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Imbalances of chain performance: the case of the traditional food sector in the EU

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Abstract: Purpose: Measure chain performance in the traditional food sector and identify the main relationship measures determining performance. Methodology: Survey with 271 chain members from 91 traditional food chains from 3 European countries in 6 traditional food product categories. First 12 types of performance imbalances are distinguished and subsequently, cluster analysis is carried out. Finally, the nature of imbalances is linked to the quality of chain relationships. Findings: Three clusters are demarcated. Cluster one represents chains being characterized by higher performance of both suppliers and focal companies as compared to customers, while cluster three represents chains with high customer and focal company performance as compared to suppliers. Cluster two includes chains hardly including chain imbalances. Several relationship measures such as trust, conflict and reputation demonstrate discriminative power between the clusters. Research limitations/implications: The research is limited to traditional food chains. Practical implications: Our findings allow the identification of chain imbalances and as a result, allow 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. Originality/value: The shift to analysis of individual chains, horizontal comparison of chains and identification of chain commonalities may contribute to develop a new management theory.

Keywords: chain performance imbalances, chain relationships, traditional food

1. Introduction

Organizations no longer compete as independent entities, but as chains [1] (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 et al., 2006). Being part of a well-performing chain generates important performance benefits for the individual organization. As a result, there is increasing interest in the performance of chains as a research subject (Beamon, 1998a).

Adequate chain performance measurement identifies how well the chain is performing, draws attention to where improvements are possible, facilitates detecting problems and helps identifying where to focus on (Cohen and Roussel, 2005). Consequently, it affects decision making through the assessment of past actions and through benchmarking (Aramyan, 2007). Further, it can assist the distribution of resources, measure and communicate improvement towards strategic goals and assess managerial practices (Ittner and Larcker, 2003). In addition, it helps managers to recognize good performance, to make tradeoffs between profit and investments, it provides ways to set strategic targets and enables managers to get involved if performance is distracting (Neely et al., 1995).

Contrary to the raising awareness of the performance potential of chains, a vast group of authors (Neely et al., 1994, Neely et al., 1995, Beamon, 1998b, Christopher, 1998, Beamon, 1999, Li and O'Brien, 1999, Van der Vorst, 2000, Gunasekaran et al., 2001, Lambert and Pohlen, 2001, Gunasekaran et al., 2004, Van Der Vorst, 2006) endorses to the need of key issues to be addressed related to chain performance measurement. First, the quality of chain relationships should be one of the central questions in chain performance measurement (Cousins and Hampson, 2000, Molnár et al., 2007, Molnár et al., 2007) because of several reasons. Managers as well as practitioners believe in the importance of enhancing chain the quality of chain relationships and getting close to chain partners (Spekman et al., 1998, Lambert and Cooper, 2000, Benton and Maloni, 2005), since flexible and successful chain relationships are the key success drivers in today's world of globalization (Mentzer et al., 2001). Successful and unique chain relationships hold the potential of being a source of

competitive advantage (Barney, 1991, Lamming et al., 1996, Russo and Fouts, 1997, Coff, 1999, Alvarez and Busenitz, 2001, Barney, 2002, Gellynck, 2006) and the ability to form valuable, compatible and complementary relationships are considered being necessary to reach chain success (O'Keeffe, 1998, Quinn, 2004). This suggests that relationship measures should be included in chain performance measurement instruments as possible performance determinants. Still, relationship measures are not extensively included into chain performance measurement (Molnár et al., 2007). Second, chain performance measurement is nowadays hardly carried out through analysing multiple chains. Some notable exception of such analysis is the one carried out by Spekman et al. (1998), Lu et al. (2006) or Clare et al. (2002). However, clear identification and comparison of chains (one chain integrating one supplier, one focal company and one customer) also lack in these studies. Third, with regard to measuring performance of chains active in the agri-business sector in general and in the traditional food [2] sector in particular, literature points a number of additional problems over the already mentioned ones (Aramyan, 2007). Many agri-food firms, including traditional food firms do not screen their performance in a regular way (Collins et al., 2001), therefore 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 can not remain neglected.

The above illustrates the interest in research about measuring performance and stresses the importance of integrating relationship measures in performance analysis. This is the rationale of our paper. Consequently, the objective of this study is to measure chain performance in the traditional food sector and to identify the main relationship measures determining performance. This 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 271 companies belonging to traditional food chains across three European countries (Belgium, Italy and Hungary). In these countries, traditional food subsectors were selected based on their socio-economic importance (Belgium: cheese and beer, Italy: cheese and ham, Hungary: white pepper, sausage and bakery). Next, a database of traditional food producers [3] were established and in each country and traditional food subsector traditional food producers as focal companies were randomly selected for interviews from the established data base (details about the composition of the sample are provided in Appendix 1). During the interviews, each focal company was asked to identify suppliers and customers they currently work with. Next, one supplier and one customer were selected per focal company to construct the chain. In this way, a total of 91 traditional food chains (including 91 suppliers, 91 focal companies and 89 customers) were created and interviewed. The interviews have been carried out between December 13, 2007 and June 20, 2008.

2.2 Measurement and scaling

To measure traditional food chain performance, respondents (suppliers, focal companies, customers) were asked the extent to which they agree or disagree with 11 statements about five main areas of chain performance using a seven-point response scale ranging from completely disagree (1) to completely agree (7). The 11 statements and the five main dimensions of traditional food chain performance have been selected following Gellynck et al. (2008). The five main dimensions of traditional food chain performance are: 1) Traditionalism, 2) Efficiency, 3) Responsiveness, 4) Quality and 5) Chain balance. Given the multi-dimensional character of the five main areas, all include several performance indicators (several statements) (Gellynck et al., 2008). Each focal company answered the statements related to their individual suppliers as well as customers, and vice versa resulting in four perspectives (Table 1). It means that the same statements

were used in both the supplier and customer questionnaire but in relation to the focal companies. Details about the statements measuring chain performance are provided in Appendix 2. The level of agreement of the focal company on statements related to the individual supplier indicates the perceived contribution of the individual supplier to the focal company'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 focal company's logistic costs. Consequently, it indicates the perceived contribution to the focal company'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 focal company and the customer, and vice versa from the supplier's and customer's perspective in relation to the focal company. In order to find out the main determinants of traditional food chain performance respondents were probed for their perception of the quality of their chain relationships.

Table 1: Perspectives of total chain performance score

DIMENSIONS:
1. Perceived supplier's contribution to focal company's performance (FC_S)
2. Perceived customer's contribution to focal company's performance (FC_C)
3. Perceived focal company's contribution to supplier's performance (S)
4. Perceived focal company's contribution to customer's performance (C)

Suppliers, focal companies, customers are asked to what extent they agree or disagree with 20 statements about eight relationship measures using a seven-point response scale ranging from completely disagree (1) to completely agree (7). 1) Trust, 2) economic satisfaction, 3) social satisfaction, 4) dependency, 5) non-coercive power, 6) coercive power, 7) reputation, 8) conflict are the integrated relationship measures. These relationship measures are selected based on previous research carried out by Molnár et al. (2008) presenting chain performance determinants. A positive relationship between performance and trust, economic satisfaction, social satisfaction, dependency, non-coercive power is expected. Further, negative relationship between performance and conflict and coercive power is assumed. Again, these statements were presented to the focal companies and their individual suppliers and customers. The focal companies answered the statements related to their suppliers and customers. The same statements were used in the questionnaire of the suppliers and the customers but in relation to the focal companies. Details about the statements measuring the quality of chain relationships are provided in Appendix 3. The level of agreement of the focal company e.g. on the trust statements related to the individual supplier indicates the level of trust of the focal company in the individual supplier. Consequently, it corresponds with a perceived level of trust the focal company in its supplier. The same applies to the focal company in relation to the customer, to the supplier in relation to the focal company as well as to the customer in relation to the focal company. Therefore, similarly to total chain performance, four perspectives apply to the quality of chain relationships as well.

2.3 Analysis

First, imbalances in chain performance are identified for each individual chain based on the differences of the chain members' performance scores. Second, cluster analysis is carried out based on the performance imbalances in each individual chain (Table 2). Third, results from the cluster analysis are validated by examining the accuracies of prediction for cluster membership (discriminant analysis, Table 3). Fourth, the nature of imbalances– i.e. clusters – is related to certain characteristics (cross-tabulations, Table 4). Fifth, the nature of imbalances is related to the quality of chain relationships (nonparametric analysis of variance—Table 5).

3. Results

3.1 Identification of chain performance imbalances

The first question to be answered before proceeding any further in the analysis of the data is whether the different chain members (suppliers, focal companies, customers) perform different and as a result, imbalances can be identified in the individual chains. This question can be answered by comparing the total performance scores of the different chain members. Following the methodology presented under section 2.2, the following comparisons can be made:

1. Dyadic upper: perceived contribution of supplier to focal company's performance (FC_S) compared with perceived contribution of focal company to supplier's performance (S)
2. Dyadic lower: perceived contribution of customer to focal company's performance (FC_C) compared with perceived contribution of focal company to customer's performance (C)
3. Upstream: perceived contribution of customer to focal company's performance (FC_C) compared with perceived contribution of focal company to supplier's performance (S)
4. Downstream: perceived contribution of supplier to focal company's performance (FC_S) compared with perceived contribution of focal company to customer's performance (C)
5. Internal: perceived contribution of supplier to focal company's performance (FC_S) compared with perceived contribution of customer to focal company's performance (FC_C)
6. External: perceived contribution of focal company to supplier's performance (S) compared with perceived contribution of focal company to customer's performance (C)

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 total score of the perceived contribution of the different chain members. Therefore, difference score are computed for dyadic upper comparison based on FC_S minus S, for dyadic lower comparison based on FC_C minus C, for upstream comparison based on FC_C minus S, for downstream comparison based on FC_S minus C, for internal comparison based on FC_S minus FC_C and for external comparison based on S minus C.
Therefore, difference scores are computed for dyadic upper comparison based on FC_S minus S, for dyadic lower comparison based on FC_C minus C, for upstream comparison based on FC_C minus S, for downstream comparison based on FC_S minus C, for internal comparison based on FC_S minus FC_C and for external comparison based on S minus C.
Logically, each difference can result in a zero, a negative or a positive score. For example when considering upstream imbalance a positive score is obtained when FC_C is higher than S. This means that the perceived contribution of customer to focal company's performance (FC_C) is higher than the perceived contribution of focal company to supplier's performance (S). Similarly, in case FC_C is lower than S, a negative score is obtained, meaning that the perceived contribution of customer to focal company's performance (FC_C) is lower than the perceived contribution of focal company to supplier's performance (S). In case of equal perceptions, the difference is zero. The stronger the positive or negative sign, the stronger the imbalance is. In total, 12 types of imbalances are identified, deriving from the six main types of comparisons:

1. Positive dyadic upper imbalance (FC_S > S): Supplier is perceived to perform higher than focal company.
2. Negative dyadic upper imbalance (FC_S < S): Focal company is perceived to perform higher than supplier.
3. Positive dyadic lower imbalance (FC_C < C): Focal company is perceived to perform higher than customer.
4. Negative dyadic lower imbalance (FC_C > C): Customer is perceived to perform higher than focal company.

5. Positive upstream imbalance (FC_C > S): Customer is perceived to perform higher upstream than focal company.
6. Negative upstream imbalance (FC_C < S): Focal company is perceived to perform higher upstream than customer.
7. Positive downstream imbalance (FC_S > C): Supplier is perceived to perform higher downstream than focal company.
8. Negative downstream imbalance (FC_S < C): Focal company is perceived to perform higher downstream than supplier.
9. Positive internal imbalance (FC_S > FC_C): Supplier is perceived to perform higher than customer from an internal (focal company's) point of view.
10. Negative internal imbalance (FC_S < FC_C): Customer is perceived to perform higher than supplier from an internal (focal company's) point of view.
11. Positive external imbalance (S > C): Focal company is perceived to perform higher upstream than downstream.
12. Negative external imbalance (S < C): Focal company is perceived to perform higher downstream than upstream.

From the above identified different kind of imbalances, upstream, downstream, internal and external imbalances are extending beyond the dyad, and therefore their involvement in further analysis is especially challenging and highly interesting. Consequently, in the analysis presented in the next sections, upper dyadic and lower dyadic imbalances are further not involved and special focus is paid on imbalances involving three chain members (chain performance imbalances).

3.2 Clusters of chain performance imbalances

Cluster analysis is conducted to form similar groups of chains using as variables the different types of chain performance imbalances (upstream, downstream, internal and external). Three significantly different clusters can be demarcated from the cluster analysis (Table 2) (p=0,00). The first cluster includes the chains being characterized by chain performance imbalances holding high supplier – focal company perceived performance while the third cluster contained the chains characterized by chain performance imbalances holding high customer – focal company perceived performance. The second cluster is represented by chains bearing chain balances but the focal company still perceives the performance of either the supplier or the customer lower than vice versa.

The first cluster, with "negative upstream imbalance" (FC_C < S), "positive downstream imbalance" (FC_S > C), "positive internal imbalance" (FC_S > FC_C) and "positive external imbalance" (S > C) contained 19 chains. The sign of the "positive downstream imbalance" (FC_S > C) and the "positive external imbalance" (S > C) is clearly stronger (absolute sign is above 1,5) than the sign of the "positive internal imbalance" (FC_S > FC_C) and the "negative upstream imbalance" (FC_C < S). It means that supplier is perceived to perform higher downstream than focal company as well as the focal company is perceived to perform higher upstream than downstream. This cluster is obviously ahead of the other two clusters with respect to supplier – focal company perceived performance. Further, this cluster represents the strongest imbalance (absolute sign is above 1,5) as compared to the other clusters.

Table 2: **Chain performance imbalances: results of cluster analysis (n=91)**

	Cluster 1 High perceived S-FC performance (n=19)	Cluster 2 Low FC perception (n=33)	Cluster 3 High perceived C-FC performance (n=35)	p[a]
Imbalances [b]	Mean	Mean	Mean	
Upstream [b]	-0,40	-0,60	1,15	0,00
Downstream [b]	1,70	-0,13	-0,15	0,00
Internal [b]	0,58	0,29	-0,14	0,00
External [b]	1,52	0,18	-1,16	0,00

[a] p = Level of significance of the Kruskall Wallis (or non-parametric ANOVA) tests. The levels of significance for the ANOVA tests are identical

[b] Maximum value = 6; minimum value = -6; these scores represent the difference computed based on the perception of chain stakeholders (see section 3.1 for more details)

The third cluster, with "positive upstream imbalance" (FC_C > S), "negative downstream imbalance" (FC_S < C), "negative internal imbalance" (FC_S < FC_C) and "negative external imbalance" (S < C) contained 33 chains. The sign of the "positive upstream imbalance" (FC_C > S) and the "negative external imbalance" (S < C) is clearly stronger (absolute sign is above 1,15) than the sign of the "negative downstream imbalance" (FC_S < C) and the "negative internal imbalance" (FC_S < FC_C). It means that customer is perceived to perform higher upstream than focal company upstream. Further, focal company is perceived to perform higher downstream than upstream. This cluster is outperforming the other two clusters with respect to customer – focal company perceived performance. Further, this cluster represents the second strongest imbalance (absolute sign is above 1,15) as compared to the other clusters.

Table 3: Multivariate validation of the three clusters

Actual group membership	Predicted group membership[a] Cluster 1 (n=19)	Cluster 2 (n=33)	Cluster 3 (n=35)	
Classification results				
Cluster 1 (n=19)	94,7%			
Cluster 2 (n=33)		100%		
Cluster 3 (n=35)			100%	
Total correctly classified: 98,9%				
Discriminant	Eigenvalues	Wilks Lambda	$\chi 2$	p
Other results				
1	2,631	0,199	134,045	0,00
2	0,385	0,722	27,020	0,00

[a] As predicted by the discriminant functions

The second cluster with negative upstream imbalance" (FC_C < S), "negative downstream imbalance" (FC_S < C), "positive internal imbalance" (FC_S > FC_C) and "positive external imbalance" (S > C) contained 35 chains. The sign of these imbalances are not too strong (absolute sign is between 0,60 and 0,13), therefore the cluster is characterized by chains having relative performance balance. Therefore, excepting the sings of these imbalances and logically grading these imbalances the following overall relationship between the different imbalances can be derived: S> C > FS > FC. Consequently, the cluster is characterized by low focal company perception as compared to the perception of supplier and customer.

Table 3 validates the results of the cluster analysis presenting that 98.90% of chains are correctly classified. Cluster one has the lowest, rate of classification (94.70%) while 100% of chains from cluster two and three were correctly classified. The results presented in Table 2 are therefore robust and valid.

Table 4: **Cluster characteristics**

	Cluster 1 High perceived S-FC performance	Cluster 2 Low FC perception (n=33)	Cluster 3 High perceived C-FC performance	
		Percentages		Statistics
Country				
Italy	17,2	41,4	41,4	
Hungary	20,7	34,5	44,8	
Belgium	27,6	37,9	34,5	P=0,85 Cramer's V=0,087
TOTAL	21,8	37,9	40,2	
Product type				
Dried sausage	18,2	36,4	45,5	
White pepper	0	20,0	80,0	
Cheese	17,9	35,7	46,4	
Beer	26,7	53,3	20,0	
Ham	26,7	33,3	40,0	
Bakery	30,8	38,5	30,8	P=0,651 Cramer's V=0,211
TOTAL	21,8	37,9	40,2	
Size of FC				
<=10 employees	26,3	26,3	47,4	
11-50	25,9	44,4	29,6	
< 50 employees	9,1	50,0	40,9	P=0,205 Cramer's V=0,185
TOTAL	21,8	37,9	40,2	
Size of S				
<=10 employees	20,0	33,3	46,7	
11-50	29,0	35,5	35,5	
< 50 employees	15,4	46,2	38,5	P=0,652 Cramer's V=0,119
TOTAL	21,8	37,9	40,2	
Size of C				
<=10 employees	27,8	27,8	44,4	
11-50 employees	14,3	42,9	42,9	
< 50 employees	19,0	47,6	33,3	P=0,652 Cramer's
TOTAL	21,2	37,6	41,2	

Significant difference calculated using Crosstabs; S=Supplier, FC=Focal company, C=Customer

1.1 Characteristics of clusters

Table 4 lists the results of the Cross-table analysis of the clusters for different characteristics. Differences between the clusters according to country of origin, type of product, and size of chain partners (supplier, focal company, and customer) has been investigated. Results reveal no significant differences regarding any of

these variables. Consequently, country-, product- or size-specific differences are not related to chain performance imbalances, which allows us to make wider generalization of the results.

To identify the relationship measures being linked to the clusters of chain performance imbalance, Kruskal-Wallis test is conducted followed by Mann Whitney U test for the clusters and the investigated relationship measures. The different clusters show significant differences regarded a number of relationship measures, such as "the level of trust of the focal company in the supplier" (FC_Trust_S), "the level of trust of the focal company in the customer" (FC_Trust_C), "the level of trust of the supplier in the focal company" (S_Trust). Table 5 presents only the significant results.

Table 5: Quality of relationships and cluster characteristics

	Cluster 1 High perceived S-FC performance (n=19)	Cluster 2 Low FC perception (n=33)	Cluster 3 High perceived C-FC performance (n=35)	Sample (n=91)
Relationship measures[1]	Mean (SD)	Mean (SD)	Mean (SD)	Mean
FC_Trust_S	6,41(0,77)b	5,78 (0,87)a	6,06 (0,82)a,b	6,02
FC_Trust_C	6,07 (0,84)b	5,25 (0,86)a	6,01 (0,88)b	5,72
S_Trust	6,12 (1,12)b	6,09 (0,72)b	5,49 (1,09)a	5,83
FC_Economic satisfaction	5,63 (1,14)b	5,06 (0,92)a	5,40 (1,32)b	5,30
C_Economic satisfaction	4,26 (1,40)a	5,45 (0,85)b	5,76 (0,90)b	5,32
FC_Social satisfaction_C	5,66 (1,25)b	4,76 (1,31)a	4,76 (1,55)a	4,90
FC_Dependency_C	3,28(1,36) a	3,63 (1,26)a,b	4,01 (1,28)b	3,71
C_Dependency	2,84 (1,54)a	3,59 (1,52)a,b	3,75 (1,45)b	3,55
FC_Non-coercive power_S	3,66 (1,91)a,b	4,12 (1,45)b	3,23 (1,63)a	3,69
S_Non-coercive power	3,21 (1,80)a,b	3,68 (1,61)b	2,68 (1,77)a	3,21
FC_Reputation_S	6,33 (0,85)b	5,72 (1,01)a	5,63 (1,20)a	5,80
S_Reputation	6,24 (1,05)b	5,99 (0,84)a,b	5,56 (0,97)a	5,83
FC_Conflict_S	2,37 (1,73)a	3,08 (1,44)b	2,37 (1,54)a	2,72
FC_Conflict_C	2,58 (1,45)a,b	3,12 (1,35)b	2,24 (1,33)a	2,72
S_Conflict	1,94 (1,10)a	2,41 (1,56)a,b	3,09 (1,80)b	2,68

[1]Seven-point Likert scale: 1 = completely disagree; 2 = moderately disagree; 3 = slightly unimportant; 4 = neither agree nor disagree; 5 = slightly agree; 6 = moderately agree; 7= completely agree;
Letters (a-b-c) indicate significantly different average scores using Mann-Whitney U test
FC_Trust_S = Focal company's trust in the supplier (see section 2.2 for more details)

Global results indicate that traditional food chains (total sample) are characterized by high levels of trust and reputation. It might be linked to the fact that relationships in traditional food chains already exist for a long period and to the fact that in many chains personnel contact between focal companies on the one hand and suppliers and customers on the other are the dominant business relationship. In addition, a fairly high score is obtained for economic satisfaction.

First, in line with the expectations cluster one (high perceived S – FC performance) score significant higher than cluster three (high perceived C – FC performance) on S_Trust (p=0,02), on FC_Reputation_S (p=0,02), on S_Reputation (p=0,01) and lower on S_Conflict (p=0,02). Further, C_Economic satisfaction (p=0,00), FC_Dependency_C (p=0,03) and C_Dependency (p=0,03) also delineate differences between cluster one (high perceived C – FC performance) and cluster three (high perceived C – FC performance). On these last relationship measures, cluster three scores significantly higher as compared to cluster one. Surprisingly, cluster one scores higher on FC_Social satisfaction_C as compared to cluster three. It means that contrary to

the high perceived C – FC performance being present in cluster three, focal companies from cluster three are socially less satisfied with the customer than the ones from cluster one. Interestingly, high perceived S – FC performance is rather driven by the "soft" side of relationships, such as trust, reputation or conflict, while high perceived C – FC performance is clearly driven by the "hard" side of relationships, such as economic satisfaction and dependency.

Second, cluster two (low FC perception) show significant differences regarding FC_Trust_C, FC_Economic satisfaction_S and FC_Conflict_S as compared to cluster one (p=,0,01, p=0,03 and p=0,04) and three (p=0,00, p=0,02 and p=0,04). Since cluster two represents chains bearing chain balances but the focal company still perceives the performance of either the supplier or the customer lower than vice versa, the lower perceived level of trust of the focal company in the customer as well as the conflict with the supplier being present in cluster two as compared to cluster one and three is logical.

Third, significant differences are present between cluster one and cluster two regarding FC_Trust_S (p=0,00), FC_Trust_C (0,01), FC_Economic satisfaction_S (0,03), C_Economic satisfaction (0,00), FC_Social satisfaction_C (0,01), FC_Reputation_S (p=0,02) and FC_Conflict_S (0,04). Understandably, cluster two score lower regarding FC_Trust_S, FC_Trust_C, FC_Economic satisfaction_S, FC_Social satisfaction_C, FC_Reputation_S and higher on FC_Conflict_S in comparison with cluster one as a result of chains characterized by lower FC perception being present in cluster two as compared to cluster one. Further, the higher perceived level of economic satisfaction of the customer in the focal company is on the one hand explained by the relatively lower perceived C – FC performance being present in cluster one, while on the other hand by the relatively low focal company perception as compared to a relatively high customer perception ("positive internal imbalance" (FC_S > FC_C).

Fourth, significant differences between cluster two and three are identified regarding FC_Trust_C, S_Trust, FC_Economic satisfaction_S, FC_Non-coercive power_S (p=0,02), S_Non-coercive power (p=0,01), FC_Conflict_S and FC_Conflict_C (p=0,01). The higher level of FC_Trust_C and FC_Economic satisfaction_S, as well as the lower level of FC_Conflict_S and FC_Conflict_C in cluster three as compared to cluster two can be explained by the relatively low FC perception in cluster two. Further, the higher level of S_Trust, FC_Non-coercive power_S and S_Non_coercive power in cluster two can also explained by the relative high perception of the suppliers (low focal company perception) in cluster two as well as by the fact that the strength of cluster three is the high perceived C – FC performance.

2. Conclusions

In the frame of our paper, we measured traditional food chain performance and identified the main type of relationships determining performance. Chain performance includes four different perspectives: 1) perceived supplier's contribution to focal company's performance, 2) perceived customer's contribution to focal company's performance, 3) perceived focal company's contribution to supplier's performance and 4) perceived focal company's contribution to customer's performance.

Based on these perspectives, 12 types of imbalances are distinguished: 1) Positive dyadic upper imbalance, 2) Negative dyadic upper imbalance, 3) Positive dyadic lower imbalance, 4) Negative dyadic lower imbalance, 5) Positive upstream imbalance, 6) Negative upstream imbalance, 7) Positive downstream imbalance, 8) Negative downstream imbalance, 9) Positive internal imbalance, 10) Negative internal imbalance, 11) Positive external imbalance and 12) Negative external imbalance.

Three clusters are demarcated using as variables the different types of chain performance imbalances. Cluster one represents chains being characterized by higher performance of both suppliers and focal companies as compared to customers, while cluster three represents chains being characterized by high customer and focal company performance as compared to suppliers. Cluster two includes chains hardly including chain imbalances. Several relationship measures such as trust, conflict and reputation demonstrate discriminative power between the three clusters. Our results are valid across participating countries, across product categories and across different sized chains.

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.

Notes

1. The definition of traditional food products involves four dimensions: (1) local production; (2) authenticity of the product; (3) 50 years commercial availability; (4) association with gastronomic heritage (Truefood, 2006).
2. Within the context of the current paper the chain definition developed by Mentzer et al. (2001) is followed, namely a chain consists of a focal company, a supplier, and a customer involved in the upstream and/or downstream flows of products, services, finances, and/or information.

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Appendixes

Appendix 1**: Sample description**

Sample	Chain member	Size
ITALY: HAM	15 S	Micro: 3, Small: 5, Medium: 16, Large: 1
15 CHAINS	15 FC	Micro: 6, Small: 7, Medium: 1, Large: 1
43 RESPONDENTS	13 C	Micro: 2, Small: 6, Medium: 5, Large: 0
ITALY: CHEESE	16 S	Micro: 10, Small: 6, Medium: 0, Large: 0
16 CHAINS	16 FC	Micro: 13, Small: 2, Medium: 1, Large: 0
48 RESPONDENTS	16 C	Micro: 11, Small: 5, Medium: 5, Large: 0
HUNGARY: DRY SAUSAGE	11 S	Micro: 2, Small: 2, Medium: 7, Large: 0
11 CHAINS	11 FC	Micro: 2, Small: 3, Medium: 16, Large: 0
33 RESPONDENTS	11 C	Micro: 1, Small: 3, Medium: 7, Large: 0
HUNGARY: WHITE PEPPER	5 S	Micro: 3, Small: 1, Medium: 1, Large: 0
5 CHAINS	5 FC	Micro: 1, Small: 2, Medium: 2, Large: 0
15 RESPONDENTS	5 C	Micro: 4, Small: 1, Medium: 0, Large: 0
HUNGARY: BAKERY	14 S	Micro: 2, Small: 7, Medium: 5, Large: 0
14 CHAINS	14 FC	Micro: 0, Small: 7, Medium: 7, Large: 0
42 RESPONDENTS	14 C	Micro: 8, Small: 3, Medium: 3, Large: 0
BELGIUM: BEER	15 S	Micro: 4, Small: 7, Medium: 1, Large: 3
15 CHAINS	15 FC	Micro: 8, Small: 5, Medium: 2, Large: 0
45 RESPONDENTS	15 C	Micro: 9, Small: 5, Medium: 0, Large: 1
BELGIUM: CHEESE	15 S	Micro: 7, Small: 4, Medium: 2, Large: 2
15 CHAINS	15 FC	Micro: 11, Small: 2, Medium: 2, Large: 2
45 RESPONDENTS	15 C	Micro: 4, Small: 5, Medium: 2, Large: 0
TOTAL	91 S	Micro: 31, Small: 32, Medium: 22, Large: 6
	91 FC	Micro: 41, Small: 28, Medium: 21, Large: 1
	89 C	Micro: 39, Small: 28, Medium: 17, Large: 5

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

Appendix 3: **Relationship measures**

Trust
Our supplier/ customer keeps promises
Our company has high confidence in our supplier/ customer
We believe that the information our supplier/ customer provides us is correct
Our supplier/ customer considers how its decisions/ actions may affect us
Economic satisfaction
Our business relationship with our supplier/ customer significantly contributes to our profitability
Our business relationship with our supplier/ customer is very attractive because of getting fair prices
Social satisfaction
Our supplier/ customer hardly considers our arguments when changing prices
Our supplier/ customer leaves our company in the dark about what we ought to know
Dependency
Our company is not significantly dependent on our supplier's/ customer's resources (e.g. raw materials, packaging machines, transport facilities)
Our company is significantly dependent on our supplier's/ customer's capabilities (soft skills, such as expertise)
Our company can easily replace our supplier/ customer
Non-coercive power
Our company receives benefits from our supplier/ customer when we regularly meet their needs /requirements (technical support/ free advice/ financial support/ market information etc.)
Our supplier/customer rewards our company without requiring specific behaviour in return (technical support/ free advice/ financial support/ market information etc.)
Coercive power
We can be sure that our supplier/customer will not retaliate our company when we do not accept our suppliers' / customers' business proposal (keep back important information / terminates contract, press down price, etc)
We can be sure that our supplier / customer will not neglect our interests even if we fully meet the conditions detailed in the contract with our supplier / customer (keep back important information / terminates contract, press down price, etc)
Reputation
Our supplier/ customer is well-known for caring about its business partners
Our supplier/ customer is well-known for its expertise
Our supplier/ customer is well-known for its accuracy
Conflict
We disagree with our supplier/ customer on critical issues
Our business interest doesn't match with that of our supplier/ customer

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