governed networks*, governance occurs by and through a single organization, acting as a highly centralized network broker, regarding issues that are critical for overall network maintenance and survival. At

the mid-range, a single organization might take on some key governance activities while leaving others to network members. Another network type involves external governance by a unique *network administrative organization*, which may be either voluntarily established by network members or mandated as part of the network formation process.

Networks can differ also by the factors of network formation. DOZ et al., (2000) emphasize that the factors of network formation can be attributed to two distinct paths: 1) emergent processes caused by changes in the environment; and 2) engineering by a triggering entity (or a focal actor). HITE and HESTERLY (2001) develop this thought and group networks into the so-called path-dependent and intentional, or emergent and engineered ones. *Path-dependent (emergent) networks* develop from changes in the environment and a common interest and similar views among potential members. *Networks of an intentional (engineered) nature* possess the focal firm that stimulates potential members to join a network. Furthermore, HITE and HESTERLY (2001) consider different types of interfirm networks at the early stages of firm evolution. Thereby they distinguish between identity-based and calculatively based networks. *Identity-based networks* represent egocentric networks that have a high proportion of ties where some type of personal or social identification with the other actor motivates or influences economic actions. *Calculative type* refers to egocentric networks where the focal actor's ties are primarily motivated by expected economic benefits. Networks of firms, thus, evolve from identity-based to calculative networks at the firm's emergence and early growth stages.

Among other things, numerous efforts on deriving typologies of interfirm networks have resulted in ambiguity of network-related terminology. This can be observed in the above Table 2-2, wherein I combine the criteria proposed by BURR (1999) with the criterion of the type of network formation to describe commonalities and differences among the aforementioned typologies of networks. As it can be generally seen, the different studies ascribe similar characteristics to networks. However, they often differ by terms used to entitle particular network types. For instance, BURR's (1999) *strategic* networks possess the same characteristics as *intentional* networks by HITE and HESTERLY (2001), *supply chain networks* by REHFELD (2006), and *lead organization-governed networks* by PROVAN and KENIS (2007). At the same time, strategic networks as defined by BURR (1999) slightly differ from those defined by REHFELD (2006). Additionally, in the network literature, one can find much more other criteria for classification of networks as well as further terms to signify the network types. The latter involve categories such as network cooperation, strategic group, value-chain partnership, value-chain network, supply chain hub, strategic coalition, virtual cooperation, virtual organization, value-adding partnership, strategic alliance, joint venture, industrial district, freelance network, business network, symbiotic web, value web, etc.

Table 2-4: Networks of organizations vs. network organizations

Underlying concept	Network type	Network management	Examples
Network of organizations	Loosely coupled networks	Unmanaged as a whole	Whole industries, "network markets," etc.
Network organization	Shared participant-governed (issue-based) networks	Managed by all network members	Health and human service networks, innovation networks by small firms, etc.
	Strategic networks	Managed by a focal actor	**Supply chain networks**, distribution networks, strategic alliances, R&D networks, etc.

Source: Own performance.

To gain understanding of management challenges that arise in a particular network type, it is necessary to reduce the ambiguity of terms used to describe the same network types. In my opinion, this can be made by distinguishing between the terms "a network of organizations" and "a network organization" (MÖLLER and SVAHN, 2003: 204). A general categorization of interfirm networks by this principle is demonstrated in Table 2-4.

The term "network of organizations" refers to any group of organizations or actors that are interconnected in relationships. According to the conceptualization by scholars of the Industrial Marketing and Purchasing Group (IMP) (HÅKANSSON and SNEHOTA, 1995), any market can be described as this kind of macro network. This perspective is also close to that of scholars in economic sociology (GRANOVETTER, 1985; BURT, 1992; UZZI, 1997), and – although more implicitly – dominant in the network externalities discussion in economics (KATZ and SHAPIRO, 1985) and in ideas about "network markets" advocated by marketing scholars (SRIVASTAVA et al., 1998; FRELS et al., 2003). Because this type of networks is characterized by low density of ties and infrequent recurrence of relationships among more than two actors, it can be generally referred to as *loosely coupled networks* (ORTON and WEICK, 1990; DHANARAJ and PARKHE, 2006).

With regard to the "network organization" term, ACHROL (1997: 59) suggests that "a network organization is distinguished from a simple network… by the density, multiplicity, and reciprocity of ties and a shared value system defining membership roles and responsibilities." This notion is in line with the following two ideas. First, it corresponds to the above described idea of shared participant-governed networks (PROVAN and KENIS, 2007) which are highly decentralized, involving most or all network members interacting on a relatively equal basis. *Shared participant-governed networks* depend exclusively on the involvement and commitment of all, or a significant subset of the organizations that comprise the network. Network participants are themselves responsible for managing internal network relationships and operations as well as external relations with such groups as funders, government, and customers (PROVAN and KENIS, 2007). Shared-participant governed networks are common in health and human services, in part because networks are

often considered to be an important way of building "community capacity" needed in these spheres (PROVAN and KENIS, 2007: 6). In business, shared governance may be used in smaller, multi-firm partnerships (where multi-firm ownership is not involved) designed to develop new products or to attract new business in ways that could not be otherwise accomplished through the independent efforts of network members (VENKATRAMAN and LEE, 2004). In summary, it is the collectivity of partners themselves that make all the decisions and manage network activities in shared participant-governed networks.

Second, the notion of network organization is consonant with the idea of *strategic networks* (GULATI et al., 2000) as that of interorganizational ties that are enduring and of strategic significance for the firms entering those networks. In a similar manner, JARILLO (1988) defines strategic networks as "long-term, purposeful arrangements among distinct but related for-profit organizations that allow those firms in them to gain or sustain competitive advantage vis-à-vis their competitors outside the network." PARK (1996: 797), following JARILLO (1988), sees a strategic network as "a purposeful and conscious arrangement among distinct, but related profit-seeking organizations." Additionally, MÖLLER and SVAHN (2003: 205) define strategic networks as "intentional structures that firms try to design deliberately for specific purposes." The focus on strategic networks generally assumes the existence of a focal firm that has a proactive ability to intentionally create, adapt, and control a specific network structure (RITTER et al., 2004). Although the manageability of networks by one actor has often been put into doubt (HÅKANSSON and FORD, 2002), a number of studies prove the opposite, especially in conditions when a large company at its maturity stage acts as focal firm in a network of a finite set of parties (DYER and SINGH, 1998; HITE and HESTERLY, 2001; MÖLLER et al., 2005). Even though the evolution of strategic networks is dominated by path-dependent processes during the emergence, it will become more intentionally managed as firms mature (HITE and HESTERLY, 2001). Furthermore, JARILLO (1988) posits that the strategic network represents pyramidal-hierarchical collaboration which is initiated by a focal firm. Along similar lines, several scholars (RITTER et al., 2004; MÖLLER et al., 2005) argue that the strategic network possesses a focal firm which operates as a broker, hub firm, channel or network captain, and is concerned with the management of the network. Accordingly, the focal firm can be considered a core element of the strategic network which develops a strategy for the whole network and coordinates the network in a hierarchical manner (HANF and DAUTZENBERG, 2006). The other network members heavily depend on the focal firm and, noteworthy, the level of such dependence appears to be higher for vertical than for horizontal linkages (WILDEMANN, 1997). Based on the resource dependency theory (PFEFFER and SALANCIK, 1978), MEDCOF (2001) maintains that the focal firm itself depends on critical inputs of other network members but, nevertheless, it has enough power to coordinate the network. According to JARILLO (1988: 34), "the relationships in strategic networks have most of the characteristics of a

"hierarchical" relationship" that underscores the difference of strategic networks from other types of interfirm networks.

Thus, in contrast to loosely coupled networks and participant governed networks, the feature of strategic networks is that they require considerable efforts to exercise both, management *of* the network and management *in* the network over a long term. In the first case, the network should be managed as a whole to guide the network itself towards the achievement of its goals. In the second, it is necessary to manage interactions within a network so that the interests of each individual profit-seeking member are taken into account. At the same time, shared participant-governed networks should be rather managed as a whole to resolve specific up-to-date issues that are relevant for all network members simultaneously; whereas, the challenge in loosely coupled networks that mainly represent whole industries or markets is to manage *in* a network.

In practice, strategic networks appear in various forms – supply chain networks, distribution networks, R&D networks, competitive coalitions such as airline alliances, and technology-coalition networks such as Bluetooth, etc. (INKPEN and TSANG, 2005). The focus of this thesis is on a particular type of strategic networks, vertically cooperating supply chain networks. As any strategic network, a supply chain network can be conducive to sustaining a long-term competitive advantage for its members (GULATI et al., 2000). By cooperating in supply chain networks, firms share risks and costs regarding the development of costly products that have short life span. Furthermore, fast access to information, flexibility, and responsiveness to changing customer needs can be gained in supply chain networks (OMTA et al., 2001). The next section aims to work out the characteristics of supply chain networks in greater detail.

2.2 Description of supply chain networks

Procurement relationships have always been in the focus of economists and management scholars. Accordingly, there has been a growing interest in networks of procurement relationships. These vertical interfirm networks are often referred to as supply chain networks[1] (WATHNE and HEIDE, 2004; HANF and DAUTZENBERG, 2006). LAZZARINI et al. (2001) describe a supply chain network as a set of networks comprised of horizontal ties between firms within a particular industry or group, such that these networks (or layers) are sequentially arranged based on the vertical ties between firms in different layers. Supply chain networks represent a relevant phenomenon in different sectors, e.g. automotive (DYER and NOBEOKA, 2000; LAZZARINI et al., 2008), textile (LORENZONI and BADEN-FULLER, 1995), packaging machine (LORENZONI and LIPPARINI, 1999) and agri-food (OMTA et al., 2001; CLARO et al., 2004) industries. One particular reason for this is the supply chain networks'

[1] The synonymous terms "supply network" (HARLAND et al., 2001) and "netchain" (OMTA et al., 2001; THEUVSEN, 2004) have been also increasingly used in the supply chain management literature.

capability of developing, signaling and monitoring of the quality aspects[2] (MÉNARD and VALCESCHINI, 2005). Additionally, supply chain networks may lead to significant efficiency improvements (HULT et al., 2007). Due to the strategic improtance of these issues, supply chain networks have been often addressed as strategic networks (CHOI and KIM, 2008). The following subsection sheds more light on the strategic nature of supply chain networks.

2.2.1 Supply chain networks as strategic networks

As maintained by the representatives of the Centre for Research in Strategic Purchasing and Supply (CHRISTOPHER, 1992; LAMMING et al., 2000; HARLAND et al., 2001), the concept of supply chain networks encompasses a more manageable set of issues compared to the broad concept of unmanageable networks defined by the IMP Group (FORD, 1990; HÅKANSSON and SNEHOTA, 1995). The "more manageable set of issues" involves the tasks performed in supply chains to serve end-customer segments now and in the future (CHRISTOPHER, 1992). Given the growing strategic importance of customer-orientation and of the related issues, one can generally postulate that supply chain networks are strategic networks, i.e. they are comprised of intentionally formed interfirm relationships that are strategically important for the involved firms. Indeed, supply chain networks possess all the important features of strategic networks. In the context of the above described strategic networks, supply chain networks are characterized by highly intensive, recurrent and long-term relationships between network members; they are characterized by a pyramidal-hierarchical type of coordination; and they possess a focal firm which coordinates the network.

The strategic nature of supply chain networks can be especially observed in sectors with high shares of products characterized by credence attributes (DARBY and KARNI, 1973). Credence attributes are the features of a product or a service that cannot be recognized by a consumer under normal conditions, neither before nor after the purchase (PICOT et al., 2001). To a great extent, the successful fulfillment of the consumers' requirements towards the quality of products or services with such attributes[3] depends on the quality of processes in respective supply chains. Yet, realization of this task demands specific investments on the part of supply chain actors. Therefore, in supply chain networks, particular attention may be paid to informal relationships and promotion of interfirm trust (ZYLBERSZTAJN

[2] Because food quality is generally considered the highest priority, examples of various aspects of supply chain networks presented in this thesis are taken from the agri-food sector. Furthermore, the implications derived from this study will be projected on the agri-food business.

[3] Although consumers cannot identify whether credence attributes are available in the purchased product, they are knowledgeable about these attributes. Thus, requirements towards credence attributes exist and guaranteeing of their fulfillment is the task of governmental and non-governmental organizations. The example of a product with credence attributes is organically produced food. The end consumer is not capable of identifying whether the product has really been produced organically (HANF et al., 2009).

and FARINA, 1999). Besides, supply chain networks involve lateral links, reverse loops, and two-way exchanges, and include a broad, strategic view of resource acquisition, development, management, and transformation (HARLAND et al., 2001).

Based on the above arguments, I arrive to the following definition of a supply chain network: *a supply chain network involves long-term and recurrent, formal and informal contractual relationships of material, resource, financial and information exchange among more than two interdependent participants of the supply chain that are strictly coordinated by the focal firm and aim at fulfillment of certain strategic tasks.*

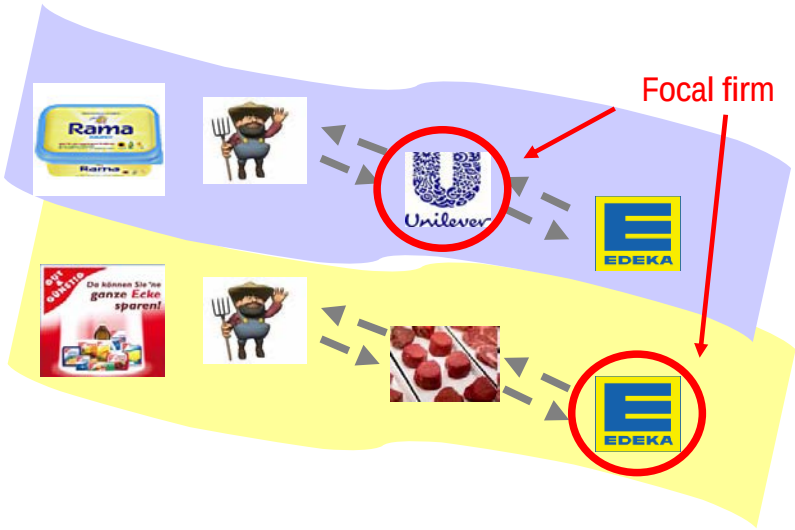
Because the focal firm is the core element of the supply chain network, the next subsection provides an overview of the role of the focal company in creating and guiding the network. Not least of all, understanding of the crucial role of the focal firm is necessary because focal companies are an exclusive subject of inquiry in the empirical part of this thesis.

2.2.2 Focal firm as the core element of a supply chain network

A focal firm can be defined as one that possesses prominence and power gained through individual attributes and a central position in the network structure, and that uses its prominence and power to perform a leadership role in pulling together the dispersed resources and capabilities of network members (DHANARAJ and PARKHE, 2006: 659). From the perspective of the focal firm, value must be created in the network, and effective creation of value hinges on deliberate, purposeful coordination efforts (MÖLLER et al., 2005; DHANARAJ and PARKHE, 2006).

Additionally, the coordination efforts by the focal firm are deliberate because this firm is most often recognized by the consumers as "responsible" for the specific product developed in the network (HANF and KÜHL, 2005). This responsibility arises as the focal firm becomes concerned with success of its branded product, i.e. the focal firm is most often a brand-owner. Thus, in a supply chain network, a focal actor can be either a manufacturer in the case of manufacturer-owned brand or a retailer in the case of distributor-owned brand. This implies that a firm can be a focal actor in one supply chain network, whereas it can be an ordinary network member in another supply chain network. For example, the German retail company EDEKA acts as a focal actor in a supply chain network which develops products under EDEKA's brand Gut & Günstig. At the same time, EDEKA is an ordinary member of the Unilever's supply chain network which develops, e.g. margarine under Unilever's brand Rama (see Figure 2-1). Similarly, Bonduelle produces canned peas under its own brand as well as for the Metro Cash & Carry's brand Aro (RETAIL STUDIO, 2010).

Figure 2-1: Examples of supply chain networks with manufacturer-owned and distributor-owned brands



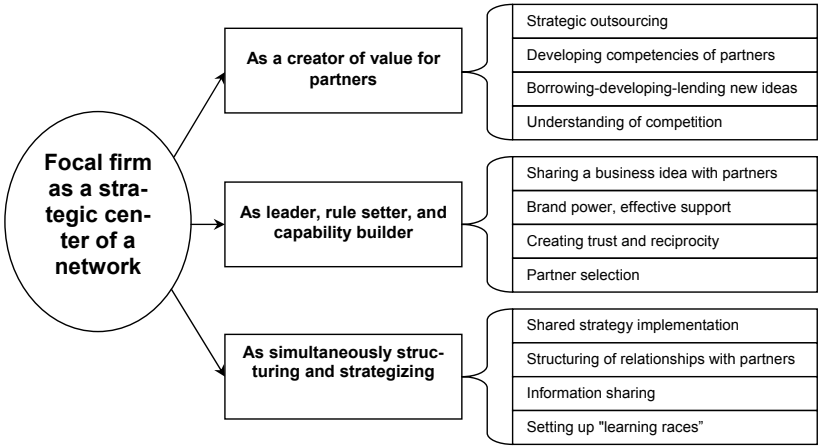
Sources: EDEKA (2009), UNILEVER (2009).

The focal firm coordinates the network to fulfil certain tasks (MÖLLER et al., 2005). For example, the focal firm has to ensure the ease with which knowledge is shared, acquired, and deployed within the network. This "knowledge mobility" (DHANARAJ and PARKHE, 2006) is necessary because significant value cannot be created if the specialized knowledge of each network member stays mostly locked within its organizational boundaries. Another task of the focal company is the creation of appropriability regimes that disable "cheating" within the network and preclude transfer of valuable knowledge to competing networks. Furthermore, given unstable linkages and competitive pressures among network members, another task of the focal firm is to foster network stability. Network stability must be primarily understood as dynamic (not static) stability, which aims for a nonnegative growth rate while allowing for entry and exit of network members. Thus, in addition to processes, focal firms also influence networks through their recruitment activities (DOZ et al., 2000). By its strategic choice of partners, a focal firm can significantly change network membership and structure. Through recruitment and brokering activities, the focal firm can control its network position, maintaining its centrality and status (DHANARAJ and PARKHE, 2006).

A more comprehensive elaboration on the role of focal firms has been made by LORENZONI and BADEN-FULLER (1995) who analyzed firms acting as strategic centers in webs of partners. In this context, they have examined three dimensions of the focal firm: as a creator of value for its partners; as leader, rule setter, and

capability builder; and as simultaneously structuring and strategizing (Figure 2-2). These dimensions involve a set of functions a focal firm performs to organize and manage the network.

Figure 2-2: The role of the focal firm as a strategic center of a supply chain network



Source: Own performance (following LORENZONI and BADEN-FULLER, 1995).

As *a creator of value for its partners*, the focal firm attaches strategic imprtance to the issues of outsourcing, i.e. it requires partners to be more than executors, expects them to be problem solvers and initiators. Additionally, the focal firm pays particular attention to the development of the core skills and competencies of partners to make them more effective and competitive. This involves forcing members to share their expertise with others in the network, and with the focal firm. Furthermore, the focal firm deliberately buys or licenses some existing technological ideas from a third party to develop these ideas in the network so that they add value for network members and for the focal firm. Finally, as a value creator, the focal firm explains partners that the principle dimension of competition is between value chains and networks. This might even involve the encouragement of rivalry between network members, in a positive manner.

To act as *a leader, rule setter and capability builder*, the focal company must have an unusual ability to conceptualize a business idea so that it can be shared not only internally, but with other partners. Shared business ideas encapsulate shared strategy and so contain a clear strategic intent (PRAHALAD and HAMEL, 1990). However, the difficulties may occur because it takes many partners operating effectively to make the network work, but the negative behavior of only a few can bring the whole system to a halt. Since contracting used to resolve this issue is often expensive and inflexible (LORENZONI and BADEN-FULLER, 1995), the focal firm must

be able to develop a sense of trust and reciprocity among network members. To control the balance of power within the network, the focal firm retains certain activities. The control of the brand names and the development of the systems that integrate the network are two activities that give the organization a pivotal role and allow it to exercise power over the system. In particular, branding is important in consumer markets. The brand name, owned by the focal firm, is promoted by the activities of the partners, who see the brand as a shared resource. Additionally, to create the correct conditions for the relationships, the focal company undertakes the partner selection process whereby it checks whether partners' capabilities, resources, management systems, decision processes, and perspectives are compatible.

In order to create a successful supply chain network, a focal firm has to be able to *strategize and structure simultaneously*. This means that the focal firm has to simultaneously conceptualize and implement a shared strategy with its partners as well as to structure the relationships with and between partners. In this context, the way in which information is collected and shared in the network reveals how structure and strategy go hand in hand. The focal firm structures the information system so that knowledge is funneled to the areas that need it the most. Furthermore, successful focal firms reject the idea of doing everything themselves. When the knowledge and capabilites exist within the network, the role of the focal firm is to orchestrate the processes so that the whole network works. The focal company may set up "learning races" among network members to create a sense of competition and rivalry, but within an overall common purpose.

All in all, the above arguments can make an impression that a focal firm is in substantial control of surrounding firms. However, in reality, the focal firm's control over a supply chain network is not exhaustive because the supply chain network involves numerous legally independent organizations. All firms are simultaneously involved in the ongoing functioning of the network and the resulting structure and performance is coproduced by their actions. Within the supply chain network, firms confront different types of relationship and network management situations, including those when they are in a powerful and controlling position, those when they are the subject of others control, and those in which multiple parties have strong influence over each other. Provided that all network members actively pursue their own self-interests and no member is inert, responding passively to the focal firm's initiatives, it is in this context of absence of hierarchical authority that the leadership by the focal firm becomes essential. Thus, although the focal company faces more situations when it is in a more powerful position than other network members, the network management is as much about management *of* the network as it is about management *in* the network (RITTER et al., 2004: 177). The existing practices and the theoretical foundations of supply chain network management are reviewed in the next Chapter.

2.3 Summary of Chapter 2

Summarizing the current Chapter, I remind that its aim was to describe the main characteristics of supply chain networks. To identify specific management challenges faced by firms in the different network types, it is necessary to identify the features of these networks. In this context, I have demonstrated that there are different types of interfirm networks. I was able to show that, despite the ambiguity of terminology, one can distinguish between the different types of interfirm networks through consideration of two disctinctive premises: network of organizations and network organizations.

In this regard, *networks of organizations* involve the so-called loosely coupled networks that refer to any group of organizations or actors that are interconnected in relationships; and any industry or market can be considered as this type of networks. *Network organizations* involve shared participant-governed networks and strategic networks. Shared participant-governed networks depend exclusively on the involvement and commitment of all organizations that comprise the network, i.e. it is the collectivity of partners themselves that make all the decisions and manage network activities in shared participant-governed networks.

Strategic networks represent long-term, purposeful arrangements among distinct but related for-profit organizations and allow firms in them to gain or sustain competitive advantage. A strategic network represents pyramidal-hierarchical collaboration which is initiated and coordinated by a focal firm. In contrast to loosely coupled networks and participant governed networks, the feature of strategic networks is that they require considerable efforts to exercise management of the whole network. This involves the guidance of the whole network towards the achievement of its goals as well as consideration of the interests of each individual network member.

Supply chain networks can be classified as a type of strategic networks because they can be conducive to sustaining a long-term competitive advantage for members. By cooperating in supply chain networks, firms share risks and costs regarding the development of costly products that have short life span. Furthermore, fast access to information, flexibility, and responsiveness to changing customer needs can be gained in supply chain networks. As a type of strategic networks, supply chain networks are characterized by highly intensive, recurrent and long-term relationships between members; they are characterized by a pyramidal-hierarchical type of coordination; and they possess a focal firm which coordinates the whole network. The coordination efforts by the focal firm are deliberate because it aims to create value through a supply chain network and it is responsible for the correctness of the attributes of the end product. Given the strategic importance of these aims, the focal firm must be able to develop and implement a strategy that will be shared by members. Additionally, given that all network members are legally independent organizations and pursue their own self-interests, the focal firm must implement the management concept for the whole network.

3 CHAIN MANAGEMENT: EXISTING PRACTICES AND THEORETICAL UNDERPINNINGS

In this Chapter, I provide an overview of the supply chain network management or, in more business-oriented terms, chain management. In doing so, I aim to delineate the strategies that are used to manage a supply chain network as a whole and to guide it towards the achievement of strategic goals. Additionally, my objective is to identify the shortcomings these strategies possess.

A systematic literature review reveals that the issues of chain management received much attention on the part of both practice and research. As a result, a number of concepts of chain management have been developed over the last 30 years. This Chapter first reviews the concepts used in practice of chain management (section 3.1). Given that some of these practices are quality-driven and the others are oriented towards the improvement of operational efficiency, i.e. logistics-driven, section 3.1 is subdivided into:

- the "quality-driven" subsection 3.1.1 which addresses the Total Quality Management concept as well as the array of the quality standardization schemes that originated from the total quality ideas, and
- the "logistics-driven" subsection 3.1.2 which reviews chain management models that arose based on considerations about efficiency of supply chain operations.

Further, Chapter 3 proceeds with section 3.2 which provides an insight into the theoretical foundations of managing a supply chain network as a whole. Here, the strategic importance of simultaneous alignment of interests and actions of supply chain network members is signified.

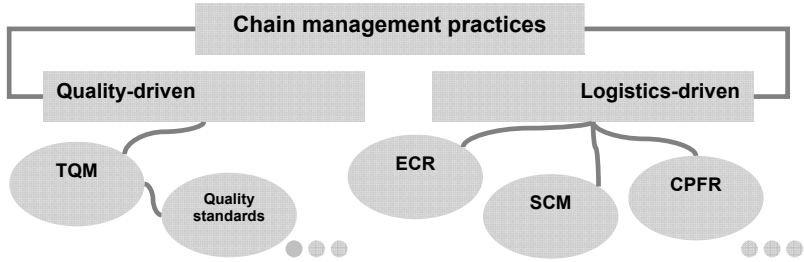
Because the alignment of interests and the alignment of actions represent self-standing and multifaceted concepts, separate sections are further devoted to each of them. Section 3.3 describes the alignment of interests of the network members; section 3.4 delineates the alignment of the members' actions. In section 3.5, I address a collective strategy as the element of chain management that integrates both the alignment of interests and the alignment of actions to achieve the goals of the whole network. Section 3.6 summarizes the contribution of Chapter 3.

3.1 Existing chain management practices

Chain management becomes a particularly important topic in the context of increasing consumer requirements towards quality. Since consumer requirements increase, their satisfaction is no more the responsibility of one single firm; instead the whole supply chain has to work together. Completeness and credibility of the

information about consumer needs, respective specifications and requirements towards the production processes as well as the timely transfer of this information along the supply chain gain in importance. Furthermore, information exchange and adaptation of the production processes should not hamper the economic efficiency. In this context, a systematic literature review reveals that the known practices of chain management are based on aspirations of either achieving high quality or improving the efficiency of supply chain processes. Accordingly, there is a range of quality-driven and logistics-driven chain management concepts that are implemented in different sectors today (Figure 3-1). The next subsections consequtively describe the quality-driven and logistics-driven chain management practices.

Figure 3-1: Examples of the existing quality-driven and logistics-driven chain management practices

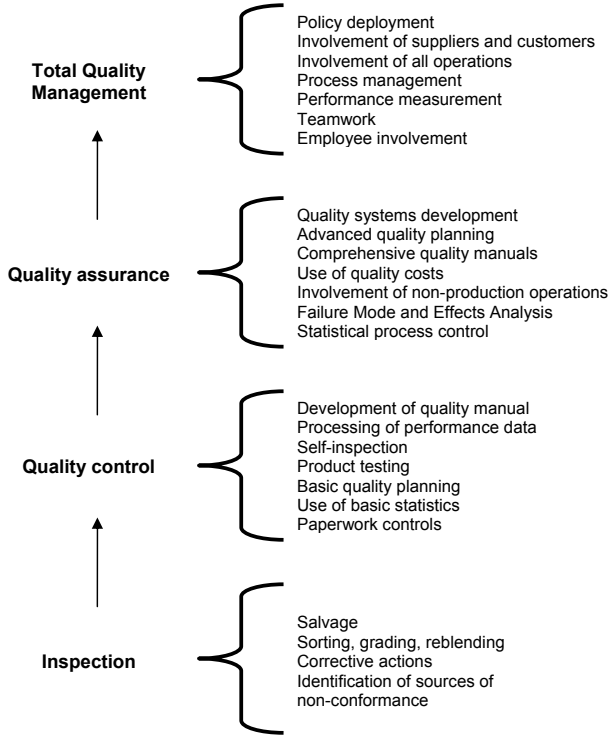


Source: Own performance.

3.1.1 Quality-driven chain management practices

Over the last three decades, systems for improving and managing quality have evolved rapidly. Simple inspection activities have been replaced or supplemented by quality control; quality assurance has been developed and refined; and the Total Quality Management (TQM) concept as a chain-wide concept has become widespread. In this progression, four fairly discrete stages can be identified: inspection, quality control, quality assurance, and TQM (see Figure 3-2).

Figure 3-2: The four stages in the evolution of quality management



Source: VAN DER WIELE et al. (1997).

The TQM concept is based on a strategic approach that focuses on maintaining existing quality standards as well as making incremental quality improvements. Additionally, TQM itself served as a basis for the development of a number of quality assurance standards. Quality standards are widely applied as chain management tools in different industries. In particular, they are increasingly used in the agri-food business where the food quality and safety are considered to be the highest priority. This subsection further describes the concept of TQM and some quality assurance schemes that are employed in the agri-food business today.

Total Quality Management

The TQM concept is often referred to as a management philosophy that seeks to integrate all organizational functions (marketing, finance, design, engineering, production, and customer service) to focus on meeting customer needs and organizational objectives (STARK, 1998). Total Quality Management is associated with the development, deployment, and maintenance of organizational systems that are required for various business processes. As a customer-oriented approach,

TQM prioritizes customer satisfaction as the main aim of the company. To accomplish this aim, a quick company's response to customer requirements must be achieved and, therefore, TQM orientates the company's focus on the whole supply chain. Based on objective data rather than on emotions, actions in the supply chain are subject to continuous improvement in order to achieve the desired quality of the product and the chain processes. This improvement is attributed, among other things, to the elimination of wastes, and lays an emphasis on quality at the product design stage with prevention (not detection) of possible mistakes. Such measures can be achieved only if all activities include management and monitoring of cycle time and responsiveness as a basis for seeking opportunities for improvement (STARK, 1998).

Quality improvement required by TQM is hard to achieve without the participation of well-trained and committed labor, and the installation of an open, cooperative TQM culture. The basic principles of TQM include customer satisfaction, supplier satisfaction and continuous improvement. Based on the maintenance of the process quality, the product quality is assured and, consequently, the customer is satisfied. Thus, according to TQM, quality assurance requires that the whole supply chain functions as a single entity. Therefore, TQM can be thought of as a management concept for the whole supply chain network that aims to enable a well-functioning vertically cooperating system and bring about benefits for each particular member of this system. The benefits of successful TQM implementation include cost reduction, improved management skills, enhanced relationships and confidence among supply chain members, increased accountability and transparency, and improved productivity and efficiency.

Although different TQM proponents (e.g., Deming, Juran, Ishikawa, and Crosby) emphasize different features, an exhaustive review and integration of the TQM literature suggests that complete TQM programs tend to share the 12 factors shown in Table 3-1.

The TQM concept provided a ground for the development of worldwide recognized quality assurance standards that are widely used as cahin management tools today (THEUVSEN et al., 2006). I further review several standards used in the agri-food industry: ISO 9000, IFS, GLOBALGAP, and QS.

Table 3-1: The twelve TQM factors

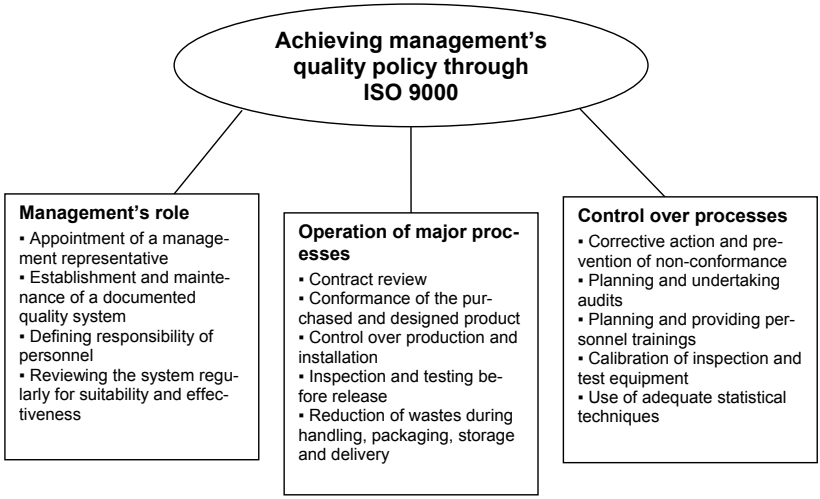
1. Committed leadership: a long-term commitment by top managers to the philosophy, usually under a name something like Total Quality Management, Continuous Improvement, or Quality Improvement.
2. Adoption and communication of TQM: using tools like the mission statement, and themes or slogans.
3. Closer customer relationships: determining customers' (both inside and outside the firm) requirements, then meeting those requirements no matter what it takes.
4. Closer suppliers relationships: working closely and cooperatively with suppliers (often sole-sourcing key components), ensuring they provide inputs that conform to customers' end-use requirements.
5. Benchmarking: researching and observing best competitive practices.
6. Increased training: usually includes TQM principles, team skills, and problem-solving.
7. Open organization: lean staff, empowered work teams, open horizontal communications, and a relaxation of traditional hierarchy.
8. Employee empowerment: increased employee involvement in design and planning, and greater autonomy in decision-making.
9. Zero-defects mentality: a system in place to spot defects as they occur, rather than through inspection and rework.
10. Flexible manufacturing: (applicable only to manufacturers) ca include just-in-time inventory, cellular manufacturing, design for manufacturability, statistical process control, and design of experiments.
11. Process improvement: reduced waste and cycle times in all areas through cross-departmental process analysis.
12. Measurement: goal-orientation and zeal for data, with constant performance measurement, often using statistical methods.

Source: POWELL (1995).

ISO 9000 quality standards

The ISO 9000 quality assurance standards were developed by the International Organization for Standardization (ISO) at the end of 1980's and revised in the middle of 1990's. ISO 9000 define TQM as "a management approach for an organization, centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and to society" (ISO, 2007). Generally, the ISO 9000 standards aim to achieve the management's quality policy. Consisting of ISO 9000, 9001, 9002, 9003 and 9004, the ISO 9000 standards strive to establish appropriate quality management systems for production and service activities in order to facilitate trade through the conformance to specified requirements. ISO 9000 and ISO 9004 describe the guidelines for use of particular standards and arrangement of a corresponding internal quality management in the context of TQM, respectively. The other ISO standards (9001, 9002, and 9003) cover the requirements for establishing and maintaining a documented quality system (ISO, 2007) of which ISO 9001 is the most comprehensive. In general, these standards are applied in the case when a contract between two parties requires the demonstration of a supplier's capability. Whereas ISO 9002 and 9003 are models for quality assurance systems in production, installation, and final inspection and test, ISO 9001 assures quality systems in design, development, production, installation and servicing (STARK, 1998).

Figure 3-3: The three groups of the ISO 9000 standards



Source: BRADLEY (1994).

Quality system requirements by ISO 9001 are described in sections of the standard. The sections cover such issues as management responsibility, quality system, contract review, design control, document control, process control, inspection and testing, internal quality audits, servicing, and others. Due to ISO 9001, the management must arrange a continuous documented quality system to make customers confident that their requirements towards products and services are satisfied. Thus, any non-conformance of the product or service must be prevented. In the case when any product does not conform to the customers' requirements, it must be excluded from the usage. To establish such a quality system, all relevant aspects of this system must be properly covered in specified documents, e.g. quality manuals. Among other things, quality manuals determine the quality objectives, management responsibility and authority, job organization, general and detailed work instructions, approval of all changes and modifications. All documents related to ISO 9001 should be controlled based on engineering documents and data from an Engineering Data Management/Product Data Management system. The satisfaction of all technical requirements presupposes their inclusion into the design and development of the product. This means that quality improvement must be continuously undertaken to enable the elimination of wastes and processes that do not add value to the product or service. Furthermore, an on-going evaluation of the processes, management and information systems, and coordination of the design, technical and support activities should be considered. In order to facilitate the prevention of quality distortions, wastes or unproductive processes, the product must be inspected for the

conformance to specified requirements. Thus, the implementation of the documented planned measures takes place.

In summary, all ISO 9001 sections reflect four core concepts, namely, conformance, documentation, design quality and prevention, and inspection and testing. Additionally, the ISO 9000 standards are implicitly divided into three groups covering the management's role, operation of major processes, and control over processes (Figure 3-3). Overall, the ISO 9000 standards aim to achieve quality by an individual company which, though, contributes to improvements in quality in the whole supply chain.

International Food Standard

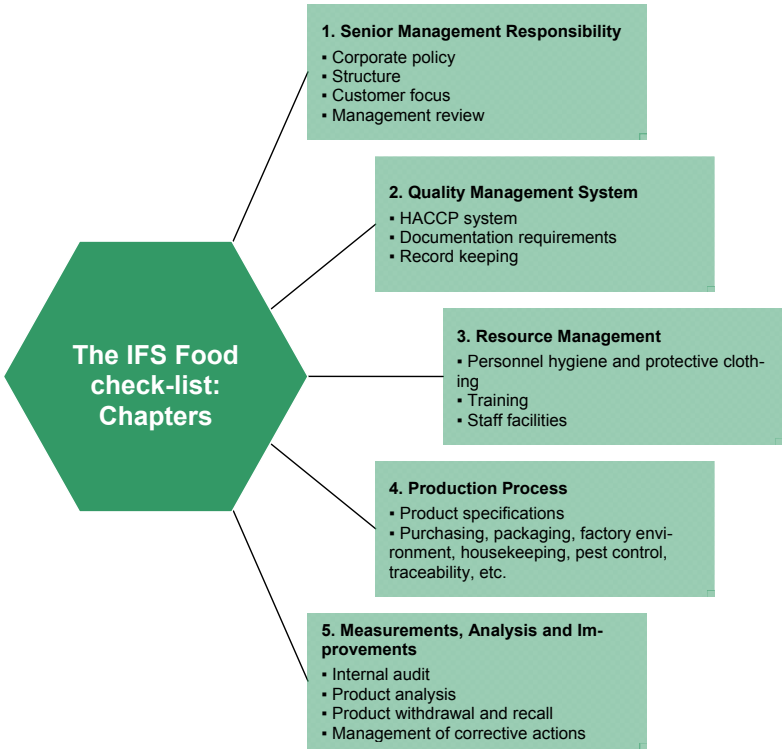
Emanating from the growing consumers' demands, the rising incidence of claims for damages, the globalization of commodity flows, and costliness of present procedures, another type of quality standards was developed, i.e. the International Food Standard (IFS). Except for the listed factors, the introduction of the IFS was stipulated by the EU directive 2001/95/EC (December 3, 2001) that aims to ensure that products placed on the market are safe. The IFS is a common audit standard for food created by German retailers from the HDE (Hauptverband des Deutschen Einzelhandels) in 2002 and set up by the Federal Union of German Trade Associations in 2003. French food retailers (and wholesalers) from the FCD (Federation des enterprises du Commerce et de la Distribution) have joined the IFS Working Group in 2003. Afterwards, the IFS has been issued by the Global Food Safety Initiative (GFSI) founded by the Global Food Business Forum in 2000. The GFSI compiled key criteria, which allow to measure food security standards and which build the basis for general acceptance of the IFS. These criteria include food safety management systems; good agricultural practices/manufacture practices/trading practices; and Hazard Analysis Critical Control Points (HACCP) systems.

On account of this, the aim of the IFS is to create a consistent evaluation system for all companies supplying retailer branded food products with uniform formulations, uniform audit procedures and mutual acceptance of audits, which will create a high level of transparency throughout the supply chain (IFS AUDIT-PORTAL, 2007). Thus, the IFS is mainly related to the retail (or wholesale) companies that practice private labeling in their businesses with subsequent increase of legal responsibilities and need for strong communication to the final consumer. Currently, the IFS is supported by such advanced retailers as German METRO, REWE, EDEKA, Aldi, Lidl; French Auchan, Carrefour, etc. The IFS concerns only the retailers' (wholesalers') suppliers from the food processing industry or companies that pack loose food products. Consequently, the IFS can only be used when a product is "processed" or when there is a hazard for product contamination during the primary packing.

In greater detail, the goals of the IFS include an installation of a common food safety standard with an uniform evaluation system; cost reduction for both, retailers (wholesalers) and suppliers; reduction of the amount of audits per year; creation of comparability and transparency throughout all stages of the supply chain; accreditation of qualified certification bodies and approval of competent auditors; and strong enforcement of the European and national law (e.g. with regard to the issues of traceability, genetically modified organisms (GMO), etc.). According to these goals, the IFS is structured into four parts, namely Service Protocol of the IFS; Catalogue of Requirements; Requirements for Certification Bodies and Auditors; and Report (IFS AUDIT-PORTAL, 2007). For the chain management purposes, the second part, i.e. Catalogue of Requirements is the most comprehensive as it covers such issues as management of the quality system; management responsibility; resource management; product realization; and measurements, analyses, and improvements.

Nowadays, IFS stands for a broader "International Featured Standards" which, among other standards, involve the IFS Food Standard. IFS Food has been subject to a revision in 2006-2007. A French, German and Italian subworking group worked on the detailed development of the new Standard. The thorough revision of the Standard, in addition to meeting the abovementioned goals, led to a number of changes. As a result the new Standard has been significantly improved and the new version of IFS Food has been finally published in summer 2007, for an application from January 1, 2008. The current check-list of IFS contains 250 requirements and is divided into 5 chapters (Figure 3-4). Overall, it can be mentioned that IFS Food is a sectoral quality standard for retailers (wholesalers) and aims to optimize dyadic relationships between retailers (wholesalers) and their suppliers. This leads, in turn, to the improvements throughout the whole supply chain, e.g. higher levels of chain transparency.

Figure 3-4: Structure of the IFS Food check-list



Source: IFS AUDIT-PORTAL (2010).

GLOBALGAP certification standards

Growing concerns by the consumers about product safety as well as environmental and labor standards have led to increasing efforts of agri-food companies on the development of certification standards that would be able to minimize these concerns (GAWRON and THEUVSEN, 2009). One of such efforts resulted in the emergence of GLOBALGAP as a series of sector specific farm certification standards. Its implementation (first as EurepGAP) became possible in 1997 due to the initiative of retailers belonging to the Euro-Retailer Produce Working Group (EUREP). As mentioned on the official website, GLOBALGAP is a private sector body that sets voluntary standards for the certification of agricultural products around the globe (EUREPGAP, 2007).

Being an equal partnership of agricultural producers and retailers, GLOBALGAP establishes certification standards and procedures for Good Agricultural Practices.

Defined by Food and Agriculture Organization of the United Nations (FAO), Good Agricultural Practices (or GAPs) are a collection of principles to apply for on-farm production and post-production processes, resulting in safe and healthy food and non-food agricultural products, while taking economical, social and environmental sustainability into account (FAO, 2007). GLOBALGAP is a pre-farm-gate-standard that means the certificate covers the process of the certified product from before the seed is planted until it leaves the farm. Additionally, GLOBALGAP is a business-to-business (B2B) label and is therefore not directly visible for the consumers (EUREPGAP, 2007).

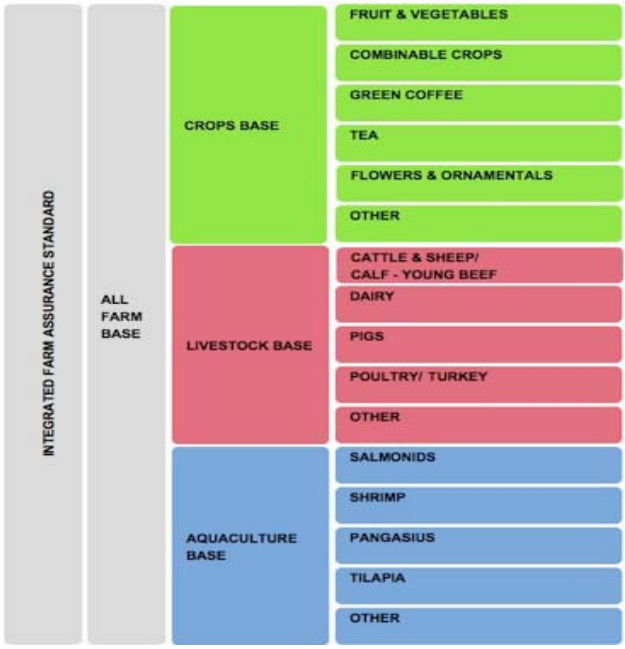
The GLOBALGAP standard is primarily designed to maintain consumer confidence in food quality and food safety. Other important goals are to minimize detrimental environmental impacts of farming operations, optimize the use of inputs and to ensure a responsible approach to worker health and safety. Members of GLOBALGAP include retailers, producers/farmers and associate members from the input and service side of agriculture. Farmers can only be certified against the GLOBALGAP criteria by authorized Certification Bodies.

GLOBALGAP is a single integrated standard with modular applications for different product groups, ranging from plant and livestock production to plant propagation materials and compound feed manufacturing (Figure 3-5).

The comprehensive documentation of the standard is organised into five major blocks, each with a set of complementary elements (GLOBALGAP, 2010):

- system rules referred to as General Regulations (GR),
- global GAP requirements referred to as Control Points and Compliance Criteria (CPCC),
- inspection documents referred to as Checklists,
- national GAP requirements referred to as Approved National Interpretation Guidelines, and
- harmonization tools referred to as Benchmarking Cross Reference Checklist (BMCL) and other guidelines.

Figure 3-5: Classification of the GLOBALGAP documents



Source: GLOBALGAP (2010).

The standard serves as a global reference system for other existing standards and can also easily and directly be applied by all parties of the primary food sector. GLOBALGAP equips members with a reliable tool kit, which allows partners in the supply chain to position themselves in a global market with respect to consumer requirements. Similarly to the IFS Food standard, GLOBALGAP is a sectoral quality standard (for agriculture) and aims to optimize dyadic relationships between retailers and their suppliers from the agricultural sector.

QS quality assurance system

As a reaction on various food scandals, in particular, Bovine Spongiform Encephalopathy (BSE), QS Qualität und Sicherheit (Quality and Safety) emerged as the quality assurance system in Germany in 2001. It voluntarily incorporates all stages and companies of the food chain with regard to the production, processing and marketing of food. Partners of the QS quality system represent retail, meat sector, agricultural production and production of feed material. The goal of QS is to regain and strengthen consumer trust in the proper and high quality

production of food, i.e. to provide the comprehensive and complete food safety (QS QUALITÄT UND SICHERHEIT GMBH, 2007).

Meeting the consumers' requirements with QS is achieved through systematic control of food production according to the criteria and guidelines of the QS system. Independent control over partners is carried out by certification bodies independent of them. In the QS system, clear procedures are defined, according to which breaches of the system and non-compliance with the criteria are sanctioned up to exclusion of the system participant in the worst case. The QS system also maintains its own event and crisis management and supports the database. Additionally, it contacts consumers through communication, advertising and labeling.

Figure 3-6: The organization of the QS quality scheme

Source: QS QUALITÄT UND SICHERHEIT GMBH (2007).

QS is based on a three-stage control system depicted in QS manuals that define the criteria and testing requirements needed to participate in the QS system. Three stages include professional internal control by the participating companies according to the QS requirements; regular inspection (audit) of the internal control by independent certification bodies that are approved by QS (neutral control); and checking of certification bodies (metacontrol). For each stage, there are specific guidelines, documents and sanctions in the system.

QS involves laboratories that test and monitor the criteria compliance as well as detect and measure faults in order to correct them. QS QUALITÄT UND SICHERHEIT GMBH (2007) mentions that the "success of the QS system lies in the consecutive alignment of the various stages and the continuous process control. This is achieved

through a continuous documentation and by complying with binding product and process requirements", and "QS stands for: Quality assurance – across all stages". The organization of the QS quality scheme is depicted in Figure 3-6.

Of all the reviewed standardization schemes, QS is the only scheme that is explicitly oriented towards quality assuranace throughout the whole supply chain. It involves participants from the retail sector, processing industry, agriculture and production of agricultural inputs.

3.1.2 Logistics-driven chain management practices

Historically, such concepts as TQM have resulted from the increased attention to the questions of quality addressing primarily the quality of processes through which the quality of products is assured. However, the issues of dealing with disrupted and inconsistent material and information flows remained essential and required a complex improvement in operations to meet the customers' demands. As a result, the logistics-driven concepts such as Supply Chain Management, Efficient Consumer Response, Collaborative Planning Forecasting and Replenishment have been developed. Noteworthy, the self-standing concepts Efficient Consumer Response and Collaborative Planning Forecasting and Replenishment have appeared as modifications of the Supply Chain Management concept stipulated by considerations of both sectoral applicability and technological advances. I further provide a general description of these practices.

Supply Chain Management

The Supply Chain Management (SCM) concept became popular in the middle of 1980's. SCM is the term used to describe the management of the flow of materials, information, and funds across the entire supply chain, from suppliers to component producers to final assemblers to distribution (warehouses and retailers), and ultimately to the consumer (JOHNSON and PYKE, 2000). The Council of Supply Chain Management Professionals (CSCMP) defines SCM as follows: "SCM encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies" (CSCMP, 2007). SCM takes its roots in logistics management and extends logistics management in that it not only puts an emphasis on managing the flow and storage of materials, but it also places a great weight on network design elements such as facility network and product development (MABERT and VENKATARAMANAN, 1998).

In terms of SCM, it is subsumed that actions of one chain member can influence the profitability of other chain members. Furthermore, firms are increasingly thinking in terms of competing as part of a supply chain against other supply chains, rather than as a single firm against other individual firms (JOHNSON and PYKE, 2000).

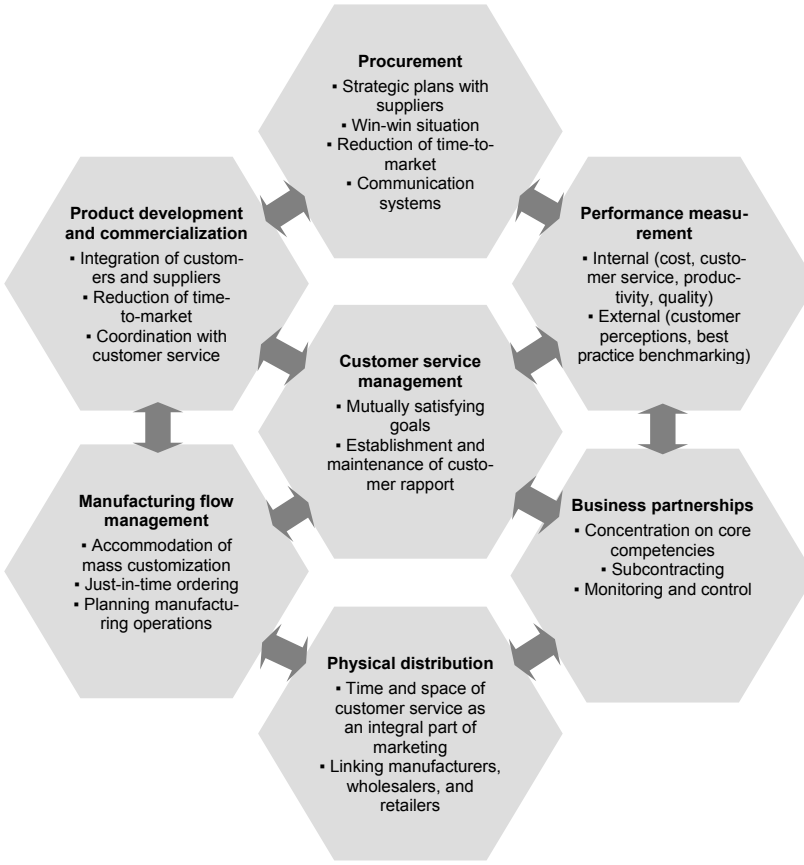
Under such conditions, the successful implementation of SCM depends on how the managerial decisions are fulfilled at different stages of a supply chain. There are five major stages of the supply chain, which represent important phases in the flow (MABERT and VENKATARAMANAN, 1998):

- Sourcing – the supply of raw materials and components through a network of vendors, product development support through subassembly design and tooling production for process changes;
- Inbound Logistics – effective and efficient movement and storage of required materials to meet production schedules;
- Manufacturing – production of a high quality and price competitive product in a timely manner;
- Outbound Logistics – movement of finished goods through the distribution network to markets for customer use; and
- After-market Service – support of the product either through replacement parts and repair service, or customer service representatives to answer product-use questions.

Successful SCM requires a change from managing individual functions to integrating activities into key supply chain processes. LAMBERT (2008) suggests the following key supply chain business processes: customer service management; procurement; product development and commercialization; manufacturing flow management; physical distribution; business partnerships; and performance management (Figure 3-7).

Thus, the SCM concept is oriented towards the whole supply chain. When successfully implemented, SCM enables a number of advantages such as timely supplies of necessary quantities of inputs or products; safe and reliable delivery of materials at the lowest cost of transportation; smooth functioning of production lines in order to provide high-quality products availability when needed; provision of stable sales; lower purchase costs; and mutual success through cooperative relationships and better access to information (HAAG et al., 2006).

Figure 3-7: Integration and objectives of the key processes in Supply Chain Management



Source: Own performance (following LAMBERT, 2008).

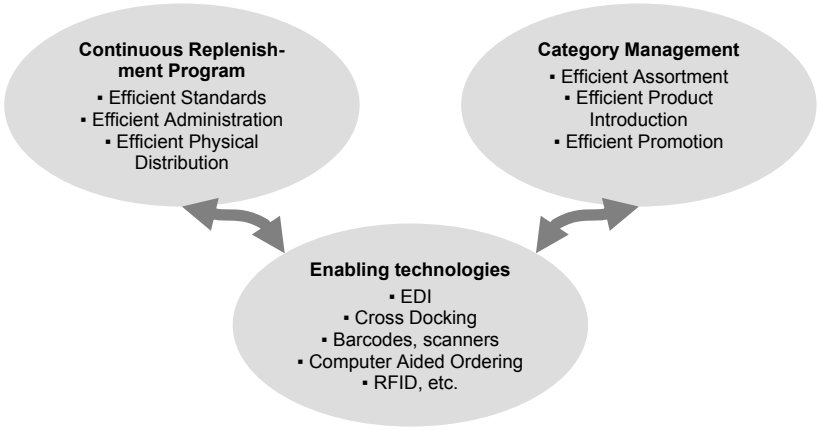
Efficient Consumer Response

JOHNSON and PYKE (2000) mention that certain industries use other terms in place of SCM. As an example, they provide grocery industry, which employs the term "Efficient Consumer Response (ECR)". However, ECR can be perceived – at least based on some empirical evidence – as an independent concept that refers to "a food and consumer products industry strategy where distributors and suppliers work together to bring better value to consumer" (KURNIA et al., 1998). ECR was introduced in the USA in 1993. Initially, it has provided a direct response by the grocery industry to threats from the alternative store formats in retail sector (SOUCIE, 1997; KURNIA et al., 1998). Nowadays its goal is to develop a more responsive, consumer-driven system in which distributors and manufacturers collaborate as business partners to maximize consumer satisfaction and minimize cost (HOBAN, 1998).

A successful implementation of ECR provides benefits for both, distributors/retailers and manufacturers. On the distributor/retailer side, benefits are attributed to increased sales and gross margin, reductions in warehouse and retailer inventories, increased variety of goods on offer, reductions in the numbers of stock keeping units, and reductions in expenses for all key operating areas. Manufacturers and brokers experience such advantages as increased sales, improved profits, reductions in costs of goods, reductions in packaging, raw materials, manufacturing and other expenses, reduction in out-of-stock problems, reduction in finish-product inventory, smoother product flows, and better information (KURNIA et al., 1998).

ECR deals with inefficiencies within the supply chain by virtue of strategic initiatives in specific focus areas supported by management programs and enabling technologies (KURT SALMON ASSOCIATES, 1993). Within the ECR concept, there are three focus areas (OBERSOJER and WEINDLMAIER, 2006): the supply side, the demand side, and enabling technologies (Figure 3-8). On the supply side, management is supported by Continuous Replenishment Program (CRP) defined as "the practice of partnering among distribution channel members that changes the traditional replenishment process from distributor-generated purchase order to one based on actual or forecast consumer demand" (THAYER, 1995). CRP strives to improve the information and product flow by an automatic order processes, standardized shipping units and a reorganization of the physical distribution (VON DER HEYDT, 1997). For that matter, the following strategic initiatives are set up: Efficient Standards, Efficient Administration, and Efficient Physical Distribution.

Figure 3-8: Strategic initiatives in the focus areas of Efficient Consumer Response



Source: Own performance.

Management of the demand side is maintained with the help of Category Management (CM) that refers to "an interactive business process whereby retailers and manufacturers work together in mutual cooperation to manage categories as strategic business units within each store" (INFORMATION ADVANTAGE, 1996). Three collaborative practices represent the strategies used in CM: Efficient Assortment, Efficient Product Introduction, and Efficient Promotion. For detailed overview of ECR strategies see, for example, KURT SALMON ASSOCIATES (1993), KURNIA et al. (1998), OBERSOJER and WEINDLMAIER (2006) and others.

In the process of implementation of ECR, an important missing link must be considered between CRP and CM. This missing link resides in an independent planning of operations by retailers, distributors and suppliers. To fill this gap, ECR uses enabling technologies that form the common basis for collaboration on the supply side (logistics) and on the demand side (marketing) (OBERSOJER and WEINDLMAIER, 2006). Enabling technologies include such exchange tools as Electronic Data Interchange (EDI), Cross Docking[4], barcodes and scanners, Computer Aided Ordering, Direct Store Delivery, Activity-Based Costing, etc.

Recent advantages of chain management can be denoted by the use of Radio Frequency Identification (RFID), the enabling technology that employs radio waves for identification of objects. With the help of special devices called tags, RFID remotely stores and retrieves data on products and goods eliminating the divergence

[4] Cross Docking is a modern logistics system based on the use of a loading dock where received items are immediately matched with the outgoing shipment requirements instead of stocking in warehouses and waiting for later ordering. Cross Docking aims to reduce costs and total lead time.

between inventory record and physical inventory. Furthermore, RFID prevents or reduces the sources of such divergence. Additionally, using RFID simplifies business processes and reduces labor costs. Demonstrating some advantages over barcodes, this technology is increasingly used in retail stores to detect the availability or absence of an item (FISH and FORREST, 2006). Today RFID is practiced by such large supermarkets as Wal-Mart and Tesco.

Figure 3-9: The CPFR model

Source: VICS (2010).

Collaborative Planning Forecasting and Replenishment

The concept of Collaborative Planning Forecasting and Replenishment (CPFR) was introduced by a consortium of US retailers and suppliers in 1998. CPFR refers to a business practice wherein trading partners use IT and a standard set of business procedures to combine their intelligence in the planning and fulfillment of customer demand (VICS, 2007). Within CPFR, retailers and suppliers jointly develop forecasts by sharing information regarding point-of-sale (POS), inventory, promotions, strategy, and production (KIM and MAHONEY, 2006).

Voluntary Interindustry Commerce Standards (VICS) Association has developed the CPFR model as the basis for the improvement of performance between retailers and suppliers. The model consists of simultaneously and collaboratively implemented stages that include: Strategy and Planning; Demand and Supply Management; Execution; and Analysis (Figure 3-9).

Trading partners that use CPFR jointly focus on consumers and the value chain success, share forecasts of consumer demand driving planning across the value chain, and share risks jointly removing supply process constraints in order to commit to the shared forecasts. Thus, the key to success is that partners agree to own the process and plan. For this, CPFR requires real time information that can be provided through the Internet using specific supply chain software.

Successfully implemented CPFR can bring about benefits to both, the demand side and the supply side. In general, the advantages by the demand side include enhanced relationship between buyer and seller, greater sales, improved shelf positioning and facings through sound category management, and improved product offering. The supply side benefits cover improved order forecast accuracy, reductions in inventories, improved returns on technology investments through enabled higher quality forecasts, improved overall returns on investments (ROI), and increased customer satisfaction (VICS, 2007).

The common feature of the above described chain management concepts is that their successful implementation requires integration and strategic orientation of actors throughout the whole supply chain (Table 3-2). However, despite subsumed strategic importance, many firms use such tools as CRP, Cross Docking, EDI or RFID just for the sake of technical exchange without being strategically integrated in particular supply chains (ANGELES and NATH, 2000). Furthermore, despite the expected positive effects on functioning of the whole supply chain, the majority of the existing quality standards optimize dyadic relationships between certain stages of the supply chain. This means that the firms, whose contribution to the supply processes can be crucial and whose involvement in implementation of the chain management concepts is important, may remain outside the relationships (PIENIADZ and HOCKMANN, 2008). Additionally, the existing chain management practices primarily address issues regarding the coordination of product and information flows. The problems of cooperation that require attention to interests of the cooperating parties are mainly neglected. However, as empirical evidence suggests, actors often exit the relationship in favor of self-oriented and often short-term pecuniary interests. First of all, this brings about losses to partners. Second, advantages that accrue from successful implementation of the chain management practices often require long-term interfirm collaboration. Thus, alongside the alignment of actions achieved through implementation of the chain management practices, one has to align complex and diverse interests of the chain actors.

Table 3-2: Summary of the reviewed chain management practices

Concept	TQM	SCM	ECR	CPFR
Aims	▪ Customer satisfaction ▪ Quick response to customer requirements	▪ Waste elimination throughout the supply chain ▪ Enhancement of customer service ▪ Competitive advantage for individual supply chain members and the supply chain as a whole	▪ A more responsive, consumer-driven system ▪ Business partnering ▪ Consumer satisfaction ▪ Cost minimization	▪ Information sharing ▪ Improvement of performance between retailers and suppliers
Basic principles	▪ Customer satisfaction ▪ Supplier satisfaction ▪ Worker empowerment ▪ Continuous improvement	▪ Viewing the supply chain as a whole ▪ Managing the total flow of goods from the supplier to the ultimate customer ▪ Strategic orientation towards cooperative efforts ▪ Customer focus	▪ Management of categories as strategic business units ▪ Collaborative planning of operations by retailers, distributors and suppliers	▪ Joint focus on consumers and the value chain success ▪ Sharing forecasts of consumer demand across the chain ▪ Sharing risks and removing supply process constraints jointly
Advantages	▪ Reduced costs ▪ Improved skills ▪ Enhanced relationships between actors ▪ Increased accountability and transparency ▪ Improved productivity and efficiency ▪ Satisfied customers	▪ Timely supplies of necessary quantities of inputs or products ▪ Safe and reliable delivery of materials at the lowest cost ▪ Smooth functioning of production lines ▪ Provision of stable sales ▪ Mutual success through cooperative relationships and better access to information	▪ Increased sales and improved profits ▪ Cost reductions ▪ Reduction of inventory ▪ Increased variety of goods on offer ▪ Smoother product flows ▪ Improved information exchange	▪ Enhanced relationship between buyer and seller ▪ Increased sales ▪ Improved product offering ▪ Improved order forecast accuracy ▪ Reduction of inventory ▪ Improved returns on investments ▪ Increased customer satisfaction

Source: Own performance based on the sources provided in the text.

3.2 The strategic importance of simultaneous alignment of interests and actions

Supply chain networks aim to produce higher quality and/or higher efficiency by cooperation rather than by full integration of the supply chain or by market transactions (LAZZARINI et al., 2001; NEVES, 2003). Since the focal company is liable without limitation for the correctness of the production, i.e. for all credence characteristics, it must be familiar with the network's structure to avoid any type of defect within the entire network. Thus, the focal company has to set incentives to create a situation, in which every actor has self-interest to secure the sustainable stability of the whole network (PICOT et al., 2003). On the one hand, these incentives must be of monetary nature to create a short-term win-win situation (e.g. higher profits). On the other hand, the incentives have to be of non-pecuniary nature to create a long-lasting "unique relationship proposition" (HANF and HANF, 2007), which cannot

be easily imitated by competitors. Exclusive benefits can include higher profits or joint growth in the future. Nevertheless, for some participants of the network this might be just to stay in business. The collaboration in supply chain networks relies on confidence and understanding. These characteristics have to grow over a long time and create the space to achieve a superior joint solution of a problem.

For example, in the agri-food business, where numerous small- and medium-size enterprises (SME) are active, collaborative networks give those enterprises the chance to concentrate on their core competencies. By collaborating, SME can better exploit their core competencies and reduce at the same time the inherent risk by focusing on single activities. In turn, the focal company has to take into account that such companies do not dispose of a sophisticated IT-infrastructure and high manpower. Additionally, single SME do not dispose of a sufficient quantity of commodities in order to supply the whole demand of the network. Particularly, for agricultural goods, the total amount of supply needed has to be delivered by various suppliers. For that matter, collaboration has to be facilitated by the focal company.

In this context, HANF and DAUTZENBERG (2006) have emphasized that the task of supply chain network management is to solve the problems of two domains, cooperation and coordination[5]. The problems of *cooperation* arise due to the conflicts of interests, i.e. if self-interested individuals optimize their private benefits before they strive for collectively beneficial outcomes. Therefore, the cooperation task is to align the interests of the participating actors or, in other words, motivate them to work together (GULATI et al., 2005: 419). The accomplishment of this task is typically addressed by the partnering strategies that are implemented to design the relationships within the supply chain (MENTZER et al., 2000).

The problems of *coordination* appear as a consequence of uncertainty about the actions of interdependent actors. In this regard, coordination is related to joint actions and can be generally referred to as the alignment of actions (GULATI et al., 2005: 419). Resource and information flows in the supply chain network have to be coordinated as to timing, quantity, quality, etc. in order to provide benefits for network members and deliver value to the consumers. This task can be fulfilled through gaining or transferring knowledge about the behavior of interdependent actors and the character of existing interdependences. HANF and DAUTZENBERG (2006) stress that the alignment of actions in supply chain networks is addressed by implementation of the supply chain management strategies (SIMATUPANG et al., 2002).

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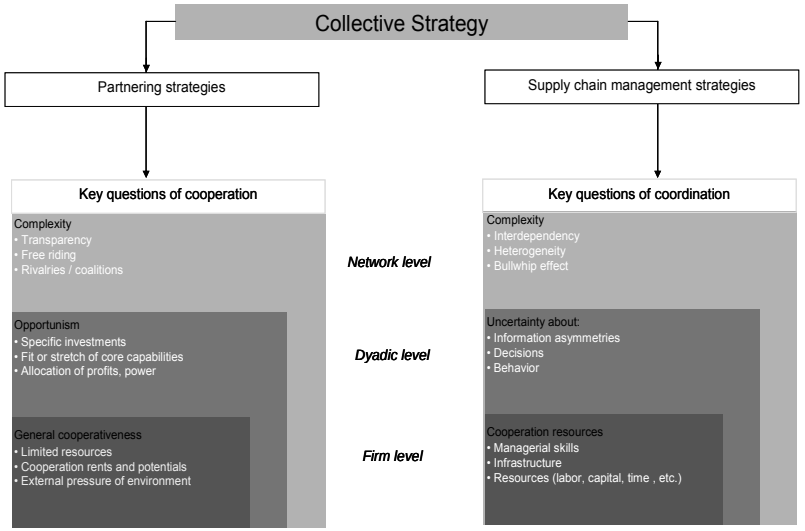
[5] The terms "cooperation" and "coordination" are often mixed or used as synonymous in different literature strands. However, although both cooperation and coordination are attributed to integration in the organization theory, there exist distinctive differences between them. PAYAN (2007) has conducted an extensive review of the organizational studies to examine the precedents with regard to the conceptual domains of cooperation and coordination. As a result, she concluded that cooperation is an orientation that one firm has about working with another organization; whereas, coordination refers to joint activities.

In the process of structuring of the long-term exchange relationships within a supply chain network, the focal company has to take into account that the problems of cooperation and coordination appear at the three different levels of collaboration, i.e. the firm, dyadic and network levels[6] (DUYSTERS et al., 2004; CONTRACTOR, et al., 2006). At the *firm level*, problems of single firms participating in a network are taken into account. These problems primarily include the issues related to resource endowments and cooperation capabilities. At the *dyadic level*, the issues that arise between two collaborating firms, i.e. problems of opportunistic behavior or information asymmetry, are analyzed; whereas, the *network level* of analysis deals with issues of collaboration among more than two firms. The problems at the network level include complexity of the network structure, bullwhip effect, etc. (HANF and DAUTZENBERG, 2006).

Figure 3-10: Theoretical framework of supply chain network management



Source: HANF and DAUTZENBERG (2006).

[6] Several authors (CONTRACTOR et al., 2006; HANF and DAUTZENBERG, 2006; PROVAN and SYDOW, 2008) mention that there is also a fourth level – personal. Because the possibility to communicate – to build trust and commitment between partners – is a basic requirement of collaboration, and because the personal level subsumes all social personal resources, it is closely connected with all three levels. However, because the requirements of the personal level are mostly important in the operative interaction between business partners and not so much in a strategic perspective, I do not discuss the personal level separately. Instead, the main problems and mechanisms of personal relationships are integrated in the discussion of cooperation and coordination in light of the three levels.

Cooperation and coordination are often intertwined, i.e. the problems of cooperation may cause difficulties for coordination and vice versa[7]. Moreover, GULATI et al. (2005) posit that the coordination problems may persist even if the interests of collaborating parties are aligned. Thus, to preclude or solve problems arising at the three levels, it is necessary to implement the partnering and supply chain management strategies simultaneously as components of the overall collective strategy (Figure 3-10).

Dealing with the problems of cooperation and coordination at the three different levels involves deployment of respective mechanisms. The application and applicability of those mechanisms has been extensively described by HANF and DAUTZENBERG (2006). I further replicate their thoughts to demonstrate how the supply chain network management is (or should be) exercised. I start by reviewing the mechanisms of interest alignment and follow by presenting the tools of the alignment of actions. Provided that the problems of cooperation and coordination have to be solved simultaneously, the chosen sequence is not based on any particular criteria. Subsequently, I will address the notion of collective strategy and its importance for a simultaneous interest and action alignment and the achievement of goals of network members.

3.3 Cooperation as the alignment of interests of network members

In the context of supply chain network management, cooperation can be referred to as the alignment of the interests of network members (HANF and DAUTZENBERG, 2006). The alignment of interests of collaborating parties has been subject to in-depth research in the organization theory. For example, game theorists (SELTEN and HARSANYI, 1972) have claimed that hybrid organizations are subject to conflicts that esteem from different interests. Such conflicts arise because self-interested individuals first optimize their own private benefits and then seek for collectively beneficial outcomes. Similarly, the theorists of collective action (OLSON, 1965) maintain that self-interest may induce firms not to join the action if they perceive collective interests as incompatible with self-interest or if they may benefit from the effort of the others without paying for this.

[7] As it can be seen below, the mechanisms such as communication, trust, cultural norms and values often have positive effects on both cooperation and coordination.

Table 3-3: Cooperation at the three levels of a supply chain network

Cooperation	Firm level General cooperativeness	Dyadic level Opportunism	Network level Complexity
Problems	Limited resources Cooperation rents and potentials Higher expected performance External pressure of environment	Conformity of general cooperativeness Fit or stretch of core capabilities Allocation of profits, power Specific investments Communication	Transparency of the structure Free riding Rivalries/coalitions Focal company/system supplier
Formal and informal mechanisms	Definition of cooperation advantages SWOT-analysis (core capabilities)	Governance structure (rules, contracts) Incentives and future prospects Trust, communication, common values Formal sanctions, informal sanctions	Clarification of tasks, resources, competencies Disclosure of network structure Social capital/relational capital

Source: HANF and DAUTZENBERG (2006).

The strategic management scholars suggest that the problem of cooperation, i.e. the alignment of interests can be regarded as a problem of motivation (GULATI et al., 2005). To overcome this problem, formal and informal mechanisms aligning the different interests can be used. Formal mechanisms include such modes as contracting, common ownership of assets, monitoring and sanctions, and prospects of future interactions. Informal mechanisms involve identification and embeddedness (HANF and DAUTZENBERG, 2006) (Table 3-3). I further shed some light on the use of these mechanisms at the different levels of a supply chain network.

Consideration of the *firm level* involves analysis of the reasons for cooperation and instruments to deal with problems which arise for individual firms participating in a supply chain network. In this regard, a necessary precondition is the firm's willingness to cooperate (general cooperativeness). When firms recognize that their own potential and resources are limited, they perceive cooperation as a means to increase their own profits in a less costly way than if they would do it themselves. In addition, market forces as well as political pressure enable cooperation (BALMANN et al., 2006). Thus, a positive willingness to cooperate occurs as long as the advantages of cooperation exceed its costs. Although the firm's willingness to cooperate is very essential at the beginning of cooperation, general cooperativeness is important at all phases of the network evolution. Furthermore, cooperation between firms has to be continuously assessed based on the analysis of strengths and weaknesses as well as of opportunities and threats of the cooperating firms.

At the *dyadic level*, the analysis covers features and constraints of cooperation between two firms cooperating with each other in the same network. Since cooperative activities take place between two independent entities, their main problem is that each firm has different motives, reasons and preconditions to join the collaboration.

These different motives often lead to opportunistic behavior by partners. Thus, interests of the involved firms have to be aligned. Besides, it should be assured within the cooperation that at least the core competencies and resources of the involved firms fit each other. Moreover, the core competencies and resources of the firms should complement each other in order to get an additional rent from cooperation. As networks generally provide access to inimitable resources (GULATI et al., 2000), cooperation itself can be a source of competitive advantage. However, if there is an additional rent from cooperation, it is still unclear how it must be shared between the involved parties. This problem is especially exacerbated in the case when the power distribution is unclear. Equal or unequal distribution of power is not itself a problem if it is explicit. Otherwise partners may not accept the actual distribution of power and behave opportunistically. Another precondition for opportunistic behavior arises when specific investments are made, and one of the parties is in a position to re-negotiate the terms of the deal. Thus, clear governance structures are needed to solve such problems. Interests of the parties can also be aligned through the assurance of future advantages of cooperation. Under such conditions, firms tend to avoid using each other's vulnerabilities and build trustful relationships. Especially, intensive communication among partners is conducive to trust promotion. If communication between cooperating firms is not proper, conflicts may occur (MOHR et al., 1996). Importantly, the causality between trust and communication is mutual, i.e. not only communication enhances trustful relationships between firms but also the interfirm trust increases information sharing and thereby reduces transaction costs (DYER and CHU, 1997).

The differences between dyadic level and *network level* reside mainly in higher complexity of cooperation problems at the network level. The reason is that the whole network normally has a very complex structure. If this structure is not transparent to all network members, the possibility of free riding increases. As networks include more than two actors, formation of coalitions is possible to satisfy the interests that might contradict the network ones (MEDLIN, 2006). There also exists a possibility of rivalry if a network involves two firms with similar competencies that simultaneously collaborate and compete. In order to overcome these difficulties, a common network culture and a shared strategy should be adopted. UZZI and GILLESPIE (2002) emphasize the role of social capital and relational capital at the network level. To deal with the free riding and rivalry issues, a network must possess a powerful focal company that is allowed and able to apply sanctions to network members. Additionally, a focal firm must itself observe the rules and follow cultural norms adopted within a network. Clear distribution of tasks in a network helps avoid inefficiency effects caused by rivals. Each network member must recognize its responsibilities and the responsibilities of other network members.

3.4 Coordination as the alignment of actions of network members

In the context of supply chain networks, coordination can be referred to as the alignment of actions of network members (GULATI et al., 2005). A pattern of network interactions is predefined by the existing interdependences among members. If actors are not aware that their actions are interdependent, then coordination problems arise.

Generally, interdependence occurs when decisions and actions by one partner influence the decisions and actions of partnering firms (THEUVSEN, 2004). Complex interorganizational settings embody several types of interdependences, which are associated with distinct sources of value and coordination mechanisms used in interorganizational collaboration. THOMPSON (1967) outlines three types of interdependences: pooled, sequential and reciprocal interdependences. Pooled interdependences are the simplest type of interdependence and take place between firms competing in the same market. They occur when each individual in a group makes a discrete, well defined contribution to a given task. Sequential interdependences arise between firms operating in different markets but linked by vertical workflows where the output of one is the input of the other. Thus, tasks are serially structured in the case of sequential interdependences. Reciprocal interdependences appear between firms that complement each other or have reciprocal product and/or information flows. This type is the most complex and involves simultaneous, ongoing relationships between parties in which each agent's input is dependent on the other's output and vice-versa (LAZZARINI et al., 2001).

To deal with problems arising from interdependences, the supply chain network management has to establish appropriate modes of coordination. In terms of pooled interdependences, different tasks depend on each other in an additive way so that each task is a discrete contribution to the whole while additionally being supported by the whole (HANF and DAUTZENBERG, 2006). When such type of interdependences occurs, the optimal status can be created if each task is performed independently (GULATI et al., 2005). Coordination problems of sequential interdependences involve substantial instability in consumer demand and commodity supply and can be solved through continuous communication, planning adjustments and independent performance of each task. For reciprocal interdependences, coordination problems caused by free-riding of network members may arise. Furthermore, uncertainty persists about others' rationality so that one does not know how the others will act. To cope with these constraints, continuous communication, intensive interaction between actors and promotion of mutual trust are necessary.

By drawing upon the ideas of THOMPSON (1967), LAZZARINI et al. (2001) also outline particular coordination modes for each type of interdependences. These modes include standardization, planning and mutual adjustments. Standardization means the use of shared mechanisms and standardized rules to arrange transactions in the case of pooled interdependences. Planning is employed to handle sequential

interdependences. It denotes discretionary managerial actions by a coordinating agent, who plans the flow of products and information, and promotes adaptation to changing internal and external conditions. In addition, efficient governance mechanisms should be aligned to transactions (ZYLBERSZTAJN and FARINA, 1999). Mutual adjustments imply joint problem solving and decision making based on personal or group coordination mechanisms. This is the most appropriate type of coordination for reciprocal interdependences.

Additionally, GULATI et al. (2005) propose formal and informal mechanisms to overcome coordination problems. Formal mechanisms coincide with those of intra-organizational coordination and include programming, hierarchy and feedback. Programming presupposes the use of schedules, standards, etc. Hierarchical elements of coordination include single sources of authority and centralized decision making. Integrating of feedback process and enhancing of communication between the network partners enables mutual adjustments on an ongoing basis (THOMPSON, 1967). Informal coordination mechanisms involve leadership, norms, culture, shared value and experience, trustworthiness, routines and behavioral patterns as well as a shared strategy (HANF and KÜHL, 2005).

Because supply chain networks normally involve heterogeneous and independent firms, coordination has to deal with manifold actions, product and information flows. Therefore, coordination in supply chain networks must also consider different network levels where these actions and flows take place.

Table 3-4: Coordination at the different levels of a supply chain network

Coordination	Firm level	Dyadic level	Network level
	Cooperation resources	Uncertainty about:	Complexity
Problems	Managerial skills Infrastructure Resources (labor, capital, time, etc.)	Knowledge/information asymmetries Decisions Behavior Communication	Interdependence Interaction Heterogeneity Bullwhip effect
Formal and informal mechanisms	Gap-analysis Education and in-house training	Programming Hierarchy Feedback Culture, ethical values, trust, leadership, etc.	Supply chain management techniques

Source: HANF and DAUTZENBERG (2006).

Although collaboration can lead to minimization of the needed resources at the *firm level*, it also presupposes the consumption of the firm's resources. Except for the intra-firm tasks, firms have to manage the interfirm tasks requiring additional resources and capabilities. Furthermore, given heterogeneous nature of firms comprising networks, the rates of management skills can vary between the single firms (HANF and DAUTZENBERG, 2006). On account of this, some mechanisms are deduced to coordinate networks at the firm level (see Table 3-4). For example, gap-analysis can be used to estimate which resources and capabilities have to be obtained. Successful collaboration has to employ a significant number of managerial

constructs known from single firms, e.g. alliance managers and databases, joint business planning, etc. Additionally, continuous broadening of education and regular participation in in-house trainings can reduce the managerial constraints.

At the *dyadic level*, independent single firms interact with each other so that pooled, sequential and reciprocal interdependences occur. Here, the general coordination problem is the lack of knowledge of one actor about how the other actor behaves. The mechanisms to overcome the uncertainty arising from this problem include the achievement of standardization for pooled interdependences, managerial discretion for sequential interdependences, and mutual adjustments – for reciprocal ones. In essence, these mechanisms involve formal and informal modes of coordination. Additionally, efficient and continuous communication plays an essential role. According to MOHR and NEVIN (1990), communication is the mechanism that transmits persuasive information, fosters participative decision making, coordinates program implementation, enables power exercising, and encourages commitment and loyalty. For coordination of pooled interdependences, communication is not so important because coordination is mostly determined by standardization approaches. In the case of sequential interdependences, communication is addressed by managerial discretion. Particularly, it provides an optimal flow of information throughout the whole supply chain network so that information asymmetries are reduced. Enhanced communication is especially conducive for coordination of reciprocal interdependences through mutual adjustments. An important prerequisite for successful coordination at the dyadic level is trust among network members. BARNEY and HANSEN (1994) define interfirm trust as the confidence that a partner will not exploit the vulnerabilities of the other. Generally, trust is promoted through making promises and keeping them. In terms of coordination, trust is necessary to reduce the perception of risk associated with opportunistic behavior. Opportunism becomes more costly due to damaging reputation effects. Trust also makes partners learn more about each other through enhanced communication and information sharing. Based on trustful relationships, upward and downward information flows become more intensive. This results in bidirectional communication between network members. Additionally, trust is conducive to creation of strong social ties among partners.

Since networks represent complex arrangements, their complexity can effect the realization of the coordination task. This is particularly evident at the *network level* of analysis. At this level, numerous interdependences between actors can increase disproportionally and make the coordination task more difficult. Furthermore, network performance is not only associated with the current ties of actors, instead it is also related to the links with potential partners. Such links are necessary to insure the network efficiency as well as to bridge structural holes. Additionally, the need for explicit knowledge about firm strategies, cultures and values can differ with the size of network firms. This can sometimes lead to opportunistic behavior between actors. Besides, so-called bullwhip effect can occur when there are

unnecessary stocks of supplies resulting from not sharing information along the supply chain. To cope with problems arising at the network level, repetitive evaluation of the current participants and their resources and capabilities is needed. Chain management must, thus, consider such features as size of firms. Tighter collaboration with the network participants can be facilitated through the creation of collective strategy and the establishment of a common culture, shared values and norms. To take control over the complexity, the common use of modern (or at least compatible) IT-infrastructure is needed. However, investments in the IT-infrastructure can be perceived as specific ones that promote the opportunistic behavior. The development of social capital can be conducive to elimination of this problem as social capital enhances information exchange that results in information advantages (UZZI and GILLESPIE, 2002). Among other things, softening of the information barriers can prevent the bullwhip effect because information about scanner data, the amount of stocks, etc. can be passed throughout the whole chain.

3.5 Collective strategy as the strategy for the whole supply chain network

Successful chain management must consider collective efforts to manage supply chains as a whole (MIN and MENTZER, 2004). In this context, strategies used to coordinate intra-firm relationships have been shown as inadequate to consider multiple linkages between firms (BRESSER and HARL, 1986). Accordingly, various authors (ASTLEY and FOMBRUN, 1983; BRESSER and HARL, 1986; BRESSER; 1988) have elaborated on the concept of collective strategies. A collective strategy subsumes strategic orientation towards cooperative efforts to synchronize and converge intra-firm and inter-firm operational and strategic capabilities into a unified whole (MENTZER et al., 2000). Thus, in a supply chain network, the collective strategy aims to simultaneously resolve the cooperation and coordination issues at the firm, dyadic and network levels in order to achieve the super-ordinate network goals (HANF and DAUTZENBERG, 2006). This section respectively addresses collective strategies with regard to the alignment of interests and actions in a supply chain network (subsection 3.5.1) and the achievement of network goals (subsection 3.5.2).

3.5.1 Collective strategy as a tool for simultaneous alignment of interests and actions

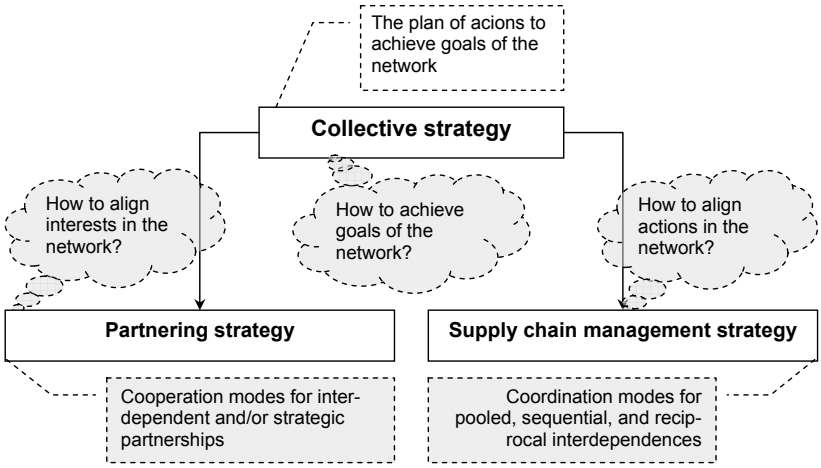
The introduction of chain management concepts often demands changes in the organizational structure of the actors involved, implying that collective decisions on the process optimization and coordination must be adopted by teams of members from different companies (MENTZER et al., 2000). To ensure that these strategic decisions are adopted timely and on an ongoing basis, the alignment of interests of the different network members has to be considered strategically. Additionally, strategies for the alignment of actions have to be implemented because the flawless implementation of chain management requires the installation of consistent

IT-systems (OBERSOJER and WEINDLMAIER, 2006), solid project-management foundation, continuous improvement of procedures, negotiating, and diffusion of technology along the whole supply chain (FISH and FORREST, 2006). The strategies for simultaneous interest and action alignment can be subsumed under the notion of collective strategies.

Collective strategies address the cooperation problem of aligning the interests through the topic of partnering (HANF and DAUTZENBERG, 2006). Partnering connotes the maintenance and continuity of relationships within a supply chain network. The ability to build and maintain cultural elements of relations among supply chain partners gains in importance. These elements include trust, commitment, cooperative norms, mutually sharing information, mutually sharing risks and rewards, and top management support (MIN and MENTZER, 2004).

However, the optimal mode of partnerships can vary widely along the whole chain because members of a supply chain network are heterogeneous. One of the main tasks is to work out how to arrange the partnerships in the network. In this regard, a continuum from interdependent to strategic partnering has to be considered (WEBSTER, 1992). MENTZER et al. (2000) define interdependent partnering as a "needed, short-term relationship for obtaining parity with competitors". Interdependent partnering is efficiency-oriented, i.e. it aims at shortening of time spans, reduction of the use of organizational resources, etc. Strategic partnering is an "on-going, long-term, inter-firm relationship for achieving strategic goals, which deliver value to customers and profitability to partners" (MENTZER et al., 2000). As such, strategic partnering is an inimitable resource because it aims to improve a company's competitive position through the development of new technologies, products and markets (WEBSTER, 1992). In the context of strategic chain management, both interdependent partnering and strategic partnering are important (HANF and DAUTZENBERG, 2006).

Figure 3-11: Collective strategy as a tool for simultaneous alignment of interests and actions and the achievement of goals of the network



Source: Own performance.

Another reason to implement collective strategy is to overcome the coordination problems among network members. To coordinate a network, it is necessary to consider the different types of interdependences and different types of association among members (ASTLEY and FOMBRUN, 1983). Here, the following key components must be deduced: integration of processes, organizational compatibility, building and maintaining long-term relationships, agreement on the vision and focus for serving customers, and agreement on supply chain leadership (MENTZER et al., 2000). A powerful focal firm is needed to introduce and design appropriate coordination mechanisms to deal with interaction problems. Moreover, although collective strategy is subsumed as jointly developed and implemented by collaborating partners, a focal company can be considered as taking the lead in the development of a collective strategy in a supply chain network (HANF and DAUTZENBERG, 2006).

Overall, a collective strategy affects the structure of supply chain network management through partnering strategies on the cooperation side and through supply chain management strategies on the coordination side. The cooperation problems (the alignment of interests) and the coordination problems (the alignment of actions) must be simultaneously solved in order to achieve the network goals (Figure 3-11).

3.5.2 Collective strategy as a plan of actions to achieve network goals

The theorists of collective strategies mainly emphasize the orientation of collective strategies towards simultaneous resolution of the cooperation and coordination problems by collaborating partners. For instance, ASTLEY and FOMBRUN (1983) define collective strategy as "a systematic response by a set of organizations that collaborate in order to absorb the variation present in their environment." Along similar lines, BRESSER (1988) posits that collective strategies are "attempts by sets of organizations to manage their mutual interdependence and the system dynamics of their interorganizational environment."

However, in the context of strategic networks, collective strategies should aim not only at shaping of network processes and relationships *per se*, but also at achieving of the specified network outcomes. This point corresponds to the general idea of the strategy as the plan of actions to achieve certain goals. For example, the economic literature defines strategies as complex bundles of actions to achieve goals (e.g. HINTERHUBER, 1996; MACHARZINA, 2003). This general economic definition has been basically accepted also by the critics of unambiguous definitions of strategies (e.g. MINTZBERG et al., 1999) and is applied in explanations of the sustainable competitive advantage based either on resources and competencies or on characteristics of the environment (MÜLLER-STEWENS and LECHNER, 2005; HUNGENBERG, 2008).

In this context, the goal orientation of collective strategies in supply chain networks is particularly important. As known, today's competition takes place between supply chains and networks (VAN DER VORST et al., 1998). Therefore, the whole supply chain network has to work as a single entity based on a collective strategy to sustain its advantage over competing supply chain networks. However, a systematic literature review reveals that there has been little consideration of collective strategies as a network's plan of actions to achieve certain goals.

This finding is surprising enough if one recalls the propositions of earlier studies on management of interfirm relationships in networks. They have explicitly emphasized that the effectuation of goals set in networks depends on the extent to which relationships are connected and organized (ANDERSON et al., 1994; RITTER et al., 2004; WATHNE and HEIDE, 2004). In particular, this holds for intentionally developed strategic networks as opposed to organically evolved networks (SYDOW and WINDELER, 1998; MÖLLER et al., 2005). Intentionality behind strategic networks implies that companies deliberately engage in their design and development to achieve specific goals through these networks. Consequently, there exists an interrelationship between goals and network structure. Goals pursued through a network are assumed to influence the type of member interdependence and the effective "governance form" (MÖLLER and SVAHN, 2003: 205), whereas the relationships among members have to be structured such that the intended goals are achieved (SCHREINER et al., 2009). Thus, the collective strategy has to consider

both, structuring of network relationships (i.e. the alignment of interests and actions) and the achievement of goals of the network (Figure 3-11).

The issue of structuring of the exchange relationships in networks has been widely addressed as the primary task of network management (DYER and SINGH, 1998; IRELAND et al., 2002; RITTER et al., 2004). However, surprisingly, there has been little research conceptualizing the goals of supply chain networks and the role they may play in managing a network. At the same time, MÖLLER et al. (2005) emphasize that the goal of the strategic network is one of the core factors that promote understanding of the strategic network management. Thus, without a complete understanding of nature of supply chain network goals, the soundness of inferences drawn from the relationships between these goals and other theoretical constructs will be disputable. As a consequence, validity of the derived implications for network management on how to develop and implement collective strategies will be brought into challenge. This general concern is a result of another underlying concern.

As maintained in sections 3.2, 3.3, and 3.4, the supply chain network management has to take the problems of the three different levels into account. In this context, I refer to the literature review presented in Appendix 1 and assert that researchers have mostly neglected goals that are set at the network level, i.e. goals that are collectively pursued by *all* the strategic network's members, and investigated issues related to firm-level or dyadic-level goals.

Little focus on network-level goals is common not only in the strategic network research but also in studies on interfirm networks in general. PROVAN et al. (2007) in their extensive review on networks have found only 26 studies (of approximately 50,000 in total) that in fact deal with issues at the network level of analysis. They have concluded that,

> *Researchers often talk of a network of relationships, but it is not the network itself that is being studied, thus ignoring the basic network theoretical insight that actors and actor-to-actor relationships are likely to be influenced by the overall set of relationships* (PROVAN et al., 2007: 483).

Furthermore, with respect to the numerous collaborative failures experienced by firms due to goal conflicts (MADHOK and TALLMAN, 1998; BRINKHOFF and THONEMANN, 2007), it is unlikely that network-level goals are adequately addressed in practice.

Overall, the lack of understanding of goals pursued thorugh supply chain networks can mislead the supply chain network management in developing and implementing collective strategies to achieve goals and, thus, cause failure in sustaining the competitive advantage for the whole supply chain network. Hence, in the next Chapter, I conceptualize the goals of supply chain networks and develop a model of goal achievement in supply chain networks.

3.6 Summary of Chapter 3

Summarizing this Chapter, I mention that its aim was to delineate the strategies that are used to manage a supply chain network as a whole, i.e. to guide it towards the achievement of strategic goals. Additionally, my objective was to identify the shortcomings these strategies possess. With this purpose, I have described the existing chain management practices and elaborated on the theoretical underpinnings of strategic chain management. Concerning the existing chain management practices, it can be stated that firms address exclusively the alignment of their *actions* when implementing the concepts such as TQM, SCM, ECR, CPFR, etc. Although the tight collaboration among the supply chain actors is one of the basic principles of these practices, the problem is that firms often neglect the issue of aligning the *interests* of each other and abstain from engagement in mutually supportive action, adjustment of organizational structures, etc. This can cause failures in establishing long-term relationships often needed to obtain the benefits from introduction of the chain management practices.

In this context, the task of chain management is to align *the actions and the interests* of the network members *simultaneously* by implementing collective strategies. Collective strategies address the issue of interest alignment through the partnering strategies, whereas the alignment of actions can be achieved by means of the supply chain management strategies. In order to implement these strategies successfully, the supply chain network management has to be knowledgeable about goals pursued through supply chain networks, implying that a collective strategy is the plan of actions to achieve goals of a network. However, by conducting a systematic literature review, I have revealed that a collective strategy has rarely been addressed as a plan of actions to achieve network goals. Moreover, the literature considers goals of interfirm networks incompletely: researchers fail to address the network-level goals, i.e. goals that require effort by all network members. This can lead to biased implications for chain management with regard to the development and implementation of collective strategies to enable both, structuring of network relationships (i.e. aligning interests and actions) and achievement of goals of the network.

4 GOALS OF SUPPLY CHAIN NETWORKS: CONCEPTUALIZATION AND A MODEL OF GOAL ACHIEVEMENT

The current Chapter aims to show that chain management and collective strategies are about achieving goals in supply chain networks. I elaborate theoretically to demonstrate how the alignment of interests and the alignment of actions are related to the achievement of firm-level and network-level goals. By combining these relationships with specific characteristics of supply chain networks, I develop a model of goal achievement in supply chain networks. In doing so, I show that it is important to consider also network-level goals to understand how to sustain a competitive advantage for the whole network. Provided that the research on interfirm networks has mainly neglected network-level goals and, thus, it is not clear how to manage with them, I also conceptualize goals pursued in different types of interfirm networks. I gradually narrow my focus towards goals of strategic networks and their particular type, supply chain networks.

The Chapter is structured as follows. Section 4.1 elaborates theoretically on individual and collective goals pursued in different types of interfirm networks and shows why the focus on goals of strategic (supply chain) networks is of interest. In this section, I first argue that the differentiation between individual and collective goals in an interfirm network has to be seen through the lens of goals set at the firm, dyadic and network levels of the network (subsection 4.1.1). Then, I address distinctions between different types of interfirm networks in relation to the issue of relevance of firm-level, dyadic-level and network-level goals (subsection 4.1.2).

In section 4.2, I develop the model of goal achievement in supply chain networks or the so-called "model of supply chain network success"[8], which encompasses the achievement of goals at the different levels and involves the hypotheses on the direction and sign of effects exerted by the chain management constructs on goal achievement (subsection 4.2.1) and by the constructs of different network characteristics on chain management (subsection 4.2.2). Then, I elaborate on the issue of originality of my model (subsection 4.2.3). Finally, section 4.3 summarizes Chapter 4.

[8] Approaches to defining the success or measuring the performance of interorganizational systems and collaborations vary widely. A common underlying principle in most interpretations is the achievement of goals (ANDERSON, 1990; ARIÑO, 2003).

4.1 Collective and individual goals in interfirm networks

This section explores two themes. First, I show that the goals of interfirm networks are pursued at the firm, dyadic, and network levels. Second, I argue that the relevance of goals of the different levels is contingent upon a type of interfirm networks. Here, I demonstrate that the strategic network type in general and supply chain networks in particular are characterized by high relevance of network-level and firm-level goals and the role of network management is crucial in the achievement of both network-level and firm-level goals.

4.1.1 Goals of the different levels in interfirm networks

Departing from the idea that collective strategies are developed for collaborating organizations to achieve certain goals, I have systematically reviewed the literature in organization theory to have an in-depth insight into the goals pursued in interorganizational relationships. In general, elaborations of the different literature strands indicate that both organizations and interorganizational relationships are characterized by simultaneous pursuit of the individual and collective goals of the participants. For example, organizational behavior theorists (CYERT and MARCH, 1963; KOCHAN et al., 1976) propose models of organization by assuming that participants of an organization have diverse and common goals (ETHIRAJ and LEVINTHAL, 2009). With respect to these assumptions, attempts are made to predict behavior in organizations, i.e. whether greater consensus or greater conflict will result in an interdependent relationship due to available goal compatibility (KOCHAN et al., 1976: 529).

Further, individual and collective goals simultaneously exist in interfirm networks. JONES et al. (1997: 916) stress that interfirm networks are composed of relationships among autonomous firms that operate like a single entity in certain tasks requiring joint activity. For example, in human service agencies, VAN DE VEN et al. (1979) found three clusters of agencies having more connections within cluster than between, and they found that each cluster aimed to achieve distinct goals. Hence, on the one hand, acting jointly as a single entity entails pursuing of specific collective goals. On the other hand, it is obvious that firms engage in a joint action being motivated by self interest (MEDLIN, 2006). In this context, I argue that the goals of interfirm networks have to be addressed in relation to the aforementioned different levels, i.e. *goals set and pursued in interfirm networks include firm-level, dyadic-level and network-level goals of network members*.

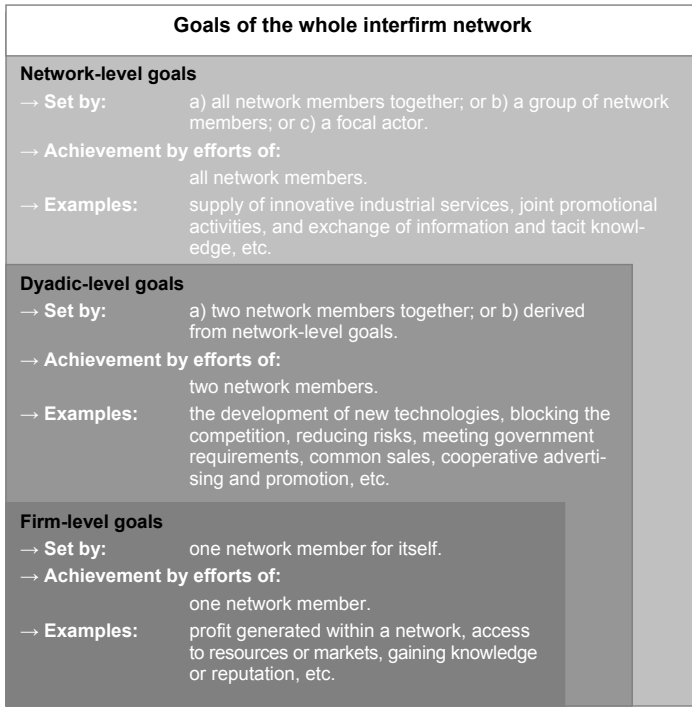
Firm-level goals are the *individual* goals of the firm participating in a particular network, i.e. goals that a single firm wants to achieve for itself in the network. Specific examples of firm-level goals may be drawn from elaborations on business relationships and strategic alliances. For instance, an economic goal of firm profit (MEDLIN, 2006: 858) can be considered as the firm-level goal in business relationships. The examples of firm-level goals in strategic alliances include profit generated within an alliance, access to resources or markets as well as non-pecuniary

elements such as gaining knowledge or reputation (SCHREINER et al., 2009: 1404). Importnatly, one has to differentiate between the firm's goals *in general* and firm-level goals *in a network* because the firm can participate in different networks in which it may pursue different firm-level goals. Firm-level goals are the characteristic of the firm's business strategies and are "subordinated" to corporate goals that guide the firm's corporate strategy. In the course of expert interviews conducted for the description of the empirical setting of this thesis (subsection 5.1.2), I have found that companies often face conflicts between firm-level goals and firm corporate goals. A purchasing director of one international retail company mentioned that the authority of corporate planners in his company is very high. As a result, the achievement of corporate goals such as growth of market shares and profits is often prioritized to obtain short-term benefits and complicates the achievement of firm-level goals such as the establishment of long-term relationships with reliable suppliers.

Dyadic-level goals are the *collective* goals of two firms, i.e. goals that a dyad of networked firms wants to achieve. Examples of dyadic-level goals appear in the strategic alliance literature as well as in the studies on strategic partnering. Dyadic-level goals in strategic alliances may include the development of new technologies, blocking the competition, reducing risks and meeting government requirements (ARIÑO, 2003: 78). In strategic partnerships, common sales, cooperative advertising and promotion were mentioned as collective dyadic-level goals (MOHR and SPEKMAN, 1994: 141).

Finally, *network-level goals* are the *collective* goals of all network members, i.e. goals that can be achieved only if all network members work together. Scanty examples of network-level goals can be found in the public administration studies as well as in the general interfirm network literature. Network-level goals in the public sector include strengthened community capacity to solve public problems, regional economic development, and responsiveness to natural or man-made disasters (PROVAN and KENIS, 2007: 3). In business, supply of innovative industrial services, joint promotional activities, and exchange of information and tacit knowledge (MÖLLER et al., 2005) can be considered as collective network-level goals.

Figure 4-1: Goals of the different levels in interfirm networks



Source: Own performance.

However, the literature on strategic networks rarely speaks of a sort of collective goals; it rather stresses the role of effective deployment of network management capabilities which leads, among other things, to "collectively beneficial outcomes" (see Appendix 1). Nevertheless, my research (see the pretest in the German fish sector, Chapter 5) shows that network-level goals exist also in strategic networks. For example, in the food industry, these goals arise from various aspects of food safety and quality, reflecting the increasing consumers' demands and the risk of food scandals. Such goals include the achievement of total chain quality, improvement of customer responsiveness, etc. Resolution of such complex issues should involve tight collaboration of all network members (Figure 4-1).

Addressing goals of interfirm networks from the perspective of three levels particularly enables consideration of multiple constituencies of a network (GAGALYUK and HANF, 2010). An interfirm network involves numerous constituencies, i.e. each participating firm as an independent organization, and the community, i.e. consumers, non-governmental organizations, and the government (ARIÑO, 2003). The difficulty caused by the need of considering the whole multiplicity of goals can be

eliminated based on the assumption that the network members' goals are constrained by the goals of other constituencies and, therefore, reflect them insofar as they are constrained by them (ARIÑO, 2003: 68). Similarly to ARIÑO (2003), I concentrate only on the goals of network members as they reflect the results the network members and the community expect to obtain from a network. Furthermore, specific goals considered depend normally on the particular constituency assessing the achievement of those goals (PROVAN and KENIS, 2007). This implies that, in discussing goals pursued in interfirm networks, I rather exemplify goals and do not consider a certain goal *a priori* as the correct one because each presents a potentially valid point of view.

Given the perspective of different levels, I contend that simultaneous attention towards goals that are set and pursued at the firm, dyadic and network levels creates possibilities to better understand the network governance structures and, thus, the management challenges that arise in different types of networks. I further develop this thought in greater detail by considering goals pursued in different types of business networks.

4.1.2 Goals in different types of interfirm networks

As shown in subsection 2.1.3, to gain understanding of a particular network type, it is necessary to distinguish between the terms "a network of organizations" and "a network organization" (MÖLLER and SVAHN, 2003: 204). The former refers to loosely coupled networks, i.e. any group of organizations or actors that are interconnected in relationships. The latter is in line with two ideas of networks: 1) the idea of shared participant-governed networks (PROVAN and KENIS, 2007), and 2) the idea of strategic networks (GULATI et al., 2000). To understand the management challenges posed by different types of networks, i.e. loosely coupled, shared participant-governed and strategic, one needs a systematic description of their characteristics. In addition to the characteristics mentioned in section 2.2, I argue that the goals pursued through networks are one of the most important characteristics that help understand how the relationships within a particular network type should be managed.

Specifically, I contend that a better understanding of network management can be gained by realizing the differences in relevance of firm-level, dyadic-level and network-level goals that persist between the different types of interfirm networks. By relevance of goals I understand the extent to which the achievement of certain goals that are pursued either collectively or individually is crucial for the existence of a given interfirm network.

In this context, I suggest that strategic networks pose more complex requirements towards network management than loosely coupled or shared participant-governed networks. The reason is that, apart from firm-level goals that are highly relevant for individual network members, strategic networks involve pursuit of network-level goals which require efforts by all network members. In contrast, loosely

coupled networks are characterized by high relevance of firm-level goals of individual firms and dyadic-level goals pursued by "only two" firms. In shared participant-governed networks, only collective network-level goals are highly relevant (Table 4-1). I further explain these distinctions in greater detail.

Table 4-1: Relevance of collective and individual goals in different types of interfirm networks

Network type	Relevance of goals		
	Firm-level goals	*Dyadic-level goals*	*Network-level goals*
Loosely coupled	High	High	Low
Shared participant-governed	Low	Low	High
Strategic	High	Low	High

Source: Own performance.

Loosely coupled networks generally represent a set of interdependent relationships that exist in themselves, emerge in the specific context, evolve organically and are very dynamic. Although these relationships generally exert an effect on each other, the interests of *all* the involved parties rarely overlap so that *all* the parties are guided by an overall collective aim. Instead, as explicitly defined by the representatives of the IMP Group, the dyad of firms is the focal object of inquiry in such macro networks (HÅKANSSON and SNEHOTA, 1995). Because loosely coupled networks are seen as a bundle of dyadic relationships in which firms are motivated by self and collective interests, I suggest that firm-level and dyadic-level goals dominate the scene while network-level goals rarely come to the forefront in this type of networks. Thus, *for members of loosely coupled networks, the achievement of firm-level and dyadic-level goals is highly relevant, whereas the achievement of network-level goals is of low relevance.*

Shared participant-governed networks are characterized by high involvement of all the organizations that comprise the network. All network members participate on an equal basis and, therefore, are committed to the goals of the network (PROVAN and KENIS, 2007: 6). Network-level goals are actually the reason why shared participant-governed networks emerge. An overlap of individual interests of *all* members results in pursuit of a collective, network-level goal. Because a superordinate network-level goal represents a sum of firm-level goals, one can speak of a generally low relevance of firm-level goals as compared to network-level goals. Dyadic-level goals do not really matter in shared participant-governed networks. Thus, *for members of shared participant-governed networks, the achievement of network-level goals is highly relevant, whereas the achievement of firm-level goals and dyadic-level goals is of low relevance.*

Strategic networks are not characterized by an overlap between firm-level goals of all network members and do not arise directly from shared interests and common understandings of what should be achieved by collaboration overall. A primary condition in strategic networks is that goals are seen as viable and acceptable by

the powerful stakeholders. Strategic networks are normally characterized by asymmetrical distribution of power (SYDOW and WINDELER, 1998), and these power asymmetries persist in favor of focal firms (RITTER et al., 2004). Thus, I suggest that, in a strategic network, network-level goals are most often set by the focal firm because this firm is capable enough of formulating network-level goals so that the *collaborative* competitive advantage is addressed. The focal firm persuades the other network members to accept network-level goals and invest effort, time and money in their achievement. Hence, network-level goals in strategic networks represent *collective* outcomes in the sense that they require all network members' collective *effort* on goal achievement rather than all members' *involvement* in the goal setting process. This makes the existence of network-level goals little recognizable and, perhaps, this is the reason why the vast majority of studies on strategic networks neglects network-level goals and concentrates on goals of individual network members.

Importantly, the theoretical focus on a strategic network *as a whole* implies lower relevance of dyadic-level goals. As emphasized by PROVAN and KENIS (2007: 3), "interactions related to resource allocation as well as coordination and control of a joint action require that the focus is on the network as a whole. These interactions are distinct from operational links, which are often dyad based including sharing of information or joint programs." Consequently, collaboration at the dyadic level within a strategic network involves pursuit of collective goals which are the *operationalization* of the network-level goals. Thus, if one aims to develop implications for strategic management of the whole strategic network, the focus on dyadic-level goals can be minimized if one addresses network-level goals.

Additionally, in strategic networks, firm-level interests may or may not overlap but, as I show in Chapter 6 of the thesis, the efforts to achieve firm-level goals affect or are affected by the efforts to achieve network-level goals. Importantly enough, the achievement of firm-level goals must be addressed simultaneously with the achievement of network-level goals to make sure that participants remain in the relationships and act in the best interests of all the parties. Thus, *for members of strategic networks, the achievement of network-level goals and firm-level goals is highly relevant, whereas the achievement of dyadic-level goals is of lower relevance.*

Because the aim of this thesis is to develop a framework of goal achievement in supply chain networks, my major interest is in the achievement of goals of strategic networks in general and supply chain networks (as a type of strategic networks) in particular. Given that strategic networks are most often addressed in the discussion on network management and intentionality of network relationships (JARILLO, 1988; DYER and SINGH, 1998; GULATI et al., 2000; RITTER et al., 2004; MÖLLER et al., 2005), my aim is most likely to be realized in the strategic network context.

Furthermore, I particularly see my task in analyzing the achievement of collective network-level goals in combination with individual firm-level goals, which has been a certain theoretical gap up to now. By drawing attention to loosely coupled or shared participant-governed networks, it would be difficult, if not impossible, to fulfill this task. In the case with loosely coupled networks, it would only make sense to analyze the dyadic level in addressing collective goals – the level which has been widely addressed, for example, by the strategic alliance scholars (ARIÑO, 2003; SCHREINER et al., 2009). In the case with shared participant-governed networks, my elaboration would mean little because individual firm-level goals play a minor role. On the contrary, analysis of strategic networks makes it possible to account for both network-level and firm-level goals simultaneously to improve our understanding of what should be achieved to sustain a competitive advantage for the whole strategic network. In this regard, I recall to the proposition of the relational view of strategic management (DYER and SINGH, 1998) that the advantages of an individual firm are often linked to the advantages of the network of relationships in which the firm is embedded. Subsequent to this proposition was an ongoing discussion about how to manage a firm's network of relationships successfully, i.e. such that the firm's competitive advantage is sustained (GULATI et al., 2000; KALE et al., 2002; DYER and HATCH, 2006).

However, the discussion on strategic network management has not exhaustively addressed the "network management – network success – firm success" cause-and-effect chain. Given that success generally means the achievement of goals, the "network success" link has been understudied, in particular, because of incomplete consideration of goals pursued in strategic networks. In fact, most studies that declare their focus on success or performance of the strategic network address the achievement of goals by an *individual firm* or a *dyad of firms* participating in the network (Appendix 1). Researchers mostly analyze the role of "collective constructs" (MEDLIN, 2006: 860) such as inter-firm trust, commitment, relational norms, etc. in achieving firm-level or dyadic-level goals. Yet, network-level goals (that are highly relevant in strategic networks) have been mainly neglected.

In this context, I devote the next section to the development of a model that accounts for the achievement of firm-level and network-level goals in supply chain networks and the role of supply chain network management in achieving the goals.

4.2 Model of goal achievement in supply chain networks

To implement a collective strategy in a supply chain network successfully, it is important that a focal company is aware of goals set in the network and aligns the interests and the actions of the network members (GAGALYUK et al., 2009). As mentioned above, the achievement of network-level and firm-level goals is highly relevant in supply chain networks. This requires the fulfillment of tasks of chain management, i.e. the alignment of interests and the alignment of actions. However, the focal company has to be aware also of network-specific factors that can

influence the fulfillment of tasks of chain management (GAGALYUK and HANF, 2009b). Generally, these factors represent the cooperation and coordination issues that arise at the network, dyadic and firm levels of analysis (see also Figure 3-10 in section 3.2, p. 48).

In this context, the model of goal achievement I develop involves three major components: 1) the achievement of network-level and firm-level goals, 2) the fulfillment of tasks of chain management, and 3) the factors that influence the fulfillment of tasks of chain management (Figure 4-2). More specifically, I model the effect of the fulfillment of tasks of chain management on the achievement of network-level and firm-level goals (subsection 4.2.1), and the effect of network-specific factors on the fulfillment of tasks of chain management (subsection 4.2.2). Respective ten hypotheses are developed.

4.2.1 Effects of the fulfillment of the chain management tasks on the achievement of network-level and firm-level goals

A supply chain network is a strategic network and, thus, it is characterized by intentionality of the network processes that are enhanced by the chain management to achieve certain goals. The achievement of goals of supply chain network members, i.e. network-level and firm-level goals, requires members a) to consent on goals themselves as well as on procedures to achieve goals, and b) to work synchronously on goal achievement as such. Thus, both the alignment of interests and the alignment of actions, respectively, have to be achieved by chain management to enable the achievement of network-level and firm-level goals.

Effects of the alignment of interests on the achievement of network-level and firm-level goals

Generally, the alignment of interests can be regarded as the establishment of good working relationships among the parties because it addresses factors such as the degree of compatibility of firms' cultures and decision-making styles, a convergence of business views, and other organizational characteristics (ARIÑO et al., 2001). The alignment of interests of the network members facilitates higher levels of relational capital (i.e. prompts trustful relationships, commitment and low levels of conflict among members) so that confidence in the reliability and integrity of the partners is gained (ARIÑO et al., 2001; KAUSER and SHAW, 2004). Furthermore, the alignment of interests enables organizations to gather high-quality information about the others and creates strong disincentives for opportunistic behavior (UZZI, 1996; SARKAR et al., 2001). Finally, interest alignment can be generally defined as the degree to which the members of the organization are motivated to behave in line with organizational goals (GOTTSCHALG and ZOLLO, 2007). As known, organizations perform better when there is more goal consensus than conflict (PROVAN and KENIS, 2007: 11). According to DOZ (1996), consensus among network members largely depends on their perception of compatibility of goals. This perception generally reflects the extent of interest divergence between the network members

(DOZ et al., 2000; SARKAR et al., 2001) because interests are the motives that lead individuals to select some goals rather than others (SIMON, 1964: 3). Given the entwinement of collective and self interests in supply chain networks, I hypothesize that:

H 1: The alignment of interests has a direct positive effect on the achievement of network-level goals.

H 2: The alignment of interests has a direct positive effect on the achievement of firm-level goals.

However, a supply chain network may fail even if interests are aligned but the network-level and firm-level goals are not achieved due to unsynchronized actions of network members or their failure to react timely on requests of each other. Therefore, it is also important to achieve the alignment of actions.

Effects of the alignment of actions on the achievement of network-level and firm-level goals

The alignment of actions generally stands for implementation of concerted, joint actions needed to capitalize on the specialized but interdependent activities of partners (THOMPSON, 1967). In the context of supply chain networks, the firms need to combine and integrate their resources and knowledge across organizational boundaries to create competitive advantage. Consequently, there exists high task interdependence between partners that involves managing a complex and overlapping division of labor, linking their specific activities with each other, and making regular mutual adjustments. In such a situation, the greater the joint efforts taken by the partners, and/or the more a partner becomes involved in activities that are traditionally considered the other's responsibility and vice versa, the greater their ability to compete successfully with the marketplace (SCHREINER et al., 2009: 1402). The aligned actions will, thus, imply that partners provide timely and reliable responses to each other's work-related needs, being responsive to concerns arising at the firm level of individual partners as well as at the network level.

H 3: The alignment of actions has a direct positive effect on the achievement of network-level goals.

H 4: The alignment of actions has a direct positive effect on the achievement of firm-level goals.

Thus, without achieving a needed extent of interest and action alignment, the achievement of network-level and firm-level goals will be put into doubt. However, a simultaneous implementation of partnering and supply chain management strategies to achieve the alignment of interests and the alignment of actions, respectively, does not mean that these strategies have to be seen as equally important. The focal company has to be aware to what extent the alignment of interests and the alignment of actions contribute to the achievement of network-level and firm-level goals. Testing the above hypotheses can provide such information. Additionally,

it is necessary to understand the role of network-specific characteristics that exert an effect on interest and action alignment and, thereby, on the achievement of goals.

4.2.2 Effects of the network characteristics on the fulfillment of the chain management tasks

In order to evaluate strategic networks, GULATI et al. (2000) have proposed to consider three types of relational characteristics: network structure, network membership, and tie modality. Network structural characteristics describe the overall pattern of relationships in the network. Network member characteristics include the identities, status, resources, access, and other features of the network actors. Tie modality is the set of institutionalized rules and norms that govern appropriate behavior in the network. While these are sometimes spelled out in formal contracts, most often they are simply understandings that evolve within the network (GULATI et al., 2000: 205).

Essentially, these types of network relational characteristics correspond to the ideas of the three network levels described in Chapter 3. As it can be seen further, network structural characteristics reflect the complexity of network structure which can be captured by considering the network level of analysis. The explication of the network tie modality characteristic is predominantly based on the premises of the transaction cost economists with regard to the dyadic relationships. Network member characteristics belong to the firm level of analysis. Based on the ideas of GULATI et al. (2000), I develop respective constructs that reveal how the supply chain network's structure, member characteristics, and tie modalities affect the fulfillment of the chain management tasks.

Effects of Network Structural Characteristics

Structural network characteristics can affect the profitability of the firms in the network. Network scholars have identified various factors such as network density, structural holes, structural equivalence, and core versus peripheral firms, each of which can influence the profitability of firms within networks (GULATI et al., 2000: 205). As mentioned in the above chapters, supply chain networks consist of a multitude of participating firms. Therefore, the embedded upstream and downstream flows of resources and information have to cross various stages of the chain, while the involved firms differ widely in size. As a result, supply chain networks are highly complex systems and they bear the high risk of failure (BRITO and ROSEIRA, 2005). Hence, reducing complexity of the structure is one of the most important tasks. In particular, chain management scholars maintain that the focal firm has to consider comprehensively the levels of transparency and interdependency within the supply chain network.

Transparency refers to the extent of coverage from upstream industries to downstream industries within the supply chain and how apparent information is to

downstream industries (THEUVSEN, 2004: 125). DYER and SINGH (1998) have emphasized the role of transparency in transferring knowledge among partners. Because of the complex nature of supply chain networks, their structure is often not made public to all network members, and a feeling of anonymity may appear. Such missing transparency of the network structure increases the probability of free-riding. Transparency is associated with open communication. Therefore, it will be primarily conducive to enabling the partners' knowledge of each other's decision-making styles, and certainty in intentions of each other. I accordingly hypothesize that:

> *H 5: Higher levels of transparency have a direct positive effect on the alignment of interests in the whole supply chain network.*

Interdependency is acknowledged by firms when they join forces to achieve mutually beneficial outcomes (MOHR and SPEKMAN, 1994). However, beyond the focal firm's set of first-level contacts, there is normally a limited amount of intentionality possible in terms of coordinating the whole network (GULATI et al., 2000). In this context, higher interdependence between the focal firm's partners and their partners makes it possible that the mechanisms employed by the focal firm to coordinate its direct partners impact on the indirect partners too. Thus, a higher level of organizational and task interdependence among network members is necessary to reduce complexity and alleviate uncertainty about the whole network on the part of chain management. Furthermore, higher levels of interdependence among the supply chain network members imply that the network functions as a single entity and is characterized by a joint action to achieve the desired goals. Based on these arguments, I hypothesize:

> *H 6: Higher levels of interdependence between the focal firm and its direct partners have a direct positive effect on the alignment of actions by the focal firm in the whole supply chain network.*

Effects of Network Membership Characteristics

Research on networks focuses primarily on the interrelationships of firms but single enterprises can be regarded as initial elements of networks because collaborations do not exist without them. Interfirm collaboration has been widely defined as the means for firms to achieve the ends which would be impossible without working together (VAN DE VEN, 1976; SCHREINER et al., 2009). Each partner in a network dedicates its unique resources and capabilities which, when combined with partners' resources and capabilities, can create inimitable and non-substitutable value (DYER and SINGH, 1998). I, therefore, express the network membership characteristics by the constructs of firms' complementarities and coordination capabilities.

Network members' complementarities create incentives for firms to collaborate (KHANNA et al, 1998). Noteworthy, collaborations do not inevitably create advantages for the involved firms; instead, especially during their establishment, they

absorb resources. Consequently, without the firms' willingness to cooperate, collaboration will not prevail. Thus, firms have to recognize collaboration not as a constraint but as a means to access complementary resources. Furthermore, since supply chain networks are formed to last over a long period, complementarities are not only essential at the beginning of collaboration but throughout the whole period. Thus, complementarities in culture and strategies (PARK and UNGSON, 2001) combined with resource complementarities (DYER and SINGH, 1998) will be conducive to action alignment among the network members.

> *H 7: Higher levels of complementarity among network members have a direct positive effect on the alignment of actions in the whole supply chain network.*

Coordination capabilities of firms include necessary skills and abilities to establish learning routines, build up unique and network-specific knowledge, use modern information technologies, etc. Despite collaboration is determined by the complementary abilities of the involved firms, only a part of the firm's strategic resources is synergy sensitive (DYER and SINGH, 1998). The need for and the explicit knowledge of firm strategies, culture, and values differ with the firm size, i.e. the network members' understanding of strategic management can differ. Additionally, the core competences and resources of the involved firms often differ, precluding additional rents from collaboration (DYER and HATCH, 2006). Therefore, coordination capabilities involve the ability to identify and build consensus about task requirements in a given network (SCHREINER et al., 2009). To this effect, higher coordination capabilities of the network members have the potential to enhance their concerted action (SCHREINER et al., 2009). As a result, I hypothesize:

> *H 8: Higher levels of coordination capabilities by the supply chain network's members have a direct positive effect on the alignment of actions in the whole network.*

Effects of Tie Modalities

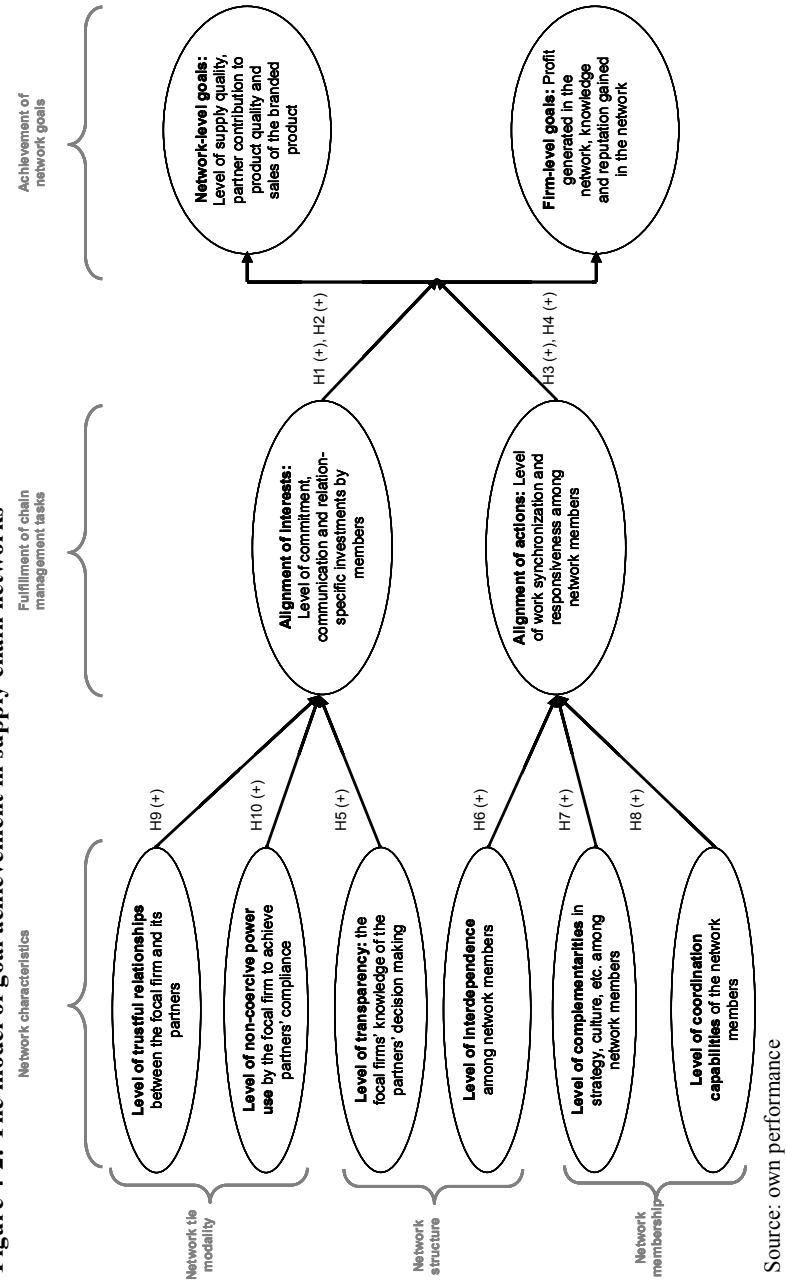
The nature of the relationships in a network could be either collaborative or opportunistic, setting the tone for the form of interactions among the actors as either benign or rivalrous (KHANNA et al., 1998). Whereas I acknowledge that the ultimate tie modalities will be reflected by the extent of interest alignment, it is important to clarify how inherent distinctions among actors are smoothed to preclude the negative consequences of relationships. As known, in today's procurement relationships, more and more specific investments must be made. Such investments create the chance for the other party to renegotiate the terms of the deal (DAVID and HAN, 2004). To overcome problems of opportunistic behavior by the network members, some scholars pose that it is feasible to exert power (HINGLEY, 2005); the others recommend employing trust-based enforcement mechanisms (DYER and SINGH, 1998). Furthermore, several studies emphasize that the use of non-coercive power (e.g., rewards, recommendations, etc.) has positive impact on the relationships

while the use of coercive power (e.g., punishment, threats, etc.) negatively affects the relationships (PAYAN and MCFARLAND, 2005; LEONIDOU et al., 2008; BELAYA and HANF, 2009b). I verify these suggestions by analyzing the effects of *trustful relationships* and *non-coercive power* on the alignment of interests.

H 9: Higher levels of trustful relationships among the supply chain network's members have a direct positive effect on the alignment of interests in the whole network.

H 10: Higher levels of use of non-coercive power by the focal firm have a direct positive effect on the alignment of interests in the whole supply chain network.

Figure 4-2: The model of goal achievement in supply chain networks



Source: own performance

4.2.3 Originality of the model of goal achievement

Overall, the model of goal achievement in supply chain networks represents a framework of the reationships between the different characteristics of supply chain networks. This implies that empirical analysis can provide information on the model as a whole, i.e. how the theoretical constructs that comprise the model are interrelated if they are analyzed altogether. To the best of my knowledge, the constructs included in my model have never been analyzed simultaneously. Additionally, some of the relationships have rarely been investigated.

For example, there has been only one empirical study that explicitly considered firm-level and network-level goals simultaneously. Namely, WINKLER (2006) has outlined formal and informal mechanisms of network governance to deal with conflicts arising between individual goals of network members on the one hand and collective network-level goals on the other hand. Besides this study, empirical investigations of collective goals in combination with individual goals have been mainly undertaken in the context of dyads, e.g. strategic alliances (ARIÑO, 2003; SCHREINER et al., 2009) and dyadic supply chain relationships (PAULRAJ and CHEN, 2005; PAULRAJ and CHEN, 2007). Thus, the network level has rarely been addressed.

However, there have been empirical analyses that included network-level goals but omitted firm-level goals. For example, PROVAN and MILWARD (1995) considered network-level goals in their study of network effectiveness in public sector. They addressed network-level goals as the total of goals of individual network members, i.e. the perspective of shared participant-governed networks was taken. Similarly, GELLYNCK et al. (2008) measured supply chain performance in the traditional food sector as the extent of achievement of goals common to all supply chain parties, whereas individual firm-level goals were excluded from analysis as the goals which are pursued outside the network. Yet, this perspective does not allow for focusing on a supply chain network as a whole and, thus, to make sure that the issues such as conflict and collective and mutually supportive action are addressed.

Thus, one can conclude that analyses of goal achievement in strategic networks have rarely addressed the achievement of network-level goals and the achievement of firm-level goals simultaneously. Nevertheless, as shown by MEDLIN (2006), studying collective constructs needs to be undertaken with regard to both collective and self-interest outcomes. By focusing solely on goals of an individual firm in a network, one will obtain biased results with respect to management styles that are actually based around self and collective interests, i.e. around the whole network of relationships. Thus, without simultaneous consideration of the whole network's goals, i.e. goals set at the firm and network levels, evaluation of the whole network will be incomplete and the derived implications will lack some validity.

Furthermore, originality of the model is attained through consideration of other relationships. For example, the simultaneous effects of the alignment of interests

and the alignment of actions on both network-level and firm-level goals have not been analyzed before. Besides, scholars have rarely studied the conditions under which interest alignment can generate competitive advantage (GOTTSCHALG and ZOLLO, 2007). I address these conditions by modeling the effects of the levels of trustful relationships, non-coercive use of power, and transparency on the level of interest alignment. All these preconditions require that my model is empirically tested. Thus, I present an empirical example of model testing in the Ukrainian agri-food business in the next Chapter.

4.3 Summary of Chapter 4

Summarizing the current Chapter, I recall that its objective was to show that management of the whole supply chain network and the implemented collective strategies aim at the achievement of firm-level and network-level goals simultaneously. I have demonstrated how the alignment of interests and the alignment of actions are related to the achievement of firm-level and network-level goals. By combining these relationships with specific characteristics of supply chain networks, I have developed a model of goal achievement in supply chain networks. The model involves respective hypotheses about the effects of chain management and network characteristics on goal achievement.

However, because there has been little attention to network-level goals in the literature on interfirm networks, I have first provided conceptualization of goals of interfirm networks. Departing from the point that individual and collective goals simultaneously exist in interfirm networks, I have shown that goals set and pursued in interfirm networks include firm-level, dyadic-level and network-level goals of network members. Furthermore, the different types of interfirm networks are characterized by the different extent of relevance of firm-level, dyadic-level and network-level goals. Accordingly, the requirements towards management in different types of networks differ.

In this context, I have argued that strategic networks pose more complex requirements towards network management than loosely coupled or shared participant-governed networks. The reason is that, apart from firm-level goals that are highly relevant for individual network members, strategic networks involve pursuit of network-level goals which require efforts by all network members. Importantly, the achievement of firm-level goals must be addressed simultaneously with the achievement of network-level goals to make sure that the strategic network members remain in the relationships and act in the best interests of the whole network.

5 ACHIEVEMENT OF GOALS OF SUPPLY CHAIN NETWORKS: AN EMPIRICAL EXAMPLE

The objective of this Chapter is to verify the hypotheses included in my model as well as to evaluate the model as a whole. By doing this, I expect to obtain information on the goals to be achieved in supply chain networks and whether and how chain management contributes to the achievement of goals. With this purpose, I present an empirical example that consists of a number of consecutive stages. First, I describe the empirical setting, the agri-food business in Ukraine (section 5.1). More specifically, I analyze retail internationalization and verticalization in Ukraine as the processes that considerably contribute to the formation of supply chain networks in Central and East-European countries. I use secondary statistics to portray the retail internationalization tendencies (subsection 5.1.1) and present the results of in-depth expert interviews to describe the verticalization tendencies in the Ukrainian agri-food business (subsection 5.1.2).

Second, I describe the collection of data for subsequent model testing (section 5.2). At this stage, I present the results of the pretest of a questionnaire in the German fish sector (subsection 5.2.1), the final version of the questionnaire, i.e. operationalization of the variables of the model of goal achievement (subsection 5.2.2), and the survey in the Ukrainian agri-food business (subsection 5.2.3).

Third, I test the model of goal achievement in supply chain networks. This stage involves the description of the approach used to estimate the model, the Partial Least Squares technique (section 5.3). Apart from outlining the algorithm of the approach, I explain why this approach was chosen to test the model. Subsequently, I present the results of the model testing (section 5.4). Then, I discuss the results with regard to chain management in general and the Ukrainian agri-food business in particular (section 5.5). Finally, I summarize the contribution of this Chapter (section 5.6).

Overall, the objective of this empirical analysis is not to compare particular supply chain networks, i.e. which network is more successful in achieving goals and which is less. The aim is to test whether my suppositions about the goal achievement in supply chain networks are correct, i.e. whether the successful chain management is the one that achieves both network-level and firm-level goals.

5.1 Empirical setting: Supply chain networks in the Ukrainian agri-food business

An in-depth analysis of supply chain networks and problems arising in them might be facilitated by considering the business environments in emerging or transition economies. In those economies, the chain managers still face various infrastructural and financial constraints and, therefore, they may have better possibilities to track the origin of problems arising in interfirm relationships. Consequently, the empirical focus of the thesis is directed towards Central and Eastern Europe in general and the Ukrainian transitional economy in particular.

The economic transition in Central and East-European countries (CEEC) is characterized by two interrelated processes which are particularly conducive to the development of supply chain networks. These processes are retail internationalization and verticalization. With regard to *retail internationalization*, an important remark is that financially strong retailers have the capability of disrupting the structure of foreign markets and installing their own business ideas in new market environments on a grand scale (GAGALYUK and HANF, 2009a). It is observable that the internationalizing retail firms try to arrange a sound supply side of their business abroad. Eventually, these efforts result in *verticalization* (BOEHLJE, 1999; BALMANN and SCHAFT, 2008), i.e. sophistication of the procurement processes and, thus, the use of chain management concepts. As a result, procurement systems evolve where a focal company coordinates the product flows and the information flows by building cooperative vertical networks (KPMG, 2001; COE and HESS, 2005). In this thesis, such networks are referred to as supply chain networks. Subseuqent subsections provide a more in-depth insight into the processes of retail internationalization and verticalization in CEEC with a special focus on Ukraine.

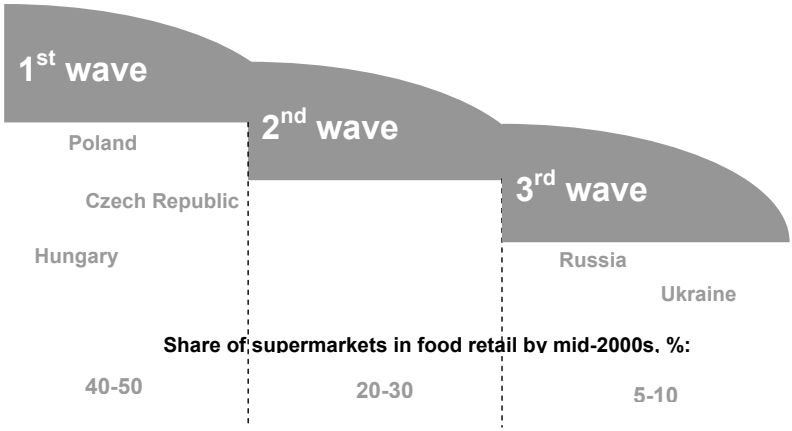
5.1.1 The process of retail internationalization in CEEC

Among the top 200 global retailers, almost all players operated in numerous countries having established a noteworthy business capacity in foreign markets in 2005 (DELOITTE, 2006). For example, Metro increased its foreign sales volume from 5 % in 1997 to 39 % in 1999, and today this share is about 55 %, with operations in 29 countries. One can generally observe that international retailers do not adopt new business practices in the new business environments (HURTH, 2003); instead, they "export" their own business models (HANF and PIENIADZ, 2007). Furthermore, emerging trends in retail business strategies are intensified with globalization.

Talking about global retailers, an essential part of their business is still connected with offering food products (REARDON et al., 2007). In this context, (food) quality and thereby food safety are considered, without exception, to be of the highest priority. Several studies on the effects of foreign direct investments (FDI) in CEEC show that foreign retailers exert significant efforts to raise the level of quality of their food suppliers to meet their own global quality requirements (GORTON et al., 2003; SWINNEN, 2006). As a consequence, procurement systems experience rapid

modernization with implications for local market institutions and trade (COE and HESS, 2005).

Figure 5-1: The three waves of retail internationalization in CEEC



Source: DRIES et al. (2004).

Recent research indicates also that the extent of such implications differs with the degree of progress in retail internationalization in a particular country. On the basis of the level of development of the modern Western-style retailers, DRIES et al. (2004) define "three waves" of retail internationalization (Figure 5-1). Specifically, DRIES et al. (2004) describe the process of retail internationalization in the CEEC by referring to the concept of "retail waves" that gradually "cover" a group of several countries. They characterize the first-wave countries as those wherein the supermarket sector went from a tiny niche of around 5 % of food retail in the mid-1990s to 40 % to 50 % by the mid-2000s. Examples are Hungary, Poland, and the Czech Republic. As the second-wave countries, they define countries wherein the sector grew to a share of 20 % to 30 %. Examples are Bulgaria and Croatia. The third-wave countries are those wherein the share was still at a "luxury" niche of 5 % in the mid-2000s. Examples are Russia and Ukraine.

The *first-wave countries* have – faster and more successfully than other CEEC – started to modernize the retail sector in the 1990s. Today, one can assume that the first-wave countries dispose of the best-developed retail sector in Central and Eastern Europe (BBE, 2006). For example, in Hungary, modern retail formats already had around 50 % market share in 2002. The rapid development of modern retailers was accompanied by heavy investments of Western retailers, and nowadays all major players are foreign-owned (HANF et al., 2010). In addition, the first round of consolidation is taking place. A similar tendency is observed in Poland. Owing to its heterogeneous market and, thereof, resulting loosely structured retail

landscape, first movers such as the German Dohle Group were able to succeed with hypermarkets. However, despite their strong market position, they have decided to sell their business to Tesco because the competition was getting very intensive and required high financial spending (KPMG, 2004). Because the "big players" on retail markets of the first-wave countries are more or less identical with those in Western Europe, I believe that today no significant differences with regard to procurement systems and quality demands and thereby vertical coordination can be found between them.

The agricultural sector in the CEEC is still a mixture of small-scale – even household – production and large-scale farming. To lower the complexity of their supply chains, retailers favor large-scale production. However, the findings of DRIES and SWINNEN (2004) show that the small-scale farmers find their place in vertically coordinated chains. Additionally, some international retailers demand that small-scale farmers set up horizontal cooperation to provide products that are meeting the qualitative and quantitative requirements of the retailers. If these requirements are not met, farmers are excluded from the procurement systems.

Comparing first-wave and *second-wave countries*, it is observable that second-wave countries (Bulgaria, Croatia, etc.) are about 5 to 6 years behind. Modern retail formats have been introduced but mainly by small local retail chains. Furthermore, the vast majority of the stores are very small (BBE, 2006). In the course of the EU accession, international retailers have lately made their inroads to Bulgaria. However, in Bulgaria most foreign investments are made in the capital, Sofia. Though international retailers are mainly located in urban areas, local retail chains still exist in rural areas (GAGALYUK and HANF, 2009a).

In comparison to the other CEEC, the development of a modern retail in *third-wave countries* is still in the fledgling stages. For example, though in Russia supermarkets, hypermarkets, and discount stores can be found in almost all cities with more than 1 million inhabitants, the market share of the whole-food retail market for the top-10 retail chains constituted 11.1 % in 2007 (PMR REPORT, 2008). According to a study of BBE Retail Experts in 2006, leading shopping formats in Russia are still street shops and open markets (32 %), small shops (26 %), and other shops and kiosks (28 %). Modern retail formats account for 14 % of the whole sales with supermarkets (6 %), discounters (6 %), hypermarkets (1 %), and Cash & Carry (1 %). Even in the large metropolitan areas of Moscow and St. Petersburg, retail chains hold 16 % to 17 % and 18 % to 20 %, respectively (BBE, 2006). French retailer Auchan has exhibited the highest growth of the top-10 retailers, jumping to the fourth-largest player as of end 2007. Metro, the second largest retailer in Russia, has opened about 30 outlets and has expanded into central and southern Russia and the Urals (A.T. KEARNEY, 2008). However, in Russia, the international retailers met with an immediate response from local players that were quick to learn modern retail trade methods and forms. Domestic retailers – such as the market leader, the X5 Retail Group – are expanding their operations, building strength in their

supply and distribution chains, and working on customer relations to capture a larger and more robust share of the market (BELAYA and HANF, 2009a).

One of the difficulties many retailers experience when entering Russia is the uncooperative behavior of Russian suppliers (ROBERTS, 2005). Furthermore, Russian supply chains are characterized by distrust and absence of professionalism (SHERESHEVA and TRETYAK, 2004). TARNOVSKAYA et al. (2007) describe the generally low level of suppliers' compliance with the norms of the code of conduct. However, the increased competition in global markets has led to the rise of various forms of partnering and inter-firm networks in the former Soviet republics (MÖLLER and SVAHN, 2006). The number of such networks is growing: in addition to traditional supplier-buyer relationships, firms collaborate within distribution channels (FORD et al., 2003; MÖLLER and HALINEN, 1999; MÖLLER and RAJALA, 2007).

Thus, despite the "third-wave" countries demonstrate the lowest level of market penetration by foreign retailers, the process of verticalization is clearly observed as an outcome of retail internationalization in the third-wave countries. To this end, the western food manufacturers such as Nestlé, Danone, Campina, etc. have also established their subsidiaries in the third-wave countries on a wide scale (BELAYA and HANF, 2010; STANGE, 2010). Activities of foreign retailers and manufacturers exert spillover effects on their local competitors who imitate the "imported" business concepts and are quite successful (Table 5-1). However, the process of internationalization in the third-wave countries is ongoing and, up to now, the effects of this process on the local business environment in general and the food chain in particular have been poorly investigated. Thus, I further analyze this process in greater detail in the Ukrainian agri-food business.

The development of the retail sector and agri-food business in Ukraine

Ukrainian retail has undergone an outstanding upturn in the last years, owing to the increase of the populations' incomes and consumers' accumulated needs. The annual growth rate of the retail turnover accounted for 120 % to 130 % in 2003-2007 (STATE STATISTICS COMMITTEE OF UKRAINE [SSCU], 2008). As the highest purchasing power is concentrated in big cities and urbanized regions, the capital Kyiv and the four oblasts of Donetsk, Dnepropetrovsk, Odessa, and Lvov account for about 50 % of the retail turnover (Kyiv itself is the most important trade center, with almost 20 % of total retail turnover of the country). These areas accordingly display the highest level of the development of modern retail formats (cash & carry, hypermarkets, supermarkets, and the like). For example, in Kyiv, there are about 15 companies operating in these formats; Dnepropetrovsk is represented by about 10 such companies; and Donetsk, Lvov, and Odessa by 3 to 5. Yet, despite the ongoing modernization, old trade forms (e.g., private kiosks, mobile traders, markets, bazaars) still prevail in the structure of the Ukrainian retail trade (ZMP, 2006).

Besides domestic retailers, international retailers are also active in Ukraine. In the retail sector, the internationalization process is marked by the presence of such

multinational players as Metro's Cash & Carry and Real (Germany), Rewe Billa (Germany), Auchan (France), and Perekrestok (Russia, former SPAR Ukraine). However, among international companies, only Metro and Auchan attained a stable success in the last years (Table 5-1).

Alongside big national retailers, multinational companies gradually contribute to the development of modern forms of retailing or the so-called "organized retail" (ZMP, 2006). In the structure of turnover by modern retail formats, the share of discounters is 32.0 %, supermarkets, 45.5 %, and other formats, 22.5 %. Overall, the share of organized retail accounted for about 15 % of total retail turnover in 2007, with an increasing tendency. Of these, almost 60 % belong to the top five retailers (RETAIL STUDIO, 2008). It is reasonable to expect that in the next few years, the concentration of the sector will deepen. Whereas big chains still grow through opening new outlets, there is also a room for merger and acquisition activities. Furthermore, international enterprises are planning to enter the market or expand their current presence (ZMP, 2006).

Table 5-1: Top 10 in food retail in Ukraine, 2007

Company/Group	Turnover, $ Mio.	Main office	Country of origin
Fozzy	1 500	Kyiv	Ukraine
Metro	1 202	Kyiv	Germany
ATB-Market	1 056	Dnepropetrovsk	Ukraine
Furshet/Auchan	871	Kyiv	Ukraine/France
Velyka Kyshenia	556	Kyiv	Ukraine
Amstor	555	Donetsk	Ukraine
LIA	294	Luhansk	Ukraine
Tavria	286	Odessa	Ukraine
Pakko Holding	235	Lutsk	Ukraine
Rewe Billa	222	Kyiv	Germany

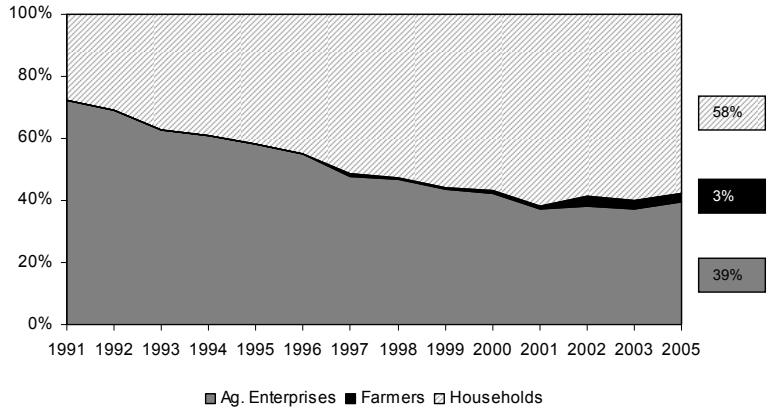
Source: RETAIL STUDIO (2008).

Thus, the competition in the sector is intensively increasing and displaying different strategies the retail companies employ to deal with the competitors. Though national players continue to compete mainly through expanding to regions with the use of their knowledge of local specifics, international ones find their own business models as an important prerequisite of successful competition. Particularly, they use their capabilities for retail branding and global sourcing. In the process of competition, retail-branding activities yield some positive outcomes, including brand awareness and quality of products. However, national retailers successfully use imitating strategies with regard to branding. Some forecasts claimed that totally the biggest players of the Ukrainian retail will sell about 25 % of products under

their own brands in 2010[9]. The actual share is yet at the level of 11 %, although some local retailers sell about 30 % of products under their own brands[10]. The use of global sources by multinational retailers is less pronounced, indicating the ability of local suppliers to catch up and comply with the retailers' least requirements. For example, about 90 % of the Metro's assortment is supplied by local producers, distributors, and importers[11].

Because retailers are responsible to end consumers for the quality and quantity of the needed products, they have to maintain undisrupted supplies and minimize the risk of scandals. This especially concerns the retail-branded and globally sourced products. Therefore, the arrangement of well-functioning cooperative supply chain networks is being undertaken by international retailers. Thus, the process of verticalization is in action. In particular, this process is evident in the agri-food business wherein the products with short life span are developed.

Figure 5-2: Structure of Gross agricultural production in Ukraine by categories of producers, 1991-2005



Source: SSCU (2006).

[9] Expert Online, "Riteil atakuet proizvoditelei" [Retail attacks producers, in Russian], February 19, 2007, http://www.expert.ru/printissues/ukraine/2007/07/torgovye_marki_supermarketov/(accessed March 30, 2007).

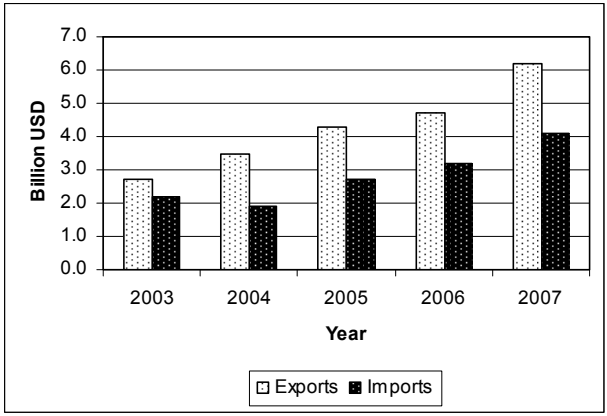
[10] Retail Studio, "Renessans ukrainskogo riteila" [Renaissance of Ukrainian retail, in Russian], January 19, 2010, http://www.retailstudio.org/trends/7664.htm (accessed July 13, 2010).

[11] Retail.Ru, "V Zaporozhye otkryt METRO Cash & Carry" [METRO Cash & Carry was set up in Zaporozhye, in Russian], August 1, 2007, http://retail.ru/ua/pressa/070801-1.asp (accessed August 14, 2007).

For retailers, it is obviously more beneficial to work with large-scale suppliers (SWINNEN, 2006). However, in Ukraine, most enterprises are small- and medium-size at the processing and farm levels. There is, nevertheless, some evidence of consolidation at these stages of the supply chain. The food processing sector is currently represented by several distinguished actors. For example, market shares of the 10 biggest players in the meat processing, milk processing, flour-milling, and sunflower-seed processing are 40 %, 40 %, 50 % and 70 %, respectively, with increasing tendency (DRAGON CAPITAL, 2006). Accordingly, these sectors exhibit some backward vertical integration tendencies in agriculture. At the same time, a specific feature of Ukrainian agriculture is that about 60 % of gross agricultural output is produced by households (Figure 5-2).

In particular, the share of animal production (about 70 %) is high in households (SSCU, 2008). After restructuring of large Soviet-type collective farms in 1990s, capital-intensive animal production has experienced a huge downturn. As a result, Ukraine is now highly dependent on imports of meat and meat products and of milk and milk products. On the contrary, the country is export-oriented in crop products, especially grain and sunflower oil, which causes a positive balance in agri-food trade (Figure 5-3).

Figure 5-3: Dynamics of foreign agri-food trade in Ukraine, 2003-2007



Source: SSCU (2008).

In general, the Ukrainian agri-food business included more than 85,000 agricultural producers, about 22,000 food processing companies, and about 60,000 food retailers (including small enterprises) in 2007 (SSCU, 2008). Nowadays, the agri-food business is being internationalized at a growing rate. In the structure of total FDI, the retail sector, processing industry, and agriculture account for 18.7 %, 13.5 %, and 2.7 %, respectively (SSCU, 2008). It is noteworthy that the retail sector and the processing industry are the most attractive sectors for FDI. There

are regional disparities in the scope of FDI, with greater shares of inflows in big urbanized regions.

Thus, the role of FDI for the national agri-food business is growing. The foreign enterprises employ their own business concepts to gain competitive advantage over the local firms. To compete with the foreign companies successfully, local firms use imitating strategies and their knowledge of local situation. Furthermore, foreign and local companies widely use brands. The development of branded products normally leads to formation of well-organized supply chain networks (HANF and HANF, 2007). Overall, it is observable that verticalization of the agri-food business is being put into practice. In order to have a closer look at this development, I further analyze the process of verticalization of the Ukrainian agri-food business based on the interviews with experts.

5.1.2 Verticalization in the Ukrainian agri-food business: Expert interviews

To reveal the characteristics of verticalization in the Ukrainian agri-food business, the study includes in-depth interviews with experts (managers, academics, and officials) in the field of Ukrainian agribusiness[12].

Table 5-2: Information about interviews

Job title of the respondent	Number	Affiliation	Date
Managing Director	6	International retail institute (1)	18.04.2007
		International standardisation bodies (2)	19.04. and 26.04.2007
		Local beverages distribution company (1)	30.04.2007
		International meat processor (1)	8.05.2007
		Local dairy company with FDI (1)	8.06.2007
Purchasing/Procurement Director	2	International retail group	24.06. and 25.06.2007
Chief Executive Officer in Total Quality Management	2	International retail group	3.05.2007
Expert for Supply Chain Management	2	International agricultural equipment company (1)	23.04.2007
		International confectionery company (1)	23.04.2007
Assistant to Management Board	1	International retail group	26.04.2007
Internal Audit Director	1	Local group of agribusiness companies	27.04.2007
Project Manager	1	International Finance Corporation	19.07.2007

Source: Own performance.

[12] The results of the interviews were published as a self-standing study in the *Journal of East-West Business, Vol. 15, No. 2,* pp. 96-118, 2009.

Description of the interviews

Interviews were conducted in the period from April 18 to July 19, 2007. In total, 15 telephone interviews (with duration from 20 to 30 minutes) have been conducted, each including about 15 questions addressing current tendencies in the Ukrainian agri-food supply chain. The interviewees were first informed about interviews via e-mail. After receiving their consent, the calls were given at times appointed by the interviewees. The interviewees were asked questions in a questionnaire prepared in advance.

In the process of sampling, I have conducted deliberate (purposeful) selection of the respondents (e.g., BLANKERTZ, 1998; MERKENS, 2000; PATTON, 1990). Specifically, I employed an expert (concentration) sampling (FRITSCH, 2007; PATTON, 1990): the persons chosen were in positions with a high level of concentration of appropriate information. Given my interest in the impact of retail internationalization on the Ukrainian agri-food business, I have assembled a sample of experts whose experience and expertise in this area can be regarded as valuable. More specifically, the interviewees were at the highest positions in their organizations and represented the sectors of retail, food processing, agriculture, agricultural equipment, and research and non-governmental institutions. Table 5-2 provides the detailed information about the interviews and respondents.

Retail. The interviewees from the retail sector included two directors of the purchasing departments of the international retailers operating in Ukraine; two chief executive officers (CEO) in total quality management of an international retailer operating in Ukraine; and an assistant to management board of an international retailer operating in Ukraine. These experts represent two of the three international retailers that were operating in Ukraine at the time of the interviews. I have selected the purchasing directors and the CEO in quality management because their departments are directly involved in the verticalization initiatives given their responsibility for procurement and supply chain management. By interviewing the assistant to a management board, I intended to clarify the opinion of the general management about consequences of its company's procurement activities in the Ukrainian agri-food chain.

Provided that I study the impact of retail internationalization on the entire food chain, I have also inquired experts from the upstream stages of the chain.

Food Processing. The interviewees from the food processing industry were a managing director of an international meat processor, a supply chain management expert of an international confectionery company, and two managing directors of a local beverage company and dairy company, respectively. These experts were chosen as those representing the suppliers of international retail companies in Ukraine. I have asked them about the changes their companies have experienced in procurement and marketing owing to established cooperation with international

retailers. Both foreign and local companies were included to compare potential differences in perceptions of the relevance of vertical collaboration.

Agriculture. An interviewee representing agricultural sector was an internal audit director of the local agribusiness group that specialized in production of cereals. Given his active participation in ongoing consolidation activities of his company, I asked him about management's perceptions of the supply chain collaboration and management and whether these are subject to influence by retail internationalization.

Agricultural Inputs. I have also decided to inquire the opinion of the suppliers of agricultural inputs about the retail internationalization and verticalization processes in Ukraine. As agricultural input suppliers are normally concerned about the business success of their clients, they often put significant efforts into supporting the functioning of the supply chains. In this context, I have interviewed an expert for supply chain management of the well-known international company that specialized in agricultural equipment and operating in Ukraine with one of the highest market shares.

Non-Governmental and Research Institutions. To add more objectivity to the expressed views of the developments induced by retail internationalization, I have also interviewed non-business actors. Specifically, they included two managing directors of international standardization bodies; a project manager of International Finance Corporation (IFC) involved in a project on horizontal and vertical cooperation in the dairy industry in Ukraine; and a managing director of an international retail institute. Similar to experts from business, these experts were selected so that they provide the insight into the entire agri-food supply chain.

The questions used in expert interviews can be grouped into five general blocks as follows:

1. The level of perception of verticalization by agribusiness actors. An overall aim of this group of questions was to find out to what extent the agri-food actors address vertical inter-firm collaboration and its coordination. Specifically, the first objective was to define whether the common issues that enable actors to work together in the food chain are recognized. The aim was to inquire whether it was reasonable to proceed with the analysis. Each of the conducted interviews was in favor of such an opportunity. Adjacent, questions of how agri-food chain actors work together, who initiates this work, and how actors perceive this work were asked.

2. Cooperation mechanisms being used. As the task of supply chain networks is to achieve certain goals by a strategically driven but also divergent interfirm environment, the network members' interests have to be aligned so that they do not impede the fulfillment of this task. For that matter, a number of cooperation mechanisms exist. Thus, the questions of this block aimed to provide information about tools used for cooperation in the sector. Additionally, the differentiation between formal

and informal mechanisms was addressed. Actual mechanisms in use were questioned, including the characteristics of their use (e.g., normal duration of contracts, a type of sanctions being imposed, and the level of general cooperativeness among actors).

3. Existing solutions to coordination problems. The objective of this group of questions was to explore how the actions of different network actors are aligned to achieve the network goals. Therefore, formal coordination mechanisms in use (e.g., quality standards, brands) and informal ones (e.g., unofficial meetings and discussions) were questioned. Furthermore, the description of the use of coordination mechanisms was asked. Particularly, the focus was on how the quality of supply chain is fulfilled (e.g., setting up of quality labs, introduction of international quality systems, contract specification including credit support, input support) and whether it is fulfilled in general.

4. Constraints on verticalization. Country-specific problems that hamper the introduction and implementation of supply chain management concepts were revealed based on the questions of this block. Particularly, the issues of partnering, infrastructure, marketing, and quality were addressed.

5. Use of known supply chain management concepts by the agribusiness actors in Ukraine. This block was represented by questions about the extent to which the agri-food actors are informed about and aware of such business models as efficient consumer response, total quality management, and so on. Another aim was to detect the actors that use these models.

Results of the interviews

In general, a pattern of current verticalization in the Ukrainian agribusiness is similar to findings of other authors with regard to different CEEC. An affirmed fact is that the verticalization process is initiated by foreign retailers and supported by big foreign food manufacturers. Additionally, spillover effects on local retailers, food manufacturers and export-oriented agri-food enterprises are being observed. Local companies widely imitate the business concepts of foreign investors. This underscores the emphasis that the formation of supply chain networks is an intentional process, whereby firms recognize the advantages of tight vertical cooperation and implement deliberate strategies (MINTZBERG and WATERS, 1985). However, spillover effects still occur at random, in individual cases. This does not necessarily imply that most local agri-food actors undervalue the importance of verticalization. However, they rather perceive it as a distant perspective. A reason for this is that the majority of companies are primarily trying to cope with infrastructural issues, including building of access roads, construction of warehouses, search for qualified labor, provision with transportation facilities, or even basic inputs, and the like. In other words, they are arranging prerequisites for sound operation of the supply chain by dealing with the consequences of the transition period such as outdated infrastructure. As one of the interviewees, the managing director of an international

standardization body, noted, *"Quality issues in the Ukrainian agribusiness are mostly addressed by foreign investors. However, they face significant problems because local supply chains have old, rudimentary features."* To this effect, another respondent, the managing director of the local dairy, added, *"The dairy production seems to be in a horrible situation. Stables, houses and warehouses are run down. There are no preconditions for any quality scheme. Even basic quality requirements are not in place because the whole dairy chain lacks appropriate infrastructure."*

One of the infrastructural constraints on verticalization is the scale inefficiency of most agri-food enterprises. Given by planning in times of the command economy, production facilities appear to be inconsistent in market conditions. As a result, production capacities are often underutilized. Additionally, owing to the prevalence of households in agricultural production, modern IT-infrastructure is seldom used. Such circumstances substantially impede procurement relationships between actors. To overcome these difficulties, the implementation of outsourcing strategies is necessary. However, these strategies require a sophisticated logistics management and specific investments by firms. At the same time, supply chain management practices are in the process of being installed by multinational retailers. One of the respondents, the assistant to a management board of an international retailer, stated, *"Our company follows a uniform strategic framework to work with suppliers all over the world. Ukraine is not an exception in this respect. We are installing our global IT-standards and supply chain management techniques."* Generally, introduction of these practices differentiates international retailers from competitors and promotes outsourcing and concentration on core competencies by agri-food actors. As the majority of agri-food enterprises are small and medium sized, they face a financial burden for introduction of logistics management concepts. Therefore, outsourcing results in the emergence of logistics service providers. At the peripheral level, logistics firms are independent organizations, whereas they are business units of big retail and processing companies in the cities and urbanized regions. To develop such procurement relationships, long-term cooperative ties between existing actors as well as specific coordination tools are highly important. Though long-term vertical cooperative relationships are still loosely formed, the coordination tools like Cross Docking are already implemented by such multinational players as METRO.

In turn, cooperation is paid no less attention than coordination because it provides operational and strategic advantages for retailers. On the operational side, the disposal of appropriate partners makes the introduction of supply chain management less costly and time-consuming. However, the main purpose of vertical partnering invoked by retailers is the achievement of long-term competitive advantage consisting in a sound chain quality. Therefore, one of the main goals the partnering pursues is quality standardization among local farmers and food processors based on international quality standards. Talking about this issue, the

purchasing director of an international retailer operating in Ukraine indicated, "*We are introducing quality standardization in Ukraine based on such international quality schemes as GLOBALGAP, ISO 9000, and HACCP. Currently, GLOBALGAP is being translated by a working group at one of the local universities. Additionally, the university spreads information about the standard."*

Another effect of such activities is that retailers indirectly educate new managers who are in demand to work in the verticalization setting. Because of prevalent production-oriented education established in Soviet times, the management inability to work in market conditions is an important issue for most agri-food companies. As one of the interviewees, the expert for supply chain management of the agricultural equipment company, stressed, *"Qualified labor is difficult to find, especially this concerns supply chain managers."* To this effect, the managing director of an international meat processor told us that sometimes his company faces specific attitudes of local employees toward work: *"My computer is broken down. So I am going home."* In the view of such problems, many agricultural enterprises prefer to concentrate on production as a core competency and outsource the managerial function. To a great extent, the emergence of huge agri-holdings is a consequence of such strategies. In agri-holdings, the responsibilities of the enterprise management are related mostly to production operations. At the same time, agri-holding management works on planning, procurement, marketing, and sales. According to one of the respondents, the managing director of an international standardization body, *"such structures exhibit a certain degree of feasibility in the current conditions. Local supermarkets serve as one of the main sales markets for agri-holdings; in this way, their products are successfully marketed."*

Additionally, a number of consulting services deal with the management's inadaptability in SME. Consulting companies provide SME with information on marketing requirements, in most cases on quality of supplies. These findings are similar to those of KLERKX and LEEUWIS (2006) indicating that consultancies substitute to some extent the focal actor and work as "knowledge brokers." Furthermore, via consultancies, high transaction costs related to marketing are avoided. The Ukrainian horticultural sector is a good example of such tendencies.

However, as another interviewee, the managing director of an international retail institute, claimed, *"Evidence of international quality standardization is still rare because of atomistic structure of agriculture. Most agricultural suppliers do not focus much on achieving even basic quality due to the first priority of infrastructural issues. Taking into account that most retailers possess their own quality control and distribution divisions, many farmers may experience problems with marketing if they want to supply for retailers. In order to overcome such problems, a horizontal cooperation between farmers is necessary at least to provide them with appropriate information about requirements retailers place on food products."* Undoubtedly, cooperation among farmers is advantageous also for retailers because it provides benefits of less costly information transfer. Yet, the farmers'

cooperation is hindered by some developments of the last decade as noted by one of the interviewees, the project manager of IFC: *"In transition period . . . efforts on horizontal cooperation between farmers resulted in creation of so-called service cooperatives to which farmers supplied their products. However, lack of liquidity in most cooperatives caused farmers' supplies outside the network. By-passing cooperatives, they sold their products to other structures that offered prompt payments or better prices. As a result, trustful relationships between cooperative members failed. Furthermore, the formation of majority of such cooperatives was initiated by local authorities that caused mistrust of the potential members."* Thus, the absence of a price premium or even prompt cash payments was one of the factors of cooperation failure. Another important point is that a strong focal actor with enough power to promote trust among other actors and make them cooperate was missing.

It can be, thus, posited that the installation of formal incentives for cooperation must go along with the arrangement of informal ones and vice versa. On account of this, informal incentives may play an even greater role in such transition countries as Ukraine. Such evidence is provided by the example of reputation effects of big multinational brands on local partners. One of the purchasing directors of an international retail company reported that, *"Small- and medium-size suppliers are proud to work with us. Furthermore, in my opinion, they like to cooperate with our company because they are confident that we will not renegotiate a contract."*

In the transition period, frequent contract breaches were a problem in the Ukrainian agri-food business. For example, GORTON et al. (2003) report that medium-sized processing enterprises have suffered most of all in Ukraine, facing about 12 % of existing contracts not realized by suppliers in 2001. At the same time, small enterprises did not use any contracts at all. One of the reasons why contracts could not be realized is poor contract enforcement mechanisms. As a result, today *"business environment is highly volatile and it can be difficult to find a reliable partner,"* as the expert for supply chain management of the agricultural equipment company said. Similarly to the study by SWINNEN (2006), my respondents emphasize that there are two reasons for contract breaches. First, producers distrust their buyers and are afraid of not being paid for production. Second, they may not be able to fulfill a contract because they cannot access basic production factors. Therefore, farmers can perceive the prompt cash payments as a benefit obtained from relationships with international retailers. The argument is that before they have had to wait long for payments or even faced the risk of non-payments owing to their inability to fulfill the contract with local companies. Thus, being engaged in cooperation with multinationals is perceived as an advantage because farmers believe they minimize their perceived income risk by working together with foreign companies as opposed to local ones (see also GAGALYUK and HANF, 2009a). Besides, another respondent, the managing director of an international retail institute, stated that, *"The foreign retailers show that they are worldwide present and*

are able to use their global sources to substitute inconsistent local supplies. In turn, suppliers try not to lose such favorable sales markets. They, therefore, are working hard to comply with the requirements of retailers." A substantial part of this work is dedicated to the achievement of appropriate product quality because international retail chains reflect the growing consumer demands towards quality. Process quality must be achieved on the basis of quality standards and systems used by international retailers as a part of their business concepts. Except for vertical implications, business concepts of international retailers have spillover effects on their local competitors who also force their suppliers to improve quality. Retailers, thus, act as focal companies exercising their powerful position to form networks of firms that can conform to their requirements. These developments largely contribute to overall improvements of the food chain quality that has considerably decreased in the former times owing to the lack of necessary inputs, expertise, and know-how. In the transition period, initial vertical ties did not aim to resolve this issue, with most contracts omitting the point of food quality. Food processors offered commodity credits to farmers just to utilize their production capacities and not to improve the quality. Such developments can be also found in SWINNEN (2006) and PEREKHOZHUK (2007). Today, however, big processors become more interested in quality.

As with retailers, processing companies start branding, implying that they recognize the importance of quality issues. To cover branding costs, processors have to expand their businesses into regions. Alongside territorial expansion, they also expand the range of their suppliers so that not only large farms but small ones become strategically embedded in the value chain of different product groups. However, by doing so, food processors face the problem of quality more sharply because most small farmers have limited possibilities in sorting and calibrating their products, quality expertise and, logistics. Therefore, on the one hand, it can be more complicated for small farmers to meet the requirements of their buyers. On the other hand, they are in an advantageous cost position when being provided with necessary inputs by the downstream partners. In fact, processing firms have no choice but to work with small farmers and support them to deal with the quality problem. For example, the managing director of the local dairy company said that big dairies organize their own collection stations with expert facilities. By doing so, they cope with both multiplicity of suppliers and (randomly conducted) quality testing. Furthermore, dairies ensure quality supplies by leasing cooling tanks to farmers as part of their contracts. These findings correspond to those of other authors in other transition countries, such as GORTON et al. (2006) in Moldova, and SWINNEN (2006) in Bulgaria and Romania. Thus, one can state that the processing enterprises have also recognized their role in enabling undisrupted food supplies and act as focal companies coordinating whole supply chain networks.

Effective vertical coordination provides big processors with an improved position on the market. Such a development, however, brings some threats to small- and

medium-sized processors because they are not strong enough to compete. Therefore, they have to maintain a particular cooperation with both big processors and retailers. This cooperation becomes apparent in two surviving strategies: small processors either become collecting points of big processing companies or produce under retail brands. In both cases, quality requirements must be fulfilled. Thus, private imposition of quality requirements serves as an effective mechanism while appropriate public institutions are missing. Specifically, it enables food chain actors to organize their cooperation so that more value is added along the supply chain from producer to end consumer.

Overall, the Ukrainian agri-food business can be considered an appropriate research setting to test the model of goal achievement in supply chain networks. The findings of the expert interviews indicate that strictly coordinated chain systems, i.e. supply chain networks are being established in the Ukrainian agri-food business. In major part, they are initiated by multinational companies, i.e. retailers and food manufacturers who introduce their business concepts. However, local competitors imitate the strategies of foreign investors and also form supply chain networks, implying that they see potential advantages and, therefore, their imitating strategies are deliberate. This is another reason why the Ukrainian agri-food business can be considered relevant for my empirical analysis. Supply chain networks in the Ukrainian agri-food business possess inherent characteristics of strategic networks, i.e. powerful focal actors that undertake the partner selection process, install control mechanisms and incentive systems, and implement chain management strategies. Given that these processes are at their initial stage, the appropriate wide-scale operationalization of strategic chain management is lagging behind. Nevertheless, the major elements of the chain management framework (partnering and supply chain management strategies at the firm, dyadic and network levels) are being addressed. This provides an opportunity for analysis of goal achievement and its determinants in supply chain networks in the Ukrainian agri-food business. Additionally, the results of my expert interviews enable a number of implications for food chain management in Ukraine. These implications will be presented in Chapter 6.

5.2 Data collection: Pretest, operationalization of variables, and the survey

The current section describes the pretest of a questionnaire, the survey design and the ultimate survey. I used survey-based, multi-item scales to measure each of the constructs of the model. In such scales, individual item idiosyncrasies cancel one another, making the measures more reliable (MARSDEN, 1990). I designed a questionnaire through a study of relevant academic literature, e.g. the literature on strategic partnerships, supply chain performance and strategic alliance performance. Since I had little precedent in developing measures for e.g. network-level goals, the questionnaire had to be pretested.

A pretest has been conducted in two stages. At the first stage, I asked five experts to make their comments on the order of questions, wording and format of the questionnaire. Their feedback was considered to modify the questionnaire. Those specialists included two professors in statistics, two CEOs of the international standardization bodies and a CEO of non-governmental organization being active in the food business. At the second stage, I pretested the survey instrument with 31 top managers of the specialized fish retail companies in Germany. This second stage of the pretest can be considered as a self-standing study; its findings were presented at a number of conferences and will be soon published in a peer-reviewed journal[13]. Thus, I have decided to devote a separate subsection to the results of the second stage of the pretest.

5.2.1 Pretest in the German fish sector

The main aims of the second stage of the pretest were 1) to reveal whether the questions posed were clear to the business people; 2) to check for appropriateness of the hypotheses about relationships between the constructs in the model because those constructs have never been analyzed altogether; and 3) to define whether the measures used to operationalize primarily network-level goals were realistic.

To fulfill these aims, I have conducted telephone interviews with specialized fish retail firms in Germany from May 2008 to July 2008. The challenges of increasing consumer requirements for quality, safety, and environmental sustainability of seafood products and the demand for continuous supply are recognized as the driving forces of the formation of supply chain networks in the fish sector (HAMERI and PÁLSSON, 2003). In such supply chain networks, a specialized fish retailer is most often responsible for the quality of the offered fish products to consumers, and its survival depends directly on how successfully it meets the consumer requirements (GAGALYUK et al., 2009). Thus, the specialized fish retailer can be considered as the focal company in its fish supply chain network, i.e. the company which sets the network-level goals and is knowledgeable about the network.

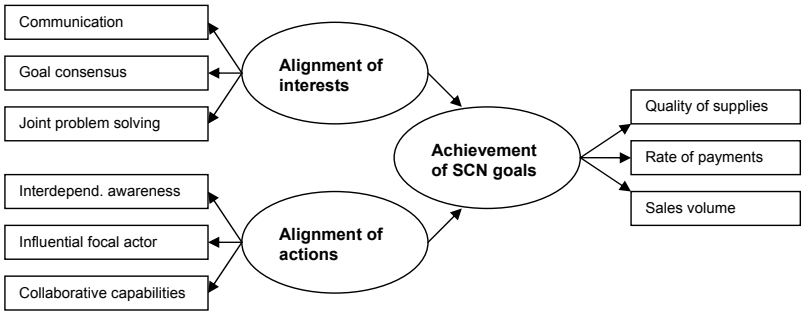
The database of the firms was obtained from the international gourmet-journal *Der Feinschmecker*, No. 7 "Fisch & Meeresfrüchte" (1st quarter 2007). In total, 90 firms involved in specialized fish retail comprised the database. Prior to contacting the potential respondents by phone, they were informed about the interviews by mail. Of the 90 specialized fish retail firms, interviews with top managers of

[13] The study is forthcoming in the special issue of the Journal of Food Economics (see GAGALYUK et al., 2010). As a conference paper, it was presented at the 113th Seminar of the European Association of Agricultural Economists in Chania, Crete, Greece, September 3-6, 2009. Additionally, it was awarded as the Best Poster at the 49th annual conference of GEWISOLA (German Association of Agricultural Economists), Kiel, Germany, September 30-October 2, 2009.

the 31 companies were conducted. This resulted in a 34 % response rate. Each interview lasted about 20 minutes on average.

The first aim of the pretest, i.e. proof of the clarity of the questionnaire, has been fulfilled by using the feedback of the respondents. Overall, the questions have been understood well. Slight modification of the questionnaire has been made.

Figure 5-4: The simplified model of goal achievement in supply chain networks



Source: Own performance.

In order to fulfill *the second aim*, i.e. to check for appropriateness of the hypothesized relationships in the model, I tested a simplified version of my model of goal achievement (Figure 5-4). The Partial Least Squares approach (see section 5.3 for a description) was used for model testing. The model involved the effects of the alignment of interests and the alignment of actions on the achievement of network goals. At this stage, clear differentiation between network-level and firm-level goals has not been made. Thus, only three variables were included: the alignment of interests, the alignment of actions, and the achievement of network goals.

However, I have operationalized these variables by means of measures which can be thought of being representative for some of the variables included in my model in Figure 4-2 (p. 77). Specifically, I used the following measures of the alignment of interests: the level of mutual information exchange among partners, goal consensus, and joint problem solving. The alignment of actions was operationalized by the following measures: presence of an influential focal firm, the focal firm's awareness of interdpendences which exist in the network, and the level of collaborative capabilities by network members. Network goals were measured by satisfaction with quality of supplies, sales volume and the rate of payments by the focal firm to suppliers for the supplied products.

The results of the model testing indicated that the alignment of interests and the alignment of actions have significant positive effects on the achievement of network goals. The significant influence the alignment of interests exerts on goal

achievement can be explained by the fact that satisfaction of single suppliers with the achievement of their firm-level goals requires that the focal company puts much emphasis on establishing of good working relationships with them. In my sample, the alignment of interests is achieved through a high level of communication among the partners about their goals and the problems to be solved. If such problems arise, they are most often solved jointly by provision of assistance from the focal actor. Additionally, an influential focal company must be allowed and be able to apply sanctions and fiats such as excluding network firms from the network. For example, of the 31 specialized fish retailers interviewed, 27 have suggested that they would initiate a relationship break off with a supplier if a supplier failed to meet their requirements repeatedly.

The alignment of actions is also relevant in the fish supply chain networks. The alignment of actions has to be paid much attention in the process of the achievement of such goals as quality of supplies. This multi-faceted goal involves issues such as timeliness of supplies, fulfillment of logistics requirements, etc., which require synchronized work of all the links in the supply chain. In particular, these issues are relevant in the fish supply chain due to high quality requirements stipulated by activities of several non-governmental organizations like Marine Stewardship Council on behalf of the end consumers. Besides, product quality and its complements, e.g. freshness, are important in the fish supply chain networks. Therefore, specialized fish retailers have to be skilled enough to coordinate their supply chain networks. They have to be aware of the network structure and the interdependencies that exist between the network members, i.e. if one requirement is not fulfilled, this can lead to failure in fulfilling the other requirements. The partners' knowledge about each other and the experience of working together are crucial to build routines which can also be regarded as a coordination mechanism. As proof, 30 of the 31 specialized fish retailers in my sample have been working with the same suppliers for more than 3 years, based on verbal agreements.

Thus, overall, one can speak of appropriateness of the hypothesized signs and directions of effects in the model of goal achievement in supply chain networks (Figure 4-2).

The third aim of the pretest has also been achieved. Apart from questions used for operationalization of the variables of the simplified model, the questionnaire included questions about the importance of working together for the achievement of particular goals. Based on the obtained scores, concrete measures for the achievement of network-level and firm-level goals in my original model have been developed. These measures as well as the measures for the other variables are presented in the next section.

5.2.2 Operationlization of the variables of the model

Apart from the results of the pretest in the German specialized fish sector, I used the literature on performance of supply chains, strategic alliances, strategic partnerships

and inter-organizational relationships to develop the corresponding measures for the variables included in my model. I further describe these measures with regard to each variable. Appendix 2 presents the measures in tabular form.

Measures of the achievement of goals of a supply chain network

These measures assess the degree of goal achievement at the network and firm levels. To develop measures for both network-level and firm-level goals, I first used elaborations of the studies on strategic alliance and supply chain performance and then relied on the pretest in the German specialized fish sector. Based on the literature, I obtained the measures of goals which can be regarded as those pursued in supply chain networks. In particular, these were measures such as product quality, overall partner reliability (e.g. quality of supplies by suppliers and quality of services by customers), product traceability (GELLYNCK et al., 2008), innovations (MÖLLER et al., 2005), profits (ARIÑO, 2003), common sales (MOHR and SPEKMAN, 1994), knowledge and reputation (SCHREINER et al., 2009). Then, the task was to define which of these belong to network-level goals and which to firm-level goals. The results of the pretest appeared to be helpful in accomplishing this task. I have asked the top managers of the specialized fish retailers to identify on the five-point scale (from "very unimportant" to "very important") the achievement of which goal requires tight cooperation with all their supply chain partners. If the goal scored four or more (above-average importance) in answers of all respondents, it was considered as the network-level goal. The remaining goals, however, could not be automatically classified as firm-level goals. Therefore, I have additionally asked the respondents to identify on the five-point scale (from "strongly disagree" to "strongly agree") what they and their partners want to achieve for themselves in cooperation.

As seen, I tried to develop measures based on managerial assessments. Interorganizational scholars, in particular, those involved in the strategic alliance research (e.g. GULATI, 1999; KALE and SINGH, 2007) have agreed over time that using managerial assessments to measure interorganizational performance or alliance success may be one of the most useful ways, regardless of some of the limitations of this approach. The use of this measure has gained acceptance in research after GERINGER and HEBERT (1991) demonstrated a positive correlation between alliance performance assessments based on this measure, with assessments based on other objective measures that use accounting or financial data. Furthermore, given the multipurpose nature of interorganizational relationships, alliances, and networks, ANDERSON (1990) suggested that instead of using single-item, managerial assessments of performance, success and other constructs, it would be more useful to have a multidimensional scale that included several of these dimensions in it. Accordingly, I use multiple measures for the achievement of network-level goals and firm-level goals as well as for other constructs constituting my model of goal achievement in supply chain networks.

As a result of the pretest in the specialized fish retail sector in Germany, the following items were chosen to measure *the achievement of network-level goals*:

- *The focal company's satisfaction with contribution of all suppliers to quality of the branded product*[14]. Over the last decades, it has been recognized that the product quality is no more in responsibility of a single firm; instead, the whole supply chain has to work together to achieve at least a basic level of quality (HANF and HANF, 2007; SCHIEFER, 2007). Thus, the focal firm's satisfaction with contribution of all suppliers to the quality of the branded product seems to be an appropriate measure of network-level goals. Product quality is generally associated with indicators such as freshness, durability, absence of contaminants, etc. (GAGALYUK et al., 2009). Additionally, because the quality assurance standards must be met at the different stages of a supply chain, quality of supplies by suppliers and quality of services by customers of the focal company gains in importance.
- *The focal company's satisfaction with quality of supplies by suppliers.* Quality of supplies is a multifaceted aspect that encompasses maintenance of necessary product volumes, guaranteeing of preservation and traceability (SCHIEFER, 2007), etc.
- *The focal company's satisfaction with quality of product-related services by customers.* Quality of services by customers involves aspects such as product appearance on the shelf, provision of storage facilities, etc.
- *The focal company's satisfaction with contribution of all customers to sales of the branded product.* Sales of the branded product reflect the end consumers' perception of the product quality, line-up and other features.

The measures for *the achievement of firm-level goals* include the focal company's assessment of:

- *Satisfaction by suppliers and buyers with their profits* generated within a network (MEDLIN, 2006).

[14] Although several authors point to improvement of the economic efficiency as the main driver of vertical cooperation (MÖLLER and SVAHN, 2003; MÖLLER et al., 2005), my measures of network-level goals are primarily associated with quality. The main reason for this was the unwillingness of respondents to speak about the issues such as profitability of cooperation, financial status of the partners, etc. I experienced this both in my expert interviews where I interrogated several managers of agri-food companies and in the interviews with the German fish retailers. The respondents mainly referred to the commercial confidentiality when I asked them about their profits gained in cooperation with supply chain partners. However, given the increasing requirements towards quality by the end consumers, the selected measures can be regarded as appropriate. Furthermore, the economic efficiency can be considered as the driver of cooperation that originates at the firm level. Thus, I have included satisfaction with profits as the measure of a firm-level goal.

- *Satisfaction by suppliers and buyers with knowledge* gained in a network (SCHREINER et al., 2009).
- *Satisfaction by suppliers and buyers with* reputation from cooperation in a network (SCHREINER et al., 2009).

These items were used in the survey of managers of the branded food manufacturing companies in Ukraine. Although the responses can be to some degree biased given the interest in the assessment of goal achievement by other network members, the answers received from the focal firm seem to be a sufficient measure because it acts as the strategic center of the supply chain network that is knowledgeable to a great extent about goals pursued in the network.

In each case, a four-point scale measuring the informants' assessment from "very dissatisfied" to "very satisfied" was employed. I used a four-point scale to make the respondents to choose one way or another. This is in order to avoid the social desirability bias, arising from respondents' desires to 1) please the interviewer or 2) appear helpful or 3) not be seen to give what they perceive to be a socially unacceptable answer (GARLAND, 1991)[15].

Measures of the fulfillment of tasks of chain management

The tasks of chain management include the cooperation task of the alignment of interests and the coordination task of the alignment of actions. The achievement of *interest alignment* was operationalized by the following measures:

- *The focal company's confidence in reliability of the partners* (SCHREINER et al., 2009), i.e. certainty that the partners will perform their tasks appropriately over a long term.
- The focal company's assessment of *the extent of suppliers' and customers' relation-specific investments* that indicates the degree to which suppliers and customers abstain from behaving opportunistically, i.e. are committed to and trust in relationships in the network (DYER and SINGH, 1998).
- *The focal company's satisfaction with communication within a network*. It has been used as a measure of interest alignment because it shows to what extent the network members are open to work together and perceive the working relationships as good (MOHR and SPEKMAN, 1994).

The *alignment of actions* was measured by:

- *The focal company's satisfaction with suppliers' and customers' willingness to perform their operational tasks*.

[15] The questionnaire also included a "don't know" option to identify whether the respondents are aware of concrete issues raised in the questionnaire. The "don't know" answers were then coded as missing values (SCHWEIKERT, 2006).

- *The focal company's satisfaction with suppliers' and customers' responsiveness* (HANDFIELD and BECHTEL, 2002) to the requests by the focal company concerning issues such as the timeliness of delivery by suppliers, correctness of merchandizing services, timeliness of payments for the supplied products by customers, etc.

Among other things, these items indicate the level of action synchronization in the network which reflects the extent to which network members are capable of generating rents from the routines developed in the network (KALE et al., 2002). In addition, synchronized actions are important to avoid coordination costs (GULATI et al., 2005).

A four-point scale measuring the focal firms' assessment from "very dissatisfied" to "very satisfied" or from "strongly disagree" to "strongly agree" was employed to operationalize the alignment of interests and the alignment of actions (see Appendix 2).

Measures of the network structural characteristics

As mentioned in subsection 4.2.2, the supply chain network's structural characteristics encompass the level of transparency of the network to the focal firm, and the level of interdependence between the focal company and its direct partners as well as between other network members. The *level of transparency* was measured by:

- *The focal company's degree of awareness of the decision rules adopted by its suppliers and customers* (CHOI and KIM, 2008).
- *The focal company's degree of awareness of the decision rules adopted by its suppliers' suppliers and its customers' customers* (CHOI and KIM, 2008).

The measures of the *level of interdependence* were drawn from MOHR and SPEKMAN (1994) and ROWLEY et al. (2000). They included:

- *The extent to which the focal firm is able to easily substitute its suppliers and customers* (reverse coded).
- *The extent to which suppliers and customers are able to substitute the focal firm* with another company (reverse coded).
- *The extent of dependence between the operational decisions* of the focal company's suppliers on the one hand and customers on the other.

For both, the level of transparency and the level of interdependence, four-point scales from "strongly disagree" to "strongly agree" were used (see Appendix 2).

Measures of the network membership characteristics

The *level of complementarities* between network members was measured by:

- *The cultural fit* between the focal company and its suppliers and customers (PARK and UNGSON, 2001).

- *The strategic fit* between the focal company and its suppliers and customers (PARK and UNGSON, 2001).

The *level of coordination capabilities* was operationalized by:

- *The suppliers' and customers' agreement on task distribution* (SCHREINER et al., 2009).
- *The ability to adopt the focal company's standards* (SCHREINER et al., 2009).

For both, the level of complementarities and the level of coordination capabilities, I used a four-point scale from "strongly disagree" to "strongly agree" (see Appendix 2).

Measures of tie modalities

I measured *the level of trustful relationships* by:

- *The focal firm's willingness to always inform its suppliers and customers about future steps in cooperation* (MOHR and SPEKMAN, 1994).
- *The suppliers' and buyers' perception of favorability of participation in a network* (MOHR and SPEKMAN, 1994).

The *level of use of non-coercive power* was measured by:

- *The frequency of placing bonuses to suppliers and customers by the focal company* (PAYAN and MCFARLAND, 2005).
- *The frequency of providing recommendations to suppliers and customers by the focal company* (PAYAN and MCFARLAND, 2005).

For the level of trustful relationships, a four-point scale measuring the informants' assessment from "strongly disagree" to "strongly agree" was employed; the level of use of non-coercive power was measured by a four-point scale from "very infrequently" to "very frequently" (see Appendix 2).

5.2.3 Survey in the Ukrainian agri-food business

To conduct the survey in the Ukrainian agri-food business, telephone interviews were used. Data was collected from both purchasing and sales managers of the top (i.e. strategic) level of the branded food manufacturers in Ukraine from September 2009 to November 2009. I assume a branded food manufacturer to be a focal company in a supply chain network of firms that work together to bring the branded product to the market. The branded food manufacturer is responsible for the attributes of the branded product and, therefore, its top managers are knowledgeable about the network to a large extent.

To control for the level of awareness of the supply chain networks by the managers, I have asked them to evaluate the following statements (which were also included in the questionnaire): a) "Our company feels responsible to coordinate the flow of this product from stable to table"; b) "To deliver this product to the market, we are working with the same suppliers and buyers for a long term"; c)

"We are knowledgeable enough about characteristics of our suppliers and buyers so that we can react quickly on the disruptions of the product flow caused consciously or unconsciously by our suppliers or buyers." If a manager indicated the score less than three on the four-point scale (1 = "strongly disagree" and 4 = "strongly agree"), then it was decided to approach another, "more appropriate" company which would exhibit the features of the focal company more clearly.

The database of the firms to be surveyed was obtained from the local-based market research company. In total, 359 firms comprised the database[16]. Of the 359 branded food processing companies, 106 interviews with both purchasing and sales managers of the top (i.e. strategic) level were conducted. However, five questionnaires were put aside because five of the interviewed managers represented vertically integrated companies and, consequently, data on cooperation with either suppliers or buyers was missing. Thus, overall, the active sample comprised 101 filled questionnaires. This resulted in a 28 % response rate. Each interview lasted about 20 minutes on average.

Distribution of the surveyed companies by product groups and the number of key supply chain partners is presented in Table 5-3. The surveyed companies involved local-based and foreign branded food processors including also well-known international brands. All interviewed managers have indicated that their companies have key partners with whom they work for more than one year. All interviewed managers have stressed that cooperation with key partners as well as with other partners is based on written contracts. Many of the respondents occupied the position of Key Partner Cooperation Director, which indicates that the firms are aware of importance of interfirm cooperation for the success of their brands. Especially, the position of this kind is common in foreign enterprises.

Table 5-3: Product groups and the average number of key supply chain partners per company

Product	Number of surveyed companies	Average number of key supply chain partners per company					
		Agriculture/ Fisheries	Additives	Packaging	Logistics	Wholesale	Retail
Fish	14	12	4	3	1	13	9
Plant oil	9	18	10	7	1	15	13
Bakery/Pasta	30	13	3	3	1	11	10
Meat	16	15	10	4	1	11	15
Dairy	16	18	7	6	2	13	14
Confectionery	16	9	10	4	1	8	12

Source: Own performance.

[16] According to the same local-based market research company, there were 627 branded food manufacturing companies in Ukraine at the time of interviews.

Having collected the data, I became an opportunity to test the model. The next section presents the statistical technique used for model testing.

5.3 Path analysis by means of Partial Least Squares

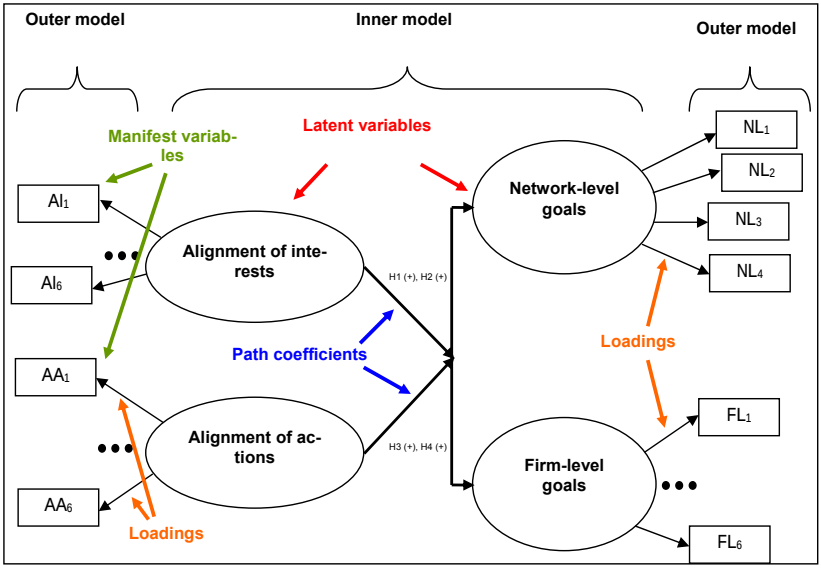
To test the model, I used the Partial Least Squares (PLS) technique for Structural Equation Modeling (WOLD, 1982). In this section, I explain why I decided to use PLS, and describe the features and the basic algorithm of PLS and how the results of the PLS path analysis have to be evaluated.

5.3.1 Why testing the model of goal achievement with PLS

Structural Equation Modeling (SEM) techniques such as LISREL and PLS are second generation data analysis techniques (BAGOZZI and FORNELL, 1982). Overall, SEM techniques test for statistical conclusion validity (GEFEN et al., 2000). Contrary to first generation statistical tools such as regression, SEM enables researchers to answer a set of interrelated research questions in single, systematic and comprehensive analysis by modeling the relationships among multiple independent and dependent constructs simultaneously (GERBING and ANDERSON, 1988). This capability for simultaneous analysis differs from most first generation regression models such as linear regression, LOGIT, ANOVA, and MANOVA, which can analyze only one layer of linkages between independent and dependent variables at a time (GEFEN et al., 2000: 4).

Using first generation regression models two unrelated analyses are required: 1) examining how the items load on the constructs via factor analysis, and then, 2) a separate examination of the hypothesized paths, run independently of these factor loadings. SEM permits complicated variable relationships to be expressed through hierarchical or non-hierarchical, recursive or non-recursive structural equations, to present a more complete picture of the entire model (BULLOCK et al., 1994). The intricate causal networks enabled by SEM characterize real-world processes better than simple correlation-based models. Therefore, SEM is more suited for the mathematical modeling of complex processes to serve both theory and practice (GEFEN et al., 2000).

Figure 5-5: Structural (inner) and measurement (outer) model in SEM



Source: Own performance.

Unlike first generation regression tools, SEM not only assesses the structural (inner) model – the assumed causation among a set of dependent and independent constructs – but, in the same analysis, also evaluates the measurement (outer) model – loadings of observed items (measurements) on their expected latent variables (constructs). As it can be seen in Figure 4-2 (p. 77), my model involves 10 latent variables (constructs), which are operationalized by respective items (manifest variables) as described in subsection 5.2.2 and systemized in Appendix 2. In Figure 5-5, I present an excerpt of my model to indicate the measurement (outer) and the structural (inner) model.

The combined analysis of the measurement and the structural model enables measurement errors of the observed variables to be analyzed as an integral part of the model, and factor analysis to be combined with the hypotheses testing. The result is a more rigorous analysis of the proposed research model and, very often, a better methodological assessment tool. Thus, in SEM, factor analysis and hypotheses are tested in the same analysis. SEM techniques also provide fuller information about the extent to which the research model is supported by the data than in regression techniques (GEFEN et al., 2000: 5).

My decision to use the PLS technique was based on the fact that, in contrast to such covariance-based approaches as LISREL, the variance-based PLS approach is adequate for causal modeling applications whose purpose is prediction and/or theory

building. Given that the achievement of network-level goals is a new construct included into analysis and the effects of the alignment of interests and alignment of actions on this construct have not been tested up to now, PLS seems to be a suitable approach. Additionally, the simultaneous effects of the alignment of interests and alignment of actions on both network-level and firm-level goals have not been analyzed before. Furthermore, scholars have rarely addressed the conditions under which interest alignment can generate competitive advantage (GOTTSCHALG and ZOLLO, 2007). Thus, by modeling the effects of the specific network conditions, i.e. network structural characteristics, network member characteristics and tie modality on the constructs of the alignment of interests and the alignment of actions, I also contribute to theory building.

5.3.2 The PLS algorithm and its main features

Although PLS path modeling can be used also for theory confirmation, it assumes that all measured variance is useful for explanations in applications and indicates the causal relationships with significant effect (SARKAR et al., 2001). Thus, parameter estimates are obtained based on the ability to minimize the residual variances of dependent variables (both latent and manifest variables). Since PLS estimates the latent variables as exact linear combinations of the manifest measures, it avoids the indeterminacy problem and provides an exact definition of component scores. Using the iterative estimation technique, the PLS approach provides a general model which encompasses canonical correlation, redundancy analysis, multiple regression, multivariate analysis of variance, and principle components. Because the iterative algorithm generally consists of a series of ordinary least squares analyses, identification is not a problem for recursive models nor does it presume any distributional form for measured variables (CHIN, 1998).

Numerous authors (e.g., FALK and MILLER, 1992; CHIN, 1998) have systemized advantages of PLS as compared to covariance-based SEM techniques. The summary is as follows:

- PLS delivers latent variable scores, i.e. proxies of the constructs, which are measured by one or several indicators (manifest variables);
- PLS path modeling avoids small sample size problems and can therefore be applied in some situations when other methods cannot;
- PLS path modeling can estimate very complex models with many latent and manifest variables;
- PLS path modeling has less stringent assumptions about the distribution of variables and error terms; and
- PLS can handle both reflective and formative measurement models.

As it is generally the case with SEM, PLS path models are formally defined by two sets of linear equations: the structural model and the measurement model. The structural model specifies the relationships between latent variables, whereas

the outer model specifies the relationships between a latent variable and its manifest variables. The structural model for relationships between latent variables can be specified as follows (HENSELER et al., 2009):

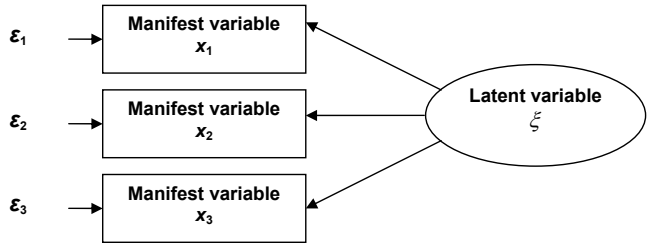
$$\xi = B\xi + \zeta \qquad (1)$$

where ξ is the vector of latent variables, B denotes the matrix of coefficients of their relationships, and ζ represents the structural model residuals. The basic PLS design assumes a recursive structural model that is subject to predictor specification. Thus, the structural model constitutes a causal chain system (i.e. with uncorrelated residuals and without correlations between the residual term of a certain endogenous latent variable and its explanatory latent variables). Predictor specification reduces Equation (1) to:

$$(\xi \mid \xi) = B\xi \qquad (2)$$

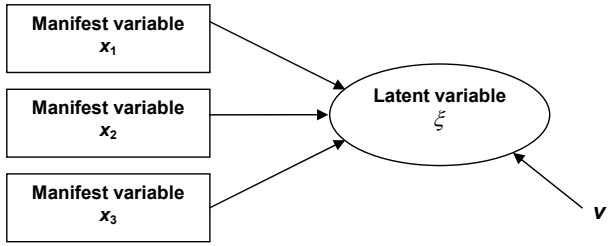
PLS path modeling includes two different kinds of measurement models: reflective and formative measurement models. The reflective mode has causal relationships from the latent variable to the manifest variables in its block (Figure 5-6), whereas the formative mode of a measurement model has causal relationships from the manifest variables to the latent variables (Figure 5-7). The selection of a certain measurement mode is subject to theoretical reasoning (DIAMANTOPOULOS and WINKLHOFER, 2001).

Figure 5-6: Reflective measurement model



Source: HSU et al. (2006).

Figure 5-7: Formative measurement model



Source: HSU et al. (2006).

With regard to my model of supply chain network success (Figure 4-2, p. 77), the reflective mode has been chosen. Generally, the reason for this is the intention to identify the existing conditions (not the processes) under which the alignment of interests and the alignment of actions enable the achievement of both network-level and firm-level goals. If the processes needed to achieve the interest and action alignment were under scrutiny, then the direction of causality would change, implying that the formative mode of the measurement model has to be used. Furthermore, some of these processes will be discussed in the Chapter 6 based on some of the findings of the model testing.

Further reasons for choosing the reflective mode were of statistical character. First, I was concerned about availability of data needed to produce the robust results. As it will be explained below, the reflective mode implies the less strict rule-of-thumb. Second, the reflective mode implicitly solves the problem of multicollinearity. In PLS models, it is assumed that the correlations between indicators are fully ascribed to their constructs. Therefore, multicollinearity plays no role. If one selected the formative measurement mode, this would lead to the multicollinearity problems in respective multiple regressions per construct (ALBERS and HILDEBRANDT, 2006; HERRMANN et al., 2006).

The reflective measurement model has its roots in classical test theory and psychometrics (NUNNALLY and BERNSTEIN, 1994). Each indicator represents an error-afflicted measurement of the latent variable. The direction of causality is from the construct to the indicators; thus, observed measures are assumed to reflect variation in the latent variable. In other words, changes in the construct are expected to be manifested in changes in all of its indicators (Figure 5-6). If one selects the reflective mode of a measurement model, each manifest variable in a certain measurement model is assumed to be generated as a linear function of its latent variable and the residual ε (HENSELER et al., 2009):

$$X_x = \Lambda_x \xi + \varepsilon_x \qquad (3)$$

where Λ represents the loading (pattern) coefficients. The measurement (outer) relationships are also subject to predictor specification – implying that there are no correlations between the outer residuals and the latent variable of the same block – that reduces Equation (3) to:

$$(X_x \mid \xi) = \Lambda_x \xi \qquad (4)$$

LOHMÖLLER (1989) identifies the following stages of the basic PLS algorithm:

1) Iterative estimation of latent variable scores, consisting of a four-step iterative procedure that is repeated until convergence is obtained:

- outer approximation of the latent variable scores,
- estimation of the inner weights,
- inner approximation of the latent variable scores, and

- estimation of the outer weights.

2) Estimation of outer weights/loading and path coefficients.

3) Estimation of location parameters.

TENENHAUS et al. (2005) describe these stages in greater detail. In step 1 of stage 1, outer proxies of the latent variables are calculated as linear combinations of their respective indicators. These outer proxies are standardized, i.e. they have a mean of 0 and a standard deviation of 1. The weights of the linear combinations result from step 4 of the previous iteration. When the algorithm is initialized, and no weights are available yet, any arbitrary nontrivial linear combination of indicators can serve as an outer proxy of a latent variable.

In the second step, inner weights are calculated for each latent variable in order to reflect how strongly the other latent variables are connected to it. There are three schemes for determining the inner weights: a) the centroid scheme (WOLD, 1982), b) the factor weighting scheme, and c) the path weighting scheme, both developed by LOHMÖLLER (1989). The centroid scheme uses the sign of the correlations between a latent variable – or, more precisely, the outer proxy – and its adjacent latent variables. The factor weighting scheme uses the correlations. The path weighting scheme which is used in this thesis pays tribute to the arrow orientations in the path model. The weights of those latent variables that explain the focal latent variable are set to the regression coefficients stemming from a regression of the focal latent variable (regressant) on its latent regressor variables. The weights of those latent variables, which are explained by the focal latent variable, are determined in a similar manner as in the factor weighting scheme. Regardless of the weighting scheme, a weight of zero is assigned to all nonadjacent latent variables (HENSELER et al., 2009).

Step 3 involves calculation of the latent variables' inner proxies as linear combinations of the outer proxies of their respective adjacent latent variables, using the aforedetermined inner weights. Furthermore, in step 4, the outer weights are calculated either as the co-variances between the inner proxy of each latent variable and its indicators (in the reflective mode), or as the regression weights resulting from the ordinary least squares regression of the inner proxy of each latent variable on its indicators (in the formative mode) (HENSELER et al., 2009).

These four steps are repeated until the change in outer weights between two iterations drops below a predefined limit. The algorithm terminates after step 1, delivering latent variable scores for all latent variables. Loadings and inner regression coefficients are then calculated in a straightforward way, given the constructed indices and using Equation (4). Manifest variables that do not significantly reflect variation in the respective latent variables are progressively removed and the analysis is repeated until all the manifest variables are significant. In order to determine the path coefficients, for each endogenous latent variable a (multiple) linear regression is conducted (GYAU and SPILLER, 2009).

PLS has an advantage over other SEM techniques regarding the sample size. For example, TENENHAUS et al. (2005) maintain that there can be more variables than observations and there may be a small amount of data that are missing completely at random. In the most extreme case, WOLD (1989) has analyzed a path model based on a data set consisting of 10 observations and 27 manifest variables, thus illustrating that the sample size requirement is low. CHIN and NEWSTED (1999) have shown that the PLS path modeling approach can provide information about the appropriateness of indicators at sample size as low as 20. This study confirms the consistency at large on loading estimates with increased numbers of observations and numbers of manifest variables per measurement model. A rule of thumb for robust PLS path modeling estimations suggests that the sample size be equal to the larger of the following (BARKLAY et al., 1995; CHIN, 1998): 1) ten times the number of indicators of the scale with the largest number of formative indicators, or 2) ten times the largest number of structural paths directed at a particular construct in the structural (inner) path model.

However, HENSELER et al. (2009) emphasize that the claim that PLS is more efficient at small sample size is misleading as it asks for accuracy instead of statistical power. The generally accepted ten times rule of thumb for the minimum sample size in PLS analyses can lead to unacceptably low levels of statistical power. Nevertheless, the critics of PLS (e.g., MARCOULIDES and SAUNDERS, 2006) agree also that PLS path modeling is a convenient and powerful technique that is appropriate for many research situations such as complex research models with sample sizes that would be too small for covariance-based SEM techniques. Thus, overall, the appropriate sample size has to be assured and researchers look for new solutions to this problem. For instance, GYAU and SPILLER (2009) have applied the first condition of the rule of thumb to the *reflective* indicators too, i.e. they have used the rule of ten times the number of indicators of the scale with the largest number of *reflective* indicators.

As mentioned above, my model involves a reflective measurement model. The number of observations obtained for the analysis of the model is 101. Hence, this meets the above conditions of the rule of thumb: the number of observations is larger than 1) ten times the number of indicators of the scale with the largest number of reflective indicators (6x10=60), and 2) ten times the largest number of structural paths directed at a particular construct in the inner path model (3x10=30).

5.3.3 Evaluation of PLS results

Evaluation of the results of the PLS path model involves two steps: 1) the assessment of the measurement (outer) model and 2) the assessment of the structural (inner) model (CHIN, 1998).

The assessment of the measurement (outer) model

Reflective *measurement* models (as in the case with my model) should be assessed with regard to their reliability and validity. The respective criteria are presented in Table 5-4.

Table 5-4: Assessing reflective measurement model

Criterion	Description
Cronbach's α	$\alpha = k \times \bar{r} / 1 + (k-1) \times \bar{r}$, where k is the number of indicators, and $\bar{r}$ is a mean of the inter-item correlations. Cronbach's α is a measure of internal consistency and must not be lower than 0.6.
Composite reliability (ρ_c)	$\rho_c = (\sum \lambda_i)^2 / [(\sum \lambda_i)^2 + \sum Var(\varepsilon_i)]$, where λ_i is the outer (component) loading to an indicator, and $Var(\varepsilon_i) = 1 - \lambda_i^2$ in case of standardized indicators. The composite reliability is a measure of internal consistency and must not be lower than 0.6.
Average variance extracted (AVE)	AVE = $(\sum \lambda_i^2) / [\sum \lambda_i^2 + \sum Var(\varepsilon_i)]$, where λ_i is the component loading to an indicator and $Var(\varepsilon_i) = 1 - \lambda_i^2$ in case of standardized indicators. The average variance extracted should be higher than 0.5.
Fornell-Larcker criterion	In order to ensure discriminant validity, the AVE of each latent variable should be higher than the squared correlations with all other latent variables. Thereby, each latent variable shares more variance with its own block of indicators than with another latent variable representing a different block of indicators.
Cross-loadings	Cross-loadings offer another check for discriminant validity. If an indicator has a higher correlation with another latent variable than with its respective latent variable, the appropriateness of the model should be reconsidered.

Source: HENSELER et al. (2009).

The first criterion which is checked is internal consistency reliability by means of Cronbach's α (CHRONBACH, 1970). This criterion provides an estimate for the reliability based on the indicator intercorrelations. While Cronbach's α assumes that all indicators are equally reliable, PLS prioritizes indicators according to their reliability, resulting in a more reliable composite. As Cronbach's α tends to provide a severe underestimation of the internal consistency reliability of latent variables in PLS path models, it is more appropriate to apply the composite reliability measure (WERTS et al., 1974). The composite reliability takes into account that indicators have different loadings, and can be interpreted in the same way as Cronbach's α. No matter which particular reliability coefficient is used, an internal consistency reliability value above 0.7 is regarded as satisfactory, whereas a value below 0.6 indicates a lack of reliability (GYAU and SPILLER, 2009).

As the reliability of indicators varies, the reliability of each indicator should be assessed. A latent variable should explain a substantial part of each indicator's variance (usually at least 50 %). Accordingly, the absolute correlations between a construct and each of its manifest variables (i.e. the absolute standardized outer loadings) should be higher than 0.7 ($\approx\sqrt{0.5}$). Some authors (e.g., HAIR et al., 1998) recommend eliminating reflective indicators from measurement models if their outer standardized loadings are smaller than 0.4.

The assessment of validity involves examination of two validity subtypes: the convergent validity and the discriminant validity (GYAU and SPILLER, 2009). Convergent validity shows that a set of indicators represents one and the same underlying construct. The criterion for estimation of convergent validity is average variance extracted (AVE) (FORNELL and LARCKER, 1981). An AVE value of at least 0.5 indicates sufficient convergent validity, meaning that a latent variable is able to explain more than half of the variance of its indicators on average.

The discriminant validity measures include the Fornell-Larcker criterion and the cross-loadings. The Fornell-Larcker criterion (FORNELL and LARCKER, 1981) postulates that a latent variable shares more variance with its assigned indicators than with any other latent variable. In statistical terms, the AVE of each latent variable should be greater than the latent variable's highest squared correlation with any other latent variable. The second criterion of discriminant validity postulates that the loading of each indicator is expected to be greater than all of its cross-loadings. Although the Fornell-Larcker criterion assesses discriminant validity on the construct level, the cross-loadings allow this kind of evaluation on the indicator level (HENSELER et al., 2009).

The assessment of the structural (inner) model

Reliable and valid measurement model estimations permit an evaluation of the structural path model estimates. The essential criterion for this assessment is the coefficient of determination (R^2) of the endogenous latent variables (Table 5-5). In PLS path models, R^2 values of 0.67, 0.33, and 0.19 can be regarded as substantial, moderate, and weak, respectively (CHIN, 1998).

The individual path coefficients of the PLS structural model can be interpreted as standardized beta coefficients of ordinary least squares regressions. Structural paths, whose sign is in keeping with *a priori* hypothesized signs, provide a partial empirical validation of the theoretically assumed relationships between latent variables. Paths that possess an algebraic sign contrary to expectations do not support the *a priori* formulated hypotheses. In order to determine the confidence intervals of the path coefficients and statistical inference, resampling techniques such as bootstrapping should be used (TENENHAUS et al., 2005).

Table 5-5: Assessing structural model

Criterion	Description
R^2 of endogenous latent variables	R^2 values of 0.67, 0.33, or 0.19 for endogenous latent variables in the inner path model can be considered as substantial, moderate, or weak
Estimates for path coefficients	The estimated values for path relationships in the structural model should be evaluated in terms of sign, magnitude, and significance (the latter via bootstrapping)

Source: HENSELER et al. (2009).

The nonparametric bootstrap procedure can be used in PLS path modeling to provide confidence intervals for all parameter estimates, building the basis for statistical inference. More information about the bootstrap procedure can be found in e.g. DAVISON and HINKLEY (2003) or TENENHAUS et al. (2005). In general, the bootstrap procedure provides an estimate of the shape, spread, and bias of the sampling distribution of a specific statistic (HENSELER et al., 2009). Bootstrapping treats the observed sample as if it represents the population. The procedure creates a large, prespecified number of bootstrap samples (e.g. 200). Each bootstrap sample should have the same number of cases as the original sample. Bootstrap samples are created by randomly drawing cases with replacement from the original sample.

PLS estimates the path model for each bootstrap sample. The obtained path model coefficients form a bootstrap distribution, which can be viewed as an approximation of the sampling distribution. The bootstrapping analysis allows for the statistical testing of the hypothesis H_0: $w = 0$ (w can be any parameter estimated by PLS) against the alternative hypothesis H_1: $w \neq 0$ at $m + n - 2$ degrees of freedom (where m is the number of PLS estimates for w in the original sample, which is 1; n is the number of bootstrap estimates for w, e.g. 200). The PLS results for all bootstrap samples provide the mean value and standard error for each path model coefficient (HENSELER et al., 2009). This enables a t-test to be performed for significance of path model relationships at a certain significance interval.

5.4 Results of testing the model of goal achievement in supply chain networks

In this section, I test my model and present the estimated results. For model testing, the SmartPLS software 2.0.1 (RINGLE et al., 2005) was employed (see Appendix 3 for the graphical presentation of calculations in SmartPLS).

5.4.1 Testing the measurement model

As mentioned in subsection 5.3.3, the fit of the model in PLS is evaluated with regard to the structural (inner) and the measurement (outer) models. Individual item reliabilities and convergent validity of the model provide information about the fit of the measurement (outer) model. The individual item reliabilities are evaluated via the factor loadings of the items on their constructs. According to HAIR et al. (1998), an

item is considered insignificant and removed from the model if its factor loading is less than 0.4. Based on this criterion, the measurement model generally demonstrates a good fit (see Appendix 4). In particular, the construct of network-level goals demonstrates high reliability and validity of the items. Of the 48 items used to operationalize the latent variables in the model, 7 were removed. Table 5-6 demonstrates the removed items as well as their respective latent constructs.

Table 5-6: The items removed from the model as insignificant

Item	Respective construct
To what extent do you think your current *customers* are satisfied with knowledge received from your company?	Achievement of firm-level goals
To what extent do you think your current *customers* are satisfied with reputation of working together with your company?	Achievement of firm-level goals
How satisfied are you with the mutual information exchange with your current *customers*?	Alignment of interests
Most of our *suppliers* know what they have to do to meet our standards	Level of coordination capabilities
How often do you provide your *customers* with specific recommendations that help them meet your requirements?	Level of use of non-coercive power
We are knowledgeable enough about decision-making styles of our *customers*	Level of transparency
If it was necessary, we could substitute our *customers* quite easily	Level of interdependence

Source: Own performance.

I also calculated the Cronbach's α and composite reliability criteria to evaluate internal consistency of the measurements. The Cronbach's α measures exceed the recommended criterion of 0.7 for all constructs except for the constructs of alignment of interests, alignment of actions, level of coordination capabilities, and level of transparency (see Table 5-7 and Appendix 4).

However, the composite reliability index is more reliable in assessing convergent validity because it takes into account the relative weights of the various indicators in a latent construct while Cronbach's α assumes equal weights (GYAU and SPILLER, 2009). Thus, because all the composite reliability indices are above 0.7 (see Table 5-7 and Appendix 4), I made a decision based on the composite reliability indices and retained the constructs of alignment of interests, alignment of actions, level of coordination capabilities and level of transparency in the analysis.

The convergent validity was estimated by calculating the AVE scores. The recommended threshold of 0.5 (BAGOZZI and YI, 1988) was exceeded for all the constructs indicating that the chosen indicators are explained by their respective constructs (see Table 5-7 and Appendix 4).

Table 5-7: Results of the assessment of the measurement model: Cronbach's α, Composite Reliability, and AVE

Latent variables	Cronbach's α	Composite Reliability	AVE
Achievement of network-level goals	0.796	0.760	0.643
Achievement of firm-level goals	0.749	0.745	0.563
Alignment of interests	0.645	0.755	0.593
Alignment of actions	0.640	0.770	0.561
Level of complementarities	0.835	0.782	0.504
Level of coordination capabilities	0.574	0.746	0.564
Level of use of non-coercive power	0.770	0.807	0.559
Level of trustful relationships	0.796	0.856	0.603
Level of transparency	0.641	0.731	0.532
Level of interdependence	0.717	0.738	0.532

Source: Own performance.

5.4.2 Testing the structural model

The fit of the structural (inner) model was evaluated by the discriminant validity criterion which means that every construct is significantly different from the others. The first way to analyze discriminant validity is a comparison of item loadings and cross loadings. If all loadings are higher than cross loadings, then the construct significantly differs from the others. The results of the comparison of loadings of the remaining items with the cross loadings indicate a good fit of the structural model (see Appendix 5).

The second way to assess discriminant validity is to compare the square root of the AVE with the correlation between the construct and the other constructs. The square root of the AVE should be higher than the correlation between the constructs (GYAU and SPILLER, 2009). The results of this comparison also support the fit of the inner model (Table 5-8).

Table 5-8: Results of the assessment of the structural model: Correlations of the latent variables and the AVE square roots

	AA[1]	AI	C	CC	FL	I	NL	P	TR	T
AA	**0.749**									
AI	0.033	**0.770**								
C	0.176	0.205	**0.710**							
CC	0.408	0.167	0.351	**0.751**						
FL	0.407	0.195	0.045	0.181	**0.750**					
I	-0.405	-0.177	-0.065	-0.413	-0.292	**0.729**				
NL	0.678	0.308	-0.027	0.194	0.526	-0.238	**0.802**			
P	0.137	0.301	0.083	0.052	-0.021	0.078	0.142	**0.748**		
TR	0.147	0.275	-0.040	0.112	0.089	0.012	0.305	0.206	**0.729**	
T	-0.191	0.384	-0.092	-0.174	0.163	0.018	0.030	-0.114	0.034	**0.777**

Source: Own performance.

Notes: [1]AA – alignment of actions; AI – alignment of interests; C – level of complementarities; CC – level of coordination capabilities; FL – achievement of firm-level goals; I – level of interdependence; NL – achievement of network-level goals; P – level of non-coercive power use; TR – level of transparency; T – level of trustful relationships.

The structural model was evaluated based on the R^2 and the significance of the path coefficients. The variances explained (R^2) for each of the endogenous variables were as follows: achievement of network-level goals 0.542, achievement of firm-level goals 0.199, alignment of interests 0.305, and alignment of actions 0.237 (see numbers within the ellipses of respective constructs in Figure 5-8 and Appendix 3). Considering the complexity of the research model, the results are indicating a good fit. Rather low R^2 values for the achievement of firm-level goals and the alignment of actions can be caused not only by the complex nature or manifold determinants of these constructs but also by some inconsitency of the operationalization of these constructs. As the results in Table 5-6 demonstrate, this might particularly concern the construct of the achievement of firm-level goals.

To determine the significance of the path coefficients, FALK and MILLER (1992) have recommended multiplying the standardized path coefficients by the correlation coefficient between the latent variables as an approximate measure of the variance of the construct explained by the latent predictive variable. Using this approach, one might consider values of less than 1.5 % as not making significant contribution to their respective latent variables (GYAU and SPILLER, 2009: 30). Thus, I accepted eight out of the ten hypotheses that were formulated. Namely, the hypothesis H7 could not be accepted based on this criterion, whereas the hypothesis H6 was rejected because of an unexpected sign obtained. The result is shown in Table 5-9.

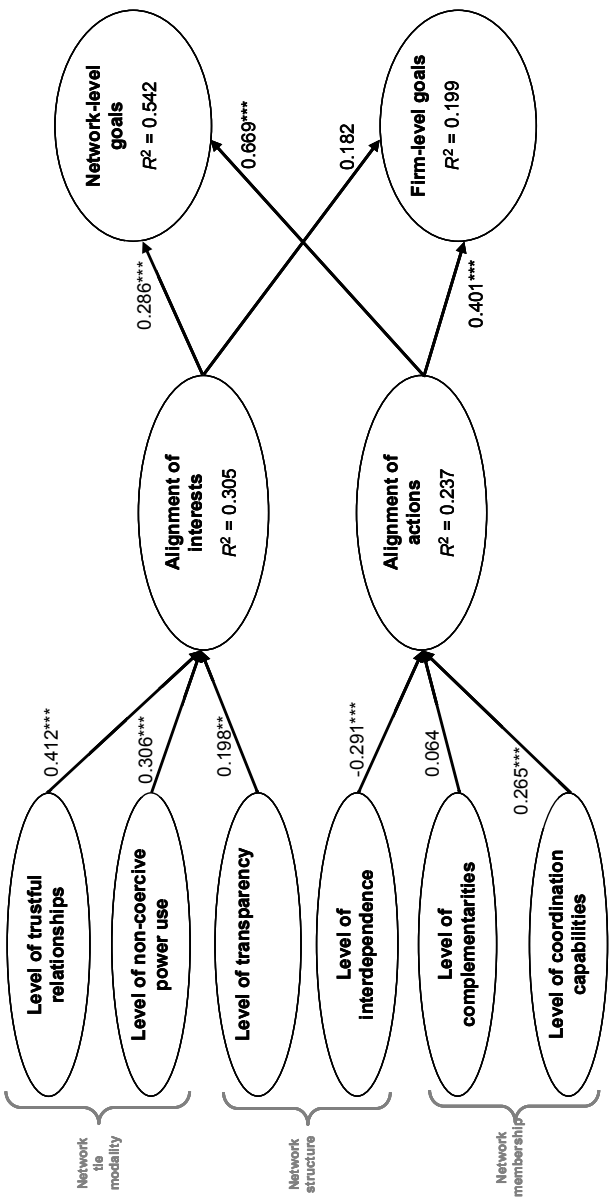
I have used bootstrap method with 200 re-sampling to define how significant the path coefficients are. The path coefficients and their significance based on t-values at the $p<0.05$ level are also shown in Table 5-9. Based on this criterion, I accepted seven out of the ten hypotheses that were formulated. Specifically, the hypotheses H2 and H7 could not be accepted because the contribution of the constructs of alignment of interests and level of complementarities was insignificant. Additionally, the hypothesis H6 was rejected due to the unexpected sign. Overall, by comparing the results by FALK and MILLER's (1992) method with those by the bootstrap method, one can postulate that the findings with respect to the hypothesis H2 have to be interpreted with some caution as they are controversial. I discuss the results in the next subsection.

Table 5-9: Results of the assessment of the structural model

Hypotheses	Constructs	Expected sign	Beta (path) coefficients (b)	Correlation coefficient (r)	b*r
H1	Alignment of interests → Network-level goals	+	0.286***	0.308	0.088
H2	Alignment of interests → Firm-level goals	+	0.182	0.195	0.035
H3	Alignment of actions → Network-level goals	+	0.669***	0.678	0.454
H4	Alignment of actions → Firm-level goals	+	0.401***	0.407	0.163
H5	Level of transparency → Alignment of interests	+	0. 198**	0.275	0.054
H6	Level of interdependence → Alignment of actions	+	-0.291***	-0.405	0.118
H7	Level of complementarities → Alignment of actions	+	0.064	0.176	0.011
H8	Level of coordination capabilities → Alignment of actions	+	0.265***	0.408	0.108
H9	Level of trustful relationships → Alignment of interests	+	0.412***	0.384	0.158
H10	Level of use of non-coercive power → Alignment of interests	+	0.306***	0.301	0.092

Source: Own performance.

Figure 5-8: Results of the model testing



Source: own performance

5.5 Discussion of the results

In this subsection, I discuss my empirical results that are presented in Table 5-9 and Figure 5-8. The results support the vast majority of my theoretical suppositions. In particular, the achievement of network-level goals is to a large extent explained by how properly both cooperation and coordination problems are solved by chain management. Thus, the results support the hypotheses H1 and H3 which state that the alignment of interests and the alignment of actions, respectively, have a positive effect on the achievement of network-level goals. This finding undersores the strategic value of viewing chain management as a multifaceted construct that consists of cooperation and coordination elements at the different levels. In particular, the alignment of actions has a strong and significant effect, emphasizing the role of a joint and responsive action in achieving collective goals.

The results also show unexpected findings enabled by the PLS property to analyze all the relationships in the model simultaneously. Calculations with regard to the hypothesis H2 produce controversial results but the tendency is that the alignment of interests has a small positive effect on the achievement of firm-level goals of the network members[17]. Importantly, this result contradicts the findings of the strategic management scholars, e.g. MENTZER et al. (2000), GULATI et al. (2005), GOTTSCHALG and ZOLLO (2007) and others who have observed large positive effects of interest alignment on the achievement of individual firm's goals. I explain this contradiction by the expanded theoretical focus from the dyadic level to the network level, i.e. by the presence of network-level goals in my model. Supposedly, the effect of the alignment of interests on the achievement of firm-level goals would be more significant if I analyzed the dyadic relationships. However, in the dyadic context, it is difficult to recognize the other connected relationships of the same network and, thus, to make complete conclusions about how the relationships should be organized. On account of this, my results show that the focal firm's efforts to align the interests in both downstream and upstream relationships have no much effect on the achievement of the individual firm-level goals of buyers and suppliers. The presence of network-level goals "distracts" the effect of the alignment of interests from the achievement of firm-level goals.

In this context, one should not forget the result of the expert interviews (subsection 5.1.2) that the suppliers in the Ukrainian agri-food business exhibit high levels of general cooperativeness, often regardless economic feasibility of cooperation.

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[17] COHEN (1988) proposes to evaluate the criterion of effect size for each effect in the path model. The effect size f^2 is calculated as the increase in R^2 relative to the proportion of variance of the endogenous latent variable that remains unexplained: $f^2 = (R^2_{included} - R^2_{excluded}) / (1 - R^2_{included})$. Values of 0.02, 0.15, and 0.35 signify small, medium, and large effects, respectively. To be able to better explain the effect of the alignment of interests on the achievement of firm-level goals, I have calculated its size: $f^2 = (0.542 - 0.479) / (1-0.542) = 0.14$. The value of $f^2 = 0.14$ indicates a small effect.

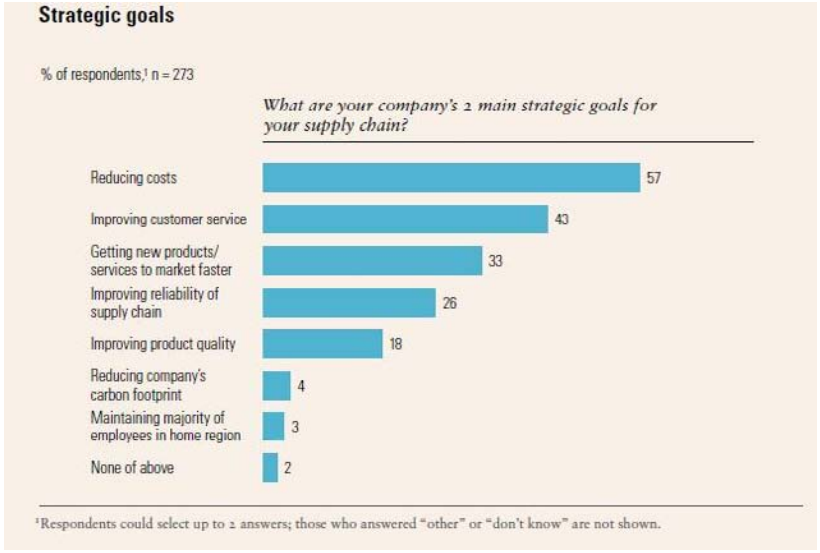
The focal firms, i.e. branded food manufacturers can use this condition to align the interests of the suppliers such that the achievement of firm-level goals of the suppliers is complicated. For example, they can require relationship-specific investments for establishment of sufficient infrastructure that makes it problematic for the suppliers to obtain profits from the relationships in the short run.

Furthermore, one has to take into account that the small effect of interest alignment on the achievement of firm-level goals appears if one also analyzes the effect of the alignment of actions. In my model, the alignment of actions has a significant positive effect on the achievement of firm-level goals. Thus, the hypothesis H4 is supported, indicating that the joint action as a collective construct is closely linked to individual constructs in business relationships (MEDLIN, 2006). This implies that the successful chain management has beneficial outcomes also at the firm level of suppliers and customers, although the respective effect (see path coefficients in Table 5-9 and Figure 5-8) is weaker at the firm level than at the network level.

Overall, the results of testing the hypotheses H1-H4 demonstrate that the constructs of strategic chain management have larger effects on the achievement of network-level goals than firm-level goals[18]. This conclusion contradicts the perceptions of strategic chain management by many top managers today. One can observe the contradiction by the example of the McKinsey's Global Supply Chain Survey (see Table 5-9). The results of this survey demonstrate that the managers reasonably consider improvement of the economic efficiency, i.e. cost reduction as one of the major goals in supply chains. However, the other strategic goals the managers define as most important for their supply chains can be regarded either as firm-level goals, e.g. reducing the company's carbon footprint, or as chain management tasks per se, i.e. improving customer service, improving reliability of supply chain, etc. In this context, I replicate the statement of one of my respondents in expert interviews who maintained that chain managers are to a great extent affected by the necessity to report about "successful numbers" to the corporate planners of their firms. As a result, chain managers must often deal with conflict between firm-level goals in supply chain networks and the corporate goals of their firms. This often leads to a distorted understanding of the destination of chain management.

[18] The results, however, must be accepted with some caution as I surveyed only focal firms. For example, the focal firm's suppliers or buyers could have expressed different opinions about satisfaction with achievement of their firm-level goals (KIM et al., 1999; EMILIANI, 2003). This limitation is caused by the strategic network approach I follow in this study by assuming that the focal firm is concerned with the management of the network and is, therefore, knowledgeable about goals pursued through the network.

Figure 5-9: The main strategic goals of supply chains as perceived by chain managers



Source: McKinsey (2008).

Further result can be regarded as surprising in my model. The alignment of actions is negatively affected by higher levels of interdependence and, thus, the hypothesis H6 is rejected. Although interdependence is usually addressed as enabler of collaboration (Doz et al., 2000; Schreiner et al., 2009), it is evident that the focal companies find higher dependence on the supply chain partners as unfavorable and try to have enough opportunities to substitute their partners.

In this regard, one has to take the specifics of the research setting into account. The result of the hypothesis H6 indicates that the issue of supplier and customer compliance is still severe in the Ukrainian agri-food business. Despite wide scope of vertical coordination practices and the growing use of chain management concepts, business environment in Ukraine is highly volatile with persisting infrastructural problems. This precludes interlocking of the actions of network members needed to capitalize on the specialized but interdependent activities. At the same time, as the results of the pretest in the German fish sector indicate, the situation can be quite different in stable business environments where companies are not afraid of engaging into a supportive action, establishing necessary routines, and making mutual adjustments on the distribution of tasks.

Furthermore, the negative effect of interdependence on the alignment of actions can be caused by the fact that the manifest variables reflect interdependencies in the *whole* supply chain network. Accordingly, higher dependence of the focal company

on the relationship with, e.g., supplier implies higher contingency upon volatilities in a supplier's relationships with its suppliers. Consequently, action alignment appears to be complicated. This conclusion is tribute to a growing interest in the structural embeddedness issues by the supply chain management scholars (CHOI and KIM, 2008) who emphasize that the buying companies should go beyond evaluating and managing suppliers as if the suppliers existed in isolation; instead they have to consider also the suppliers' suppliers. Especially this holds in the context of the following result.

The hypothesis H5 addressed the effect of another network structural characteristic, i.e. the level of transparency, on the alignment of interests. The hypothesis has been accepted, implying that higher levels of transparency have a significant positive effect on the alignment of interests. This result is consistent with the findings of DEIMEL et al. (2008) who have revealed that high levels of transparency are associated with partner commitment. Although the surveyed focal companies belong to the different sectors which, accordingly, exhibit (and often require)[19] different levels of chain transparency, the issue of transparency in the supply chain network has to be addressed at the strategic management level regardless the sector in which a firm operates. The reason is that transparency among partners enables transfer of valuable knowledge and precludes free-riding (DYER and SINGH, 1998).

Besides, interest alignment is subject to significant positive effects by higher levels of trustful relationships and non-coercive power as proposed by hypotheses H9 and H10, respectively. These results are consistent with the findings of earlier research if considered both separately and simultaneously. For example, HANDFIELD and BECHTEL (2002) have shown that trustful relationships have a significant effect on partner responsiveness, whereas LEONIDOU et al. (2008) have found that the exercise of non-coercive power is negatively related to conflict in interfirm working relationships. Additionally, HASANAGAS (2004) have illustrated that the stronger trust is, the more non-coercive power mechanisms become effective to achieve compliance of the partner.

The remaining hypotheses (H7 and H8) proposed that network members' complementarities and higher levels of coordination capabilities, respectively, have a

[19] DEIMEL et al. (2008) have compared transparency of the dairy and pork supply chains in Germany. They have found that the transparency profiles of the dairy and pork chains are quite different and that transparency is somewhat higher in the dairy chain than in the pork business. Compared to pork production, transparency in the dairy chain was positively influenced by a lower number of transaction partners and a tendency toward a longer-term governance structure in transactions due to more specific investments. Furthermore, the explicitness and clearness of information exchanged and the levels of trust and commitment were higher in the dairy sector. On the other hand, the pork chain has revealed advantages over the dairy chain due to higher satisfaction with supply chain partners' performance, a more balanced distribution of power between the partners, and a lower frequency of transactions.

direct positive effect on coordination. Only the latter of these constructs has a significant influence on the alignment of actions. The reason why high levels of complementarities have no significant effect can be of statistical nature. There is some inconsistency of operationalization of the latent construct: the manifest variables of the strategic fit between the focal company and its suppliers and customers have very low loadings on the construct (see Appendix 4). Another reason can be the fact that supply chain networks represent well-defined value systems (MÖLLER et al., 2005) where firms from different stages of the supply chain possess complementary resources and perform complementary tasks. The strategic complementarity (DYER and SINGH, 1998: 668) between network members is, thus, predefined, implying that the existing complementarities are well-known to members and can have only minor effect on the alignment of actions.

However, once a focal firm has partners with the requisite complementary strategic resources, a challenge is to develop organizational complementarity (DYER and SINGH, 1998: 668) – the organizational mechanisms necessary to enable the alignment of actions. In the case when the need for the development of organizational complementarity arises, one of the main factors the focal firm has to consider is the partners' coordination capabilities (KALE et al., 2002). The result with regard to the hypothesis H8 supports this proposition, indicating that the suppliers' and customers' abilities to work by standards and to identify and build consensus about task requirements contribute to successful resolution of coordination problems and establishment of a joint action. This result coincides with the findings of SCHREINER et al. (2009) who have confirmed the positive link between alliance management capability and joint action.

Overall, two general conclusions can be made based on the results of empirical analysis of my model. First, network-level goals must be considered alongside firm-level goals in supply chain networks. Network-level goals are subject to large effects on the part of chain management and have to be of particular interest for focal firms that are responsible for the development and implementation of the collective strategy.

Second, I postulate that supply chain networks in the Ukrainian agri-food business require modification of the "imported" chain management concepts. Although PLS does not allow for conclusions about the whole population, representativeness of the sample is not of high importance if the task is to examine the hypothesized relationships (BEREKOVEN et al., 1999; DIEKMANN, 1999). *The analysis of the hypothesized relationships in my model reveals that the investigated supply chain networks (the active sample of 101 respondents of 627 branded food manufacturers in Ukraine in total) are characterized by a negative effect of higher interdependence among members on the alignment of their actions. In line with the results of the in-depth expert interviews (subsection 5.1.2), this finding can be explained by high volatility of the business environment and infrastructural problems. Additionally, there might be a lack of capabilities by focal firms with*

regard to capturing the whole supply chain network, i.e. to address the existing interdependencies as the issue of the network level of analysis which reflects the complexity of the network structure (see section 3.2, Figure 3-10, p. 48).

These conclusions lead to the development of some implications for chain management in general and the Ukrainian food chain managers in particular. The implications will be presented in Chapter 6.

5.6 Summary of Chapter 5

Summarizing the current Chapter, I remind that its aim was to test the model of goal achievement in supply chain networks empirically. I have chosen the Ukrainian agri-food business as an empirical setting. By conducting a systematic review of literature on the issues of chain management, I have revealed that the transition countries in Central and Eastern Europe are characterized by a wide scope of verticalization practices, especially in the agri-food business. Several studies point to the process of retail internationalization as the main driver of verticalization. Foreign retailers exert significant efforts to raise the level of quality of their food suppliers in CEEC to meet their own global quality requirements. As a consequence, procurement systems experience rapid modernization with tightening of the relationships among supply chain members, and the supply chain networks are formed. The extent of such implications differs with the degree of progress in retail internationalization in a particular country. On the basis of the level of market penetration by modern retail formats, one can distinguish between "three waves" of retail internationalization in CEEC. In this context, the countries that belong to the third wave of retail internationalization, e.g. Russia, Ukraine, etc. exhibit the lowest level of presence by foreign retailers but their market shares grow steadily. Additionally, the western food manufacturers establish their subsidiaries in these countries on a wide scale. The "imported" business concepts are widely imitated by local competitors. As a result, one can speak of deliberate strategies implemented in the course of verticalization and establishment of supply chain networks. Therefore, I have chosen the Ukrainian agri-food business as an empirical setting for my research. Another reason why I have chosen Ukraine as an empirical setting was little research on the effects of internationalization on verticalizaiton in the third wave countries.

My empirical analysis involved three subsequent stages[20]. At the *first stage*, I have tested the suitability of my empirical setting by means of expert interviews. I aimed to define whether supply chain networks exist and to what extent chain management is exercised in the Ukrainian agri-food business. The results of the interviews support the suitability of the empirical setting and indicate that the chain management practices are primarily introduced by the foreign investors

[20] The three stages of my empirical analysis can be regarded as self-standing studies. The results obtained at each stage have been presented at numerous conferences and published in or submitted to international peer-reviewed journals.

and the local branded enterprises. However, the implementation of the chain management concepts faces a lot of constraints caused by outdated infrastructure and volatile business environment.

The *second stage* of analysis involved the pretest of the questionnaire, aiming to modify the survey instrument for the final data collection in Ukraine and to check for appropriateness of the hypotheses and measures included in my model. For the pretest, I have conducted 31 telephone interviews with top managers of the specialized fish retail firms in Germany. Specialized fish retailers are responsible for the quality of the offered fish products to consumers and can be considered as focal companies in their supply chain networks, i.e. the companies which are knowledgeable about the whole network.

The interviews with fish retailers revealed that a slight modification of the questionnaire was necessary. This task has been completed. Additionally, by using the results of the interviews, I was able to check for appropriateness of some hypotheses in my model. I tested a simplified version of my model by means of the PLS technique. The simplified model involved the effects of the alignment of interests and the alignment of actions on the achievement of goals of a supply chain network. Clear differentiation between network-level and firm-level goals has not been made at this stage.

The results of the model testing indicated that the alignment of interests and the alignment of actions have significant positive effects on the achievement of network goals. In my sample, the alignment of interests was achieved through a high level of communication among the partners about their goals and problems. If problems arose, they were most often solved jointly by provision of assistance from the focal actor. Additionally, focal company had to possess some influence to be able to apply sanctions and fiats such as excluding network firms from the network. To align the actions, the focal firm had to be aware of the existing interdependencies and to possess necessary skills and coordination capabilities. Thus, the hypothesized signs and directions of effects in my model were found to be reasonable.

The pretest has also provided an opportunity to develop concrete measures for the constructs of my original model which were little conceptualized in literature. In this regard, network-level goals were operationalized by the following measures: the focal company's satisfaction with contribution of all suppliers to quality of the branded product; the focal company's satisfaction with quality of supplies by suppliers; the focal company's satisfaction with quality of product-related services by customers; the focal company's satisfaction with contribution of all customers to sales of the branded product.

At *the third stage* of empirical analysis, I have collected data through telephone interviews with branded food manufacturers in Ukraine and tested my model. Of the 359 branded food processing companies, 106 interviews with both purchasing and sales managers of the top (i.e. strategic) level were conducted. Five questionnaires

were put aside because five of the interviewed managers represented vertically integrated companies and, consequently, data on cooperation with either suppliers or buyers was missing. Thus, overall, the active sample comprised 101 filled questionnaires. This resulted in a 28 % response rate.

I have tested my model using the PLS technique. As a technique for structural equation modeling, PLS not only assesses the structural model – the assumed causation among a set of dependent and independent constructs – but, in the same analysis, also evaluates the measurement model – loadings of observed measures on their expected latent constructs. Apart from these advantages, I have chosen PLS due to its suitability for prediction and/or theory building. Given that the achievement of network-level goals is a new construct included into analysis and the effects of the alignment of interests and alignment of actions on this construct have not been tested up to now, PLS seems to be an appropriate tool. More importantly, the constructs included in my model have never been analyzed simultaneously. The PLS approach allows for such type of analysis and enables conclusions about the model as a whole.

The results of model testing indicated a good fit of both measurement and structural models. Significance of the hypothesized relationships was defined by means of the bootstrap method. Based on the results of bootstrapping, I have accepted seven out of ten hypotheses. A hypothesis testing demonstrated that the constructs of strategic chain management have larger effects on the achievement of network-level goals than on the achievement of firm-level goals. This conclusion contradicts the perceptions of strategic chain management by the majority of top managers. Strategic chain managers often define firm-level goals or the fulfillment of chain management tasks per se as the main strategic goals for their supply chains. In contrast, my results imply that the attention chain managers pay to network-level goals must be higher than that paid to firm-level goals.

Additionally, the results show that supply chain networks in the Ukrainian agri-food business require modification of the "imported" chain management concepts. The investigated supply chain networks are characterized by a negative effect of higher interdependence among members on the alignment of their actions. This finding can be explained by high volatility of the business environment and the infrastructural problems.

6 IMPLICATIONS FOR CHAIN MANAGEMENT AND THE UKRAINIAN AGRI-FOOD BUSINESS

The main contribution of the previous chapters is in showing that alongside individual firm-level goals there are collective network-level goals in supply chain networks. What implications does this provide for chain management? First of all, apart from dealing with relationships between firm-level goals of individual network members, chain management has to deal with another dimension of goal interrelationship, i.e. between network-level and firm-level goals. Second, chain managers have to be aware that the achievement of network-level goals often requires more effort than the achievement of firm-level goals. Overall, network-level and firm-level goals have to be addressed simultaneously in collective strategies and the derived thereof partnering and supply chain management strategies. Accordingly, in this Chapter, I use the results of my model testing to extend the existing frameworks of chain management and develop a framework which shows how network-level goals and firm-level goals can be achieved simultanously. In particular, I develop respective implications for collective strategies, partnering strategies and supply chain management strategies. Additionally, based on the results of the expert interviews and the model testing, I provide implications for chain management in the Ukrainian agri-food business.

The Chapter is structured as follows. Section 6.1 addresses implications for collective strategies as the plan of actions to simultaneously align and achieve network-level and firm-level goals. In section 6.2, I present implications for partnering strategies which should deal with relationships between network-level and firm-level goals, i.e. align goals. Subsequently, section 6.3 provides implications for supply chain management strategies which should involve mechanisms to enable the achievement of network-level goals alongside firm-level goals. Given that sections 6.1-6.3 provide general implications for strategic chain management, Chapter 6 proceeds by providing specific implications for managers of the agri-food supply chains in Ukraine (section 6.4). Finally, section 6.5 summarizes the contribution of Chapter 6.

6.1 Implications for collective strategies

The results of the previous Chapter support my idea that supply chain networks are characterized by pursuit of collective network-level goals alongside individual firm-level goals. Thus, I extend the existing frameworks of chain management by calling for more attention to network-level goals. With regard to network-level goals, there are a few major points to be mentioned. First, they may play an important role in creating long-term collaborative advantage because, as collective goals,

they serve as an integrating mechanism that creates initial conditions for collaboration and stabilizes the relationships if there is agreement upon them. They may act as glue that holds all network members together.

Second, in strategic networks in general and in supply chain networks in particular, network-level goals do not represent just a sort of abstract views that are introduced by the focal firm and have to be shared by other network members for the sake of integration. They are concrete goals to be achieved through collaboration of all the network members and, if not achieved, may be a cause of network dissolution or relationship break-off. In a strategic network, network-level goals are an inherent characteristic. These goals can be regarded as one of the departing points or even the main departing point for the development and implementation of the whole network's collective strategy. Prior to entering a supply chain network, potential members have to understand that the network is not just a lever for them to achieve their individual goals but it aims also to achieve certain goals by itself.

In essence, this premise provides an opportunity to adopt a somewhat different perspective of collective strategies. The prevailing idea has been that the collective strategy represents a collaboratively developed plan of actions aimed at reduction of variation in interorganizational environment, i.e. dealing with uncertainty that arises from behavior of interdependent organizations caused by their endeavors to achieve firm-level goals. However, as my results show, members of supply chain networks pursue also certain goals at the network level. In this context, I extend the existing idea of collective strategies along two lines. First, a collective strategy should address not only the relationships between firm-level goals of network members but also the relationships between network-level and firm-level goals. Second, a collective strategy has to be seen as a plan of actions to achieve network-level and firm-level goals simultaneously.

> *Implication 1a: Implement collective strategies to simultaneously align and achieve network-level and firm-level goals.*

With regard to goal alignment, an important task of chain management is to address the relationships that can occur between network-level and firm-level goals – the issue that has been underresearched in strategic networks due to little attention paid to network-level goals. However, it seems that, similarly to the relationships between firm-level goals of individual network members, the relationships between network-level and firm-level goals tend to be either complementary or conflicting. In this regard, chain management has to primarily deal with conflicting relationships as they lead to problems for the whole network. For example, such network-level goals as product quality may not be in the focus of all firms that participate in the network. Moreover, network-level goals can be rather difficult to get aware of by all network members because they are collective by the directionality of effort of all network members but they are most often

set by the focal firm. In order to reduce such risks, focal companies have to formulate network-level goals clearly and address them explicitly.

Furthermore, even if the awareness of network-level goals is gained, they may be a source of conflict and interfirm rivalry. BRINKHOFF and THONEMANN (2007) have found that unclear definition of collective goals and lack of agreement upon them are the main reasons why 50 % of interorganizational projects in supply chains fail. Because conflict resolution and goal consensus are the tasks of partnering strategies, I contend that collective strategies have to deal with this extended conflict dimension, i.e. conflict between network-level and firm-level goals, through partnering strategies.

> *Implication 1b: Implement partnering strategies to align network-level and firm-level goals.*

However, one of the reasons why relationships dissolve is inappropriate consideration or misunderstanding of the issue of network-level goals by focal companies themselves. The results of the McKinsey Survey presented in subsection 5.4.3 support this thought by indicating that the strategic chain managers prioritize either firm-level goals or chain management tasks per se as the main strategic goals for their supply chains. In this context, I suggest that the extended focus on goals of a supply chain network which includes network-level goals alongside firm-level goals enables the vision of where the network itself aims and how effective it is. Especially, if one takes notice of a focal firm which is responsible for the correctness of attributes of the final product in a supply chain network, "the network-visioning capability" (MÖLLER et al., 2005: 1279) is important. From the strategic management standpoint, the focal firm can gain strategic advantage if network-level goals are achieved but it can sustain this advantage only if firm-level goals of the network members are achieved. The other network members can gain strategic advantage if they achieve their firm-level goals but they can sustain this advantage if they achieve network-level goals.

The examples of successful focal firms support this notion. As the results of my expert interviews (subsection 5.1.2) demonstrate, the well-known international branded companies implement their own chain management concepts and quality assurance standards that enable quality of supplies (network-level goal) and bring about benefits such as access to markets (firm-level goal) to their suppliers. Similarly, LINDGREEN and HINGLEY (2003) provide the example of Tesco, the largest food retailer in the UK. Tesco has formed its beef supply chain network in which it has set up effective guidelines for managing relationships with suppliers and customers. Following these guidelines, Tesco has enhanced long-term vertical and horizontal cooperation among the network members and effectively informed the public about mad cow disease and food issues in general. As a result, the retailer has been successful in selling British meat and in establishing equivalent standards for meat produced on its behalf overseas and imported into the UK. In this

example, Tesco demonstrated a high level of network-visioning capability with the focus on both network-level goals (food safety and animal welfare) and firm-level goals (economic goals of Tesco and its suppliers who have benefited from meeting the retailer's standards).

Thus, I see the contribution of my study in showing that the simultaneous achievement of network-level and firm-level goals requires strong coordination capabilities of network members. The results of model testing indicate that the abilities of the network members to make effective decisions on how the network should function make significant contribution to alignment of actions. In turn, the alignment of actions has a significant positive effect on the achievement of both network-level and firm-level goals. Because the alignment of actions is the task of supply chain management strategies, I maintain that collective strategies address the simultaneous achievement of network-level and firm-level goals through supply chain management strategies.

> *Implication 1c: Implement supply chain management strategies to achieve network-level and firm-level goals simultaneously.*

In the following sections, I respectively elaborate on implications for partnering strategies as the strategies to align network-level goals and firm-level goals; and supply chain management stratgies as the strategies to simultaneously achieve network-level and firm-level goals.

6.2 Implications for partnering strategies

The existence of network-level goals in supply chain networks implies that the focus of partnering strategies has to be extended from the alignment of interests of individual network members to a more sophisticated task of aligning goals of the network level with those of the firm level. This thought is supported by the results of empirical analysis. In my model, the alignment of interests appears to have a weak effect on the achievement of firm-level goals. I explain this finding by the presence of network-level goals in my model; whereas, if one had remained on the dyadic level of analysis, the results could have shown a strong positive effect on the achievement of firm-level goals. On account of this, I suggest that the dyadic relationships in supply chain networks require only the alignment of interests of the collaborating parties, i.e. making them *behave in line with the goals* of each other when they pursue their firm-level goals. In contrast, if one includes the network level of analysis, it is important to make all network members *pursue the goals* of the network level, i.e. to align network-level goals with firm-level goals. In this context, it is necessary to understand the relationships that can occur between network-level and firm-level goals. Thus, this section describes the relationships that exist between network-level and firm-level goals (subsection 6.2.1) and elaborates on how partnering strategies address these relationships, i.e. align goals (subsection 6.2.2).

6.2.1 Relationships between network-level and firm-level goals

Because the predominant focus in the literature has been on balancing relationships between goals of individual firms, one might derive some thoughts about relationships between network-level and firm-level goals from that literature. For example, the literature in cooperation theory differentiates social situations into cooperative and competitive ones, depending on how actors' goals are related to each other. A situation is cooperative if the goals of actors are positively related to each other but is competitive if the goals are negatively related to each other (CHEN et al., 1998). Theories of organizational behavior often pose differential assumptions of goals. Some of them assume that participants of an organization have common goals while the others assume that diverse goals characterize organizations (ETHIRAJ and LEVINTHAL, 2009). Further, with respect to these assumptions, attempts are made to predict behavior in organizations, i.e. whether greater consensus or greater conflict will result in an interdependent relationship due to available goal compatibility (KOCHAN et al., 1976: 529). Similarly, the agency view addresses goal conflict within the principal-agent framework (LEVINTHAL, 1988; JACOBIDES and CROSON, 2001), and the marketing channels scholars analyze the issue of goal incompatibility to explain channel conflict (REVE and STERN, 1979; BROWN and DAY, 1981; FRAZIER, 1983; ELIASHBERG and MICHIE, 1984). In the context of interfirm networks, RITTER et al. (2004) state that relationships have a mixture of both positive and negative dependencies containing cooperative, competitive, and conflictual elements just as the relationship counterparts have complementary and conflicting views and agendas. Positive dependence is when another firm's actions help a firm achieve its goals while negative dependence is when another firm's actions hinder a firm from achieving its goals. Thus, the management of interactions with other firms and organizations is a key part of a firm's managerial activities because it is critical for achieving goals (RITTER et al., 2004).

Table 6-1: Preconditions for and outcomes of the relationships between firm-level and network-level goals[21]

Preconditions	Relationship between goals	Outcomes
High level of ideological agreement on the nature of tasks and the appropriate approaches to these tasks (FRAZIER, 1983) Insensitivity of the organizational domain issue (SCHERMERHORN, 1975); domain similarity (DOZ et al., 2000) Similarity of cultural values (CHEN et al., 1998; DOZ et al., 2000; PARK and UNGSON, 2001)	***Complementary***	Improvement in performance measurability (HÖLMSTROM and MILGROM, 1991) Reduction of misunderstanding between the actors (PARK and UNGSON, 2001) Improvement of transactional efficiency (PARK and UNGSON, 2001)
Structural differentiation (KOCHAN et al., 1976) Differences in policies and procedures used to achieve individual members' goals and common goals (BROWN and DAY, 1981; FRAZIER and SUMMERS, 1984); distinctive interests with regard to actions to be undertaken (FRAZIER, 1983) Each party has its own business philosophy and interests (ELIASHBERG and MICHIE, 1984)	***Conflicting***	Manifest conflict (BROWN and DAY, 1981) Relationship break off (KUMAR and VAN DISSEL, 1996) Poor communication and mutual distrust (PARK and UNGSON, 2001); communication difficulties (LEONIDOU et al, 2008) Negative effect on network satisfaction and network continuity (BRADFORD et al., 2004)

This literature review shows that the relationships between the goals of individual actors can be either complementary or conflicting. In this context, I maintain that network-level and firm-level goals can also be characterized by complementary and conflicting relationships because goals at the network level as well as at the firm level are set by *different* network actors and, thus, these goals also differ and can exhibit either complementary or conflicting relationships (Table 6-1).

A complementary relationship between network-level and firm-level goals facilitates the achievement of both network-level and firm-level goals. For instance, implementation of the tracking and tracing system (FRITZ and SCHIEFER, 2009) is set as the network-level goal in the supply chain network. In this case, the complementary firm-level goal can be an endeavor of an individual network member to gain necessary knowledge from a network about requirements of a corresponding certification scheme. If network members possess necessary knowledge, then the introduction of tracking and tracing system will be facilitated. This idea is supported by the results of my empirical analysis. In my model, knowledge gained by suppliers in the network was included as the firm-level goal and had a moderate loading on the respective construct.

On the contrary, *a conflicting relationship between network-level and firm-level goals hinders the achievement of both network-level and firm-level goals.* For

[21] Primarily based on the literature on relationships between goals of individual actors.

example, cost minimization at the firm level and the installation of electronic data interchange at the network level may be perceived as conflicting goals because the latter requires investments. The results of my expert interviews indicate that the achievement of chain quality (network-level goal) in the Ukrainian agri-food business is hampered by orientation of individual network members towards gaining short-term financial benefits (firm-level goal) or by economizing on quality to resolve infrastructural problems (firm-level goal).

Thus, the non-achievement of firm-level goals may lead to failure in the achievement of network-level goals, and vice versa. If an individual firm aims to gain necessary knowledge from a network and fails to achieve this goal, this may cause failure in fulfilling specific tasks needed to attain the network-level goal, e.g. implementation of a quality assurance system. Conversely, non-achievement of a network-level goal, e.g. sufficient product quality, may result in non-achievement of firm-level goals, e.g. increased profits or improved reputation.

> *Implication 2a: Define the character of relationship between network-level and firm-level goals.*

A complementary relationship between network-level and firm-level goals can be seen through a high level of agreement on the nature of tasks completed by individual members and also appropriate approaches to these tasks. Despite each member specializes in performing particular functions, such an agreement indicates the members' awareness and readiness to contribute to the achievement of network-level goals and is often a consequence of similar cultural values which may reduce misunderstanding between the members. Additionally, the perceived status and legitimacy as well as perceptions of procedural justice contribute to goal complementarity (Table 6-1).

A conflicting relationship between network-level and firm-level goals can persist due to incongruent preference structures which originate from different cultural, organizational and resource characteristics and are reflected in different reward expectations. Dissimilarities among network members are typically evident in differences between firms' capabilities and strategies, i.e. opinions of the network actors about managerial routines, marketing policies, quality control, etc. may differ from each other. While lack of cultural fit leads to poor communication and mutual distrust, dissimilarities in organizational structures and processes can cause disagreements over operating strategies, policies and methods, leading to a manifest conflict or even relationship break off (Table 6-1). Although goal conflict can be a stimulant for some positive outcomes, it is widely argued that organizations perform better when there is more goal consensus than conflict (PROVAN and KENIS, 2007: 11).Thus, an implication is relatively straightforward, but important nonetheless:

> *Implication 2b: Align conflicting network-level and firm-level goals to establish a complementary relationship between them.*

6.2.2 The alignment of network-level and firm-level goals

In supply chain networks, a negative relationship between network-level and firm-level goals has a particularly high potential to occur because the network-level goals are collective by the directionality of effort but not by the involvement in the goal setting process. Given this precondition, one could think of a potential for interpersonal conflict between network members that would require using of accommodative conflict management (BRADFORD et al., 2004). Accomodative conflict management behavior is defined as the behaviors that network members use to create an environment where each party allows others to have their way and/or accept the other members' perspectives (BRADFORD et al., 2004: 184).

However, as the results of my expert interviews indicate, goal conflict in supply chain networks of branded food enterprises appears rather due to incompatible activities than because of opposing interests. Suppliers of the branded food manufaturers or retailers are generally cooperative but they often face an objective necessity to deal with own infrastructural problems just to stay in business. Therefore, they may be unable to orientate themselves towards the achievement of network-level goals such as improvement of the supply quality or product quality. In my model, the small effect of the alignment of interests on the achievement of firm-level goals also rejects the idea that a conflicting relationship between network-level and firm-level goals is a matter of opposing interests. Instead, if it appears, it is caused by incompatible activities of the network members and results in task conflict rather than interpersonal conflict between the focal company and its suppliers or customers. In this context, I propose that partnering strategies have to align the conflicting network-level and firm-level goals by means of collaborative conflict management behavior.

> *Implication 2c: Use collaborative conflict management to align conflicting network-level and firm-level goals.*

Collaborative conflict management reflects activities in which network members explore integrative solutions (BRADFORD et al., 2004). When this style of conflict management is used, network members try to find new and creative solutions to problems by focusing on their needs as well as on the needs of the entire network. Thus, the use of collaborative conflict management can be mutually beneficial for the whole network. In particular, this view is supported by the results of my empirical analysis. According to my expert interviews, big branded dairies organize their own collection stations with expert facilities and ensure quality supplies by leasing cooling tanks to farmers as part of their contracts. Furthremore, my pretest in the German fish sector has shown that a joint problem solving is positively associated with goal consensus within the construct of the alignment of interests which, in turn, exerts a significant positive effect on the achievement of such goals as supply quality and suppliers' profits. Thus, the focal firms that establish collaborative

conflict management will be successful in aligning conflicting network-level and firm-level goals.

Collaborative style can be used not only for resolution of conflict between network-level and firm-level goals but also for establishment of a complementary relationship between them. As shown by my expert interviews, well-known branded companies educate their suppliers to work by such international quality schemes as GLOBALGAP, ISO 9000, and HACCP. Training sessions and common meetings are organized quite frequently. At the meetings and socialization events, network members get an opportunity to better understand how they should contribute to the achievement of network-level goals so that the achievement of their firm-level goals is not hampered. Besides, they can define how compatible network-level goals are with their firm-level goals and, so, the process of partner selection is implicitly exercised by focal firms. In this context, I suggest that partnering strategies should involve the use of socialization regimes to establish a complementary relationship between network-level and firm-level goals.

Implication 2d: Use socialization regimes to establish a complementary relationship between network-level and firm-level goals.

Socialization processes such as common events or training sessions can be used to enhance members' identification with the network and thereby proliferate existing cooperation norms and values among network members. As found by GOTTSCHALG and ZOLLO (2007), identification involves group efforts toward the congruence in goals and values among different parties. Additionally, socialization as a mechanism of goal alignment can be supplemented with mechanisms that are used for interest alignment at the dyadic level. For example, socialization processes can be supplemented by procedural fairness. As documented by BROCKNER (2002) and LUO (2008), fair procedures nourish parties' commitment to joint efforts, increase their belief in and acceptance of collective goals and values, and strengthen their loyalty. Moreover, procedural fairness increases the interpartner conformity in strategic responses to major events or market changes even though consequences of such events may be unfavorable to one party. For instance, Metro Cash & Carry Ukraine has recently reported that it has managed to preserve the relationships with most suppliers during financial crisis because it has beforehand informed them about possible difficulties with timeliness of payments (RETAIL STUDIO, 2010). The results of my model testing in Chapter 5 indicate that the focal company's readiness to always inform its suppliers and customers about its next steps in cooperation has a high loading on the construct of the level of trustful relationships in the supply chain network. In turn, trustful relationships have a strong positive effect on the alignment of interests.

Furthermore, socialization can be supplemented by the use of incentives, i.e. self-enforcing agreements or price and margin premiums. Self-enforcing agreements can take a form of investments in dedicated equipment, procedures, and training

(WATHNE and HEIDE, 2004; VALENTINOV, 2007). The results of my model testing indicate high loadings of suppliers' and customers' investments in network relationships on the construct of the alignment of interests. Additionally, the results demonstrate that the focal company's provision of suppliers and customers with bonuses shows high loading on the construct of the level of non-coercive power use where bonuses were included as a form of reward power. In turn, non-coercive power has a strong positive effect on the alignment of interests. Overall, incentives help preclude the network members' deviations from the behavior required to achieve network-level goals. This implies that the members may pursue network-level goals, although a complementary relationship between network-level and firm-level goals may be not established. Therefore, I emphasize that especially socialization in combination with procedural fairness contributes to establishment of a strong cooperative system which, according to BARNARD (1938), requires inculcating belief in the real existence of common purpose.

6.3 Implications for supply chain management strategies

Even if a complementary relationship between network-level and firm-level goals has been established and a goal conflict has been minimized, a supply chain network may fail because the goals themselves are not achieved. This may happen primarily due to unsynchronized actions of partners, their insufficient responsiveness to the problems of each other or failure to react timely on requests of each other. Therefore, I argue that collective strategies address the goal achievement itself through implementation of supply chain management strategies whose task is to align the actions of network members. The alignment of actions enables that a complementary relationship between network-level and firm-level goals is realized at its best so that both network-level and firm-level goals are achieved. This argument is supported by significant positive effects of the alignment of actions on the achievement of network-level and firm-level goals in my model.

According to the results of my empirical analysis, successful implementation of supply chain management strategies requires that the focal firm possesses strong coordination capabilities. For this matter, it is particularly important that the focal company has enough influence in its supply chain network. As the results of my expert interviews and the pretest in the German fish sector show, powerful focal companies are able to adequately address the growing consumer demands toward quality by introducing quality standards and systems. Additionally, they are capable of providing their suppliers with access to profitable distribution markets or different kinds of support, ranging from provision with necessary inputs to credit and financial support. Thus, the presence of a powerful focal actor in a supply chain network is conducive to successful implementation of supply chain management strategies and thereby enables the achievement of network-level and firm-level goals.

Implication 3a: Allow a powerful focal company to enable the simultaneous achievement of network-level and firm-level goals.

Importantly, the power by the focal firm should not be understood as solely the use of coercive mechanisms such as sanctions and fiats or non-coercive mechanisms such as bonuses and recommendations. Instead, the focal firm's power means also that it is able and allowed to specify formal rules (e.g., quality standards) to handle routine delivery processes or establish cross-company management teams to deal with nonroutine tasks that require more information processing, fast decision-making, and mobilization of resources. This view of power of a focal actor is supported by my results from the German fish sector where focal companies are small specialized fish retailers which have little potential to sanction their big suppliers and, therefore, must possess strong coordination capabilities.

My results from expert interviews, the pretest and the model testing indicate that coordination capabilities are important not only on the part of the focal firm but also on the part of the other network members. The network members should be able to identify and build consensus about task requirements and adopt standards introduced by the focal company. It is, thus, necessary that the focal firm develops necessary capabilities of its suppliers and customers and creates conditions for the network members to communicate, learn from relationships, and develop knowledge of how to work together.

Implication 3b: Develop capabilities of the network members to enable the simultaneous achievement of network-level and firm-level goals.

With regard to required capabilities on the part of the other network members, I suggest that the network members should possess learning capability and exhibit willingness to learn. In my model, knowledge gained by the focal firm's suppliers demonstrates a certain degree of importance by having a moderate loading on the construct of firm-level goals. This result coincides with the findings by GULATI et al. (2000) who demonstrate that the knowledge or information each partner obtains has also benefits that accrue to one partner alone. However, learning efforts in supply chain networks can only be successful if the network members communicate in appropriate way. The focal firm has to implement a set of interorganizational processes that allow members to systematically identify valuable information and then transfer it across organizational boundaries. Thus, communication is necessary not only to align the interests by reducing uncertainty about partner's motives[22] but

[22] In my model, the focal company's satisfaction with mutual information exchange with its suppliers has a high loading on the construct of the alignment of interests which indicates that open and honest communication is associated with good working relationships. The importance of communication for the alignment of interests can be considered also within the mechanism of socialization as described in subsection 6.2.2. Meetings and common events enable network members to communicate openly and honestly. On the part of the alignment of actions, the other dimensions of information exchange would gain in importance: timeliness,

it is also necessary to align the actions in order to achieve network-level and firm-level goals.

> *Implication 3c: Enhance communication among network members to enable the simultaneous achievement of network-level and firm-level goals.*

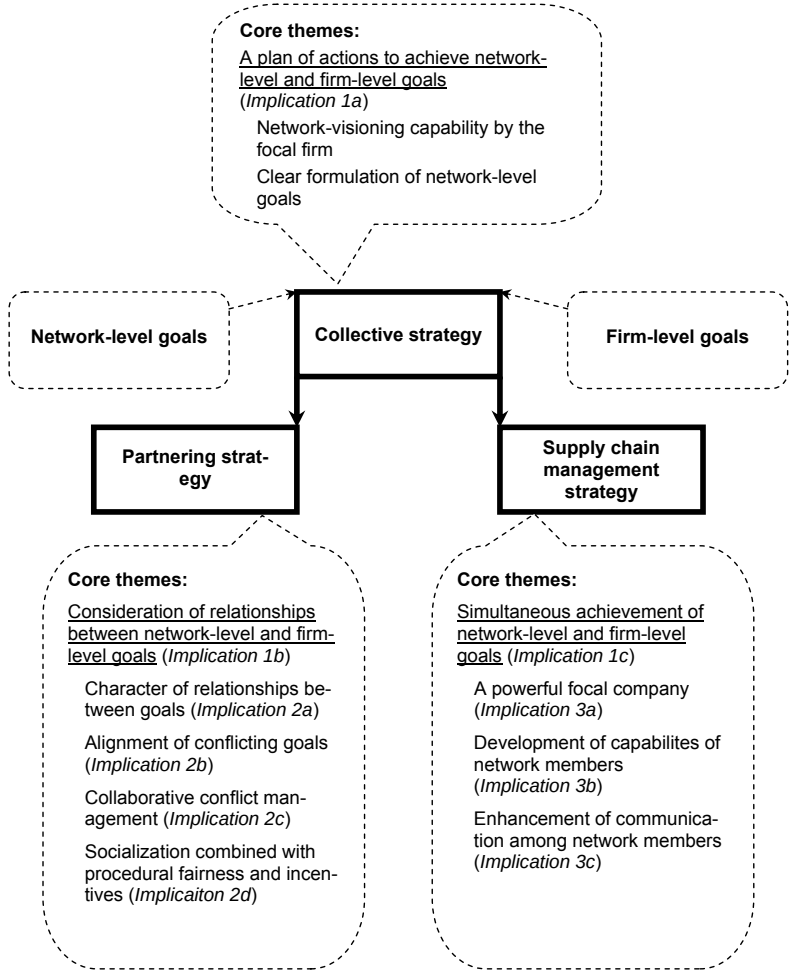
Communication as a mechanism of supply chain management strategies involves deploying a variety of communication modes and adjusting them over time or to the specific context. Prescheduled meetings can be combined with regular status reports. These communication modes complement each other (SCHREINER et al., 2009) in helping network members understand what and how should be done to achieve network-level goals alongside their firm-level goals.

Prior to developing specific implications for the agri-food business in CEEC, it makes sense to summarize and structure the above ideas of this Chapter within one framework to show how I extend the existing theory. Two general conclusions for strategic chain management can be provided based on the above argumentation.

First, network-level and firm-level goals have to be considered simultaneously within a collective strategy. Thus, I extend the notion of collective strategy by arguing that the collective strategy should address not only the alignment of interests of individual network members but also the alignment of network-level and firm-level goals. Moreover, a collective strategy has to be seen as a plan of actions to achieve network-level and firm-level goals simultaneously.

accuracy, credibility and completeness of information received from partners (MOHR and SPEKMAN, 1994).

Figure 6-1: The framework of goal achievement in supply chain networks



Source: Own performance.

Second, I show that the alignment and the achievement of network-level and firm-level goals must be addressed simultaneously because the acceptable degree of goal consensus by itself does not guarantee goal achievement while the concerted action alone may fail due to goal conflict. In essence, the partnering and the supply chain management strategies aim to deal with goal alignment and goal achievement, respectively. For that matter, I define specific mechanisms. Overall, these thoughts are integrated within the framework of strategic chain management in Figure 6-1.

6.4 Implications for chain management in the Ukrainian agri-food business

As shown by recent studies there is clear evidence that the introduction of chain management concepts goes East and the supply chain networks are being formed in countries such as Russia (BELAYA and HANF, 2009a) and Ukraine (GAGALYUK and HANF, 2009a; HANF and GAGALYUK, 2009). Due to growing importance of the phenomenon, I believe that there is a need for its in-depth research to clarify how the supply chain networks can be better managed. However, despite the economic importance attached to interfirm collaboration, the effectiveness of collaboration does not seem to be subject to a systematic evaluation by practicing managers. In the view of the presented results of the McKinsey survey, this is not surprising. Chain managers often have difficulties to understand how the supply chain networks should be evaluated. In this context, the model tested in this study and the resulting framework of strategic chain management demonstrates that the research is sometimes ahead of practice in terms of developing new ideas.

In particular, the model tested can be employed as a tool of chain management because it includes constructs which can be used to evaluate the whole supply chain network, i.e. it encompasses the simultaneous effects of chain management on the achievement of both network-level and firm-level goals. My results indicate that network-level goals such as product quality, sales of the branded product, supply and service quality can be considered as the measures of the effectiveness of supply chain networks. In particular, taking notice of network-level goals is important today, when there is a shift from competition between single firms towards competition between supply chains and networks. Focus on network-level goals might be helpful in understanding the supply chain network's position relative to the competing networks.

However, it is still evident that the Ukrainian agri-food business faces difficulties in establishing well-functioning supply chain networks. This is indicated by the result of a negative effect of the level of interdependence on the alignment of actions. Thus, the branded food manufacturers in Ukraine might perceive tight collaboration with partners as a disadvantage[23]. Moreover, they might even think tighter collaboration be worse for the achievement of beneficial outcomes. There are a few reasons for this conclusion.

First, one has to consider the influence of the volatile business environment. Agri-food chains in Ukraine exhibit a high degree of volatility with frequent contract breaches in order to please short-term pecuniary interests. This leads to supply disruptions and induces costs for the parties. Not least of all, such difficulties arise due to unfavorable institutional environment: property rights are

[23] On the contrary, as shown by the results of my pretest in the German specialized fish supply chain, the awareness of the existing interdependencies by a focal firm has a high loading on the alignment of actions (see GAGALYUK et al., 2009).

weakly protected, contract enforcement is poor, etc. Thus, chain management has to address a conflicting relationship between network-level and firm-level goals. However, this is predominantly missing because network members normally treat this type of goal conflict as a firm level vs. firm level and not as a network level vs. firm level, or they prefer focusing on exploitation of complementarities rather than on precluding conflicts. In this case, the motivational problem can be solved by using self-enforcement agreements that involve reputational elements. The results of my expert interviews and the model testing indicate that gaining reputation from the cooperation by suppliers is one of the firm-level goals. Symptomatically for CEEC, collaboration with some suppliers can be established based on suppliers' general cooperativeness and reputation quests. Consider a strong reputation effect of a well-known multinational brand on small local suppliers. Furthermore, being engaged in cooperation with big brand-owners is recognized as an advantage because small farmers believe they minimize their income risk by working together with financially strong companies.

> *Implication 4a: Use the network members' quest for reputation to achieve network-level and firm-level goals simultaneously.*

Second, difficulties in establishing tight working relationships are not limited to poor contract enforcement. They also reflect the existing infrastructural problems. For example, the network members might be in a need of necessary skills and knowledge to conceive of the issues related to the functioning of the supply chain network. Additionally, it has to be considered that a supply chain network is deliberately orchestrated by a focal company which sets network-level goals and develops a collective strategy. In this context, other network members might often have abstract idea of network-level goals because of unclear formulation of goals by the focal firm. Further, network members (and often a focal firm) tend to recognize network-level goals as firm-level goals of the focal firm. As a consequence, other network members may abstain from investing in the achievement of network-level goals. To overcome such problems, it is necessary to adopt socialization regimes, i.e. organize common events, meetings and training sessions which can be used to clearly formulate network-level goals and educate network members. Communication during social events can facilitate the network members' understanding of what and how should be done to achieve network-level goals, not hampering the achievement of firm-level goals.

The third reason is also related to the infrastructural problems. In countries such as Russia and Ukraine, firms face high adjustment costs to the ongoing restructuring processes at the procurement and the distribution stages. This facilitates the strong cost orientation of most firms. As a result, different firms exhibit varying attitudes towards such network-level goals as supply quality, i.e. network-level goals may not be in the focus of some relevant network actors which contribute to the supply. Additionally, a conflict between long-term orientation of chain management and the need to produce high returns on investments in short terms persists.

Apart from using incentives to achieve necessary supply quality, I suggest that the focal companies have to engage into the resolution of infrastructural problems themselves. The results of my expert interviews indicate that the companies which strive to establish a sound supply side of their businesses in Ukraine are involved into construction of access roads, warehouses, etc. However, their efforts will not be enough to deal with infrastructural constraints in the short run. Therefore, the other network actors should be involved.

Implication 4b: Set resolution of infrastructural problems as a network-level goal.

This implication as well as the negative effect of the level of interdependence on the alignment of actions signifies that there is a need for modification of the existing chain management concepts in different business environments. In this context, I posit that one way the chain management concepts can be modified is to consider the different degrees of competitive advantage each relationship in the supply chain network entails. As shown by HANF and HANF (2007), focal firms should make a distinction between parity and advantage chain management[24]. In the case of parity chain management, the aim of the collective strategy is to gain parity with the competing supply chain networks, e.g. a certain level of chain quality can be regarded as a competitive necessity while other differentiating elements such as cost leadership are used to gain an advantage. These elements are supplemented by private standardization approaches, e.g. QS, IFS, etc.

Furthermore, the development of one single product can require both parity and advantage chain management. For example, a company producing hamburgers exercises the advantage chain management in its burger chain, whereas the parity chain management is realized in the onion chain. In the case with the parity chain management, it will be enough just to pay attention to firm-level goals of the relationship parties, whereas both network-level and firm-level goals should be considered simultaneously within the advantage chain management. Moreover, the focal company can try to use the parity chain management system to create long-term enduring competitive advantages by adding strategic elements that are higher than the parity standards. In this case, the focal firm has to convince the specially selected partners to accept additional attributes and norms, e.g. superior quality. It should be much easier to formulate an integrated and consistent management system with the differentiation between parity and advantage chain management.

[24] In the original source, i.e. HANF and HANF (2007), the terms "operative chain management" and "strategic chain management" were used. However, I think that "parity chain management" and "advantage chain management" fit better because the term "operative" creates an impression that the issues addressed within this part of chain management should not be raised at the strategic level. Similarly, the term "strategic" might imply that only the issues considered within this part are of strategic importance which is not the case because both the parity and advantage aspects are strategically relevant.

However, in the view of necessity to resolve infrastructural problems, I posit that it is necessary to take the focal firm's resource endowments into account when differentiating between parity and advantage chain management. Considerations about economic efficiency of implementation of the chain management concepts can be improved if the chain management is divided into an advantage part and a parity one. The advantage chain management will bear traits that are oriented to a long term, i.e. it will include all mechanisms fortifying the network. In particular, the bundle of mechanisms should allow for: a) maintaining the network vision and explicit setting and formulation of network-level goals; b) simultaneous consideration of network-level and firm-level goals, i.e. minimization of conflict between network-level and firm-level goals; c) synchronization of actions so that the network operates as a single entity to achieve both network-level and firm-level goals; and d) the alignment of interests and actions of individual network members in their dyadic relationships within a network. The parity chain management will be more short-term and operational efficiency oriented, focusing exclusively on the latter point, i.e. the alignment of interests and actions at the dyadic level to ensure expected firm-level benefits.

According to the results of my expert intrerviews, a clear distinction between parity and advantage chain management cannot be found in the Ukrainian agri-food business. One reason for this is that the chain management is rather a new tendency. In the time of interviews, most of the respondents inclined to stress that the chain management approaches employed in Ukraine involve few features of advantage chain management because even initial verticalization requires the strategic design of supply chain networks. At the same time, operationalization of the chain management concepts is substantially lagging behind the Western economies.

> *Implication 4c: Differentiate between parity and advantage chain management when implementing the chain management concepts.*

At first sight, the infrastructural problems that persist in the Ukrainian agri-food business require usage of as much mechanisms of chain management as possible. Thus, at the current stage, those firms which strive to organize tightly coordinated chain systems will be one way or another engaged in the advantage chain management which really provides them with the advantage over competitors. The challenge, however, is to make the directionality of the current advantage chain management, e.g. basic quality, a competitive necessity and to move further by installing new elements that could bring further advantages for the whole network, i.e. superior quality, transparency, know-how, etc.

6.5 Summary of Chapter 6

The aim of the current Chapter was to develop implications for chain management based on the results of my empirical analysis. Thus, I have derived a number of implications for chain management in general and the chain management in the Ukrainian agri-food business in particular.

Two general implications for strategic chain management can be derived from my results. First, network-level and firm-level goals have to be considered simultaneously within a collective strategy. Thus, the collective strategy should address not only the alignment of interests of individual network members but also the alignment of network-level and firm-level goals. Moreover, a collective strategy has to be seen as a plan of actions to achieve network-level and firm-level goals simultaneously.

Second, I show that the alignment and the achievement of network-level and firm-level goals must be addressed simultaneously because the acceptable degree of goal consensus by itself does not guarantee goal achievement while the concerted action alone may fail due to goal conflict. In essence, the partnering and the supply chain management strategies aim to deal with goal alignment and goal achievement, respectively. For that matter, I define specific mechanisms. Collaborative conflict management behavior as well as socialization processes in combination with procedural fairness and incentives can serve as appropriate tools to align network-level and firm-level goals. The goal achievement requires presence of a powerful focal company, strong coordination capabilities of the focal company and network members as well as the use of various communication modes.

I have also developed a number of implications for chain managers in the Ukrainian agri-food business. Apart from considering the implications for chain management in general, chain managers are recommended to take the specifics of a different business environment into account. Agri-food chains in Ukraine exhibit a high degree of volatility with frequent contract breaches in order to please short-term pecuniary interests. However, given a strong reputation effect of well-known brands on small suppliers, focal companies are recommended to use the network members' quest for reputation to achieve network-level and firm-level goals simultaneously.

Yet, difficulties in establishing tight working relationships in the Ukrainian agri-food business are not limited to poor contract enforcement. They also reflect the existing infrastructural problems. Firms face high adjustment costs to the ongoing restructuring processes at the procurement and the distribution stages. This facilitates the strong cost orientation of most firms. As a result, network-level goals may not be in the focus of some relevant network actors which contribute to the supply. Additionally, a conflict between long-term orientation of chain management and the need to produce high returns on investments in short terms persists. I have recommended resolving this dilemma by setting the resolution of infrastructural problems as a network-level goal. The companies which are successful in establishing a sound supply side of their businesses in Ukraine are involved into construction of access roads, warehouses, etc. However, their efforts will not be enough to deal with infrastructural constraints in the short run.

The effect of a volatile business environment requires modifying of known chain management concepts when implementing them in the Ukrainian agri-food business. In this context, I have posited that one way the chain management concepts can be modified is to consider the different degrees of competitive advantage each relationship in the supply chain network entails. Focal firms should make a distinction between parity and advantage chain management. In the case of parity chain management, the aim of the collective strategy is to gain parity with the competing supply chain networks, e.g. a certain level of chain quality can be regarded as a competitive necessity while other differentiating elements such as cost leadership can be used to gain an advantage. These elements can be supplemented by private standardization approaches. It should be much easier to formulate an integrated and consistent management system with this division.

7 CONCLUSIONS

The aim of this thesis was to develop a framework of goal achievement in supply chain networks. My motivation to conduct this study stems from the fact that many failures in interfirm cooperation result from deficiencies in planning and managing cooperation. In particular, firms fail to address what they want to achieve by working together. Most firms specify only their own contributions to cooperation and focus on operational performance as an indicator of successful cooperation. Yet, these measures tend to lose their relevance as the economic environment changes. As a result, interfirm cooperation fails. Supply chain networks as a form of vertical interfirm cooperation make no exception in this respect. Several consulting studies indicate that the main reason why relationships in supply chain dissolve is the unclear definition or lack of agreement upon collective goals. Surprisingly, this issue has not been exhaustively addressed in research. The majority of studies pay attention to the achievement of goals by individual firms in cooperation. However, an exclusive focus on goals of single firms can result in biased implications with regard to management of a supply chain network as a whole. For example, potential conflict between network-level and firm-level goals can go undetected and lead to relationship break off or induce costs for collaborating parties.

Thus, to accomplish my aim, I have developed and tested a model of goal achievement in supply chain networks. My model includes the relationships between the achievement of network-level and firm-level goals and the constructs of chain management and the network characteristics. The respective framework of strategic chain management has been subsequently developed based on the results of empirical analysis and evaluation of the model.

Thus, the thesis has contributed to the understanding how the goals in supply chain networks can be achieved and what chain management should do in this respect. This concluding Chapter summarizes the contribution of each chapter of the thesis to accomplishment of its aim (section 7.1), outlines the limitations of the study (section 7.2), and proposes several directions for future research (section 7.3).

7.1 Summary of the contribution of the thesis

The aim of *Chapter 2* was to describe the main characteristics of supply chain networks. To identify specific management challenges faced by firms in the different network types, it is necessary to identify the features of these network types. Despite the ambiguity of terminology used to designate the different types of interfirm networks, I was able to show that supply chain networks can be classified as a type of strategic networks. They possess the main characteristics of strategic

networks, i.e. they are characterized by highly intensive, recurrent and long-term relationships between network members; they are characterized by a pyramidal-hierarchical type of coordination; and they possess a focal firm which coordinates the network. The coordination efforts by the focal firm are deliberate because it aims to create value through the supply chain network and it is responsible for the correctness of the attributes of the end product. Given high strategic importance of these aims, the focal firm must be able to develop and implement a strategy that will be shared by network members. Additionally, provided that all network members are legally independent organizations and pursue their own self-interests, the focal firm must implement the management concept for the whole network. Thus, the feature of supply chain networks is that they require considerable efforts to exercise management of the whole network. This involves the guidance of the whole network towards the achievement of its goals as well as consideration of the interests of each individual network member.

My aim in *Chapter 3* was to address the strategies that are used to manage a supply chain network as a whole and to guide it towards the achievement of goals. I also aimed to identify the shortcomings of these strategies. For that matter, I have described the existing chain management practices and elaborated on the theoretical underpinnings of chain management. With regard to the existing chain management practices, it can be stated that firms mainly address the alignment of their *actions* when implementing the chain management concepts such as TQM, SCM, ECR, CPFR, etc. Although the tight collaboration among the supply chain actors is one of the basic principles of these practices, firms often neglect the issue of aligning the *interests* of each other and abstain from engagement in mutually supportive action, adjustment of organizational structures, etc. This can cause failures in establishing long-term relationships often needed to obtain the benefits from introduction of the chain management practices. In this context, the task of chain management is to align *the actions and the interests* of the network members *simultaneously* by implementing collective strategies. Collective strategies address the issue of interest alignment through the partnering strategies, whereas the alignment of actions can be achieved by means of the supply chain management strategies. In order to implement these strategies successfully, the supply chain network management has to be knowledgeable about goals pursued through supply chain networks, implying that a collective strategy is the plan of actions to achieve goals of a network. However, by conducting a systematic literature review, I have revealed that collective strategies are rarely seen as a tool to achieve goals of a network. Moreover, the literature considers network goals incompletely: researchers fail to address the network-level goals, i.e. goals that require effort by all network members. This can lead to biased implications for chain management with regard to the development and implementation of collective strategies to enable both, structuring of network relationships (i.e. aligning interests and actions) and achievement of goals of the network.

The objective of *Chapter 4* was to show that management of the supply chain network as a whole, including respective collective strategies, aims to achieve network-level and firm-level goals simultaneously. With this purpose, I have developed a model of goal achievement in supply chain networks. My model involves hypotheses about the relationships between the achievement of network-level and firm-level goals, the alignment of interests and actions as the chain management constructs, and the network structural, relational and member characteristics.

However, little is known about network-level goals because the literature on interfirm networks has mainly concentrated on goals of individual firms in networks. Thus, I have elaborated theoretically on the goals of interfirm networks. Departing from the point that individual and collective goals simultaneously exist in interfirm networks, I have shown that goals set and pursued in interfirm networks include firm-level, dyadic-level and network-level goals of network members. Furthermore, the different types of interfirm networks are characterized by the different extent of relevance of firm-level, dyadic-level and network-level goals. Accordingly, the requirements towards management in different types of networks differ.

In this context, I have argued that supply chain networks as strategic networks pose more complex requirements towards management than other, non-strategic types of interfirm networks. The reason is that, apart from firm-level goals that are highly relevant for individual network members, strategic networks involve pursuit of network-level goals which require efforts by all network members. Importantly, the achievement of firm-level goals must be addressed simultaneously with the achievement of network-level goals to make sure that the strategic network members remain in the relationships and act in the best interests of the whole network.

In *Chapter 5*, I aimed to verify my theoretical suppositions by testing my model empirically. As an empirical setting for analysis, I have chosen the Ukrainian agri-food business. By conducting a systematic review of literature on the issues of chain management, I have revealed that the transition countries in Central and Eastern Europe are characterized by a wide scope of verticalization practices, especially in the agri-food business. Several studies point to the process of retail internationalization as the main driver of verticalization. Foreign retailers exert significant efforts to raise the level of quality of their food suppliers in CEEC to meet their own global quality requirements. As a consequence, procurement systems experience rapid modernization with tightening of the relationships among supply chain members, and the supply chain networks are formed. The extent of such implications differs with the degree of progress in retail internationalization in a particular country. On the basis of the level of market penetration by modern retail formats, one can distinguish between "three waves" of retail internationalization in CEEC. In this context, the countries that belong to the third wave of retail internationalization, e.g. Russia, Ukraine, etc. exhibit the lowest level of presence by foreign retailers but their market shares grow steadily. Additionally, the western

food processors establish their subsidiaries in these countries on a wide scale. The "imported" business concepts are widely imitated by local competitors of foreign retailers and manufacturers. As a result, one can speak of deliberate strategies implemented in the course of verticalization and establishment of supply chain networks. Therefore, I have chosen the Ukrainian agri-food business as an empirical setting for my research.

Empirical analysis involved three subsequent stages. At the first stage, I have tested the suitability of the empirical setting by means of expert interviews. I aimed to define whether supply chain networks exist and to what extent chain management is exercised in the Ukrainian agri-food business. The results of the interviews support the suitability of the empirical setting and indicate that the chain management practices are primarily introduced by the foreign investors and the local branded enterprises. At the same time, the implementation of the chain management concepts faces a lot of constraints caused by outdated infrastructure and volatile business environment.

The second stage of analysis involved the pretest of the questionnaire, aiming to modify the survey instrument for the final data collection in Ukraine and to check for appropriateness of the hypotheses and measures included in my model. For the pretest, I have conducted 31 telephone interviews with top managers of the specialized fish retail firms in Germany. Specialized fish retailers are responsible for the quality of the offered fish products to consumers and can be considered as focal companies in their supply chain networks, i.e. the companies which are knowledgeable about the whole network.

The interviews with fish retailers revealed that a slight modification of the questionnaire was necessary. This task has been completed. Additionally, by using the results of the interviews, I was able to check for appropriateness of some hypotheses in my model. I tested a simplified version of my model by means of the PLS technique. The simplified model involved the effects of the alignment of interests and the alignment of actions on the achievement of goals of a supply chain network. Clear differentiation between network-level and firm-level goals has not been made at this stage.

The results of the model testing indicated that the alignment of interests and the alignment of actions have significant positive effects on the achievement of network goals. In my sample, the alignment of interests was achieved through a high level of communication among the partners. If problems arose, they were most often solved jointly by provision of assistance from the focal actor. Additionally, focal company had to possess some influence to be able to apply sanctions and fiats such as excluding network firms from the network. To align the actions, the focal firm had to be aware of the existing interdependencies and to possess necessary skills and coordination capabilities. Thus, the hypothesized signs and directions of effects in my model were found to be reasonable.

The pretest has also provided an opportunity to develop concrete measures for the constructs of my original model which were little conceptualized in literature. In this regard, network-level goals were operationalized by the following measures: the focal company's satisfaction with contribution of all suppliers to quality of the branded product; the focal company's satisfaction with quality of supplies by suppliers; the focal company's satisfaction with quality of product-related services by customers; the focal company's satisfaction with contribution of all customers to sales of the branded product.

At the third stage of empirical analysis, I have collected data through telephone interviews with branded food manufacturers in Ukraine and tested my model. Of the 359 branded food processing companies, 106 interviews with both purchasing and sales managers of the top (i.e. strategic) level were conducted. Five questionnaires were put aside because five of the interviewed managers represented vertically integrated companies and, consequently, data on cooperation with either suppliers or buyers was missing. Thus, overall, the active sample comprised 101 filled questionnaires. This resulted in a 28 % response rate.

I have tested my model using the PLS technique. As a technique for structural equation modeling, PLS not only assesses the structural model – the assumed causation among a set of dependent and independent constructs – but, in the same analysis, also evaluates the measurement model – loadings of observed measures on their expected latent constructs. Apart from these advantages, I have chosen PLS due to its suitability for prediction and/or theory building. Given that the achievement of network-level goals is a new construct included into analysis and the effects of the alignment of interests and alignment of actions on this construct have not been tested up to now, PLS seems to be an appropriate tool. More importantly, the constructs included in my model have never been analyzed simultaneously. The PLS approach allows for such type of analysis and enables conclusions about the model as a whole.

The results of model testing indicated a good fit of both measurement and structural models. Significance of the hypothesized relationships was defined by means of the bootstrap method. Based on the results of bootstrapping, I have accepted seven out of ten hypotheses. A hypothesis testing demonstrated that the constructs of strategic chain management have larger effects on the achievement of network-level goals than on the achievement of firm-level goals. This conclusion contradicts the understanding of strategic chain management by the majority of top managers. Although the managers reasonably consider the goal of economic efficiency as one of the major drivers of vertical cooperation, they often define firm-level goals or the fulfillment of chain management tasks per se as the main strategic goals for their supply chains. In contrast, my results imply that the attention chain managers pay to network-level goals must be higher than that paid to firm-level goals.

Additionally, the results have shown that supply chain networks in the Ukrainian agri-food business require modification of the "imported" chain management concepts. The investigated supply chain networks are characterized by a negative effect of higher interdependence among members on the alignment of their actions. This finding can be explained by high volatility of the business environment and the infrastructural problems.

In *Chapter 6*, I aimed to develop a framework of goal achievement in supply chain networks and derive implications for chain management based on the results of my empirical analysis. Thus, I have developed the framework and derived a number of implications for chain management in general and the chain management in the Ukrainian agri-food business in particular.

Two general implications for strategic chain management can be derived from my results. First, network-level and firm-level goals have to be considered simultaneously within a collective strategy. Thus, the collective strategy should address not only the alignment of interests of individual network members but also the alignment of network-level and firm-level goals. Moreover, a collective strategy has to be seen as a plan of actions to achieve network-level and firm-level goals simultaneously.

Second, I show that the alignment and the achievement of network-level and firm-level goals must be addressed simultaneously because the acceptable degree of goal consensus by itself does not guarantee goal achievement while the concerted action alone may fail due to goal conflict. In essence, the partnering and the supply chain management strategies aim to deal with goal alignment and goal achievement, respectively. For that matter, I define specific mechanisms. Collaborative conflict management behavior as well as socialization processes in combination with procedural fairness and incentives can serve as appropriate tools to align network-level and firm-level goals. The goal achievement requires presence of a powerful focal company, strong coordination capabilities of the focal company and network members as well as the use of various communication modes. Altogether, these implications have constituted my framework of goal achievement in supply chain networks.

I have also developed a number of implications for chain managers in the Ukrainian agri-food business. Apart from considering the implications for chain management in general, managers are recommended to take the specifics of the different business environment into account. Agri-food chains in Ukraine exhibit a high degree of volatility with frequent contract breaches in order to please short-term pecuniary interests. However, given a strong reputation effect of well-known brands on small suppliers, focal companies are recommended to use the network members' quest for reputation to achieve network-level and firm-level goals simultaneously.

Yet, difficulties in establishing tight working relationships in the Ukrainian agri-food business are not limited to poor contract enforcement. They also reflect the

existing infrastructural problems. Firms face high adjustment costs to the ongoing restructuring processes at the procurement and the distribution stages. This facilitates the strong cost orientation of most firms. As a result, network-level goals may not be in the focus of some relevant network actors which contribute to the supply. Additionally, a conflict between long-term orientation of chain management and the need to produce high returns on investments in short terms persists. I have recommended resolving this dilemma by setting the resolution of infrastructural problems as a network-level goal. The companies which are successful in establishing a sound supply side of their businesses in Ukraine are involved into construction of access roads, warehouses, etc. However, their efforts will not be enough to deal with infrastructural constraints in the short run.

However, the effect of a volatile business environment requires modifying of known chain management concepts when implementing them in the Ukrainian agri-food business. In this context, I have posited that one way the chain management concepts can be modified is to consider the different degrees of competitive advantage each relationship in the supply chain network entails. Focal firms should make a distinction between parity and advantage chain management. In the case of parity chain management, the aim of the collective strategy is to gain parity with the competing supply chain networks, e.g. a certain level of chain quality can be regarded as a competitive necessity. Advantage chain management aims to create long-term enduring competitive advantages by adding strategic elements that are higher than the parity standards. It should be much easier to formulate an integrated and consistent management system with this division.

7.2 Limitations of the study

The analysis conducted in this thesis has faced a number of objective difficulties and, therefore, suffers from some limitations. First of all, because I aimed to develop the implications for the strategic network management, the thesis has primarily based its arguments on the existing premises of the strategic management research. Although I used some elaborations of the literature on goal setting, collective action, and cooperation theory, I am aware that substantial insights into the topic of, e.g., collective goals could have been gained by conducting a more in-depth study of these literature strands.

The second limitation resided in some difficulties of distinguishing between the mechanisms, preconditions and measures of cooperation and coordination. Both terms are often used synonymously or are even mixed in the literature. Furthermore, they are often intertwined. For example, in some situations, resolution of the cooperation and coordination problems may require the use of the same mechanism, e.g. communication, and thereby complicate clear understanding of what is what.

Third, the primary addressees of the implications of this study are focal firms. In this context, I am aware that taking a focal firm's suppliers or buyers into account could have produced somewhat different results, e.g., with regard to opinions about

satisfaction with the achievement of firm-level goals. Yet, this limitation is caused by the strategic network approach I use in this thesis by assuming that the focal firm is concerned with the management of the network and is, therefore, knowledgeable about the whole network. Besides, I have provided examples which indicate that network-level goals which were brought to the forefront of my argumentation are most often set by focal firms.

Given these limitations as well as the results of my study, the issues related to the strategic chain management require further investigations. Some directions for future research are presented in the next section.

7.3 Future research

This thesis involves the development of propositions on how to manage supply chain networks successfully. Whereas several hypotheses received some attention in the empirical example, several aspects still have to be empirically tested. In particular, one can consider testing the effects of the different mechanisms of partnering strategies on the relationships between network-level and firm-level goals. Because the empirical example presented in this thesis involved goals that tend to be pursued in supply chain networks in general, one can think of the development of measures of network-level goals for a particular set of supply chain networks. Such type of analysis may require using methods that are appropriate in conditions of small sample sizes.

Future empirical analysis of goals pursued through supply chain networks could also take a direction similar to what GELLYNCK et al. (2008) did in the traditional food sector in the EU, i.e. analysis could encompass responses of all supply chain actors. However, in contrast to GELLYNCK et al. (2008) who considered only goals mentioned by *all* supply chain actors, analysis should differentiate between network-level and firm-level goals if one aims to develop implications for chain management. Additionally, one could think of the development of methods for consideration of complexity arising from responses of multiple network members.

Another issue for future empirical research could be comparison of goal achievement among different supply chain networks. The approach I used, i.e. focus on perceived rather than objective measures (BUURMA and BOSELIE, 2000; MEDLIN, 2006) seems to be suitable for this type of analysis because different supply chain networks have distinctive features and, thus, objective measures will mean little without a benchmark for comparison.

One of the interesting directions for both empirical and theoretical analysis is to account for intrinsic dynamism of networks which implies that goals of the different levels may change over time and, consequently, relationships between network-level and firm-level goals may change. Furthermore, relationships between goals may change even if the goals remain the same but the views by network members on how to achieve goals diverge in the course of time. Further research is, thus, needed

to understand how these issues can be addressed within the network's collective strategy and the partnering and supply chain management sub-strategies. Particular attention should be paid to the development of network management capabilities that would enable capturing of goals of the whole network. In this thesis, I was able to show the general pattern of relationships occurring between goals pursued in strategic networks and how the chain management should be exercised to cope with these relationships successfully.

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APPENDIX 1

REVIEW OF LITERATURE ON GOALS PURSUED IN SUPPLY CHAIN NETWORKS

This Appendix presents the results of a literature review on the topic of network goals in international peer-reviewed scientific journals listed in international literature databases. Specifically, I conducted a search for journal articles in the different journal databases, including JSTOR and ScienceDirect among others. Journals in consideration belonged to the spheres of management, strategic management, supply chain management, and marketing (see Table A-1 for the list of journals that have published more than 10 articles on the topic of interest).

Table A-1: The list of journals with more than 10 articles related to the topic of interfirm network performance

Journals' titles
Academy of Management Journal
Academy of Management Review
Administrative Science Quarterly
Industrial Marketing Management
International Journal of Business Studies
International Journal of Operations and Production Management
International Journal of Physical Distribution and Logistics Management
Journal of the Academy of Marketing Science
International Food and Agribusiness Management Review
Journal of Marketing
Journal of Retailing
Journal on Chain and Network Science
Management Science
Marketing Science
Strategic Management Journal
Supply Chain Management: An International Journal
The International Journal of Logistics Management
The Journal of Supply Chain Management

The main search term was *network goals*. Furthermore, since the achievement of goals is generally referred to as success and the level of goal achievement is defined as performance (ANDERSON, 1990), the following search terms were also used: *network success, network success factors*, *strategic alliance success*, *network performance*, *interorganizational performance*, *interfirm performance*, and *supply chain performance*. These terms were inquired in titles, abstracts and keywords of journal articles. The search was also limited to the 20-year period from 1986 to 2006 because the research on interorganizational performance is relatively

new. After the search process, obtained articles have been subject to screening for elimination of irrelevant ones with regard to their content. In particular, I eliminated articles falling outside interfirm research, e.g. articles on firm performance, computer networks' performance or interpersonal networks. After the process of screening, the remained literature has included a relatively large amount of articles (about 300). I then read the remained articles to obtain detailed information about the theoretical background, unit of analysis, methodology used, and the research results.

In general, the results of the review reveal the following tendencies in the interorganizational liteature:

- There is high interest in analyzing performance in the interorganizational setting. Particularly, the number of articles on supply chain performance has increased over the last decade.
- Despite emphasizing the focus on network performance, most of the reviewed studies examine performance of a single firm in a network, i.e. the focus is on the firm level. These studies analyze e.g. the impact of collaboration, implementation of supply chain management, network structure, interfirm trust etc. on the firm's performance or success.
- There are a few articles that analyze the performance of dyadic relationships (e.g., ELLRAM, 1995; PAULRAJ and CHEN, 2005). Pure dyadic perspective with analyses of performance of collaboration between two firms is widely viewed in the articles obtained due to the term *strategic alliance success* (e.g., ARIÑO, 2003; KALE et al., 2002, etc.). Again, a number of articles consider the influence of dyadic interactions on the firm's performance (e.g., MONCZKA et al., 1998; BAIMAN, 2001).
- Five studies that address the performance at the network level have been found (see Table A-2). The idea of network-level goals can be obtained from the performance measures employed in these studies. However, in most cases, these articles do not explicitly provide the theoretical foundations of these goals, i.e. who is setting the goals, who works to achieve them, which issues are related to goal setting, goals pursuit and goal achievement, etc. As a result, it is not clear whether these goals are collective or individual by nature and, therefore, the proposed methods of managerial inference with regard to goal achievement can lead to biased outcomes. Thus, network-level goals as a construct that can be used for the development of the systematic approach to network performance and, consequently, network management still have to be conceptualized.

Table A-2: The results of the review: Studies of interorganizational performance at the network level

Study	Main findings
DYER (1996)	In the auto industry, a tightly integrated production network characterized by proximity and a high level of human co-specialization will outperform a loosely integrated production network characterized by low levels of interfirm specialization. Quality and new model cycle time can be considered as the network-level goals.
DYER and NOBEOKA (2000)	The notion of a dynamic learning capability that creates competitive advantage needs to be extended beyond firm boundaries. If the network can create a strong identity and coordinating rules, then it will be superior to a firm as an organizational form at creating and recombining knowledge due to the diversity of knowledge that resides within a network.
GUIMARAES et al. (2002)	Business clockspeed moderates the relationship between IT use effectiveness and supplier network performance. The same is true in the case of supplier relations depth, and hence, managers are encouraged to pay attention to the items comprising network performance as a determinant of supplier network performance.
PARK and HARTLEY (2002)	The supplier management practices adopted by first-tier suppliers affected second-tier suppliers' performance. Second-tier suppliers' performance consequently influenced both first-tier suppliers' quality and delivery performance. These findings suggest that best practices in supplier management should be transferred upstream in the supply chain to improve overall performance of the entire supply chain.
POWELL ROBINSON JR. et al. (2005)	While the potential economic benefit of e-replenishment in a decentralized system is substantial, greater operational improvements may be possible through supply chain coordination.

The results of this review generally coincide with those obtained by SHEPHERD and GÜNTER (2005) and PROVAN et al. (2007) who conducted literature reviews on supply chain performance measurement and "whole" networks, respectively. The conclusion by SHEPHERD and GÜNTER (2005) was that, surprisingly, the majority of approaches to measurement of supply chain performance are based on the firm-level indicators, whereas the supply chain management requires measures that would encompass the whole supply chain. In turn, PROVAN et al. (2007) have found that, of more than 50,000 existing journal articles on interorganizational issues, only 26 are dedicated to the network level of analysis, which is a very small number given the persistence of issues that require explanation of how the whole network can work effectively.

APPENDIX 2

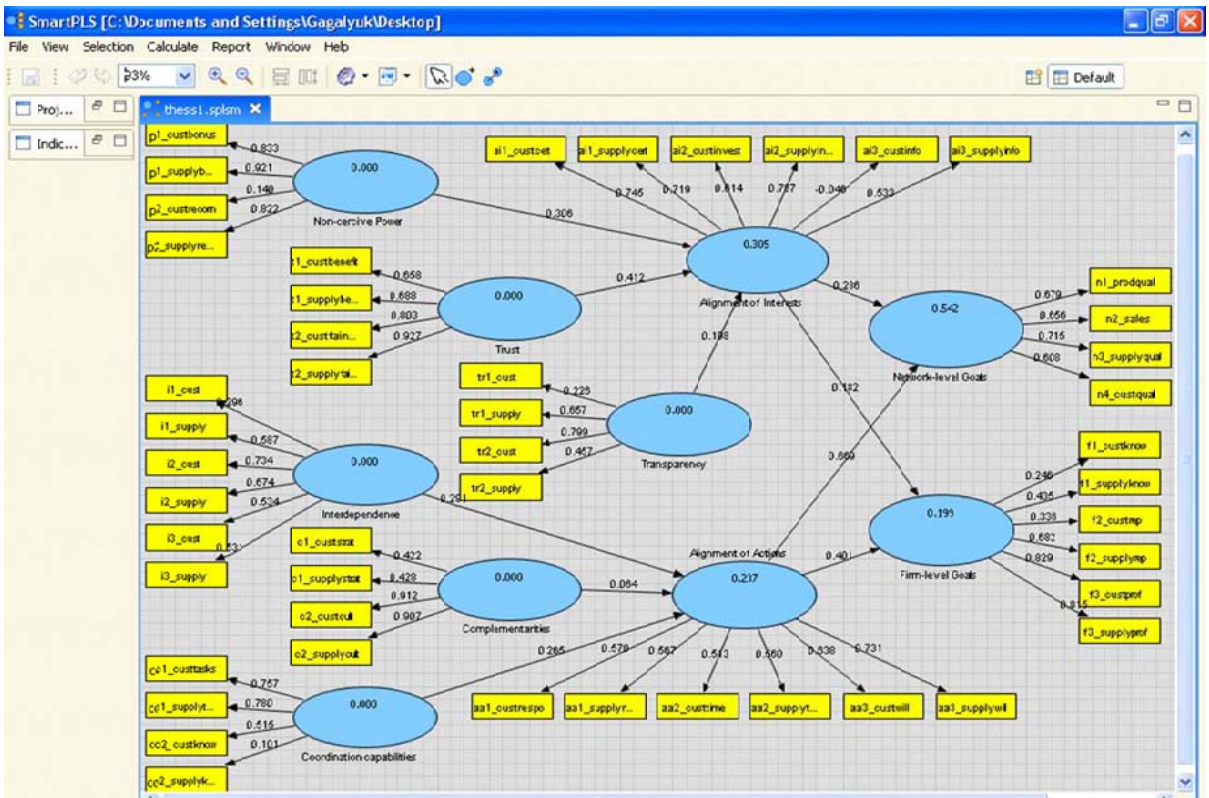
OPERATIONALIZATION OF THE LATENT VARIABLES

Latent construct	Measure (manifest variable)	Item designation in SmartPLS
The level of achievement of network-level goals of network members	**1. How satisfied are you with contribution of *all* your *suppliers* to the quality of your branded product (e.g. maintenance of product freshness, durability, absence of contaminants, etc.)?** (From "very dissatisfied" to "very satisfied")	**n1_prodqual**
	2. How satisfied are you with contribution of *all* your *customers* to the sales of your branded product? (From "very dissatisfied" to "very satisfied")	**n2_sales**
	3. How satisfied are you with the work of *all* your *suppliers* regarding the following aspects: supplies of necessary volumes of product components, proper preservation, traceability of the supplied components, etc.? (From "very dissatisfied" to "very satisfied")	**n3_supplyqual**
	4. How satisfied are you with the work of *all* your *customers* regarding the following aspects: product appearance on the shelf, provision of logistics and merchandizing services, etc.? (From "very dissatisfied" to "very satisfied")	**n4_custqual**
The level of achievement of firm-level goals of network members	**1. To what extent do you think your current *suppliers* are satisfied with knowledge received from your company?** (From "very dissatisfied" to "very satisfied")	**f1_supplyknow**
	2. To what extent do you think your current *suppliers* are satisfied with reputation of working together with your company? (From "very dissatisfied" to "very satisfied")	**f2_supplyrep**
	3. To what extent do you think your current *suppliers* are satisfied with profit generated from cooperation with your company? (From "very dissatisfied" to "very satisfied")	**f3_supplyprof**
	4. To what extent do you think your current *customers* are satisfied with knowledge received from your company? (From "very dissatisfied" to "very satisfied")	**f1_custknow**
	5. To what extent do you think your current *customers* are satisfied with reputation of working together with your company? (From "very dissatisfied" to "very satisfied")	**f2_custrep**
	6. To what extent do you think your current *customers* are satisfied with profit generated from cooperation with your company? (From "very dissatisfied" to "very satisfied")	**f3_custprof**
The level of the alignment of interests (cooperation goal of chain management)	Please indicate your opinion about the following statements: (From "strongly disagree" to "strongly agree")	
	1. We are certain that the majority of our current *suppliers* will perform their tasks properly	**ai1_supplycert**
	2. We are certain that the majority of our current *customers* will perform their tasks properly	**ai1_custcert**

Latent construct	Measure (manifest variable)	Item designation in SmartPLS
	3. Most of our *suppliers* invest enough in quality and technology to be able to meet our requirements	**ai2_supplyinvest**
	4. Most of our *customers* invest enough in quality and technology to be able to meet our requirements	**ai2_custinvest**
	5. How satisfied are you with the mutual information exchange with your current *suppliers*? (From "very dissatisfied" to "very satisfied")	**ai3_supplyinfo**
	6. How satisfied are you with the mutual information exchange with your current *customers*? (From "very dissatisfied" to "very satisfied")	**ai3_custinfo**
The level of the alignment of actions (coordination goal of chain management)	**1. How satisfied are you with the responsiveness of your *suppliers* to your requests regarding e.g. process quality, product quality, etc.?** (From "very dissatisfied" to "very satisfied")	**aa1_supplyrespo**
	2. How satisfied are you with the timeliness of delivery of components for your branded product by your current *suppliers*? (From "very dissatisfied" to "very satisfied")	**aa2_supplytime**
	3. How satisfied are you with the responsiveness of your *customers* to your requests regarding e.g. product storage, merchandizing, etc.? (From "very dissatisfied" to "very satisfied")	**aa1_custrespo**
	4. How satisfied are you with the timeliness of payments for your branded product by your current *customers*? (From "very dissatisfied" to "very satisfied")	**aa2_custtime**
	5. How satisfied are you with the willingness by your current *suppliers* to perform their operational tasks? (From "very dissatisfied" to "very satisfied")	**aa3_supplywill**
	6. How satisfied are you with the willingness by your current *customers* to perform their operational tasks? (From "very dissatisfied" to "very satisfied")	**aa3_custwill**
The level of complementarities among network members	Please indicate your opinion about the following statements: (From "strongly disagree" to "strongly agree")	
	1. The strategies of most of our *suppliers* correspond to our strategy	**c1_supplystrat**
	2. The cultural norms and values of most of our *suppliers* correspond to our cultural norms and values	**c2_supplycult**
	3. The strategies of most of our *customers* correspond to our strategy	**c1_custstrat**
	4. The cultural norms and values of most of our *customers* correspond to our cultural norms and values	**c2_custcult**
The level of coordination capabilities of network members	Please indicate your opinion about the following statements: (From "strongly disagree" to "strongly agree")	
	1. Most of our *suppliers* easily agree if we ask them to perform certain tasks to meet our requirements	**cc1_supplytasks**
	2. Most of our *customers* easily agree if we ask them to perform certain tasks to meet our requirements	**cc1_custtasks**
	3. Most of our *suppliers* know what they have to do to meet our standards	**cc2_supplyknow**
	4. Most of our *customers* know what they have to do to meet our standards	**cc2_custknow**

Latent construct	Measure (manifest variable)	Item designation in SmartPLS
The level of use of non-coercive power by the focal company	**1. To make your *suppliers* comply with your standards, how often do you use premiums/bonuses?** (From "very infrequently" to "very frequently")	**p1_supplybonus**
	2. How often do you provide your *suppliers* with specific recommendations that help them meet your requirements? (From "very infrequently" to "very frequently")	**p2_supplyrecom**
	3. To make your *customers* comply with your standards, how often do you use premiums/bonuses? (From "very infrequently" to "very frequently")	**p1_custbonus**
	4. How often do you provide your *customers* with specific recommendations that help them meet your requirements? (From "very infrequently" to "very frequently")	**p2_custrecom**
The level of trustful relationships among network members	Please indicate your opinion about the following statements: (From "strongly disagree" to "strongly agree")	
	1. Most of our *suppliers* believe that our decisions are beneficial for them	**t1_supplybenefit**
	2. Most of our *customers* believe that our decisions are beneficial for them	**t1_custbenefit**
	3. We always inform our *suppliers* about our next steps in cooperation	**t2_supplyfairness**
	4. We always inform our *customers* about our next steps in cooperation	**t2_custfairness**
The level of transparency among network members	Please indicate your opinion about the following statements: (From "strongly disagree" to "strongly agree")	
	1. We are knowledgeable enough about decision-making styles of our *suppliers*	**tr1_supply**
	2. We are knowledgeable enough about decision-making styles of *our suppliers' suppliers*	**tr2_supply**
	3. We are knowledgeable enough about decision-making styles of our *customers*	**tr1_cust**
	4. We are knowledgeable enough about decision-making styles of *our customers' customers*	**tr2_cust**
The level of interdependence among network members	Please indicate your opinion about the following statements: (From "strongly disagree" to "strongly agree"; reverse coded)	
	1. If it was necessary, we could substitute our *suppliers* quite easily	**i1_supply**
	2. If our *suppliers* wanted, they could substitute us by another partner quite easily	**i2_supply**
	3. If it was necessary, we could substitute our *customers* quite easily	**i1_cust**
	4. If our *customers* wanted, they could substitute us by another partner quite easily	**i2_cust**
	5. If it is necessary, our *suppliers* easily find common language with each other	**i3_supply**
	6. If it is necessary, our *customers* easily find common language with each other	**i3_cust**

Appendix 3
The results of calculations in SmartPLS 2.0.1



Appendix 4
Fit of the measurement model

Item designation	Latent variables and items	Factor loading	Cronbach's Alpha	Composite Reliability	AVE
	The level of achievement of network-level goals of network members		**0.796**	**0.760**	**0.643**
n1_prodqual	How satisfied are you with contribution of *all* your *suppliers* to the quality of your branded product (e.g. maintenance of product freshness, durability, absence of contaminants, etc.)?[1]	0.679			
n2_sales	How satisfied are you with contribution of *all* your *customers* to the sales of your branded product?	0.656			
n3_supplyqual	How satisfied are you with the work of *all* your *suppliers* regarding the following aspects: supplies of necessary volumes of product components, proper preservation, traceability of the supplied components, etc.?	0.715			
n4_custqual	How satisfied are you with the work of *all* your *customers* regarding the following aspects: product appearance on the shelf, provision of logistics and merchandizing services, etc.?	0.608			
	The level of achievement of firm-level goals of network members		**0.749**	**0.745**	**0.563**
f1_supplyknow	To what extent do you think your current *suppliers* are satisfied with knowledge received from your company?	0.435			
f2_supplyrep	To what extent do you think your current *suppliers* are satisfied with reputation of working together with your company?	0.682			
f3_supplyprof	To what extent do you think your current *suppliers* are satisfied with profit generated from cooperation with your company?	0.815			
f1_custknow	To what extent do you think your current *customers* are satisfied with knowledge received from your company?[2]	-			
f2_custrep	To what extent do you think your current *customers* are satisfied with reputation of working together with your company? [2]	-			
f3_custprof	To what extent do you think your current *customers* are satisfied with profit generated from cooperation with your company?	0.829			
	The level of the alignment of interests		**0.645**	**0.755**	**0.593**
ai1_supplycert	We are certain that the majority of our current *suppliers* will perform their tasks properly	0.719			
ai1_custcert	We are certain that the majority of our current *customers* will perform their tasks properly	0.745			
ai2_supplyinvest	Most of our *suppliers* invest enough in quality and technology to be able to meet our requirements	0.787			

ai2_custinvest	Most of our *customers* invest enough in quality and technology to be able to meet our requirements	0.614			
ai3_supplyinfo	How satisfied are you with the mutual information exchange with your current *suppliers*?	0.533			
ai3_custinfo	How satisfied are you with the mutual information exchange with your current *customers*? [2]	-			
	The level of the alignment of actions		**0.640**	**0.770**	**0.561**
aa1_supplyrespo	How satisfied are you with the responsiveness of your *suppliers* to your requests regarding e.g. process quality, product quality, etc.?	0.567			
aa2_supplytime	How satisfied are you with the timeliness of delivery of components for your branded product by your current *suppliers*?	0.560			
aa1_custrespo	How satisfied are you with the responsiveness of your *customers* to your requests regarding e.g. product storage, merchandizing, etc.?	0.570			
aa2_custtime	How satisfied are you with the timeliness of payments for your branded product by your current *customers*?	0.513			
aa3_supplywill	How satisfied are you with the willingness by your current *suppliers* to perform their operational tasks?	0.731			
aa3_custwill	How satisfied are you with the willingness by your current *customers* to perform their operational tasks?	0.638			
	The level of complementarities among network members		**0.835**	**0.782**	**0.504**
c1_supplystrat	The strategies of most of our *suppliers* correspond to our strategy	0.428			
c2_supplycult	The cultural norms and values of most of our *suppliers* correspond to our cultural norms and values	0.907			
c1_custstrat	The strategies of most of our *customers* correspond to our strategy	0.422			
c2_custcult	The cultural norms and values of most of our *customers* correspond to our cultural norms and values	0.912			
	The level of coordination capabilities of network members		**0.574**	**0.746**	**0.564**
cc1_supplytasks	Most of our *suppliers* easily agree if we ask them to perform certain tasks to meet our requirements	0.780			
cc1_custtasks	Most of our *customers* easily agree if we ask them to perform certain tasks to meet our requirements	0.757			
cc2_supplyknow	Most of our *suppliers* know what they have to do to meet our standards[2]	-			
cc2_custknow	Most of our *customers* know what they have to do to meet our standards	0.515			
	The level of use of non-coercive power by the focal company		**0.770**	**0.807**	**0.559**
p1_supplybonus	To make your *suppliers* comply with your standards, how often do you use premiums/bonuses?	0.921			
p2_supplyrecom	How often do you provide your *suppliers* with specific recommendations that help them meet your requirements?	0.822			
p1_custbonus	To make your *customers* comply with your standards, how often do you use premiums/bonuses?	0.833			

p2_custrecom	How often do you provide your *customers* with specific recommendations that help them meet your requirements? [2]	-			
	The level of trustful relationships among network members		**0.796**	**0.856**	**0.603**
t1_supplybenefit	Most of our *suppliers* believe that our decisions are beneficial for them	0.688			
t1_custbenefit	Most of our *customers* believe that our decisions are beneficial for them	0.658			
t2_supplyfairness	We always inform our *suppliers* about our next steps in cooperation	0.927			
t2_custfairness	We always inform our *customers* about our next steps in cooperation	0.803			
	The level of transparency among network members		**0.641**	**0.731**	**0.532**
tr1_supply	We are knowledgeable enough about decision-making styles of our *suppliers*	0.657			
tr2_supply	We are knowledgeable enough about decision-making styles of *our suppliers' suppliers*	0.457			
tr1_cust	We are knowledgeable enough about decision-making styles of our *customers*[2]	-			
tr2_cust	We are knowledgeable enough about decision-making styles of *our customers' customers*	0.799			
	The level of interdependence among network members		**0.717**	**0.738**	**0.532**
i1_supply	If it was necessary, we could substitute our *suppliers* quite easily	0.587			
i2_supply	If our *suppliers* wanted, they could substitute us by another partner quite easily	0.674			
i1_cust	If it was necessary, we could substitute our *customers* quite easily[2]	-			
i2_cust	If our *customers* wanted, they could substitute us by another partner quite easily	0.734			
i3_supply	If it is necessary, our *suppliers* easily find common language with each other	0.531			
i3_cust	If it is necessary, our *customers* easily find common language with each other	0.534			

Notes: [1] For scales, see Appendix 1.
[2] Removed from analysis due to factor loading lower than 0.4.

Appendix 5

Loadings and cross loadings of items (manifest variables) and latent variables (constructs)

	AA	AI	C	CC	FL	I	NL	P	TR	T
aa1_custrespo	**0.5700**[1]	0.0042	0.0936	0.1283	0.3438	-0.2007	0.3545	0.0017	0.0804	0.1499
aa1_supplyrespo	**0.5668**	0.1213	0.2343	0.2905	0.2357	-0.2441	0.2947	0.0302	0.1545	-0.0375
aa2_custtime	**0.5131**	-0.0359	0.0036	0.1043	0.2512	0.0910	0.3484	0.1484	0.2422	-0.2988
aa2_supplytime	**0.5597**	0.3570	0.1035	0.1878	0.1787	-0.4053	0.3839	0.2244	0.1104	0.0210
aa3_custwill	**0.6384**	-0.1822	0.0685	0.2790	0.2779	-0.3500	0.3229	0.0423	-0.1383	-0.2517
aa3_supplywill	**0.7309**	-0.1554	0.1326	0.4460	0.2008	-0.2951	0.4233	0.0311	0.0957	-0.2563
ai1_custcert	0.0577	**0.7452**	0.1643	0.3204	0.1619	-0.3311	0.2162	0.1505	0.2578	0.2402
ai1_supplycert	0.0933	**0.7189**	0.1692	0.3380	0.2311	-0.3356	0.2475	0.0730	0.1842	0.3136
ai2_custinvest	-0.1084	**0.6141**	0.0725	-0.1197	-0.0573	0.1776	0.1075	0.2739	0.2182	0.1817
ai2_supplyinvest	-0.0446	**0.7870**	0.1805	-0.0789	0.1565	0.1018	0.3008	0.2482	0.2011	0.3582
ai3_supplyinfo	0.1258	**0.5332**	0.1964	0.1358	0.1247	-0.2812	0.1000	0.3282	-0.0212	0.1874
c1_custstrat	-0.0064	0.1226	**0.4215**	0.0069	-0.0112	0.1148	0.1101	0.0596	0.0610	-0.0898
c1_supplystrat	-0.0266	0.2200	**0.4281**	-0.0545	0.0298	0.0890	0.1627	-0.0002	0.0170	0.0471
c2_custcult	0.1418	0.2911	**0.9115**	0.3144	0.1166	-0.1086	0.0096	0.1026	-0.1391	0.0916
c2_supplycult	0.1559	0.1150	**0.9072**	0.2822	-0.0276	0.0112	-0.0217	0.0454	0.0668	-0.2307
cc1_custtasks	0.2022	0.1265	0.2415	**0.7575**	0.1267	-0.3297	0.0546	-0.0816	-0.1822	-0.0193
cc1_supplytasks	0.3429	-0.0502	0.3674	**0.7803**	0.0504	-0.2901	0.0777	0.0555	0.0099	-0.3034
cc2_custknow	0.2614	0.3221	0.0749	**0.5146**	0.2140	-0.2257	0.2677	0.1060	0.3752	0.0374
f1_supplyknow	0.2610	-0.1856	0.2047	0.1386	**0.4349**	0.1424	0.1715	0.0945	0.0385	-0.1130
f2_supplyrep	0.2760	0.0859	0.0309	-0.0458	**0.6822**	0.1297	0.3574	0.1635	-0.0808	0.1184
f3_custprof	0.3678	0.2003	0.0692	0.2135	**0.8289**	-0.4595	0.4904	-0.1424	0.1950	0.1677
f3_supplyprof	0.2636	0.3061	-0.0829	0.1996	**0.8153**	-0.4146	0.3870	-0.0741	0.0413	0.1888
i1_supply	-0.1379	0.0039	0.0921	-0.0890	-0.1591	**0.5871**	-0.1380	0.0515	-0.1505	0.1013
i2_cust	-0.3087	-0.1875	-0.2803	-0.2055	-0.2777	**0.7343**	-0.2275	0.0646	0.0139	-0.1243
i2_supply	-0.2218	-0.0834	-0.1994	-0.2329	-0.1014	**0.6745**	-0.1694	-0.0022	-0.0327	0.0826
i3_cust	-0.2327	-0.1550	0.1379	-0.2640	-0.1208	**0.5343**	-0.1466	0.1190	0.0245	0.0315
i3_supply	-0.2872	-0.0594	0.1201	-0.4170	-0.2152	**0.5313**	-0.0529	-0.0157	0.0787	0.0435
n1_prodqual	0.3279	0.2955	0.0287	0.2247	0.2895	-0.1711	**0.6789**	0.0099	0.1186	0.1910
n2_sales	0.3168	0.1336	-0.0142	0.1767	0.3087	-0.1109	**0.6558**	0.3415	0.3092	-0.2956

n3_supplyqual	0.4493	0.1287	-0.0842	0.0506	0.3679	-0.2835	**0.7151**	0.0385	0.2035	0.0395
n4_custqual	0.2055	0.2777	-0.0185	-0.0188	0.3548	-0.0304	**0.6085**	-0.0819	0.1940	0.2055
p1_custbonus	0.1155	0.1646	0.1076	-0.0031	0.0375	0.2443	0.1211	**0.8327**	0.1521	-0.1598
p1_supplybonus	0.0993	0.2456	0.0889	0.1310	0.0124	0.0940	0.0871	**0.9212**	0.2377	-0.1962
p2_supplyrecom	0.0934	0.2759	0.0678	-0.0847	-0.1197	0.0050	0.1574	**0.8220**	0.0986	0.0643
t1_custbenefit	-0.2004	0.1423	-0.1223	-0.0385	0.0759	0.0054	-0.0055	-0.0854	0.1044	**0.6584**
t1_supplybenefit	-0.1325	0.2027	-0.0258	0.1211	0.1476	-0.1229	-0.0172	-0.0041	0.0724	**0.6885**
t2_custfairness	-0.1637	0.2325	-0.2581	-0.3565	0.1355	0.0799	0.0717	-0.1432	0.0702	**0.8032**
t2_supplyfairness	-0.1480	0.4561	0.0108	-0.1808	0.1430	0.0451	0.0289	-0.1083	-0.0370	**0.9274**
tr1_supply	0.1789	0.1819	0.1889	0.1267	-0.0831	-0.0336	0.1642	0.2386	**0.6570**	-0.1149
tr2_cust	0.0876	0.2363	-0.2109	0.0595	0.2214	-0.0339	0.3063	0.0433	**0.7987**	0.1735
tr2_supply	0.0070	0.0379	-0.0903	-0.1947	0.0469	0.2888	0.1273	0.0283	**0.4569**	-0.0385

Notes: [1] Bold numbers highlight the value of item loadings on their respective latent constructs. The bold values indicate that loadings are higher than cross loadings.

AA = level of alignment of actions
AI = level of alignment of interests
C = level of complementarities
CC = level of coordination capabilities
FL = level of achievement of firm-level goals
I = level of interdependence
NL = level of achievement of network-level goals
P = level of non-coercive power use
TR = level of transparency
T = level of trustful relationship

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ISSN 1436-221X
ISBN 978-3-938584-63-7