

## Why Differences Make a Difference: Traditional Food Chain Performance in Selected European Countries

**Adrienn Molnár<sup>1</sup>, Xavier Gellynck<sup>1</sup>, and Robert D. Weaver<sup>2</sup>**

<sup>1</sup>*Ghent University, Faculty of Bioscience Engineering, Department of Agricultural, Economics, Division Agro-Food Marketing, Coupure Links 653, B-9000 Ghent, Belgium*

<sup>2</sup>*The Pennsylvania State University, Department of Agricultural Economics and Rural Sociology, 201E Armsby Building, University Park PA 16802*  
[Adrienn.Molnar@Ugent.be](mailto:Adrienn.Molnar@Ugent.be); [Xavier.Gellynck@Ugent.be](mailto:Xavier.Gellynck@Ugent.be); [r2w@psu.edu](mailto:r2w@psu.edu)

### 1 Introduction

Organizations no longer compete as independent entities, but as chains (Christopher 1998; Cox 1999; Lambert and Cooper 2000), and these organizations more and more realize the performance potential of chains (Pearson and Samali 2005; Gellynck, Vermeire and Viaene 2006). Being part of a well-performing chain generates important performance benefits for the individual organization (Zhenxin, Hong and Edwin 2001). As a result, there is increasing interest in the performance of chains as a research subject (Beamon 1998).

A vast group of authors (Neely, Mills, Platts, Gregory and Richards 1994; Neely, Gregory and Platts 1995; Beamon 1998; Christopher 1998; Beamon 1999; Li and O'Brien 1999; Van der Vorst 2000; Gunasekaran, Patel and Tirtiroglu 2001; Lambert and Pohlen 2001; Gunasekaran, Patel and McGaughey 2004; Van Der Vorst 2006) endorses the need to address the measurement of chain performance. Nonetheless, previous studies investigating chain performance have considered multiple individual chains, but rather compared groups of chain members. Some notable exceptions of such analysis are Spekman et al. (1998), Lu et al. (2006) or Clare et al. (2002). Second, with regard to measuring performance of chains active in the agri-business sector or in the traditional food [2] sector in particular, (Aramyan 2007) notes a number of challenges. First, this type of firm does not typically gauge their performance in a standardized way that allows comparison (Collins, Henschion and Reilly 2001), implying the collection of secondary data from these firms are highly challenging. Further, chains belonging to different sectors may have different characteristics such as chain length, closeness of chain relationships and types of process links (Lambert and Cooper 2000) possibly influencing their performance. Consequently, chain performance measurement being carried out in other sectors might reveal differences as compared to performance measurement of traditional food chains. Therefore, traditional food as a potential focus of chain performance measurement cannot remain neglected.

The above illustrates the interest in research concerned with measuring chain performance that motivates the focus of this paper. Specifically, in this paper, we present results that contribute to an understanding of the challenges in measuring chain performance in the traditional food sector. In particular, we consider chain member assessments of their chain partner contribution to their own and chain performance. The paper is structured as follows. In the following part the methodology of the paper is presented. Next, the research results are discussed and finally conclusions are drawn as well as further research topics formulated.

## 2 Material and Methods

### 2.1 Research method and research sample

Quantitative data were collected via individual interviews with 270 companies from 3 European countries (Belgium, Hungary, Italy) representing 5 traditional food subsectors (cheese, beer, white pepper, dry sausage, bakery, and ham). The selection of the countries was informed by the objective to cover a wide geographical diversity in Europe (Belgium: Western Europe, Italy: South Europe, Hungary: Central Eastern Europe). In these countries, traditional food subsectors were selected based on their socio-economic importance on the one hand (number and size of enterprises, employment rates, value added, turnover, investments, import/export, and consumption rates) and on facilitating cross-product (e.g. Belgian cheese with Belgian beer) and cross-country (e.g. Belgian cheese with Italian cheese) comparison on the other. Traditional food products are defined according to four criteria: (1) the key production steps are performed in a recognizable national, regional or local area, 2) the product is authentic in its a) recipe and/or b) raw material and/or c) production process, 3) the product is commercially available for at least 50 years and (4) the product has a unique and memorable gastronomic identity based on which the product is part of the gastronomic heritage. According to this definition, a database of traditional food producers was established. Next, in each country traditional food SMEs (small and medium sized enterprises) - as food manufacturers - were randomly selected for interviews from the established database. The focus on SMEs is justified by the large number of SMEs being active in the European agri-business sector. SMEs were defined as companies with less than 250 employees and maximum turnover of 50 million EUR. During the interviews with the food manufacturers, each food manufacturer was asked to identify the most important suppliers and customers they currently work with. Next, one supplier and one customer were selected and interviewed per food manufacturer. The selection of suppliers and customers was informed by the role, place and importance in the traditional food chains. For instance, when selecting suppliers, priority was given to suppliers holding a key position in the quality of the processed product such as pig breeders for processed meat and malt-houses for beer. In this way, a total of 90 traditional food chains (including 90 suppliers, 90 food manufacturers and 90 customers) were created and interviewed (details about the composition of the sample are provided in Appendix 1). This approach corresponds to the chain definition developed by Mentzer et al. (2001), namely a chain consists of a food manufacturer, a supplier, and a customer involved in the upstream and/or downstream flows of products, services, finances, and/or information. The interviews were carried out between December 2007 and June 2008.

### 2.2 Measurement and scaling

To measure traditional food chain performance, respondents (suppliers, food manufacturers, customers) were asked to indicate their agreement with 11 items designed to measure five constructs each indicating different aspects of chain performance. A seven point Likert scale ranging from completely disagree (1) to completely agree (7) was used. The 11 item statements were related to five latent constructs relating to the main dimensions of traditional food chain performance based on previous research (Bensaou and Venkatraman 1995; Neely, Gregory and Platts 1995; Beamon 1998; Beamon 1999; Bowersox, Closs and Stank 2000; Van der Vorst 2000; Akkermans, Bogerd, Yucesan and van Wassenhove 2003; Claro, Hagelaar and Omta 2003; Chen and Paulraj 2004; Aramyan 2007; Fox 2007; Gellynck, Molnár and Aramyan 2008). The study developed indicators of subjective evaluation of

traditional food chain performance for five main categories of performance: 1) Traditionalism, 2) Efficiency, 3) Responsiveness, 4) Quality and 5) Chain balance. Within each category, a set of questions addressed specific aspects of that category of chain performance. Together, these items are interpreted as providing multiple measures of the underlying category indicators. Each item was measured with ordinal scores. Respondents included chain members at three locations on the chain including supplier, manufacturing, and customer firms. Each respondent provided their subjective assessment of the contribution made by other chain members to the respondent firm's performance. Thus, each food manufacturer provided evaluation scores with respect to their individual supplier and customer contributions to that food manufacturer's economic performance. Similarly, each supplier provided item responses that indicate their assessment of the food manufacturer's contribution to that supplier's performance. Finally, each customer firm provided assessment of the food manufacturer's contribution to the customer firm's performance.

Descriptive statistics of responses are summarized in Table 1. The item questions and constructs are presented in Appendix 2. Each item question focuses on the respondent firm's assessment of a particular partner firm's contribution to the focal firm's performance. For example having a high score on the statement "Doing business with our supplier helps my company to lower logistic costs significantly" corresponds with a high perceived contribution of the supplier to lower significantly the food manufacturer's logistic costs. Consequently, it indicates the perceived contribution to the food manufacturer's performance. Similarly, having a high score on the statement "Doing business with our supplier helps my company to reduce lead time (time from sending/getting the request till reply)" corresponds with a high perceived contribution of the supplier to reduce lead time. The same approach is used when analyzing the relation between the food manufacturer and the customer, and vice versa from the supplier's and customer's perspective in relation to the food manufacturer. We interpret chain partner contribution to another chain member's performance as an indicator of chain performance.

For each of the five performance categories, indicator scores were computed for each respondent firm bilateral relationship. That is, for the focal manufacturing firm, two bilateral relationships are of interest, one with the supplier, and one with the customer, noted FC\_S and FC\_C respectively. In contrast, only one relationship was of interest for suppliers and customer firms that with the focal manufacturing firm, noted S and C, respectively. Indicator scores for the constructs were calculated as the median of the item scores in each category. This is consistent with the ordinal character of responses and with the interpretation of items as providing multiple measures of the underlying latent concept. As it is shown in Appendix 2, each performance category composed of two or three underlying items. When a missing value was present for one of the items, the category score were calculated using the other items. However, when missing values were present for more than one of the items, the category score was not calculated. In this case, the whole chain was excluded from further analysis to make sure that the included chains do not have missing values. Thus, only 71 chains out of the 90 were included in the present analysis. For each respondent firm relationship type, we also created a "total performance" indicator as the median of the seven category scores. We interpret this to indicate the overall respondent firm perception of the performance contribution of the chain partner to the respondent firm's performance. One has to note that, although the title of the paper suggests that we measure "performance", we actually measure the perception of the respondent firm of the chain partner's contribution to respondent firm's performance. The use of actual performance values (objective and not perceived performance) was considered, however actual performance values mean little without a benchmark for comparison. Thus, we focus on a perceptual criterion (Medlin 2006). Further, in many empirical studies, perceived performance is used to measure

performance since respondents are often unwilling to release sensitive “objective” data (Ward, Leong and Boyer 1994). Finally, past research has found that perceived assessments are consistent with objective performance (Vickery, Dröge and Markland 1997), therefore we consider our measures as valid indicators of performance.

**Table 1.** Types of bilateral relationships and performance assessments

Notation
FC_S = Food manufacturers' perception about their suppliers' performance
FC_C = Food manufacturers' perception about their customers' performance
S = Suppliers' perception about their food manufacturers' performance
C = Customers' perception about their food manufacturers' performance

### 2.3 Computation of performance differences

In order to analyze performance differences in the chain, first we introduce and use three measures of difference in partner contribution to respondent firm performance. For statistically testing the existence of differences in these performance indicators, Mann-Whitney U tests were used (Table 2). By comparing responses bilaterally we consider the nature and extent of stress within the chain caused by differing contributions to member performance and, thereby, chain performance.

**Definition:** Dissonance is present in the chain when in a pair of members, each member holds a significantly differing perception of the other member's contribution to performance. We examine dissonance for two pairings of chain members: FC and S, and FC and C.

We can further differentiate dissonance depending on between which chain partners it occurs. FC and S dissonance is present on the one hand when the perceived contribution of supplier to focal company's performance (FC\_S) is significantly different from the perceived contribution of focal company to supplier's performance (S). On the other hand, FC and C dissonance is present when the perceived contribution of customer to focal company's performance (FC\_C) significantly differs from the perceived contribution of focal company to customer's performance (C).

**Definition:** Chain imbalance is present in the chain when significant difference is identified between the perception of the first chain partner of the contribution of the second chain partner to the performance of the first chain partner and between the perception of the second chain partner of the contribution of the third chain partner to the performance of the second chain partner (S and FC\_C or C and FC\_S)

We can further differentiate chain imbalance depending on whether it occurs downstream or upstream. Upstream chain imbalance is present on the one hand when the perceived contribution of customer to focal company's performance (FC\_C) significantly differs from the perceived contribution of focal company to supplier's performance (S). On the other hand, downstream chain imbalance is present when the perceived contribution of a supplier to a focal company's performance (FC\_S) significantly differs from the perceived contribution of the focal company to the customer's performance (C).

**Definition:** Bias is present in the chain, when a member holds differing evaluation of upstream vs. downstream partner contribution to performance. For example, when

significant difference is identified between the perception of one agent (FC) about the contribution of its two chain partners (up and downstream) (S and C) to the performance that that one agent (FC). It also present, when the perception of two different chain members (S and C) significantly differ regarding the contribution of a third agent (FC) to the performance of that one agent.

As such, bias can be further differentiated. Internal bias is present, when the perceived contribution of supplier to focal company's performance (FC\_S) significantly differs from the perceived contribution of customer to focal company's performance (FC\_C). External bias occurs when perceived contribution of focal company to supplier's performance (S) compared with perceived contribution of focal company to customer's performance (C) significantly differs.

It has to be noted that the direction of the "contribution" and not the direction of the "perception" is taken into account when compiling the above taxonomy of the different comparisons. Therefore upstream (back to source, back to supplier) refers to the contribution of customer to focal company's performance (FC\_C) together with the contribution of focal company to supplier's performance (S). Further, the comparisons are carried out by computing the differences between the score of the perceived contribution of the different chain members. Therefore, difference score are computed for dissonance based on FC\_S minus S (FC and S dissonance) and based on FC\_C minus C (FC and C dissonance), for chain imbalance based on FC\_C minus S (upstream chain imbalance) and based on FC\_S minus C (downstream chain imbalance), for bias based on based on FC\_S minus FC\_C (internal bias) and based on S minus C (external bias).

Logically, each difference can result in a zero, a negative or a positive score. For example, when considering FC and S dissonance a positive score is obtained when FC\_S is higher than S. This means that the perceived contribution of supplier to focal company's performance (FC\_S) is higher than the perceived contribution of focal company to supplier's performance (S). Similarly, in case FC\_S is lower than S, a negative score is obtained, meaning that the perceived contribution of supplier to focal company's performance (FC\_S) is lower than the perceived contribution of focal company to supplier's performance (S). In case of equal perceptions, the difference is zero. Based on differences, we define our measures of dissonance, bias, and chain imbalance as the absolute value of differences. This results in a measure interpretable as the distance between assessments. Chain performance differences are analyzed following the above performance difference taxonomy as summarized in Table 2.

### 3 Results

#### 3.1 Chain performance imbalances

Looking across results, all three types of chain performance imbalances can be identified (Table 2) regarding the overall performance. The significant difference between FC\_S and S indicates that the perception of the food manufacturer and the supplier differs regarding the extent to which they contribute to each others' performance. Food manufacturers perceive their suppliers' contribution to their performance higher than the other way around (FC\_S and S dissonance). Further, the significant difference between FC\_S and FC\_C indicates that the perception of the food manufacturer about the extent to which his supplier (S) contributes to his performance is higher than the extent to which his customer (C) contributes to his performance (Internal bias). Last, higher FC\_S than C difference suggests that the chains investigated are characterized by downstream chain imbalance, whereas the perceived contribution of supplier to focal company's performance (FC\_S) is significantly

higher than the perceived contribution of focal company to customer's performance (C). To understand the underlying differences, the three main imbalances concepts are next considered for each of the five performance constructs.

**Table 2.** Performance differences of the different chain members, median and interquartile range (n=71)

	FC_S n=71	FC_C n=71	S n=71	C n=71
Performance <sup>a</sup>	Median (IQR)	Median (IQR)	Median (IQR)	Median (IQR)
<b>Traditionalism</b>	6.00 (3.00)	5.50 (2.50)	6.00 (2.50)	6.00 (1.50)
Authenticity	6.00 (2.00)	6.00 (3.00)	6.00 (3.00)	6.00 (2.00)
Gastronomic heritage	6.00 (3.00)	6.00 (3.00)	6.00 (2.00)	6.00 (2.00)
<b>Efficiency</b>	5.00 (1.50)b	5.00 (1.50)a,b	5.00 (1.50)a	4.50 (2.00)a
Logistic cost	5.00 (2.00)c	5.00 (2.00)b,c	5.00 (3.00)a,b	4.00 (3.00)a
Profit	5.00 (1.00)	5.00 (2.00)	5.00 (2.00)	5.00 (2.00)
<b>Responsiveness</b>	6.00 (1.50)b	5.50 (1.00)a,b	5.50 (2.00)a,b	5.00 (1.50)a
Lead time	6.00 (2.00)b	5.00 (1.00)a,b	6.00 (3.00)a,b	5.00 (2.00)a
Customer complaints	6.00 (2.00)	5.00 (1.00)	6.00 (2.00)	6.00 (1.00)
<b>Quality</b>	6.00 (3.00)b	5.00 (2.00)a	5.00 (2.00)a	6.00 (1.00)a,b
Safety	7.00 (1.25)b	5.00 (2.00)a	6.00 (3.00)a	6.00 (2.00)a
Attractiveness	4.50 (2.25)a	6.00 (2.00)b	4.00 (2.00)a	6.00 (1.00)b
Environmental friendliness	5.50 (3.00)	5.00 (2.00)	5.00 (2.00)	4.00 (2.00)
<b>Chain balance</b>	5.00 (1.50)	5.50 (1.50)	5.00 (1.50)	5.00 (2.00)
Distribution of risks and benefits	5.00 (2.00)a,b	5.00 (2.00)a	5.00 (2.00)a,b	5.00 (2.00)b
Chain understanding	5.00 (2.00)a,b	6.00 (1.00)a	5.00 (2.00)a,b	5.00 (2.00)b
<b>Total</b>	6.00 (2.00)b	5.00 (1.00)a	5.00 (2.00)a	5.00 (1.00)a

<sup>a</sup> Seven-point Likert scale: 1 = completely disagree; 2 = moderately disagree; 3 = slightly disagree; 4 = neither agree nor disagree; 5 = slightly agree; 6 = moderately agree; 7= completely agree

<sup>b</sup> FC\_S = Food manufacturers' perception about their suppliers, FC\_C = Food manufacturers' perception about their customers, S= Suppliers' perception about their food manufacturers, C=Customers' perception about their food manufacturers

### 3.1.1 Dissonance

FC\_S and S dissonance is identified regarding efficiency (logistic cost), quality (safety), while FC\_C and C dissonance is found regarding chain balance (chain understanding). FC\_S and S dissonance on efficiency (logistic costs) suggests that the extent to which food manufacturers perceive the contribution of their suppliers to lowering their logistic costs significantly differ from the extent to which suppliers perceive the contribution of the food manufacturers to lower their logistic costs. The descriptive comments made during the interviews explain some of the hindrances to collaborative practices in the logistic channel. It is a common practice that suppliers bring the raw materials to the site of the food manufacturers, or the food manufacturers are often located near the suppliers (e.g. dairy farmers being closely located to the traditional cheese processing plant). Suppliers often provide additional services by being responsible for transport of raw materials. Further, it happens frequently that suppliers harvest the raw materials, and their lorries have to wait at the factory entrance because of disorganization at the level of the food manufacturers.

FC\_S and S dissonance regarding quality (safety) indicates that the perceived extent to which suppliers contribute to managing product safety of the food manufacturers (and especially to) is higher than the extent to which food manufacturers contribute to managing product safety of the suppliers. This perceived performance corresponds to reality, whereas the raw material suppliers' role and responsibility in the safety or environmental friendliness of the final manufactured product is much higher than the other way around. Suppliers' perception about the extent to which food manufacturers help them to manage safety is lower. The reason can be that in today's world of series of food scandals, if anything in the agri-food sector goes wrong, the media and the public are immediately involved. Therefore food is a critical item, it can be nothing less than completely safe (Woerkum and Lieshout 2007) which requires each chain members' contribution, however, the suppliers' contribution to it is still perceived higher than the contribution of later agents in the chain.

FC\_C and C dissonance shows a significant perceptual difference between the food manufacturers and their customers regarding chain understanding. This refers to the fact that food manufacturers' perception regarding their customers' contribution to better understanding other chain members' interests is higher than vice versa. This higher score can refer to the fact that customers' possess important market information which could help food manufacturers to understand e.g. consumers' preferences. Food manufacturers also possess important information coming from the previous agents in the chain; however customers do not attach such high importance to this.

### 3.1.2 Chain imbalance

Upstream chain imbalance is present regarding quality (attractiveness) (significant difference between FC\_C and S), while downstream chain imbalance is present regarding efficiency (logistic cost), responsiveness (lead time), quality (safety, attractiveness) and chain balance (chain understanding) (significant difference between FC\_S and C). Upstream chain imbalance (FC\_C - S) regarding quality (attractiveness) shows that food manufacturers consider customers' contribution (FC\_C) in helping them to produce more attractive products higher than suppliers consider food manufacturers' contribution (S). Some example of customers helping food manufacturers to produce more attractive products would be for instance providing valuable feedback to food manufacturers about consumers' preference, or even providing promotional shelf space or regional corner for traditional food manufactures, or financing product line extension. It seems that the contribution to more attractive products is more relevant between the food manufacturers and the customers than between the food manufacturers and the suppliers.

Downstream chain imbalance (FC\_S and C) regarding logistic costs suggest customers evaluating focal manufacturers' contribution to lowering their logistic costs as less significant than focal companies do in relation to their suppliers. Customers' perception regarding the food manufacturers' contribution to lowering logistics costs are lower than food manufactures' perception regarding the suppliers' contribution. This confirms the reliance of the food manufacturers on both suppliers and customers in terms of logistic services because of the poor distribution systems of food manufacturers.

Downstream chain imbalance (FC\_S and C) regarding lead time reveal that food manufacturers are the weakest links in the chain when it comes to reducing lead time. It means that the time interval between getting request from the food manufacturers for raw material till sending reply or delivery is acceptably short according to the food manufacturers. As a result, food manufacturers perceive the extent to which their suppliers help them to reduce lead time significant. This can be explained by the fact that the kind of businesses these companies are involved in require short lead times, for instance in case of a milk

supplier and a cheese manufacturer, delivery appointments are crucial. Further, the partnership relationship between suppliers and food manufacturers also would support improved lead time (Fawcett 1992). However, when we move further downstream on the chain, the customers' perception about the extent to which the food manufacturers help them to reduce lead time is significantly lower. Customers pressure food manufacturers to reduce lead time, but still, the manufacturing lead-times at the level of the food manufacturers – which are linked with delivery lead time – are often very long. This of course further influences the customers' ability to towards the final consumer or towards further customers to perform well.

Downstream chain imbalance (FC\_S and C) regarding safety and attractiveness shows interesting picture. Food manufacturers' perception about the extent to which suppliers help them to manage product safety is higher than customers' perception about the extent to which food manufacturers help them to manage product safety. Does it mean that the food manufacturer is the weakest link in the chain in terms of safety? Or does it mean that customers "put their face" in the spot light, towards the consumers, and perceive the importance of safety much higher therefore have higher expectations and food manufacturers can meet these expectations with more difficulties than suppliers meeting food manufacturers' expectations? Anyhow, the raw material suppliers' role and responsibility in the safety of the final manufactured product is critical, and they seem to perform accordingly, while there are more critiques at the downstream side of the chain. Interestingly, when it comes to attractiveness, the picture looks different. Food manufacturers' perception about the extent to which suppliers help them to manage product safety is higher than customers' perception about the extent to which food manufacturers help them to manage product safety. Logically, the raw material suppliers' role and responsibility in helping the producers to produce more attractive final products is much lower than the food manufacturers' role. As such, although chain imbalance exist both for safety and for attractiveness, lower performance is experienced at the level of the food manufacturers related to safety, and lower performance is experienced at the level of the suppliers related to attractiveness.

Downstream chain imbalance (FC\_S and C) regarding chain balance (chain understanding) shows that it is not equally important at the different levels of the chain that chain partners understand each others' interest.

### 3.1.3 Bias

Internal bias can be observed regarding quality (safety, attractiveness) (significant difference between FC\_C and FC\_C), while external bias regarding quality (attractiveness) (significant difference between S and C).

The difference perception of the food manufacturers about the extent to which their suppliers and their customers help them to manage product safety or to produce more attractive products confirms what has been said before. The raw material suppliers' role and responsibility in the safety of the final manufactured product is higher than the customers' role in it. All what customers do is obliging food manufacturers to compile with regulations and standards on safety, but food manufacturers do not consider this as a significant help. As for attractiveness, the pictures looks different, and customers score higher than suppliers. Last, external bias regarding attractiveness also confirms what we already explored, namely that suppliers' perception about the extent to which food manufacturers help them to produce more attractive products is less relevant, than for customers.



## 4 Conclusions

In the frame of our paper, we measured traditional food chain performance and identified chain performance imbalances. Therefore, we collected quantitative data via individual interviews with 270 companies from 3 European countries (Belgium, Hungary, Italy) representing 5 traditional food subsectors (cheese, beer, white pepper, dry sausage, bakery, and ham). We measured traditional food chain performance by asking respondents (suppliers, food manufacturers, customers) about the extent to which they agree or disagree with 11 statements about 5 main categories of chain performance using a seven-point response scale ranging from completely disagree (1) to completely agree (7). Thus, each food manufacturer provided evaluation scores with respect to their individual supplier and customer contributions to that food manufacturer's economic performance. Similarly, each supplier / customer provided item responses that indicate their assessment of the food manufacturer's contribution to that supplier's / customer's performance.

We found that all three types of chain performance imbalances can be identified regarding the overall performance. Further, we observed internal bias regarding quality (safety, attractiveness) external bias regarding quality (attractiveness), upstream chain imbalance regarding quality (attractiveness), downstream chain imbalance regarding efficiency (logistic cost), responsiveness (lead time), quality (safety, attractiveness), chain balance (chain understanding), FC\_S and S dissonance regarding efficiency (logistic cost), quality (safety), and last but not least FC\_C and C dissonance regarding chain balance.

The results present extensive comparison of multiple individual chains. Per individual chain it looks into the nature of imbalances being present. These findings create an opportunity for improvement through rigorous comparison of chain members' performance. It allows the identification of the weakest link, as well as chain members and policy makers to make specific and tailor made efforts to enhance performance at specific location of the chains, depending on the type of imbalance occurring. The shift to analysis of individual chains, horizontal comparison of chains and identification of chain commonalities may contribute to develop a new management theory.

Future research could repeat the applied methodology in other both food and non-food sectors. Besides, it should conceptualize the identified performance imbalances by grounding it deeper in theory dealing with relationship economics. Last, additional comparison of individual chains should be carried out to generate hard evidence from which innovative management theory might be developed.

## 5 References

- Akkermans, H. A., P. Bogerd, E. Yucesan and L. N. van Wassenhove (2003). "The impact of ERP on supply chain management: Exploratory findings from a European Delphi study." *European Journal of Operational Research* **146**(2): 284-301.
- Aramyan, L. H. (2007). *Measuring supply chain performance in the agri-food sector*. Wageningen, Wageningen University: 0-144.
- Beamon, B. M. (1998). "Supply chain design and analysis: Models and methods." *International Journal of Production Economics* **55**(3): 281-294.
- Beamon, B. M. (1998). "Supply chain design and analysis:: Models and methods." *International Journal of Production Economics* **55**(3): 281-294.
- Beamon, B. M. (1999). "Measuring supply chain performance." *International Journal of Operations & Production Management* **19**(3): 275-292.

- Bensaou, M. and N. Venkatraman (1995). "Configurations of Interorganizational Relationships: A Comparison between U.S. and Japanese Automakers." *Management Science* **41**(9): 1471-1492.
- Bowersox, D. J., D. J. Closs and T. P. Stank (2000). "Ten Mega-Trends That Will Revolutionize Supply Chain Logistics." *Journal of Business Logistics* **21**(2): 1-15.
- Chen, I. J. and A. Paulraj (2004). "Understanding Supply Chain Management: Critical Research and a Theoretical Framework." *International Journal of Production Research* **42**(1): 131-163 p.
- Christopher, M. (1998). *Logistics and supply chain management : strategies for reducing cost and improving service*. London, Financial times.
- Clare, B., N. Shadbolt and J. Reid (2002). *Supply Base Relationships in the New Zealand Red Meat Industry: A Case Study*. Fifth International Conference on Chain and Network Management in Agribusiness and the Food Industry, Noordwijk, Wageningen Academic Publishers.
- Claro, D. P., G. Hagelaar and O. Omta (2003). "The determinants of relational governance and performance: How to manage business relationships?" *Industrial Marketing Management* **32**(8): 703-716.
- Collins, A., M. Henschion and P. Reilly (2001). "Logistics customer service: performance of Irish food exporters." *International Journal of Retail & Distribution Management* **29**: 6-15.
- Cox, A. (1999). "Power, value and supply chain management." *Supply Chain Management: An International Journal* **4**(4): 167 - 175
- Fawcett, S. E. (1992). "Strategic logistics in co-ordinated global manufacturing success." *International Journal of Production Research* **30**(5): 1081.
- Fox, R. (2007). "Reinventing the gastronomic identity of Croatian tourist destinations." *International Journal of Hospitality Management* **26**(3): 546-559.
- Gellynck, X., A. Molnár and L. Aramyan (2008). "Supply chain performance measurement: the case of the traditional food sector in the EU." *Journal on Chain and Network science* **8**(1): 47-58.
- Gellynck, X., B. Vermeire and J. Viaene (2006). *Innovation and networks in the food sector: Impact of regional factors*. 99th EAAE Seminar on 'Trust and Risk in Business Networks, University of Bonn, Germany.
- Gunasekaran, A., C. Patel and R. E. McGaughey (2004). "A framework for supply chain performance measurement." *International Journal of Production Economics* **87**(3): 333-347.
- Gunasekaran, A., C. Patel and E. Tirtiroglu (2001). "Performance measures and metrics in a supply chain environment " *International Journal of Operations & Production Management* **21**(1/2): 71-87.
- Lambert, D. M. and M. C. Cooper (2000). "Issues in Supply Chain Management." *Industrial Marketing Management* **29**(1): 65-83.
- Lambert, D. M. and T. L. Pohlen (2001). "Supply Chain Metrics " *International Journal of Logistics Management* **12**(1): 1-19.
- Li, D. and C. O'Brien (1999). "Integrated decision modelling of supply chain efficiency." *International Journal of Production Economics* **59**(1-3): 147-157.
- Lu, H., J. H. Trienekens and S. W. F. Omta (2006). *Does Guanxi Matter for Vegetable Supply Chains in China? A Case Study Approach*. 7th International Conference on Management in AgriFood Chains and Networks. Ede, The Netherlands.
- Medlin, C. J. (2006). "Self and collective interest in business relationships." *Journal of Business Research* **59**(7): 858-865.

- Neely, A., M. Gregory and K. Platts (1995). "Performance measurement system design: A literature review and research agenda." *International Journal of Operations & Production Management* **15**(4): 80-116.
- Neely, A., J. Mills, K. Platts, M. Gregory and H. Richards (1994). "Realizing Strategy through Measurement." *International Journal of Operations & Production Management* **14**(3): 140-152.
- Pearson, M. and A. Samali (2005). "Offsite Solution Delivery Centers Increasingly Important to High-performance Supply Chains." *Outlook Point of View* **January**
- Spekman, R. E., J. W. K. Jr and N. Myhr (1998). "An empirical investigation into supply chain management: A perspective on partnerships." *International Journal of Physical Distribution & Logistics Management* **28**(8): 630-650.
- Van der Vorst, J. (2000). *Effective food supply chains: generating, modeling and evaluating supply chain scenarios*. Wageningen, Wageningen University: 305 p.
- Van Der Vorst, J. G. A. J. (2006). *Performance Measurement in Agri-Food Supply-Chain Networks*, *Logistics and Operations Research Group, Wageningen University*: 14-24.
- Vickery, S. K., C. Dröge and R. E. Markland (1997). "Dimensions of manufacturing strength in the furniture industry." *Journal of Operations Management* **15**(4): 317-330.
- Ward, P. T., G. K. Leong and K. K. Boyer (1994). "Manufacturing Proactiveness and Performance\*." *Decision Sciences* **25**(3): 337-358.
- Woerkum, C. M. J. v. and I. M. v. Lieshout (2007). "Reputation management in agro-food industries: safety first " *British Food Journal* **109**(5): 355-366.
- Zhenxin, Y., Y. Hong and C. T. C. Edwin (2001). "Benefits of information sharing with supply chain partnerships." *Industrial Management & Data Systems* **101**(3): 114-121.

**Appendix 1. Sample description**

Country/product/chain/respondent	Chain member	Size
ITALY: HAM	14 S	Micro: 3, Small: 5, Medium: 6
14 CHAINS	14 FC	Micro: 6, Small: 7, Medium: 1
42 RESPONDENTS	14 C	Micro: 2, Small: 6, Medium: 4, Large: 2
ITALY: CHEESE	16 S	Micro: 10, Small: 6
16 CHAINS	16 FC	Micro: 13, Small: 2, Medium: 1
48 RESPONDENTS	16 C	Micro: 11, Small: 5
HUNGARY: DRY SAUSAGE	11 S	Micro: 2, Small: 2, Medium: 7
11 CHAINS	11 FC	Micro: 2, Small: 3, Medium: 6
33 RESPONDENTS	11 C	Micro: 1, Small: 3, Medium: 7
HUNGARY: WHITE PEPPER	5 S	Micro: 3, Small: 1, Medium: 1
5 CHAINS	5 FC	Micro: 1, Small: 2, Medium: 2
15 RESPONDENTS	5 C	Micro: 4, Small: 1
HUNGARY: BAKERY	14 S	Micro: 2, Small: 7, Medium: 5
14 CHAINS	14 FC	Small: 7, Medium: 7
42 RESPONDENTS	14 C	Micro: 8, Small: 3, Medium: 3
BELGIUM: BEER	15 S	Micro: 4, Small: 7, Medium: 1, Large: 3
15 CHAINS	15 FC	Micro: 8, Small: 5, Medium: 2
45 RESPONDENTS	15 C	Micro: 9, Small: 5, Large: 1
BELGIUM: CHEESE	15 S	Micro: 7, Small: 4, Medium: 2, Large: 2
15 CHAINS	15 FC	Micro: 11, Small: 2, Medium: 2
45 RESPONDENTS	15 C	Micro: 4, Small: 5, Medium: 2, Large: 4
TOTAL	90 S	Micro: 31, Small: 32, Medium: 22, Large: 5
	90 FC	Micro: 41, Small: 28, Medium: 21
	90 C	Micro: 39, Small: 28, Medium: 16, Large: 7

Micro: Micro sized enterprise: < 10 employees, Small: Small sized enterprise: < 50 employees, Medium: Medium sized enterprise: < 250 employees, Large: Large sized enterprise: > 250 employees; S=Supplier, FC=Focal company, C=Customer

## Appendix 2. Traditional food chain performance

---

### **Traditionalism**

Authenticity: Doing business with our supplier/customer is crucial in maintaining the authenticity of our products

Gastronomic heritage: Doing business with our supplier/ customer helps my company to be part of the gastronomic heritage

### **Efficiency**

Logistic cost: Doing business with our supplier/ customer helps my company to lower logistic costs significantly

Profit: Doing business with our supplier/ customer helps my company to maintain acceptable profitability

### **Responsiveness**

Lead time: Doing business with our supplier/ customer helps my company to reduce lead time (time from sending/getting the request till reply)

Customer complaints: Doing business with our supplier/ customer contributes to avoid (customer/consumer) complaints

### **Quality**

Safety: Doing business with our supplier/ customer helps my company to manage product safety

Attractiveness: Doing business with our supplier/ customer helps my company to produce more attractive products

Environmental friendliness: Doing business with our supplier/ customer helps my company to manage environmental friendliness

### **Chain balance**

Distribution of risks and benefits: Doing business with our supplier/ customer contributes to a more balanced distribution of risks and benefits along the chain

Chain understanding: Doing business with our supplier/ customer helps my company to better understand other chain members' interests.

---