THE IMPACT OF SUPPLY CHAIN MANAGEMENT INTEGRATION ON FINANCIAL PERFORMANCE

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Abstract

Previous research has highlighted the influence of organizational structure and processes on companies' financial performance. In this paper we present a preliminary study which investigates the impact of various supply chain perspectives on performance indicators such as Return on Assets (ROA), Return on Capital Employed (ROCE), Sales Growth, and the Earnings before Interest and Taxes (EBIT) margin. We start by investigating the organizational integration of Supply Chain Management (SCM) and its connection to logistics. Building on an established framework, we differentiate between four different perspectives, i.e. traditionalist, re-labeling, unionist and intersectionist, and test for significant differences in the financial performance of companies working from those perspectives. The findings are not unambiguous, but the descriptive results indicate that a potential relationship may exist. Finally, we develop various propositions which can be used to guide further research.

Keywords: Supply Chain Management, SCM, SCM perspectives, Financial Performance

1. Introduction

The relationship between logistics and SCM and their organizational integration has been widely debated without a general consensus being reached (Halldórsson et al., 2008). Larson et al. (2007) suggested four different perspectives and labels, i.e. logistics equals SCM (re-labeling), logistics subsumes SCM (traditionalist), logistics is subsumed by SCM (unionist), or logistics and SCM overlap partially (intersectionist). In this paper we first show how Supply Chain Management is understood within the top 250 companies in Austria. We conducted a replication study in order to test for the general perception of the SCM-logistics relationship. Although the importance of replication studies is frequently highlighted in academic literature (Alm, 2010), few papers based on such research have been published. Selecting Austria as a country of focus offers several advantages, such as a wide range of company sizes, a variety of international headquarters and a fairly advanced technological status (Strebinger and Treiblmaier, 2006). Due to the small size of the country, many Austrian companies face a similar business environment, which reduces the impact of regional developments as a confounding factor. Austria is an economically and logistically well-developed region and is ranked as the 12th richest nation in the world according to GDP per capita (International Monetary Fund, 2012). The Logistics Performance Index, published by the World Bank ranks Austria in 11th place (Arvis et al., 2012).

Previous research has highlighted the manifold interdependencies between organizational strategy, structure, and processes (Chandler, 1962). Complex processes within the company are shaped by the conceptual understanding of "how business has to be done" and an organization's structure, which in turn has implications for corporate culture and financial performance (Strebinger and Treiblmaier, 2004). In this paper we therefore focus on the influence of various supply chain perspectives and their impact on performance. In order to operationalize the latter construct, we utilize four commonly used performance indicators, i.e. Return on Assets (ROA), Return on Capital Employed (ROCE), Sales Growth, and the Earnings before Interest and Taxes (EBIT) margin. We refrain from deriving hypotheses, but rather present the results of an exploratory study which might serve as the basis for future research.

The remainder of the paper is organized as follows: Section 2 provides a review of the relevant literature followed by a discussion of the research methodology in Section 3. Research findings and further developed propositions are shown in Section 4. Finally, Section 5 presents the conclusions, discusses research limitations and future research directions.

2. Literature Review

2.1 Four Integration Perspectives on SCM

A multitude of definitions of "supply chain management" and "logistics" (Burgess et al., 2006; Kauffman, 2002; Lambert et al., 2005; Lummus et al., 2001; Mentzer et al., 2001; New, 1997;) and their relationship with each other (Halldórsson et al., 2008; Larson et al., 2007) can be found in the relevant literature. Larson et al. (2007) suggest four perspectives on logistics versus supply chain management which elucidate all possible relationships between those two concepts (see Figure 1). Traditionalists perceive SCM as a logistics function or a subset of logistics, i.e. an outside activity which includes customers and suppliers (Stock and Lambert, 2001). This perspective reduces SCM to a special type of logistics with an external

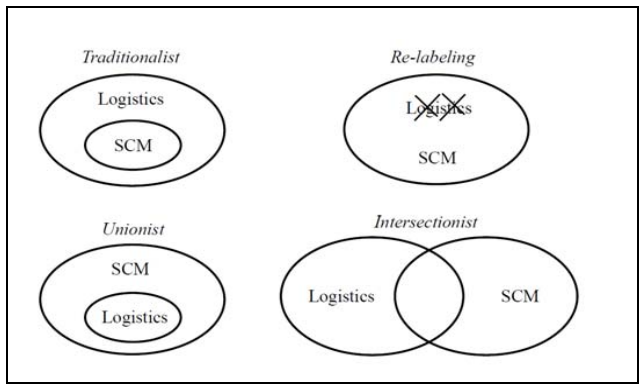
focus that would be situated within the logistics department dealing with logistical problems and opportunities in an inter-organizational context (Halldórsson et al., 2008).

According to the Re-labeling perspective, SCM is simply a name change; from logistics to SCM. Simchi-Levi et al. (2003), for example, do not distinguish between logistics and SCM. Logistics managers therefore simply become supply chain managers (Halldórsson et al., 2008).

"Unionists" position logistics within SCM. In their view, SCM subsumes numerous traditional business functional areas such as purchasing, logistics, operations, and perhaps even marketing (Halldórsson et al., 2008). In line with this position, Lambert et al. (1998, p.1) defined SCM as "the integration of key business processes from end-user to original suppliers that provide products, services, and information that add value for customers and other stakeholders". Companies strictly following the unionist perspective do not position SCM inside the logistics department; they would rather create a new high-level position, e.g. Vice President of SCM, and proceed by changing reporting relationships and the organizational chart. Similarly, Tan et al. (2002) describe SCM as an integrated strategic approach to purchasing and logistics management, whereas Rich and Hines (1997) see it at the convergence of many academic disciplines.

The last group, called intersectionists, focuses on strategic, integrative elements across purchasing, logistics, operations, marketing and other functions. According to this perspective, supply chain managers are to be involved in third-party logistics provider negotiations, but not the actual pick-and-pack decision. Intersectionist organizations usually own a supply chain council or team, consisting of executives across functions and institutions. This council strives to break down SCM barriers in order to improve the overall supply chain performance rather than developing solutions which are suboptimal (Halldórsson et al., 2008).

Figure 1 Perspectives on Logistics vs. SCM (Halldórsson et al., 2008)



The SCM perspective a company finally implements determines not only organizational structure, but also processes in day to day business. Several authors prefer supply chain perspectives that are recognized as being broad and interdisciplinary. This is especially true of the unionist's perspective, which is expected to have a stronger positive influence on a company's financial performance than other supply chain perspectives (Halldórsson et al., 2008; Lambert et al., 1998; Mentzer et al., 2001).

2.2 SCM Integration Perspectives and Financial Performance

Previous literature has shown the impact of SCM decisions on a company's financial performance (Lai and Cheng, 2003; LaLonde, 2000; Lambert and Pohlen, 2001; Morgan, 2004). Supply chain managers need to be able to accurately quantify the impact of their decisions and to communicate with top management (Ellram and Liu, 2002). They frequently have to convince executives that SCM investments will improve the financial ratios of the company (Lapide, 2012). Although the positive relationship between SCM and a company's performance seems to be logical and straightforward (Wagner et al., 2012), and studies in logistical literature associate outstanding logistics and SCM performances with positive financial performance, such as low costs, high revenues and efficient and effective asset utilization (Anderson et al., 1997; Christopher and Ryals, 1999; Ellram and Liu, 2002; LaLonde, 2000; Lambert and Burduroglu, 2000), empirical proof is notoriously difficult to find (Frohlich and Westbrook, 2001). This is shown by the difficulty of accurately attributing costs and benefits to supply chain decisions, both technically and financially (Tan et al., 1999). In a standard managerial setting (multi-company, multi-site, multi-problem), many functions simultaneously contribute to a company's performance. Isolating the direct impact of SCM decisions on financial ratios without any confounding variables is a challenging task (Otto and Kotzab, 2002). It is therefore of critical importance for SCM managers to be able to translate outcomes of SCM decisions into monetary or financial terms, which is an important prerequisite of gaining top management's attention (Lai and Cheng, 2003; Lambert and Pohlen, 2001; Morgan, 2004).

In spite of the importance of this issue, it has been proven difficult to empirically determine the exact impact of supply chain decisions (Frohlich and Westbrook, 2001) and neither a large amount of empirical proof nor systematic analyses exist (Wagner et al., 2012). As a consequence, the majority of literature dealing with logistics and supply chain performance has focused on constructing performance measures rather than determining the impacts themselves (Beamon, 1999; Blumberg, 1994; Bowersox et al., 1999; Chow et al., 1994; Fawcett and Cooper, 1998; Gilmour, 1999; Gunasekaran et al., 2001; Korpela and Tuominen, 1996; van Landeghem and Persoons, 2001).

This situation is aggravated by the fact that the most commonly used metrics of supply chain and logistics performance are based on "soft" data, which is self-reported and perceptual (Töyli et al., 2008; Otto and Kotzab, 2002). These metrics subsequently need to be converted into monetary terms so that executives can actually interpret findings in "their own language", and can easily compare them with other performance indicators. Wagner et al. (2012) therefore recommend that using the ROA as a general measure of supply chain fit will benefit corporate practice. This is mainly achieved by providing managers with a language they are more familiar with than subjective, perceptual performance measures (Lapide, 2012).

Literature explores three key areas where SCM can actually affect the financial performance of an organization: profitability, liquidity and productivity of asset utilization (Anderson et al., 1997; Christopher, 1998; Christopher and Ryals, 1999; Ellram and Liu, 2002; LaLonde, 2000; Lambert and Burduroglu, 2000). Since all those aspects are covered by the ROA, using this metric allows the supply chain community to substantiate operational supply chain improvements with financial data (Lapide, 2012). The ROA is therefore used as the main metric to analyze SCM impact on a firm's financial performance. In order to test for validity, other indicators (Return on Capital Employed (ROCE), Sales Growth and Earnings before Interest and Taxes (EBIT)) are included which are frequently used as measures of organizational performance.

3. Methodology

In order to find the most suitable research framework we followed the procedure suggested by Tranfield et al. (2003). The members of the research team were selected first based on their SCM experience. The members subsequently agreed on relevant keywords such as “SCM”, “logistics”, “SCM metrics”, and “financial impact” and used the databases “Emerald”, “EBSCO” and “ScienceDirect”. In order to verify that only those studies which meet all the inclusion criteria (Tranfield, 2003) were included in the review process, quality assessments based on Brown (2007) were conducted. Five criteria (literature review, theoretical clarity, theoretical robustness, contribution, strength of the paper) and four applicability ratings (not applicable, low, medium, high) were used in order to assess the relevance and quality of the publications. In a final step, data synthesis was used to extract important and relevant findings for further analysis and comparison. After finishing the review process the team members unanimously agreed that the most suitable concept for the assessment of the SCM-logistics relationship is the one introduced by Larson et al. (2007), which will be discussed below.

Based on the findings of the literature review, we developed a questionnaire with a focus on the basic understanding of SCM and its link to logistics, the hierarchical integration of the supply chain manager or the SCM department in the organization and the general strategic SCM orientation. In total, interview invitations were sent to the top 250 Austrian companies which were selected according to turnover. The interviews were conducted over the phone by logistics students who had received special training. In order to make sure that the terminology was consistent, the interviewers explained crucial terms, such as the SCM perspectives, using standardized definitions.

The Bloomberg database was used to gather the financial data, i.e. the Return on Assets (ROA), Return on Capital Employed (ROCE), Sales Growth, and the Earnings before Interest and Taxes (EBIT) margin (Bloomberg, 2013). In 109 cases (i.e. 43.6%) the companies both agreed to participate in the survey and the Bloomberg data was available.

4. Results

In a first step we identified the organizational (i.e. structural) implementation of supply chain management. A total of 64 % of the respondents (70 out of 109) stated that their company had officially embedded SCM into their company structure. For all further analyses we focused on those companies.

4.1 SCM Perspectives

We asked for the conceptual relationship between logistics and supply chain management, according to the classification elaborated above. The second column in Table 1 shows the Austrian distribution of the four perspectives. The unionist perspective is clearly the most popular one, followed by intersectionists, traditionalists and re-labeling perspectives. Subsequently, we compared our findings to those of Halldórsson et al. (2008), who conducted a similar study in American and Scandinavian companies. In order to test for significant differences in our findings, we conducted a Pearson’s chi-square test of independence, using R (R Core Team, 2013). The relation between the SCM Integration perspective and geographical location turned out to be insignificant, $(df = 6) = 4.97$, $p = 0.055$, indicating that similar organizational structures exist in those countries.

Table 1 A Comparison of SCM Perspectives

	Austria	America	Scandinavia
Unionist	31	47	12
Intersectionist	10	28	6
Traditionalist	7	19	3
Re-labeling	7	6	2
Total	55	100	23

Note:The data for America and Scandinavia were taken from Halldórsson et al. (2008)

4.2 SCM Perspectives and Financial Ratios

In order to find out whether the existence of a formal supply chain management strategy has a significant impact on financial performance, we conducted a t-test for independent samples. The results showed that those companies with a formal SCM system indeed performed better (average ROA 9.34% as opposed to 8.87%), but the difference turned out not to be significant ($t(72)=-0.20$, $p=0.84$). Subsequently, we investigated the impact of different SCM perspectives on the four financial performance indicators ROA, ROCE, Sales Growth and EBIT. Table 2 shows the average values. In order to account for significant differences we conducted a one-way ANOVA with the SCM perspective as the single factor. The impact on the ROA turned out to be non-significant ($F(1, 46)= 0.154$, $p=0.70$), as was the case for ROCE ($F(1,46)=1.825$, $p=0.183$), and EBIT ($F(1, 34)= 0.154$, $p=0.70$)). The impact on sales growth (SG) was significant ($F(1, 47)= 4.774$, $p=.0.034$). Care has to be taken when interpreting the statistical tests, due to several limitations which we will discuss in the final section.

Table 2 Financial Ratios

	Companies	ROA	ROCE	SG	EBIT
Unionist	31	10.05%	23.18%	18.92%	6.32%
Intersectionist	10	9.06%	12.23%	30.23%	4.16%
Traditionalist	7	8.00%	21.68%	12.41%	7.29%
Re-labeling	7	8.43%	10.74%	87.69%	7.90%

5. Further Research Directions and Conclusions

Corroborating previous studies, we found that the top 250 Austrian companies have multiple perspectives on the conceptual relationship between SCM and logistics. Most practitioners favor a unionist perspective (n = 31), followed by intersectionist (10), traditionalist (7) and re-labeling (7). Our descriptive data indicated that there is an influence of SCM on organizational performance. Most results (t-test and ANOVAs) were not significant, but care has to be taken when interpreting the results, since the data are subject to several shortcomings, which was mainly due to the exploratory character of this study. First, the sample size studied was relatively small; in total, 109 out of 250 companies participated in the survey. Second, we did not test for any potential bias in the data. Third, the data was heteroscedastic and, due to the small sample size, there was a lack of statistical power. Notwithstanding these limitations, the findings from the literature and our data indicate that further research is required in order to assess the important impact of the organizational

adoption of a specific SCM perspective on financial performance. In the remainder of this section, we will derive several propositions which are of strategic importance for companies and warrant further attention from the academic community.

The descriptive data indicates a potential relationship between a formal integration of SCM and its financial impact. We therefore suggest:

P1: Companies with an organizational integration of SCM have better financial ratios than those without.

By taking a deeper look into the data of our survey it became obvious that financial performance differs between the four perspectives. Companies which follow narrow, single function, logistics-based perspectives (traditionalist and re-labeling) (Halldórsson et al., 2008) of SCM show a lower ROA than companies without SCM:

P2: A company's supply chain integration perspective has an influence on its financial ratios.

Companies which understand SCM from a broad perspective (i.e. unionist and intersectionist) had a higher ROA than those which do not. This outcome supports the unionists' perspective that an integrated supply chain management yields the best results (Halldórsson et al., 2008; Lambert et al., 1998; Mentzer et al., 2001). Based on these findings, one might even argue that is better not to invest time and money in SCM than to invest in the wrong SCM actions. We therefore further refine our second proposition:

- P2a: Implementing an SCM solution which lacks organizational fit is worse than having no formal SCM implementation.

- P2b: The unionist perspective has a greater positive influence on a company’s financial ratios than other supply chain perspectives.

Based on these propositions, we suggest the following approach for further research. First, an in-depth understanding of how intra-organizational processes are affected by the introduction of SCM in a company is needed. A promising way to achieve this might be the application of a system dynamics model in one or more companies. Such models might subsequently serve as the basis for further empirical research including behavioral research based on surveys. Second, more empirical data is needed from organizations which have implemented SCM and are willing to share relevant performance indicators before and after the implementation. This line of research might also help to identify those indicators which are crucial for a company's success. Using a quasi-experimental research design might shed light on the question of which indicators are causally linked to financial performance. Third, models are needed which are based on theory and can be tested in large-scale surveys. These models not only need to take into account SCM perspectives and financial ratios, but also various moderating and mediating factors included in the model as well as potentially confounding variables. The relevance of those research questions for both practitioners and academics makes for a field which is of high strategic importance.

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