



# A classification of logistic outsourcing levels and their impact on service performance: Evidence from the food processing industry

H.I. Hsiao<sup>a,\*</sup>, R.G.M. Kemp<sup>b</sup>, J.G.A.J. van der Vorst<sup>c</sup>, S.W.F. (Onno) Omta<sup>b</sup>

<sup>a</sup> Graduate Institute of Management, National Taiwan Normal University, 162, He-ping East Road, Section 1, Taipei 10610, Taiwan, ROC

<sup>b</sup> Management Studies Group, Wageningen University, Hollandseweg 1 (Building no. 201), 6706KN Wageningen, The Netherlands

<sup>c</sup> Logistics and Operations Research Group, Wageningen University, Wageningen, The Netherlands

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## ABSTRACT

Most studies of logistics outsourcing have focused on cost reduction, while few studies have reported on service benefits. This study empirically examines if outsourcing different logistics activities results in differences in logistics service performance. We identify and analyze the outsourcing of four levels of logistics activities: transportation (level 1), packaging (level 2), transportation management (level 3), and distribution network management (level 4). A research framework was formulated to discuss the effect of the outsourcing decision of different levels on perceived logistics service performance and includes the moderating role that supply chain complexity may play in the proposed relationships. Our findings show that outsourcing has no direct impact on service performance (delivery reliability, flexibility and lead-time) in any of the four levels. However, the performance when outsourcing level 4 activities increases with an increasing degree of demand complexity. Furthermore, chilled foods have higher service performance than non-chilled foods. These findings show the complex relationships between levels of outsourcing, performance and supply chain characteristics.

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## 1. Introduction

Supply chain management involves the design and management of seamless, value-added processes across organizational boundaries to meet the real needs of the end customer (Christopher, 1992; Ellram, 1991; Fawcett et al., 2007). The essence is to align goals, share resources, and collaborate across company boundaries (Fawcett et al., 2007). For example, collaborating with a third-party service provider, that is, outsourcing, allows a company to concentrate on its core business—the few activities it does very well and for which it has unique skills.

Logistics outsourcing is growing in importance and incidence worldwide. According to Capgemini (2007), more than 70% of companies in Western Europe, USA and Asia Pacific have outsourcing experience in a pattern expanding from basic transportation to full logistics network control. In the early 1980s, logistics services in the outsourcing market were confined to the traditional activities, for example transportation and warehousing. In the 1990s, a number of network players such as DHL and TNT entered the outsourcing market and began providing a wider geographic coverage of their transport networks. At that time also value adding activities were introduced, such as sorting and

labeling. In the late 1990s, a number of players from areas as information technology, management consultancy and financial services began working together with logistics service providers. This period saw the creation of a new service, the 'supply chain solution', also called 'fourth-party logistics (4PL)', where a logistics service provider (LSP) is hired to manage a customer's complete logistics network (Carbone and Stone, 2005; Hertz and Alfredsson, 2003; Lai, 2004).

Outsourcing can be a value-enhancing activity. However, the top benefits for companies outsourcing are often related to cost-savings (Capgemini, 2005, 2007). Among the outsourcing performance-related studies conducted to date, few empirical studies have reported on service benefits; most report on cost performance, for example Larson and Kulchitsky (1999) and Lau and Zhang (2006). This study seeks to advance understanding of the relationship between the outsourcing decision, outsourcing level and a firm's logistics service performance. We sought answers to the following questions:

Does logistics outsourcing enhance logistics service performance? Does outsourcing different types of logistics activities have different service outcomes? Do higher levels of outsourcing result in better performance?

The study was undertaken in the food industry because the logistical planning process is far more complex than other industries. For example, seasonality in material production,

\* Corresponding author. Tel.: +886 928 001509; fax: +886 2 23648372.

E-mail addresses: [hihsiao@ntnu.edu.tw](mailto:hihsiao@ntnu.edu.tw), [hsiao629@hotmail.com](mailto:hsiao629@hotmail.com) (H.I. Hsiao).

requirement for conditioned transportation and storage means, or quality decay, which could make logistical planning and transportation more difficult (Grievink et al., 2002). In recent years, researchers have recognized the relevance of supply chain management and innovations for the agri-food sector (Folkers and Koehorst, 1997; Omta, 2004; Taylor, 2006; Van der Vorst and Beulens, 2002; Van der Vorst et al., 2005; Van Duren and Sparling, 1998; Westgren, 1998). However, food industry literature has paid little attention to logistics outsourcing (Bourlakis and Weightman, 2004).

To achieve our research objective, we developed a classification of outsourcing levels and examined not only the general effect of outsourcing on service performance but also how the supply chain logistics environment moderates the relationship between outsourcing and service performance. Our article is organized as follows: Section 2 presents a literature review. Section 3 develops hypotheses related to the direct effect of logistics outsourcing and the moderating effect of supply chain complexity on service performance. Section 4 presents the research design, providing details on data collection and the constructs applied in this research. The results of our investigations on direct and moderating effects are presented in Section 5. Finally, Sections 6 and 7 discuss our findings, sketches in the research limitations and makes suggestions for further research.

## 2. Literature review

Various theoretical perspectives on potential benefits explain why firms engage in outsourcing: for example, focus on core business (Barney, 1991; Nordin, 2008), or cost-savings (Abdel-Malek et al., 2005; Kim, 2003; McCarthy and Anagnostou, 2004; Poppo and Zenger, 1998; Williamson, 1975). Table 1 provides a brief overview of some empirical studies on actual benefits. In this

section we discuss some previous studies on outsourcing effects with a focus on manufacturing firms. Two categories are discussed: core business outsourcing (manufacturing activities) and non-core business outsourcing (e.g. logistics activities, human resource activities).

### 2.1. Core business outsourcing

Current studies have related positive effects of manufacturing outsourcing to production volume flexibility or market value, but negative effects to innovation capabilities, quality, speed, and on-time delivery. For example, Dabhiikar and Bengtsson (2008) found positive direct effects of outsourcing on volume flexibility. The focal firm can improve its responsiveness to variability in demand by outsourcing peak demand to suppliers. According to Jiang et al. (2007) core business-related outsourcing is positively related to outsourcing firms' market value. It demonstrates a positive signal to the stock market. They mention that firms, recognizing that they cannot be world class in every activity and function involved in producing their products, are moving toward business strategies based on 'core competencies' that help maintain their competitive advantage in serving customers.

However, core business outsourcing tends to be negatively related to innovation capabilities. Dankbaar (2007) investigates the relationship between manufacturing outsourcing and innovation. He indicates that the long-term impact may well be a loss of innovative capabilities on the part of the outsourcing company because product development follows manufacturing. Furthermore he explains that if manufacturing is done in another company, access to manufacturing knowledge by development people will tend to become more difficult. This may result in less producible products. In addition, Dabhiikar and Bengtsson (2008) also found that manufacturing outsourcing might have negative effects on quality, speed and on-time delivery.

**Table 1**  
Literature review: outsourcing and performance in manufacturing industry.<sup>a</sup>

Activities	Sources	Performance metrics	Results of main effect	Is there any moderating effect discussed?
Core business Manufacturing	Dabhiikar and Bengtsson (2008)	Quality, speed, dependability, flexibility, cost (at plant level)	Positive effect: volume flexibility Negative effect: quality, speed and on-time delivery	No
Manufacturing Manufacturing	Dankbaar (2007) Jiang et al. (2007)	Innovation capability Market value	Negative effect Positive effect	No No
Non-core business Human resource	Gilley et al. (2004a, b)	Financial performance	Positive effect: innovation performance	Yes (firm size)
Logistics	Power et al. (2006) <sup>a</sup>	Innovation performance Stakeholder performance Customer satisfaction, inventory control, capacity management, productivity, service quality, flexibility, sales growth, net profit, cycle times, cash flow, general cost management, backlog management and transportation cost management	Positive effect: cost management and flexibility	No
Logistics	Larson and Kulchitsky (1999) <sup>a</sup>	Customer service, cost reduction	No direct effect	No
Not specified Not specified	Gilley and Rasheed (2000) <sup>a</sup>	Financial, innovation, stakeholders	No direct effect	Yes (corporate strategy and environmental dynamism)
Not specified	Jiang et al. (2006) <sup>a</sup>	Cost efficiency, productivity, profitability	Positive effect: cost efficiency	No
Not specified	Salimath et al. (2008) <sup>a</sup>	Profitability, sales revenue, net profit, growth in profits and in sales revenue	Positive effect on all	Yes (organizational configuration: age, size, innovation, ownership)

<sup>a</sup> Studies that cover wide ranges of industries.

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