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# Moderating the impact of global sourcing on inventories through supply chain management

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ABSTRACT

In recent years, companies have paid growing attention to supply chain management at a global level. With regard to the upstream part of the supply chain, the need for better suppliers, the research into specific competences and concerns related to international competition have forced companies to improve their ability to cope with suppliers located in different countries around the world. The literature suggests that the geographical distance of suppliers should create higher inventory levels primarily because of longer and more uncertain lead times. However, as this paper aims to demonstrate, companies can limit this effect by means of specific investments in the supply chain and in their relationships with suppliers. The empirical analysis is based on data from the last edition of the International Manufacturing Strategy Survey (IMSS). The results show that companies performing global sourcing have invested in supply chain management (SCM) and that this has been helpful in keeping their inventories under control.

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## 1. Introduction

During the last 20 years, companies have witnessed a considerable expansion of their supply chains into international locations (Taylor, 1997; Dornier et al., 1998). Companies' supply chains have tended to expand beyond national barriers because of increasing competitive pressures, reduced trade barriers and advancements in transportation and communication technologies (Schary and Skjøtt-Larsen, 2001; Hülsmann et al., 2008). This phenomenon, which is still in progress, has introduced increased complexity into the supply chain (e.g., new and more suppliers, variable exchange rates, changing local policies) that can reduce firms' performance if they are not properly managed (Hülsmann and Grapp, 2005). As a result, academic interest has been devoted to the concept of *global supply chain management* (Prasad and Babbar, 2000).

Global supply chains have been analyzed from different perspectives: products' global value chains (Gereffi et al., 2005), networks (Chung et al., 2004), double or multi-echelon systems (Arda and Hennet, 2006) or (focusing on a company perspective) the coordination and management of sourcing, manufacturing and distribution activities on a global scale (Murray et al., 1995b; MacCarthy and Atthirawong, 2003; Bello et al., 2004; Cohen and Mallik, 1997).

*Global sourcing* – here defined as the purchasing of goods outside the geographical area to which the company belongs – has been specifically considered and analyzed from this last managerial perspective (e.g., Kotabe and Omura, 1989; Murray et al., 1995a,b). Recent studies (Trent and Monczka, 2003; Cagliano et al., 2008) show that global sourcing, even if still relatively diffuse, is significantly growing in popularity. Cagliano et al. (2008), for example, provide evidence of global sourcing practice based on more than 600 companies in the assembly industry from 20 different countries. The authors report that the majority of the companies considered in their study (about 64% of the sample) do only 4% of their spending outside their continent. This limited rate of adoption may be due to several inhibiting factors, such as management experience or logistical costs. However, a significant number of companies are still looking for suppliers abroad: e.g., Cagliano et al. (2008) find that the overall sample used in their work displayed an average growth in purchases outside the continent of about 4% between 2001 and 2004.

This growth trend has driven researchers to more thoroughly analyze the impacts of global sourcing on companies' processes and performance to determine the best ways to cope with it. In fact, recent studies have shown that global sourcing, especially from low-cost sources, makes it harder to manage the cost versus response trade-off (Nair and Closs, 2006; Lowson, 2003).

One evident effect is that longer lead times and less dependable deliveries from suppliers require companies – *ceteris paribus* – to

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maintain higher safety stocks to preserve the same service level. This has been confirmed at an aggregate level; in 2005, increased import ratios for US manufacturing companies were reflected in additional costs of raw materials inventories (Han et al., 2008).

However, limited empirical research has been done on this topic. In particular, in this work, attention will be devoted to two related questions. First, this paper aims to explore the relationship between global sourcing and inventory levels. Secondly, we aim to understand how companies can overcome the problems mentioned above when they increase the use of foreign suppliers by means of upstream supply chain management (SCM). Specifically, this paper aims to contribute to our understanding of this issue by providing evidence of the relationship between global sourcing, upstream SCM and inventory performance. The remainder of the paper is therefore structured as follows. In the next section, the concept of global sourcing and its motivators and inhibitors are described according to the literature. Next, the literature on the relationship between global sourcing and inventory levels is reported, highlighting the role of upstream SCM in moderating this relationship. Then, the research objectives and methodology are detailed, and the empirical analysis is described. Subsequently, a proper discussion of the empirical results is provided, and, finally, we draw conclusions and suggest potential future research.

## 2. Global sourcing

The first question regarding global sourcing is why companies extend their relationships internationally and to what extent this practice contributes to increase their competitive advantage (Alguire et al., 1994; Ettlie and Sethuraman, 2002; Frear et al., 1992; Smith, 1999; Trent and Monczka, 2003; Birou and Fawcett, 1993; Womack and Jones, 1996). Bozarth et al. (1998) identify different motivating factors in global sourcing. Among these, lower procurement prices are typically considered the most important; foreign supplier markets can be also a source of technology, knowledge or higher-quality products. Taxation or currency advantages due to international agreements or exchange rate fluctuations are other important factors. Access to new markets, shorter product development processes and product life cycles, or even company image can be also motivating factors (Alguire et al., 1994, Nassimbeni and Sartor, 2007). Global sourcing is, in fact, related not only to the procurement of low-price and standard products but also to the need for high-quality and technical components (Nassimbeni and Sartor, 2007).

However, global supply chains are more difficult to manage than domestic supply chains (Dornier et al., 1998; Wood et al., 2002; MacCarthy and Atthirawong, 2003). Geographical distances not only increase transportation costs but also complicate decision-making because inventory tends to increase due to longer lead times in the supply chain. Moreover, infrastructural deficiencies in developing countries (e.g., transportation and telecommunications, inadequate worker skills, supplier availability, supplier quality, etc.) create challenges that are normally not experienced in developed countries (Meixell and Gargeya, 2005). Also, establishing positive relationships with suppliers abroad can pose serious issues (Nassimbeni and Sartor, 2007). Furthermore, global supply chains carry specific risks such as variability and uncertainty in currency exchange rates, economic and political instability, and changes in the regulatory environment (Dornier et al., 1998; Carter and Vickery, 1988, 1989).

This trade-off between costs, benefits and risks pushes companies towards different degrees of adoption of global sourcing. Different authors (Swamidass, 1993; Bozarth et al., 1998; Trent and Monczka, 2003; Nassimbeni and Sartor, 2007) have indicated that there is an evolutionary pattern to the sourcing strategy that companies follow; it moves from mainly domestic purchasing to international purchasing and finally to a fully integrated global sourcing strategy. This is in line with Chung et al. (2004): given the increasing level of outsourcing and the internationalization of the supplier base, the purchasing function is raising its relevance inside the realm of the company's operations. In particular, global sourcing is transitioning the purchasing function from a matter of simple administrative sourcing to the coordination and management of the entire supply chain.

There are several factors influencing the adoption of global sourcing. It is to a large extent dependent on the company, the sector in which it operates, the type of product purchased and the country where the foreign supplier is located (Quintens et al., 2006). For example, Nassimbeni and Sartor (2007) reports that in Italy, textiles/clothing and chemicals/pharmaceuticals are the sectors where global sourcing is more widely adopted.

Company size is not always relevant in determining global sourcing strategy; even smaller companies often appear willing to globalize their sourcing (Cagliano et al., 2008; Cavusgil et al., 1993, Quintens et al., 2006; Leonidu, 1999; Scully and Fawcett, 1994). However, small companies may face difficulties because appropriate resources (i.e., people, money, and competences) are required to effectively operate purchasing on a global scale (Arnold, 1989; Narasimhan and Carter, 1990; Ellram, 1991). Moreover, larger companies with worldwide production facilities have easier access to foreign supply markets (Trent and Monczka, 2003; Cagliano et al., 2008). Additionally, as presupposed in Hofstede (2001), companies in countries that have cultural differences may adopt different approaches to managing suppliers internationally (Monczka and Giunipero, 1984; Matthyssens and Wursten, 2003; Bello et al., 2004; Quintens et al., 2006). Finally, organizational culture may also influence the ability of companies to develop relationships with suppliers overseas, thus reducing the possibility of extending the supply chain (Grewal and Dharwadkar, 2002; Yaibuathet et al., 2008). For example, it can be difficult to establish solid supply chain relationships with Chinese companies until the foreign company is accepted into the local social network, the so-called Guanxi (Jiang and Prater, 2002; Yaibuathet et al., 2008).

The impact of global sourcing on performance is still a controversial topic. Several studies have failed to detect any significant impact of global supply chains (and, specifically, global sourcing) on general business success (Kotabe and Omura, 1989; Steinle and Schiele, 2008). Only some weak evidence has been found: it seems that global sourcing can improve product innovation, process innovation and financial performance (e.g., Return On Investment), but it appears to have no impact on market share (Kotabe, 1990; Murray et al., 1995a). This may be true for several reasons. First of all, different companies may move globally for different purposes—i.e., cost reduction, technology, quality, etc. (Handfield, 1994). This implies that if we do not consider why companies extend their boundaries abroad, it may be misleading to compare their performance. A second reason is that different companies may have gained different results from investments in globalization: several companies may have also changed their global strategy according to the results achieved (Leonidu, 1999).

## 3. Global sourcing, supply chain management and inventory performance

In a global sourcing setting, companies typically protect themselves from supply variability and disruption by means of

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