



Emerging market characteristics and supply network adjustments in internationalising food supply chains



Harri Lorentz^{a,*}, Pichawadee Kittipanya-ngam^{b,1}, Jagjit Singh Srail^{b,1}

^a Operations and Supply Chain Management, Turku School of Economics at the University of Turku, Rehtorinpellonkatu 3, 20014 Turku, Finland

^b Centre for International Manufacturing, Institute for Manufacturing (IfM), University of Cambridge, 17 Charles Babbage Road, Cambridge CB3 0FS, UK

ARTICLE INFO

Article history:

Received 2 December 2011

Accepted 17 April 2013

Available online 13 May 2013

Keywords:

Supply networks

Internationalisation

Emerging markets

Market characteristics

Supply chain design

ABSTRACT

The effect of emerging market characteristics on supply network design is explored through case studies involving international food manufacturers entering emerging markets. Our findings suggest that institutions, and primary and supportive actors may often be considered as potential constraints, and appear to have a dominant role in determining the adjustment of supply network's structural attributes. A supply network adjustment categorisation emerges from the results, as emerging market characteristics may require adjustments in the company's supply network configuration, practices and policies in terms of: (1) network strategy and position; (2) changes to firm boundaries; (3) changes to product mobility; and (4) changes to geographical configuration. These adjustments may go through a life cycle of initial home country convergent practice as firms attempt to roll out established practices, later divergent strategies that adapt to emerging market contexts, and finally more convergence as contexts develop. From a managerial perspective, our findings suggest that a proactive network design approach is needed, requiring analysis of market characteristics and exploring potential supply network adjustments under four configuration dimensions. Our research also enables policy makers to better understand the implications of market characteristics to internationalising firms.

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1. Introduction

Globalisation and the continued growth in the international trade of manufactured products and components (Buckley and Ghauri, 2004; WTO, 2005), require effective international supply networks (SN) to procure, use and transform resources into goods and services (Harland et al., 2001; Srail and Gregory, 2008) that can be distributed to customers. Inevitably this requires firms from advanced markets (AM) to operate in diverse environments and conditions (e.g. Klassen and Whybark, 1994; Narasimhan and Mahapatra, 2004). This issue of managing operations in diverse contexts is very relevant for firms from AMs, as emerging markets (EM; such as Brazil, Russia, India and China, the so called 'BRIC' economies), but also other developing countries (World Bank, 2011) are both attractive offshore manufacturing locations and key centres of demand.

In many cases, EMs present operational challenges in terms of supply chain cost and reliability (Arvis et al., 2007a; Badri et al., 2000). Existing research has suggested the negative effects of EM characteristics on supply chain management (SCM) related to the

lower quality and availability of infrastructure and resources, or the nature of local regulations in EMs (e.g. Fawcett (1993), Gallup et al. (1999), Gulyani (2001)). Transferring resources to a new market may be difficult and the outcome of such a process is dependent on for example key suppliers and technologies (Carranza et al., 2002), or complementary resources in the host country (Cuervo-Cazurra et al., 2007). These effects are expected to be particularly strong in the food sector where the characteristics of products and raw materials (e.g. perishability) place specific requirements on SN configuration (Taylor and Fearn, 2006; van der Vorst and Beulens, 2002; van Hoek, 1999).

In support of the argument that the business environment may potentially have a significant impact on operations performance and network design, previous research has relevantly pointed out that the value of a firm's resources and capabilities depends as much on the context, as on the properties of the asset itself (Miller and Shamsie, 1996; Priem and Butler, 2001; Wan, 2005). As a result of resource value-affecting characteristics of the environment, internationalising firms from advanced markets have been shown to redesign, adapt or adjust their SN configurations (Liao et al., 2011; Lorentz and Ghauri, 2010; Nassimbeni and Sartor, 2007; Jiang, 2002). Prior research has also confirmed that high performing companies (re)design manufacturing strategies to fit their environments (Swamidass and Newell, 1987; Ward et al., 1995). These potentially costly and difficult to implement SN

* Corresponding author. Tel.: +358 2 50 502 7087.

E-mail addresses: harri.lorentz@utu.fi (H. Lorentz), pk289@cam.ac.uk (P. Kittipanya-ngam), jss46@cam.ac.uk (J. Singh Srail).

¹ Tel.: +44 1223 339 560; fax: +44 1223 338 076.

adjustments, which are however essential for maintaining performance and competitiveness, are the focus of this research. Again, food supply chains represent a particularly interesting sector context, as the SN tier structure involves extended long tier supply chains of upstream and downstream actors with firms making strategic choices on product characteristics and the location of upstream and downstream activities (Srai, 2013).

Hence, we state our research question as follows: *How do emerging market characteristics affect the food supply networks of internationalising firms?* Underscoring the relevance of this research question, previous research has stressed the importance of understanding the EM environment and the resulting practices of internationalising firms (Handfield and Withers, 1993; Avittathur and Swamidass, 2007). We contribute to this extant understanding by taking the SN practice perspective and considering the relationship of a range of drivers to particular SN adjustments, and how supply networks evolve through stepwise adjustments.

The research is limited to AM firms' internationalising their operations to EMs. Therefore, we aim to contribute to the body of literature on international operations management, and specifically on the less studied area that deals with operations in developing countries and EMs (Prasad and Babbar, 2000). We also contribute to the emerging literature on supply chain adaptation (Seifert and Langenberg, 2011; Liao et al., 2011). In practical terms, the exploratory case studies presented in this paper provide operational level insight into SN design adjustments in EMs.

2. Literature review and research framework

The central aim of this research is to understand how food SN designs are adjusted in EMs. In other words, we examine the relationship between EM characteristics (independent variable) and SNs (dependent variable).

2.1. EM characteristics and their influence on supply networks

In the economic development literature, factors of production, such as private capital, labour, public capital stock, technology (Arrow et al., 1961; Shah, 1992; Dewan and Min, 1996), or resource endowments, have been identified as the direct determinants of economic growth and long-term development (Engerman and Sokoloff, 2002), alongside *geographic* features, i.e. climate, health, soil quality, access to markets (Gallup et al., 1999). Furthermore, *resources* and *geography* have been shown to have an indirect effect on economic performance through the construct of *institutions* (Engerman and Sokoloff, 2002; North, 1990). Institutions, it has been argued seem to predominantly determine the use and development of resources in a given geographical setting, and further, the competitiveness of a country (Rodrik et al., 2004).

It may be concluded that geography, resources and institutions (GRI) are the important determinants of economic growth. In the context of AM firms' internationalisation in an EM, it is appropriate to utilise these three dimensions as a framework for reviewing their influence of market characteristics on SNs.

From a supply chain perspective, *geographic* features, such as topography and population density are obvious determinants of transport infrastructure characteristics, and also shippers' freight logistics practices, such as warehouse strategy, backhaul, and shipment consolidation (Sankaran, 2000). Geographic distance imply uncertainty and the exposure of supply chains (Prater et al., 2001), long lead times and reduced responsiveness in global supply chains (Christopher et al., 2006), and determine a large share of the total logistics costs (Hesse and Rodrigue, 2004). A land-locked status of a country may also have a significant impact

on the logistics costs and lead times associated with operations in a specific market (Arvis et al., 2007b), and, more generally, on effective participation in global production networks (ADB, 2006). From a food supply network perspective, climate and soil quality influence the availability of local raw materials and the requirements for controlling the conditions of material flow.

Limited *resource* endowments constrain the development of a country's infrastructure (e.g. Razzaque (1997), Button (1998)). Low quality and availability of infrastructure imply lower productivity (Button, 1998), higher logistics costs (Arvis et al., 2007a), geographic fragmentation of distribution channels (Jiang and Prater, 2002), excessive inventory holding (Handfield and Withers, 1993), barriers to lean production implementation (Gulyani, 2001), as well as higher uncertainty in general (Prasad et al., 2005). Amoako-Gyampah and Acquah (2008) suggest that firms whose operations are constrained by poor transport infrastructure, should seek to achieve competitive advantage through high product quality instead of example delivery performance. The levels of expertise and competence of the labour force determine the extent of sophistication in SCM policies and practices (e.g. Tan (2001), Abdulrahman et al., in press). Resources may also impact SCM policy and practice, as for example Dadzie (1998) has pointed out how the availability of foreign currency determines materials management practices in Ghana, Prasad et al. (2005) show how a lack of capital and high interest rates encourages a more coordinated control of build-to-order supply chains, and Abdulrahman et al. (in press) suggest that lack of capital inhibits implementation of reverse logistics systems in China. Yi et al. (2009) point out the implications of general lack of resources to new product introduction capability in Chinese firms.

Institutional frameworks have been shown to affect the development of service and manufacturing industries (e.g. Jiang (2002)), long-term evolution of supply networks (Li et al., 2010), as well as complexity, uncertainty and reliability in international supply chains (Prater et al., 2001; Arvis et al., 2007a). Institutions may regulate certain areas of SCM, such as transport management, international trade and facility location. Effects may be manifested in network design (Dadzie, 1998) and logistics strategies of internationalising firms (Goh and Ang, 2000), and reverse logistics implementation (Abdulrahman et al., in press). Manufacturing performance has been shown to be higher in free-market economies in comparison to those that are state-managed (Kadipasaoglu et al., 1998). Mutual trust and communications conventions that are related to more informal institutions can also have an effect on supply chain management (Tan, 2001; Yaiuathet et al., 2008). Similarly, national culture has been shown to be an important factor in developing successful purchasing strategies (Cannon et al., 2010).

General economic and industrial development in a country, driven by the GRI dimensions, has been shown to influence the distribution system in general (Mallen, 1975; Mueller et al., 1993; Jain, 1996; Waters, 1999; Zinn, 1999; Jiang and Prater, 2002). Stank and Daugherty (1997) describe the impact of aggregate supply capacity and concentration on cooperative relationships in international supply chains. The development of international trade and foreign entrants to the market contribute to the polarisation of supply systems and echelon elimination (Coe and Hess, 2005), and distribution channel evolution (Lorentz et al., 2007). In terms of SCM practices, foreign competition creates pressure to improve supply chain performance (Zinn, 1999; Carranza et al., 2002) and product quality (Cadilhon et al., 2006).

In conclusion, the GRI market dimensions influence SNs directly, but also indirectly, via their influence on economic and industrial development. From the market entrant perspective, the indigenous business system and networks of actors, which are the outcomes of past economic and industrial development, may

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