

LOGISTICS ASPECTS OF FIRMS' CAPABILITIES TO INCREASE INTERNATIONAL COMPETITIVENESS

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Abstract

The elimination of a great number of trade barriers between countries in recent decades as well as some considerable changes in the supply and demand in different parts of the world have brought a tremendous growth in trade relationships between countries and regions and have led to an increase of international competition in nearly all industries. The enlargement of firms' logistics systems on a continental and global scale and the associated increased complexity of logistics processes have increased the importance of the development of adequate logistics capabilities, not only to ensure access to the new markets and supply sources but also to increase competitiveness through reduction of logistics costs and improvement of customer service. The current paper utilizes this idea of the development of adequate logistics capabilities as the basis for evaluating firms' perceived competitiveness. In particular, the study examines the logistics aspects of the strengths and weaknesses of Bulgarian manufacturing firms servicing foreign markets, the extent of invested resources in information systems and technologies facilitating integration of material and information flows, as well as planned actions to improve their capabilities in order to increase their competitiveness in foreign markets. The results reveal the existence of linkages between some logistics capabilities and the international competitiveness of companies.

Key words: logistics, supply chain, competitiveness, information systems, international markets

1. INTRODUCTION

During the second half of the 20th century a number of interconnected social, economic and political phenomena led to the development of globalization. From an economic point of view, globalization means growth, on an international scale, of business activities, competition and markets, as well as increased interdependence of national economies and markets, resulting in global integration of goods, capital and human resources markets (Stonehouse et al., 2004, p. 5). On a micro economic level, globalization involves global coordination and integration of firms' international activities, encompassing not only their export/import activities but also their international manufacturing operations and transfer of technology and capital.

Undoubtedly globalization is involving an increasing number of enterprises and is bringing to the forefront specific and complex problems which complicate logistics systems. Some of the factors generating risk and uncertainty are the great geographical distances, political changes, currency fluctuations, inflation in some countries, and natural disasters. These factors have a considerable effect on logistics costs. Another characteristic feature of international logistics systems is that besides the main players (exporters and importers) they also include a number of participants that facilitate the movement of material and information flows - logistics service providers, insurance companies, inspection and verification companies, customs and other governmental institutions. The addition of more participants and links in the international supply chain (SC) increases the complexity of logistics activities, the difficulties in coordination in view of the great geographical distances and different time zones, the operational risks, and the associated costs. These costs are related to losses as a result of operational problems concerning people, processes and technologies. Such problems include fraud, inadequate computer systems, poor management control of firms' activities, working mistakes, and ignorance of procedures (Crouhy et al., 2006, p.14).

The development of firms' capabilities for solving the specific problems resulting from the international environment reveals opportunities for increasing competitiveness, not only in foreign but in domestic markets too. Capabilities are an element of the contemporary view of firms' resources; they are tools for strategic management and for defining the process of organizational growth. In contrast to the classical view of firms' resources, which considers them from an economic standpoint and is based on the aim of maintaining a sustainable competitive advantage through the achievement of larger income from possessed resources such as

labour and capital, the contemporary view focuses on capabilities as a mix of two or more organizational, technological, human, physical or financial resources. Whether the standpoint is economic or strategic, according to the resource-based view the tangible and intangible organizational resources constitute the firms' key competences and influence the acquisition and maintenance of competitive advantage. Resources that are part of the key competence should be valuable, rare, and hard to copy or replace (Kraaijenbrink et al., 2010, p. 350).

This paper starts with a literature review of the issues related to firms' capabilities and their links with competitiveness, and then discusses the logistics aspects of the strengths and weaknesses of Bulgarian exporting manufacturers, the extent of their invested resources in logistics information systems and technologies, as well as their planned actions to improve international competitiveness. Conclusions are drawn about those logistics capabilities which are associated with higher competitiveness in foreign markets.

2. LITERATURE REVIEW

Capabilities can be defined as high-level learned routines that confer upon a firm's management a set of decision options for converting inputs into outputs, typically combining both tangible and intangible resources (Winter, 2003, p. 991). Distinctive logistics capabilities are firm's critical strategic resources that provide a competitive advantage and contribute to the firm's overall performance (Lynch et al., 2000, p. 48). Research into logistics theory and the measures used in empirical surveys reveals that the subject of logistics is mostly viewed from two aspects: internal and external. The first one is associated with the extent of integration of the material and other related flows within the company, and the second one reflects the nature of the relationships between SC members, i.e. the extent of cooperation between them concerning the management of flows. Capabilities relevant for managing SCs are basically technical and relational. Technical ones are the organizational routines based on the science and technology involved in producing and sourcing goods and services, while relational capabilities are associated with designing contractual and informal mechanisms to facilitate coordination, collaboration, knowledge transfer, and adaptation across the SC (Parmigiani et al., 2011, p. 214). Since the most important barriers that hamper the SC collaboration are power domination and inadequate recognition of the sharing of risks and benefits (Grzybowska, 2011, p. 54), relational capabilities, which are reflected in aligned incentives, shared information, increased commitment, and common goals between the firm and other entities, receive ever increasing attention.

Lia and Linb further suggest that global logistics competence is an important strategic asset that firms need to compete in the current global environment, and building it poses a major challenge for them (Li & Lin, 2006, p. 334). The authors find out that resource integration and IT infrastructure capacities are positively associated with global logistics competence. This means that using the latest information and communication technologies to link global SC members is not the only constituent of global logistics competence. It is much more important to effectively manage the relationships with all SC partners because of their interdependence, resulting from various resource flows throughout the SC. Consequently, the operational capability to manage this interdependence is crucial. Some studies indicate that coordination and configuration of functional activities are two important capabilities enabling firms to do that (Lin & Hsieh, 2010, p. 53). Reiter et al. focus essentially on the interfaces between manufacturing and logistics systems along global SCs. They argue that the balanced and stable integration of manufacturing and logistics through appropriately utilizing logistics information in the manufacturing systems can result in cost and lead time savings (Reiter et al., 2010, p. 216). Another study proposes that in an attempt to improve the interaction with foreign counterparts, firms are paying increasing attention to search, evaluation and monitoring processes as part of the management of international relationships. This represents a complex and demanding task in view of the various business contexts and partner companies (Pagano, 2009, p. 910).

Research has increasingly contributed to an improved understanding of the capabilities a company has to possess in order to gain a competitive advantage. Many studies reveal that more organizations use information technology (IT) to improve the SC process. Wu et al. assert that IT-enabled SC capabilities are firm-specific and hard-to-copy across organizations (Wu et al., 2006, p. 493). Youn et al. show the positive influence of SC information capabilities on competitive advantage for the firm (Youn et al., 2014, p. 378). Moreover, it is important for firms to sustain information quality in the context of mutual trust, so that information is effectively used for positive performance impact. The authors conclude that firms may accomplish both customer responsiveness and cost reductions through SC flexibility based on widespread implementation of information capabilities and trust-based information sharing practices among SC partners. Another study shows that IT-enabled sharing capability has a direct impact on the firm's SC flexibility, which includes a firm's product development, production and logistics, suppliers' and supply base flexibilities. In turn, the firm's SC flexibility influences the firm's competitive advantage and ultimately the firm's competitive performance. This finding suggests that a firm should focus on flexibility in the SC to improve its performance (Jin et al., 2014, p. 29). Kisperska-Moron and Swierczek also found from a survey of the agile capabilities of Polish companies that

the main factors contributing to the agility of companies and their respective SCs are relationships with business partners, IT technology, and relations with competitors (Kisperska-Moron & Swierczek, 2009, p. 224). New technologies contribute to high flexibility because they allow continuous comparison of forecasts with real demand, allowing timely identification of discrepancies and control of material flows in the system (D'Souza & White, 2006, p. 31). In short, information-based capability is one of the logistics capabilities which is most valuable because it can help organizations increase the value-added and minimize costs. Information should be shared with SC partners to improve flexibility and maintain long-term superior logistics performance which, in turn, leads to better performance (Shang & Marlow, 2005, p. 228.).

The characteristics of information and communication systems in the international environment depend on the technological infrastructure in different countries and the ability of SC members to invest in contemporary solutions. For example, in North America and Western Europe, the implementation of systems contributing to the integration of material and information flows started in the 60s and by the end of the 90s, many companies in these regions had implemented ERP systems (Easton & Zhang, 2002). In most Asian and Eastern European countries, firms are less prone to invest in such systems mostly due to a lack of skills, infrastructural problems and general reluctance to invest in intangible resources. That is why it is not surprising that costs are higher and delivery reliability is lower in comparison to companies in North America and Western Europe.

Concerning the logistics capabilities of small and medium enterprises (SMEs) we should point out that traditionally the owner-managers take logistics decisions, and in order to perform this task effectively they require explicit knowledge and skill-sets. Nevertheless they may not possess those skills, and qualified professionals are not employed in the business due to its limited size and the ownership mindset. There is proof that companies which have professional management have higher SCM capability compared to those companies which do not have professional management (Jayaram et al., 2014, p. 482). Further analyses show that IT infrastructure and information system (IS) capability play important roles as key attributes. Also, a set of dynamic capabilities enables internationally-oriented SMEs to develop knowledge-intensive products, paving the way for their accelerated market entry (Weerawardena et al., 2007, p. 294). According to the study of Eriksson et al. this ability set includes cognitive, managerial, and organizational capabilities (Eriksson et al., 2014, p. 169). Cognitive capabilities represent cultural awareness, entrepreneurial orientation, and a global mindset, which are crucial for opportunity recognition and exploitation. Organizational flexibility and managerial capabilities in the areas of interface competence and analytical capability are needed for the steering of international SMEs.

We can summarize that the capability to manage international logistics activities in a way to balance the required customer service level and the costs of providing it is one of the leading factors associated with gaining competitive advantage. As a result of developing this capability, firms can increase the number of their potential markets and sources of supply on a continental and global scale, which has been one of the leading trends in logistics for the last 30 years. While previous studies have made a considerable contribution to the logistics capability literature, some issues remain to be studied. Therefore, in an effort to enrich the logistics capability literature the present research reports the results from a study investigating the logistics capabilities of firms in order to determine how these capabilities help to increase the international competitiveness.

3. METHODOLOGY

The assessment of the logistics aspects of firms' capabilities to increase international competitiveness is done on the basis of data collected from Bulgarian exporting companies through personal interviews using questionnaires with predominantly structured questions. The research includes 94 manufacturing export companies; 58.6% of them represent light industry, 17.2% - heavy industry, 8% - the high technology sector, 4.6% - mining, and the rest represent other industries including telecommunication, agriculture and construction. Concerning the number of employees, 86.8% of the respondents are SMEs.

In investigating logistics capabilities related to the increase of international competitiveness, this article specifically addresses the following: the strengths and weaknesses of Bulgarian exporting manufacturers in terms of their competitiveness, the extent of invested resources in information systems and technologies facilitating the integration of material and information flows, and planned actions to increase competitiveness in foreign markets. Since these are qualitative attributes, the methods for their assessment include the development of 5-point scales and calculation of the means of the responses for the items measuring these attributes. Significant differences in means are examined between two categories of exporters in terms of company size – large enterprises (LEs) and SMEs.

4. RESULTS AND DISCUSSION

Understanding the importance that firms attach to their strengths or weaknesses allows the assessment of their capabilities to compete in foreign markets. The results in Table 1 show that six capabilities, led by the provision of high quality, are assessed highly as strengths since they receive means around and over 4 (1 - serious weakness, 5 - great strength). Among these six capabilities is the provision of quick and reliable delivery, which is a logistics capability and as such is viewed as a strength by nearly 70% of the firms. The fact that almost half of the firms (47.7) have determined as their strength the geographical proximity to markets, and that most of them service the European market does not diminish the need to develop a capability for quick and reliable delivery.

At the forefront are also such strengths as long-lasting relationships with customers/suppliers, and the firm's reputation. Their high valuations (4.1 and 3.9 respectively) show that there are prerequisites for collaboration between SC members and for the application of SC management practices. Moreover, an undisputable necessity for competing in foreign markets is to have well-developed management skills, including those connected with the movement and storage of material flows, and this is proved by the results – current management skills of the firms are assessed highly by 71% of them.

The fact that price is not among the leading strengths and is rated after quality, relationships with customer/suppliers and the characteristics of delivery, shows that most of the interviewed firms are oriented towards differentiation strategy and possibly a considerable number of firms use logistics as a competitive weapon.

It is disturbing that around 60% of the firms determine the availability of an appropriate information system as their weakness (means under 3). It can be concluded that nearly 2/3 of the firms need to update their information systems in order to increase their international competitiveness. Furthermore, partnering with similar firms is assessed with the lowest score (2.9), which means that horizontal cooperation with the aim of combining resources and capabilities in serving foreign markets is a rare phenomenon.

The absence of statistically significant differences between LEs and SMEs for most indicators speaks for their unanimity concerning the importance of the different capabilities for international competitiveness. There are differences only in relation to the experience in servicing foreign markets (including its duration and number of markets), which understandably is assessed higher by LEs.

Table 1 Logistics aspects of the strengths and weaknesses.

Strengths and weaknesses	Responses 4-5 (%)	Mean	Groups	Group's mean
Quality of products	82.6	4.2		
Long-lasting relationships with customers	80.2	4.1		
Firm's reputation	77.9	4.1		
Long-lasting relationships with suppliers	75.6	3.9		
Management skills	70.9	3.9		
Quick and reliable delivery	68.6	3.9		
International experience***	69.8	3.8	SME	3.5
			LE	4.4
Price of products	66.3	3.8		
Qualification of personnel	67.4	3.7		
Contemporary technology	65.1	3.7		
Sufficient production capacity	66.3	3.7		
Variety of products	55.8	3.6		
Financial stability	57.0	3.5		
Long experience in servicing foreign markets**	56.5	3.4	SME	3.2
			LE	4
Geographical proximity to markets	47.7	3.3		
Information system	39.5	3.2		
Experience in servicing a large number of foreign markets***	40.0	3.0	SME	2.6
			LE	3.8
Partnerships with similar firms	35.3	2.9		

*** Statistically significant difference at $p < 0.001$

** Statistically significant difference at $p < 0.01$

The figures in Table 2 show the extent of invested resources (financial, human, time) in information systems and technologies facilitating the integration of material and information flows (1 - no resources invested; 5 - considerable resources invested). These figures also provide evidence that firms determine their current IT

capabilities as being lower than necessary. They try to overcome this disadvantage with investments in software, production automation, information systems integrating purchasing, production and distribution, and warehouse management systems (means over 3). Bearing in mind that one of the most important indications for logistics capabilities is an information system that integrates purchasing, production and distribution, the fact that this area has attracted investment in 47% of the firms is at first sight a positive sign. Since the volume of data exchanged between the three functional areas is significant, it implies the usage of computers. There are also some non-computer systems as is the case with just-in-time manufacturing based on the pull approach, which however is implemented by just ¼ of the firms. As for the computerized systems contributing to the internal integration, they are actually not well embedded in the Bulgarian business practice – systems like ERP, DRP, MRP and Intranet are characterized by comparatively low means, under 3. Even lower (under 2.5) are the scores for the IT capabilities contributing to higher inter-organizational integration and effective management of material and information flows in SC. Such IT capabilities include integrating the information systems with customers and suppliers, WEB-based catalogues, point-of-sales (POS) systems and satellite systems for delivery tracing.

Comparative analysis reveals that LEs invest more resources in systems integrating the material flow (ERP, DRP, MRP), i.e. their investments in software are not in isolated management areas but aim at achieving well developed integration capabilities.

Table 2 Invested resources in information systems and technologies

Invested resources in information systems and technologies	Responses 4-5 (%)	Mean	Groups	Group's mean
Production automation	56.0	3.6		
Software**	57.0	3.6	SME	3.4
			LE	4.2
Information system integrating purchasing, production and distribution	46.5	3.2		
Warehouse management system	36.7	3.0		
Enterprise resource planning system (ERP)**	36.0	2.8	SME	2.5
			LE	3.3
"Just-in-time " system	26.5	2.5		
Material requirements planning system (MRP)**	23.8	2.4	SME	2.2
			LE	3.0
Intranet system	27.1	2.4		
Integration of the information system with main customers and suppliers	22.4	2.4		
WEB-based catalogues	28.2	2.3		
Distribution requirements planning system (DRP)**	20.9	2.2	SME	1.9
			LE	2.7
Point-of-sales (POS) system	14.1	2.1		
Satellite system for delivery tracing	11.6	1.6		

**Statistically significant difference at $p < 0.01$.

Since the achievement of high competitiveness in foreign markets is a complex and difficult task, the research also considers actions that firms will take to overcome the challenges in the international environment. Actions in two basic areas are examined - products and management system, using the scale "1- no actions will be taken, 5 – considerable number of actions". Data in Table 3 show that firms' efforts in the products area will be focused mainly on the continuing improvement of quality, and to a lesser extent on increasing the variety of products and decreasing the costs of their production, which proves the orientation of Bulgarian exporting manufacturers towards a differentiation strategy. Quality is considered as the most apparent competitive product characteristic and because of that it exerts great influence on customer satisfaction, so it is not surprising that 71.8% of the researched firms intend to take actions aimed at its improvement.

Table 3 Planned actions to improve firms' capabilities.

Planned actions to improve firm's capabilities	Responses 4-5 (%)	Mean	Groups	Group's mean
Improve quality	71.8	4.1		
Increase qualification of personnel	71.0	3.9		
Increase service levels for foreign customers*	63.5	3.7	SME	3.5
			LE	4.1

Increase the variety of products	65.1	3.7		
Implement new production technologies	60.5	3.7		
Decrease costs	61.6	3.6		
Implement information systems**	58.1	3.5	SME	3.3
			LE	4.1
Improve the speed and reliability of deliveries	58.8	3.5		
Develop capabilities for a wider geographical scope**	53.5	3.5	SME	3.2
			LE	3.9
Develop SCM capabilities*	47.7	3.2	SME	3.0
			LE	3.6
Develop capabilities for integration of international activities	47.7	3.2		
Improve promotional activities**	34.9	3.0	SME	2.8
			LE	3.4

** statistically significant difference at $p < 0.01$.

* statistically significant difference at $p < 0.05$.

A future priority for the firms will be the improvement of human resources qualification (nearly 4), which is identified by around 1/3 of them as a weakness. This is an acknowledgement that personnel are an essential factor for firms' success.

There is a strong relation between logistics capabilities and actions, such as increasing service levels, implementing information systems, improving the speed and reliability of deliveries and developing capabilities for a wider geographical scope. These actions are considered by more than half of the firms and have mean scores of 3.5 or more. Since these actions are closely related to logistics, this result points to the importance that firms attach to logistics as a factor associated with increased competitiveness, especially the role of information systems. It should be considered that results in table 1 show that information systems are not determined as a particular strength in comparison with other areas, so apparently there is awareness among firms of the need to invest more resources in this area.

The development of capabilities for integration of international activities and SC management capabilities is assessed lower (3.2), which shows that some firms do not realize the contribution of these capabilities to the improvement of service, the delivery characteristics and the expansion of the geographical scope (¼ of the respondents state that their firms will take no action along these lines). The development of these capabilities also requires contemporary information systems and technologies since the open communication in the SC is an accelerator of integration. Some of the firms consider the absence of qualified personnel as a barrier to the improvement of SC management capabilities, which emphasizes again the importance of human resources for competitiveness.

The assessment of the statistically significant differences between SMEs and LEs reveals that the latter place great emphasis on the increase of service levels for foreign customers, the development of capabilities for a wider geographical scope, and SC management capabilities. Obviously, LEs realize that all of these objectives can be achieved through the implementation of contemporary information systems.

5. CONCLUSION

Internationalization of firms' activities leads to more complex logistics systems and the need to integrate domestic and international logistics processes, which is not an easy task and requires the development of international logistics capabilities. The research results reveal that the capabilities that Bulgarian exporting manufacturers assess as important for their success in foreign markets are those that are predominantly differentiating in their nature, and amongst them, besides quality, are the provision of quick and reliable deliveries, and long-lasting relationships with other SC members. At the same time, while information systems should be used as powerful tools for facilitating logistics management and thus increasing competitiveness, their current state in Bulgarian firms is inadequate. The most frequently stated reason for that is the lack of resources for the implementation of the necessary technologies and systems. Nevertheless, firms are aware of the need to refine this area since their plans for future actions for increasing foreign competitiveness include the improvement of the state of the information systems, as well as a greater focus on quality, speed, reliability of deliveries and customer service.

The research also reveals that SMEs lag behind LEs in the development of capabilities for servicing foreign markets, which is due to their more limited experience. This lag stands out mostly in relation to the invested resources in integrating the material flows systems. It is alarming that they have less interest in improving in this direction, in increasing foreign customer service levels, or in developing SC management capabilities.

Apparently, the implementation of the logistics principles and methodologies in management remains a challenge for SMEs, bearing in mind the complex flows of goods and information. Future research should examine the factors, besides limited resources, leading to this lag affecting SMEs and should formulate specific guidelines for them to overcome it with the aim of increasing their competitiveness in foreign markets.

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