Journal of Business and Economics, ISSN 2155-7950, USA
July 2014, Volume 5, No. 7, pp. 1052-1067
DOI: 10.15341/jbe(2155-7950)/07.05.2014/010

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Supply Chain Management—Part of Strategic Management

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Abstract: The purpose of the paper is to investigate how Supply Chain Management (SCM) is integrated with strategic management of companies and how this degree of integration impacts the competitiveness of companies. SCM is a capability that connects operational levels, where innovation actually occurs, with strategic levels and synchronizes the strategic and operational factors when managing resources strategically. Therefore, SCM is concerned with managing all activities involved in integrating supply and demand management within and across companies composing the supply chain (CSCMP, 2009). The new competitive landscape is described as "hypercompetitive" (D'Aveni R. A., 1994) because it is characterized by "escalating competition and strategic manoeuvring" (D'Aveni R. A. & Ravenscraft D. J., 1994) due to rapid technological developments and increasing globalization (Hitt M. A., Keats B. W., & DeMarie S. M., 1998). For the purpose of this work, I will adopt the definition of dynamic capabilities as the "ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments" (Hitt M. A., Keats B. W., Harback H. F., & Nixon R. D., 1994). Strategic supply chain management means that supply chain management is not merely a function that supports business strategy but a key part of strategy and strategy implementation. The strategic integration of SCM on firm base will be evaluated by literature study. In parallel a questionnaire will be developed to empirically understand how SCM (SCM-strategy is developed, is part of business strategy, drives business strategy) is part of business strategy and how this is communicated and what is the business impact compared to peers. Findings-Many executives are still hesitant to surrender the control of their operations to a total SCM function that tries to optimize the entire demand network rather than an individual firm's operations. Strategic management research has been concerned with the question of, "why certain firms attain and sustain competitive advantage during both stable and unstable market conditions" (Zahra S. A., Sapienza H. J., & Davidsson P., 2006) propose that firms' dynamic capabilities, which they define as "the abilities to reconfigure a firm's resources and routines (Teece D. J., Pisano G., & Shuen A., 1997; Shimizu K. & Hitt M. A., 2004) in the manner envisioned and deemed appropriate by its principal decision-maker(s)" (Zahra S. A., Sapienza H. J., & Davidsson P., 2006) lead to differences in firms' abilities to identify and exploit future growth opportunities which could lead to attaining and sustaining competitive advantage. Trust between partners develops more effectively when incentives and purposes of the partners are aligned and a shared identity is created. Surely, incorporating perspectives from strategy research into SCM can guide SCM and elevate it to a more strategic level, while at the same time, strategy can benefit from SCM in implementing and enabling organizational strategies.

Keywords: supply chain management (SCM); strategic management; dynamic capabilities; competitiveness
JEL codes: F

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1. Introduction

Global competition and advancing technologies render borders irrelevant and link companies more closely. Supply chains—with the networks of suppliers, plants, channels as, distributors, retailers and others that participate in the sale, delivery and production of goods and services—are growing increasingly more complex (Christopher M., 2011).

This globalization of supply chains has forced companies to look for more effective ways to coordinate the flow of material into and out of the company. Companies are striving for ways to achieve and sustain competitive advantage, during stable and during volatile developments of the environment (Christopher M., 2011).

Further, companies in particular and supply chains in general compete more today on the basis of time and quality. Getting a defect-free product to the customer faster and more reliably than the competition is no longer seen as a competitive advantage, but simply a requirement to be in the market (Mentzer J. T., 2001).

One of the ways to improve competitiveness of a company is to outsource non-core competencies and focus on core-competencies. As a consequence, all other activities have been outsourced to other firms, nationally or internationally, if possible. Consequently, the characteristics and the quality of a product or service sold to a customer largely depend on several functions and firms involved in its creation.

Therefore key priorities are aligning the supply chain with company strategy, aligning incentives across functions and with external parties, arming people with the right data, so they can make holistic decisions, and building flexibility to quickly respond to demand, rather than relying on forecast (Cohen S. & Roussel J., 2004). This brought about new challenges for the integration of legally separated firms and the coordination of materials, information and financial flows not experienced in this magnitude before. This global orientation and increased performance based competition, combined with rapidly changing technology and economic conditions, all contribute to marketplace uncertainty. This uncertainty requires greater flexibility on the part of individual companies and supply chains, which in turn demands needs better coordination to deliver customer value and leads to customer satisfaction (Cohen S. & Roussel J., 2004).

2. Theoretical Development

The early understanding of competitive advantage is based on theory of perfect competition (Walras L., 1965). In perfect competition products are homogenous, consumers and producers have perfect information, prices will reach equilibrium, and as a result profits are zero in the long run. A later approach is the industrial organization approach (Tirole J., 1988), which argues that success comes from market power and a firm's efficiency. However, the proponents of this approach agree that in the long term there would be industry equilibrium and little profit.

One of the first researchers to propose a theoretical framework for understanding a firm's performance is Porter (Porter M. E., 1980). He takes a strategic and analytical approach to understanding competitive strategy, and argues that, "Every firm competing in an industry has a competitive strategy, whether explicit or implicit". Porter asserts that, except for microeconomic theory, the strategy field and literature had offered few analytical techniques for gaining this understanding. Porter argues that with the right approach it is possible to break away from the economic equilibrium situation and achieve superior performance. Therefore he proposes a framework for analyzing industries and competitors and describes three generic strategies:

- Cost leadership

- Differentiations
- Focus

He postulates that to be successful, the firm has to do well in one or more of these strategies.

Porter's ideas and proposals on achieving competitive advantage have influenced many other researchers to propose complementary theories on achieving competitive advantage. All the theories proposed by researchers are supported with examples of winning strategies implemented at renowned companies. The theories include an emphasis on planning (Porter, M. E., 1985) strategic approach (Hamel G., Prahalad C. K., 1990, 1998; Porter M. E., 1991) marketing strategies (Day G. S., 1994) value chain management (Porter M. E., 1985) and supply chain management (Day G. S., 1999; Christopher M., 1998; Poirer C., 1999; Tyndall G., Gopal Ch., Partsch W. & Kamauff J., 1998).

This theory has gained momentum in the last decade as the concept of supply chain management. In the recent years, there have been numerous advances and developments in supply chain techniques and management. One of the reasons is that as trade barriers drop and markets open, competition has become more intense—hence companies need to be more competitive and cost effective. An initiative to help achieve this is a supply chain management program. Supply chain management is the management of upstream and downstream activities, resources, and relationships with suppliers and customers, which is required to deliver products and services. In theory, if this is done well it will lead to competitive advantage through differentiation and lower costs as suggested by Porter (1985). Moreover, some researches claim that effective supply chain management can reduce costs by several percentage points of revenue (Cohen S. & Roussel J., 2004). Furthermore, there has been little verification or research done on measuring competitive advantage gained through supply chain management.

Supply chain management is a capability that connects operational levels, where innovation actually occurs, with strategic levels and synchronizes the strategic and operational factors when managing resources strategically. According to Ireland and colleagues (Ireland R. D., Hitt M. A. & Sirmon D. G., 2003), financial, human and social capitals are the critical resources and capabilities that need to be managed strategically in a manner that supports both entrepreneurial and strategic actions (Ireland R. D., Hitt M. A. & Sirmon D. G., 2003; Sirmon D. G., Gove S. & Hitt M. A., 2008).

A valuable resource portfolio is a necessary but insufficient condition to create a competitive advantage (Sirmon D. G., Gove S. & Hitt M. A., 2008). In fact, it is the management's capability to bundle and leverage the resources in its resource portfolio that differentiates it from its similarly endowed competitors (Sirmon D. G., Gove S. & Hitt M. A., 2008). "Rightsizing" the organizational "processes", "products" and "people" is crucial to the firm's ability to compete during hypercompetitive times (Hitt M. A., Keats B. W., Harback H. F. & Nixon R. D., 1994).

SCM has to be viewed as part of strategic management to become more effective and deliver successful results, as it influences all key business processes within the organization and between the organization and it's partners. Organizational boundaries also play a role in the firm's strategic flexibility. The new competitive landscape is described as "hypercompetitive" (D'Aveni R. A., 1994) because it is characterized by "escalating competition and strategic manoeuvring" (Hitt M. A., Keats B. W. & DeMarie S. M., 1998) due to rapid technological developments and increasing outsourcing and globalization. Therefore, not only do the transaction costs, resources and capabilities' endowments play a role in determining a firm's boundary but also does the knowledge-base and knowledge-absorptive capacity of the firm (Cohen W. M., Levinthal D. A., 1990).

In summary, a firm's boundary decisions are clearly critical for a firm's ability to attain and sustain competitive advantage. Researchers warn against making hasty boundary decisions based on the operational level

consideration only, because they can unintentionally create dependencies that may negatively affect future flexibility (Insigna R. C., Werle M. J., 2000). Knowing when to vertically integrate and when to disintegrate, is a competitive capability that can lead to successive temporary competitive advantages adding up to sustained competitive advantage (Fine C. H., 1998). Moreover, a firm's boundary at the product level is not necessarily identical to its capabilities and knowledge boundaries because firms often need to know how their products and processes fit with complementary components or processes even if they were produced or carried out externally (Araujo L. M., Gadde L. E. & Dubois A., 2003). Thus, it is important to be able to manage the boundaries dynamically and know how different capabilities complement one another. Therefore, the ability to decide which set of capabilities to develop and which to outsource in the process of designing the supply chain (i.e., demand network) is the ultimate core competency in a fast-clock speed world according to Fine (Fine C. H., 1998). This competency also means (re)designing and (re)configuring the supply chain on a continuous basis in order to gain a series of temporary competitive advantages in pursuit of a sustainable competitive advantage (Fine C. H., 1998). Therefore, the vertical integration strategy is a corporate strategy that rests in the hands of the corporate CEO and top management, who solely can, at times, dictate and push for coordination among the business unit's (Harrigan K. R., 1984). In fact, a firm being involved in multiple value chains can have multiple boundaries depending on the stage it occupies on a certain product's value chain (Fine C. H., 1998; Fisher M. L., 1997). Although, SCM capacities holds much potential, many executives are still hesitant to surrender the control of their operations to a total SCM function that tries to optimize the entire supply chain rather than an individual firm's operations part.

It can be noted that the abilities to sense and seize market changes and opportunities, the ability to learn, the ability to coordinate and integrate, and the ability to reconfigure are common among all above conceptualizations of dynamic capabilities. Reconfiguring capability is the ability to build, combine and reconfigure resources and operational competencies in response to the identified market changes and opportunities in order to gain and sustain competitive advantage. Because the resource reconfiguration capability is the goal process of dynamic capabilities enabled by the sensing and learning capabilities, and the coordinating and integrating capabilities, it will have clear implications for the SCM capabilities.

The sensing capability is not only important in times of instability but is as important in times of stability because a firm must scan and sense new opportunities at all times, both inside and outside the firm in order to be able to improve on and sustain its operational excellence and advantage. Technological change can affect the firm's and its "co-opetitors" (suppliers and customers) capabilities directly or indirectly by affecting one or all members of a network (Afuah A. & Tucci C. L., 2001). Thus, a firm must constantly scan the environment for changes or opportunities that might affect itself, its suppliers, customers and even competitors. The ability to align the internal units of any firm is an extremely important process in order to be able to integrate supply and demand management and efficiently create value for the end customer (Narayanan V. G. & Raman A., 2004). SCM by definition endeavors to deliver products and services of higher quality, demanded by the market, at lower costs and higher speed than rivals.

3. Strategic Supply Chain Management

Strategic supply chain management means that supply chain management is not merely a function that supports business strategy but a key part of strategy (Hult G. T. M., Ketchen D. J. Jr. & Arrfelt M., 2007; Hult G. T. M., Ketchen D. J. Jr. & Stanley Slater F., 2004; Ketchen D. J. Jr. & Hult G. T. M., 2007) and strategy

implementation (Evans R. & Danks A., 2000; Upson J., Ketchen D. & Ireland R. D., 2007). In fact, strategic supply chain management is defined as "the strategic, operational, and technological integration of supply chain organizations and activities through relationships, processes, and information sharing to provide member organizations a competitive advantage" (Upson J., Ketchen D. & Ireland R. D., 2007, p. 78). Moreover, strategic supply chain management can "both drive and enable the business strategy of many firms, rather than performing only a part of the operations strategy" (Evans R., Danks A., 2000, p. 20). The term strategic supply chain management obviously encompasses all previous definitions mentioned so far for managing the supply chain, such as supply chain management, demand chain management, supply and/or demand network management. These three macro supply chain processes encompass the primary and support value chain activities proposed by Porter (Porter M. E., 1985). According to Porter, primary (Porter M. E., 1985) activities include inbound logistics, operations, outbound logistics, marketing, and sales and service. And support activities include firm infrastructure, human resource management, technology development, and procurement. Manage the value chain by integrating, coordinating, and collaborating among these primary and support activities in order to synchronize and smoothly operate the value chain processes.

According to Chopra and Meindl (Chopra S. & Meindl P., 2004) "Customer Relationship Management" practices focus on the interaction processes between the firm and its customers, for example, order management and service are key processes under customer relationship management. While design collaboration, sourcing, negotiating, buying and supply collaboration are key processes under "Supplier Relationship Management" which focus on the interaction processes between the firm and its suppliers. And "Internal Supply Chain Management" focuses on all the processes internal to the firm carried to fulfil the customer demand like strategic planning, demand planning, supply planning, order fulfilment and field service (Chopra S. & Meindl P., 2004). These SCM activities are: Integrated behavior (Supply Chain Orientation), mutually sharing information, mutually sharing risks and rewards, cooperation, congruence of servicing the customer goal, integration of the processes, and building and maintaining long-term relationships between partners (Mentzer J. T., 2001). In a more recent work on SCM practices, Li S., Subba Rao Ragu-Nathan T. S., Ragu-Nathan B. (2005) cite many practices from previous literature, in addition to the above mentioned practices, such as, agreed vision and goals, cooperation, process integration, agreed supply chain leadership (Min S. & Mentzer J. T., 2004), and internal integration (Pagell M., 2004).

In addition, Lideveloped six dimensions of SCM practices and research and show their ability to lead to enhanced competitive advantage (Li S., Subba Rao Ragu-Nathan T. S. & Ragu-Nathan B., 2005). These six constructs are: Strategic supplier partnership, customer relationship, information sharing, information quality, internal lean practices, and postponement (Li S., Subba Rao Ragu-Nathan T. S. & Ragu-Nathan B., 2005). It is the foundation upon which coordinative and collaborative decisions can be made among supply chain members (Harland C. M., Caldwell N., Powell P. & Zheng J., 2007; Holland C. P., 1995; Hult G. T. M. & Slater D. J., 2004; Lee H. L., 2000). Trust between partners develops more effectively when incentives and purposes of the partners are aligned and a shared identity is created.

3.1 Supply Chain Orientation

The next set of SCM activities: integrated behavior, integration of processes, cooperation, and congruence and alignment of goals (Mentzer J. T., 2001) that connect the three macro processes and are essential for postponement and other important supply chain initiatives. These activities represent the supply chain orientation that promotes network alignment.

Strategic planning is necessary to optimally use and deploy the resources available internally and in the supply network. Strategic decisions such as which markets to serve, and which facilities to build and where to build them and how to allocate production and distribution among facilities significantly affect a firm's competitive abilities.

Order fulfilment processes on the other hand, can be considered part of the supply planning practice because they are concerned with outlining each order's resources and logistics requirements. The manufacturing and service flow management process can be considered part of supply planning as well. In addition to the above, postponement: keeping generic inventory and delaying the final product configuration until more precise customer demand requirements are known, is another practice that has gained popularity as means for achieving flexibility and lowering costs (Cvsa V. & Gilbert S. M., 2002).

In addition to the above, postponement: keeping generic inventory and delaying the final product configuration until more precise customer demand requirements are known, is another practice that has gained popularity as means for achieving flexibility and lowering costs (Feitzinger E. & Lee H. L., 1997; Hoeck R. I., Harrison A., 2001; Christopher M., 2005).

The demand network orientation or in other words, the integrated system wide view and behavior, is defined as "the recognition by an organization of the systemic, strategic implications of the tactical activities involved in managing the various flows in a supply chain" (Mentzer J. T., 2001). By emphasizing a total system and holistic approach in managing the supply chain, by emphasizing cooperative efforts to synchronize internal and external supply chain operations and capabilities, and by emphasizing the creation of unique value for the end customer, this integrative philosophy is a critical prerequisite to any effective SCM effort.

All definitions promote the holistic system approach and allude to the supply chain management's significance for supporting the firm's strategy in order to attain and sustain competitive advantage. Even so, along the years, SCM has evolved to a much broader definition of value chain or value system management. Beyond that, some authors (Christopher M., 2005; Croxton K. L., Lambert D. M., Garcia-Dastugue S. J. & Rogers, D. S., 2002; Frohlich M. T., Westbrook R., 2002; Lee H. L. & Whang S., 2001) use supply or demand network management instead of supply chain management or demand chain management because firms usually belong to multiple chains at the same time.

Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third party service providers, and customers. In essence, supply chain management integrates supply and demand management within and across companies (CSCMP; Council of supply chain management professionals http://cscmp.org/aboutcscmp/definitions.asp, 2009) underline added for emphasis.

It was considered by logistics practitioners and academics as an extension of logistics outside the firm to include suppliers and customer (Chen Y. F., Drezner Z., Ryan J. K. & Simchi-Levi D., 2000). Nonetheless, in 1998, the Council of Logistics Management noted that logistics is only a part of supply chain management, and that supply chain management is broader in scope because it takes into account the effect of more than just the logistics function, on processes that span across the supply chain member firms (Lambert D. M. & Pohlen T. L., 2001).

However, the term supply chain management has broadened in meaning (Chopra S., Meindl P., 2004), to the extent that it is seen as a critical part of competitive strategy (Li S., Ragu-Nathan B., Ragu-Nathan T. S. & Rao S., 2006) and can be a core competency (Tummala R., Philips V. M. & Johnson M., 2006). Effective and efficient supply chain management can indeed lead to improved product and service quality, increased product and service value, while at the same time lower total system costs (Davis T., 1993). Therefore, supply chain management strategies can clearly support the organization's competitive strategy (Hult G. T. M., Ketchen D. J. Jr., Arrfelt M.,

2007; Ketchen D. J. Jr., Hult G. T. M., 2007).

Moreover, managing the supply chain has become a critical capability for staying competitive (Power D. J., Sohal A. & Rahman S. U., 2001; Tan K. C., Lyman S. B. & Wisner J. D., 2002). The concept of supply chain management has been covered extensively in the academic literature but a consensus on its definition is yet to form. Because supply chain management involves managing processes across many different functional areas in an organization and across different organizations, it is natural that it has received attention from different academic disciplines, which has contributed to the development of the supply chain management field (Ketchen D. J. & Giunipero L. C., 2004).

3.2 Hypothesis Development—Construct Development

Based on the relevant literature empirical case studies, I have identified the most relevant factors that are the key driving forces behind an effective implementation of SCM and contributing to competitive advantage (Porter M. E. & Kramer M. R., 2006; Hitt M. A. & Ireland R. D., 2002). I've developed by an in depth literature and case study review an entire model consisting of the independent constructs, customer orientation, strategic view on SCM, leadership and trust, SCM-practices and processes, and the dependent constructs of SCM-performance, financial performance, customer satisfaction and competitiveness.

For this paper I'm looking only into one part of my entire model developed, which is about SCM as part of strategic management, reflected by the construct, strategic view on SCM.

Strategic view on SCM: The strategic view on Supply Chain management reflects the management commitment to SCM in terms of senior management responsibility and resource deployment. It reflects the alignment between corporate strategy and SCM-Strategy, specification of SCM goals, SCM performance measurement systems, quality and frequency of reporting (Ahire S. L., Dreyfus P., 2000).

Hypothesis: Strategic view on SCM has a high influence on SCM-practices and processes

Supply Chain Practices: This is related to the bundle of activities undertaken in an organization to effective management of its supply chain. Li S., Ragu-Nathan B., Ragu-Nathan T. S., Rao S. S. (2004) proposes SCM practices as a multi-dimensional concept including, strategic supplier partnership, customer relationship, cross functional collaboration level of information sharing, quality of information sharing and postponement (Ahire, Dreyfus, 2000). Postponement is the practice of moving forward the customer decoupling point to a much later point in the supply chain (Li S., Ragu-Nathan B., Ragu-Nathan T. S. & Rao, S. S., 2004). Order fulfilment processes on the other hand, can be considered part of the supply planning practice because they are concerned with outlining each order's resources and logistics requirements. The manufacturing and service flow management process can be considered part of supply planning as well (Feitzinger E. & Lee H. L., 1997; Cvsa V., Gilbert S. M., 2002; Hoeck R. I., Harrison A., 2001). This means if SCM is not part of strategic management and an SCM strategy aligned with corporate strategy does not exist, this is as well visible through missing SCM practices and processes. The reasoning is, that SCM is a management philosophy where cooperation, collaboration across functions and across companies dominates, where the trade off between service, efficiency and utilization has a clear priority ranking, which needs strategic alignment with corportate, channel and operations strategies.

Hypothesis: Strategic view on SCM impacts also indirectly firm performance.

The maturity stage model follows the qualitative practice assessment of PRTM. In order to increase questionnaire returns and willingness to respond the original questionnaire was condensed from 270 questions to 95 questions that characterize supply chain practices in the areas plan, source, make and deliver. The questionnaire covers in a multiple choice form the following scope: planning strategy: demand planning, supply planning,

demand and supply balancing and decision making; sourcing strategy, sourcing processes, supplier development/management, sourcing organization and infrastructure; manufacturing strategy, production scheduling, material issue, movement and tracking, manufacturing process control; delivery enablement, order entry and scheduling, warehousing, transportation, and delivery, invoicing and cash collection; overall supply chain strategy, overall supply chain performance management, overall supply chain processes, and overall supply chain organization.

The maturity questionnaire shall answer the majority of the constructs:

- Strategic View on SCM
- SCM practices

The model has 4 stages:

Stage 1 functional focus: functional departments within an organization focus on improving their own process steps and use of resources. Manager typically focus on their individual department's costs and functional performance, processes that cut across multiple functions or divisions are not well understood, resulting in limited effectiveness of complex supply chain processes (Hitt M. A. & Ireland R. D., 2002).

Stage 2 internal integration: division and company-wide processes are now defined, allowing individual functions to understand their roles in complex supply chain processes. Cross functional performance measures are clearly defined, and individual functions are held accountable for their contributions to overall operational performance. Resources requirements typically are balanced across the organization. A well defined demand supply balancing process that combines forecasting and planning with sourcing and manufacturing is evident at this stage (Hitt M. A. & Ireland R. D., 2002).

Stage 3 external integration: policies are now extended to the points of interface with customers and suppliers. The company has identified strategic customers and suppliers, as well as the key information it needs from them in order to support its business processes. Joint service agreements and score card practices are used, and corrective actions are taken when performance falls below expectations.

Stage 4 cross enterprise collaboration: Customers and suppliers work to define a mutually beneficial strategy and set real-time performance targets. IT now automates the integration of the business processes across these enterprises in support of an explicit supply chain strategy (Hitt M. A. & Ireland R. D., 2002). The correlation between advanced processes (maturity stages) and quantitative performance results will be checked in the model.

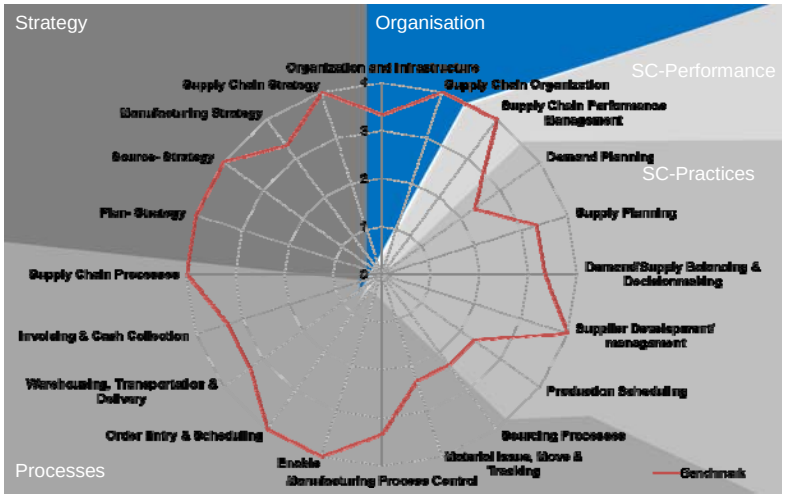

Figure 1 Own Figure—Supply Chain Maturity Levels Based on Different Categories

Measurement variables based on SCM-maturity questionnaire clustered on content into 5 categories developed by literature study.

The questions will be clustered based on the following groups:

- strategy,
- organization,
- performance management,
- practices,
- processes,
- maturity overall

3.3 Sample Size and Spread of Companies—Data Collection Method

The study is focusing on companies in producing industries, with their key operations in Europe. The size of the companies is not smaller than 500 employees. The turnover starts with EUR 50 million up to more than 20 bn. The size parameters for the companies has been chosen, as this size of companies have different functional responsibilities for sales, marketing, production, logistics, procurement, innovation, construction, and it has therefore a need for cross-functional co-ordination in the sense of SCM. As the construct covers several aspects of SCM and even leadership and behavioural aspects the best way of data collection will semi-structured interviews to avoid miss-interpretations and misunderstanding of questions (can be avoided as the interviewee can ask questions if terms are not clearly understood). Due to this methodological approach a small sample of 20 to 30 companies allows identifying the relations between the constructs (Babbie E., 1990; Fowler F. J., 2002). The questionnaires are used for interviews with the head of supply chain or logistics, or operations of these companies. This strengthens further the validity, as we talk with the right people in the organization, being responsible for SCM.

4. Summary and Conclusions

Supply chain management is no longer just about efficient flow of material, money and information, but instead about improving the performance of the entire value chain or network. Calls for research integrating organizational and strategy research with supply chain management research has been increasing (Ketchen D. J. Jr. & Hult G. T. M., 2007; Miles R. E. & Snow C. C., 2007). The move incorporating perspectives from strategy research into SCM can guide SCM and elevate it to a more strategic level, while at the same time, strategy can benefit from SCM in implementing and enabling organizational strategies.

Indeed, SCM offers the holistic management and the visibility of the network that can and will implement the corporate and firm strategies. On the other hand, strategy theories (transaction cost theory & resource based view in particular) and alliance, network and social capital research from the strategy field give the supply chain management practices a strategic objective, a purpose, a goal to pursue when developing and implementing these practices, and the means for evaluation (Grover V. & Malhotra M. K., 2003).

The model development started with an in depth literature review and my experience from past supply chain benchmarking exercises, which I did extensively from 2004 till 2007 in the paper industry, by using the standard model and the data base from PRTM, to compare the company for which I worked at that time in the supply chain maturity and in the operational and financial performance with the benchmark of an anonymous sample for the same sector in the data base. Based on the long term experience with a standard model and on literature study of

existing models and concepts I could identify some of the missing parts to answer the impact of SCM and competitiveness. Key topics which were identified, as missing from a multi-disciplinary view in most of the models, were about customer orientation and about leadership, culture and trust. SCM needs trust between functional areas and trust between supply chain partners to maximize collaboration and speed of flow of information, material and money. This can only work if SCM is seen as a matter of strategic importance by the top management.

Having developed the constructs I developed the hypothesis how the constructs could support each other. The key topic was now how to measure each construct. Based on literature a questionnaire was developed to measure *customer orientation*. For the constructs, *strategic view on SCM* and *SCM practices* the questions were based on the maturity stage model developed by Roussel, Cohen (Cohen S., Roussel J., 2004; Hitt M. A., Ireland R. D., 2002). The questionnaire was reduced from 320 questions to 95 questions. This was done in a way that for each stage at least one main question per section was kept to secure content validity. The questions were not combined in the same way as in the original model. The questions were grouped into 5 sections, strategy, organization, performance management, practices and processes. The group of questions related to strategy, organization and performance management, were related to strategic view on SCM and the questions related to practices and processes were related to supply chain practices. Once I had reduced and grouped the questions I tested it with the company for which I worked at that time and the results reflected the stages in the model.

I tested in a first step the strategic view and the process view on SCM and their impact on operational performance (delivery reliability, delivery capability and delivery lead time) and financial performance (development of turnover, Earnings before interest and tax, return on capital employed (ROCE), working capital, cash to cash cycle) as part of the model with 12 companies and the results showed not just from a descriptive perspective a high correlation with the operational and financial performance. The exercise was used in an open benchmark between the companies who are part of the SCM expert group which I organized. We analyzed the figures in a descriptive way to discuss maturity constructs and their impact on firm performance and discussed them in the expert group.

On the other hand we analyzed the figures with other statistical methods, like the factor analysis which showed as well significant correlations between SCM organization, SCM practices, SCM processes, SCM-strategy and SCM overall (correlation levels from 0.89 to 0.944) as the maturity parts. This means companies who have a clear SCM strategy, a supply chain organization, employ postponement and supplier and customer collaboration, and have a higher maturity of processes, have an overall higher maturity on SCM than others. In addition companies who have a higher maturity in SCM show a lower volatility in their financial performance, especially in terms of ROCE and cash to cash cycle. High mature companies showed during 2008-2010 volatility through crisis even a steady increase on ROCE, although turnover was reduced by about 20%.

There was as well a strong correlation visible between delivery lead time and cash to cash cycle and a high correlation between delivery reliability, delivery capability and the cash to cash cycle standard deviation from 2007 till 2009. The double validation of findings was an excellent indicator of model fit because it reflected that companies with lower delivery reliability and delivery capability have a higher cash to cash cycle volatility reflected by the standard deviation of the cash to cash cycle. The last information which was highly visible was that a low maturity of SCM performance management, this means SCM performance figures are not measured regularly and in a standardized way, correlates negatively with the cash to cash cycle.

Nevertheless I learned out of the analysis that absolute numbers of delivery reliability and delivery capability are not meaningful, because 98% delivery reliability for fast moving consumer goods is not enough to be best in class, but the same figure in the steel industry would be a high performer. This is the reason why this is asked now for the full study as relative measure (much better than your competitor, better than,…).

In addition I have done a cross functional testing of the model within one company, where I interviewed 15 people from all functional areas of the company, and results about the maturity were highly correlating between functions within this company. This was done with a high performing company and with a low performing company. The link to financial results also proved to be strong (low maturity, missing strategic view on SCM, low ROCE, high cash to cash cycle time.

Through triangulation I could gain validity and reliability of this part of the model.

Once I had finished the full model (enclosed in the APPENDIX) I discussed the questionnaire and the model with 2 academic supply chain experts. Based on their recommendation I made further adaptations to the questionnaire. Through this discussion I got as well aware that some questions need explanation and feedback questions. This was the reason why I decided for validity reasons and for additional valuable information which can be gained by interviews, to carry out the study by semi-structured interviews. The bias which I could bring into the study through interviews is mitigated by a triangulation of interviewers. I carry out interviews with experienced students and train them in doing as well interviews to make sure that validity is not influenced through my personal bias. I conduct the companies and make the appointments. We have now done 15 interviews with different companies and first results show already that the constructs highly connected. I see that companies who have a high strategic view on SCM have as well a high customer orientation. Companies who are highly mature in terms of processes and practices and have a strategic view on SCM show as well high levels of leadership support for SCM. The SCM-manager is strongly supported by top management and top management believes that SCM delivers significant contribution to results. Sales and operations planning teams are trusted to prepare, decide and execute monthly sales and operations plans, with low intervention of top management. Companies with high SCM maturity know as well where they are in comparison with their competitors in terms of SCM-performance. The companies who are more mature feel themselves as well overall more competitive than their peers. Valuable information which was gained by the interviews relates to industry specifics and how the companies differentiate themselves from the competitors. It is as well valuable to understand how companies measure SCM performance figures, 30% out of our small sample does not measure the performance figures in a meaningful way and another 20% measures them wrong, which is important information for my further analysis. These findings clearly undermine, if SCM is not seen as part of strategic management, the probability of implementation success is very little. It can be as well seen that firms with higher SCM maturity show better business results, this means both hypothesis are confirmed by the study so far.

The entire study is for sure the most comprehensive study in this area with much higher quality than any other studies done before, due to the fact that I carry out semi-structured interviews, that I target the right people, that we explain terms and ask questions about the quality of data. The interviewer’s bias is eliminated by having different interview persons with training and knowledge on the subject. Companies who participate in the study gain information about the maturity of their supply chain and how good SCM strategy as part of strategic management supports a company’s competitiveness.

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Appendix
Model and Questionnaire Overview

Measurement Method and Variables

Each construct in this study is modelled as a latent variable (unobservable level) and most of them will be measured by several items (observable level) on a five-point Likert-Scale. The model developed consists of the following independent and dependent variables.

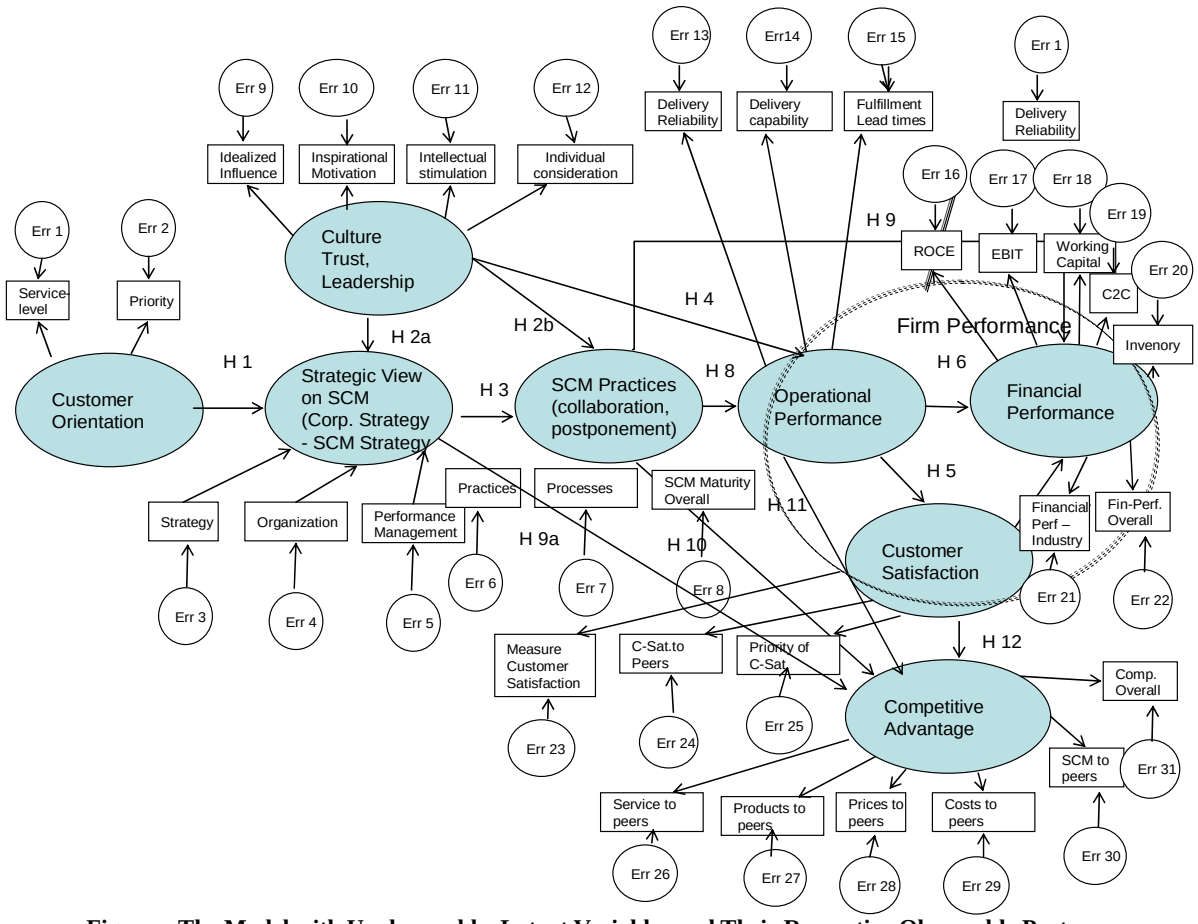

Figure The Model with Unobservable, Latent Variables and Their Respective Observable Parts

Independent Variables and Their Measurement Methods

Customer orientation measured through 5 questions about service level agreement with customers. The measurement scale is a 5 point Likert-Scale (fully agree, agree, don't know, disagree, fully disagree), where 5 means fully agree and 1 means fully disagree and with a priority rating of the following terms, productivity, costs, turnover, margins and customer satisfaction. The measurement is a ranking from 1 to 5, where 5 is the most important and 1 is the least important. For the measurement the ranking of "customer satisfaction" can be interpreted like a Likert-Scale measure.

Strategic view on supply chain management gets measured by the parts:

Strategy	16 questions
Organization	9 questions
Performance management	8 questions

The questions for each part are based on the developed (based on SCOR) supply chain maturity questionnaire. The measurement is a 5 point Likert-Scale (fully agree, agree, don't know, disagree, fully disagree), where 5 means fully agree and 1 means fully disagree.

Supply Chain practices get measured by the following parts:

Practices	20 questions

Processes 42 questions

The questions for each part are based on the developed (based on SCOR) supply chain maturity questionnaire. The measurement is a 5 point Likert-Scale (fully agree, agree, don't know, disagree, fully disagree), where 5 means fully agree and 1 means fully disagree.

Leadership impact gets measured by the following parts based on the full range leadership concept (Bass & Avolio, 1994):

Idealized influence 8 questions

Inspirational motivation 3 questions

Intellectual stimulation 3 questions

Individualized consideration 6 questions

The questions get measured by a 5 point Likert-Scale (fully agree, agree, don't know, disagree, fully disagree), where 5 means fully agree and 1 means fully disagree.

Dependent Variables Measurement Methods

Firm performance constructs are the dependent variables in the model.

Operational performance gets measured with the parts:

- Delivery reliability
- Delivery capability
- Fulfilment lead times

The operational performance gets measured as a percentage and fulfilment lead times in days. In addition the relative performance for all three operational performance measures compared to peers is asked and measured in a 5 point Likert-Scale (much better, better, equal, worse, much worse), where 5 is the best and 1 is the worst.

Financial performance gets measured with the following parts:

- Revenue development
- Profitability development
- ROCE development
- Working capital development
- Cash to cash cycle development (C2C)
- Overall financial performance

The figures get measured as Index where 2007 represents 100 and the years till 2010 represent than the respective index. For the parts revenue, profitability, ROCE it is better if the index is increasing and for the parts of working capital, cash to cash cycle it is better when the index is decreasing.

Financial data will come from structured record reviews as financial figures of the companies are publicly available.

The second part of financial performance measurement is with questions measured on a 5 point Lickert-Scale on financial performance to peers (much better, better, equal, worse, much worse), where 5 is the best and 1 is the worst.

The third part of financial performance measurement is a ranking compared to industry, which will be done by a 5 point Likert-Scale (top quartile, between average and top, average, below average, last quartile), where 5 is the top quartile and 1 is the last quartile.

Customer satisfaction gets measured by questions about customer satisfaction surveys and how regular they are done. The measurement is a 5 point Likert-Scale (Fully agree, agree, don't know, disagree and fully disagree), where fully agree is the best and fully disagree is the worst.

The second question will be about customer satisfaction compared to peers, which will be measured as well by a 5 point Likert-Scale (much better, better, equal, worse, much worse), where much better is 5 and much worse is 1.

A third part of customer satisfaction is a ranking of 7 importance factors for customers. The seven factors are product quality, price, service, delivery reliability, delivery capability, innovation, assortment variety), where 7 is the highest and 1 is the least important from a customer's view point.

Competitiveness gets measured with the following parts: Service, products, prices, costs, assortment, supply chain performance, innovation, overall.

The measurement is a 5 point Likert-Scale (Fully agree, agree, don't know, disagree and fully disagree), where fully agree is the best and fully disagree is the worst.