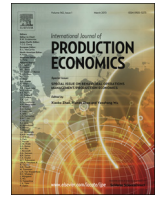




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Making decisions on offshore outsourcing and backshoring: A case study in the bicycle industry

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ABSTRACT

Small and medium-sized enterprises (SMEs) are expected to generate new innovations, as well as future growth and employment for the European economy. In the last two decades a large number of European manufacturing companies have *offshored* their production operations to low-cost countries outside of the Eurozone. However, also bringing back home the once offshore outsourced manufacturing, i.e. *backshoring*, has become a notable phenomenon even if it has received less attention in research until very recently. This paper reports research on consecutive offshoring and backshoring decisions of a Northern European bicycle manufacturing company. We identified an over 30 percent cost advantage from offshore outsourcing that turned, over a two year period, into an advantage for the firm's own manufacturing in the home country. The main reasons for the rediscovered advantage of in-house manufacturing were (1) the increasing accuracy of cost allocation procedures, (2) changes in external factors, such as exchange rate variations and supplier costs, (3) growing sales volumes and the simultaneous requirement for shorter lead-times resulting from the redefinition of the product, and (4) the network-level learning to combine factory and network-level operations. The contribution of this paper is the insight that it provides into how companies can overvalue the cost benefits of offshore outsourcing, as well as highlighting factors to be considered and the sensitivity analysis to be carried out in evaluating such decisions.

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1. Introduction

High costs and poor productivity development have been considered as threats for the future of European manufacturing since the 1990s (Schmenner, 1997). Many manufacturing operations have been driven towards locations with lower costs, both labor and other manufacturing costs. The decision-making has been rather straightforward, where firms have been looking for lower cost alternatives for manufacturing products in order to respond to the price competition from their offshore competitors (Ferreira and Prokopets, 2009). By starting to offshore their production activities to low-cost countries, large multinational enterprises (MNEs) have been able to take competitive advantage of the emerging new division in global labor markets (Hayes et al., 2005).

There are numerous studies on offshoring by MNEs (e.g. Grossman and Rossi-Hansberg, 2008; Ørberg Jensen and Pedersen, 2012) and the ways that MNEs can address complex offshoring cases

(e.g. Kamann and van Nieuландe, 2010). Cost remains a very important driver when it comes to the decision to offshore, also according to the most recent literature (Da Silveira, 2014; Drauz, 2014). But several research papers raise also the issue of reconsideration of the offshoring decisions (Arlbjørn and Mikkelsen, 2014; Ellram et al., 2013; Fratocchi et al., 2014; Kinkel, 2014; Tate et al., 2014) and the challenges in bringing work back to domestic factories (Shih, 2014). These papers elaborate on the reversal of the offshoring and outsourcing trends, i.e. the *backshoring* (or *reshoring*) of manufacturing, both in Europe and in the USA.

In this study, we have adopted the following definitions of the key terms:

- *Offshore outsourcing*: relocation of in-house activities or functions from a company's home country to an independent party in another country.
- *Backshoring* (or *reshoring*): repatriation of activities or functions from another country to be carried out in-house by a company in its home country.

Offshoring and *backshoring* (or *reshoring*) refer to transferring production from one geographic location to another, either from

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the home country to another country (offshoring) or bringing it back home (backshoring). However, they do not necessarily concern ownership of the activities that are being transferred. *Outsourcing*, in turn, is about handing over all or part of an activity across organizational boundaries to an outside supplier. *In sourcing* is the reverse, i.e. moving activities previously sourced from an external supplier back in-house.

To understand decision making of offshore outsourcing and backshoring on the level of an individual SME firm, we present a case study which explores two consecutive decisions of first offshore outsourcing, and then backshoring of manufacturing operations in a business environment characterized by high uncertainty. We focus on the following issues:

- Comparison of the production costs in the own factory in Finland and the costs of the alternative decisions for manufacturing locations.
- The sensitivity of the offshore outsourcing and backshoring decisions to external factors, such as exchange rate variations, and supplier costs.
- The influence of sales volume development and supply-demand mismatches on the success of the products in the market.

Our research consists of an analysis of two choices of the manufacturing location for bicycle production in a Finnish company, Helkama Velox (hereinafter Velox). Velox is an SME manufacturing company serving primarily its home country markets. The research was carried out in two phases, in 2007–2008 and in 2010. This time period was characterized by particularly high uncertainty in the company's business environment. The research phases were coordinated with the firm's manufacturing location decisions to respond to changes in its market environment. Our research builds on the earlier descriptive case study of the same company (Jussila et al., 2014).

2. Decision-making in choosing a manufacturing location

We position our research in the domain of decision making in individual manufacturing firms, particularly SME manufacturing companies. Location decisions normally have a long-term impact on the competitive position and profitability of the firm. Regardless of the importance of these decisions, they must often be based on limited knowledge and they are consequently fraught with numerous business risks (Lorentz, 2008; Goetschalckx, 2002). The rationality of managers making these decisions is limited by the information they have, their cognitive limitations, and the time available for making the decision. Decision makers apply their rationality usually after simplifying the choices available (Simon, 1957, 1991; March, 1994).

One prominent approach to location problems is to use quantitative models for optimizing the costs of demand fulfillment, production volume levels and logistics solutions in a broad international network of operations (Arcelus, 1989; Canel and Khumawala, 1996; Canel and Das, 2002; Bhutta et al., 2003; Fleischmann et al., 2006; Das and Sengupta, 2009). However, more comprehensive decision making approaches, such as multi-criteria analysis, were suggested already in the 1970s as an enhancement to pure cost optimization in production location decisions (Nijkamp and Spronk, 1979). The basic feature of multi-criteria analysis is that a wide variety of relevant decision aspects can be taken into account without the necessity of translating all these aspects into monetary terms.

Colotla et al. (2003) used a case-based methodology to explore the interplay and interdependencies of factory and network capabilities by using the resource-based view of two international manufacturing (MNE) networks, comprising eight factories in six countries.

The case studies showed that decisions regarding factory and network issues were often taken independently of each other, despite the fact that they may be heavily interdependent. Decisions regarding factory-level practices are often made by factory or production managers, while network-level decisions regarding factory location, re-location or closure, and global co-ordination issues are usually made by the highest levels of management (Colotla et al., 2003). However, this situation is quite different in an SME manufacturing firm, typically with a small group of people having the responsibility for both the network-level and factory-level decisions.

Colotla et al. (2003) also remind us of the importance of the time needed to build capabilities both at the factory and network levels. The time taken may be of critical strategic importance. Factory and network capabilities need to be continuously upgraded. This underlines the importance of developing dynamic capabilities, defined as the firm's ability to "integrate, build and reconfigure internal and external competencies to address rapidly changing environments" (Teece et al., 1997).

Song et al. (2007) provide a framework of items to be included in decision making and implementing offshoring decisions. The framework was used in a case study of a UK-based high-tech multinational manufacturer that was planning to move 80 percent of manufacturing for one of its products from the United Kingdom to the People's Republic of China. Considering only the immediate direct cost items resulted in considerable cost savings. But when the total cost was considered, including all the items that could be quantified, the saving was about 25 percent lower. There are a number of sources of volatile costs in the total cost model items for which it is difficult to find reliable data. These costs introduce a significant amount of risk into the offshoring projects.

Backshoring of previously offshored activities from foreign locations to the domestic location is a more common phenomenon than generally believed, but it has not yet been analyzed in detail (Kinkel and Maloca, 2009). According to Kinkel (2012, 2014), for every three offshore relocating German companies there is now one backshoring company. De Treville and Trigeorgis (2010) suggest that the commonly used discounted cash flow (DCF) model for making production location decisions undervalues the flexibility advantage of production close to where the markets and business control are located. As a result, companies may end up with global supply chains that are lean and low cost in normal situations, but very expensive during high uncertainty. Therefore, business environments with high uncertainty favor locating production close to where the markets are located (Da Silveira, 2014). As a result, on-shore and near-shore production are becoming viable and competitive again in many cases (Ferreira and Prokopets, 2009).

3. Research approach

Our research approach is action research, applying the principles of design science, particularly its early phase, i.e. *solution incubation*. Design science is an approach aimed primarily at discovery and problem solving as opposed to accumulation of theoretical knowledge (Holmström et al., 2009). In the design science approach, research questions are typically *ill-structured* (term introduced by Simon (1973)). Design science focuses on tackling ill-structured problems in a systematic manner. The early phase, *solution incubation*, consists of framing the problem and developing the rudiments of a potential solution design (Holmström et al., 2009).

In design science, researchers assume the role of *problem solvers* in their research, actively seeking to develop solutions, not merely explanations (Argyris and Schön, 1996; Argyris, 1997; Kaplan, 1998). We used participatory observation and cost modeling as the main research, data collection and analysis methods. We had direct access to the company cost accounting data and to

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