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## Integrated foreign exchange risk management: The role of import in medium-sized manufacturing firms

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### ABSTRACT

Empirical research has focused on export as a proxy for exchange rate exposure and the use of foreign exchange derivatives as an instrument to deal with this exposure. This empirical study applies an integrated foreign exchange risk management approach with a particular focus on the role of import in medium-sized manufacturing firms in Denmark (a small, open economy). We find a strong, negative relation between import and the use of foreign exchange derivatives on the aggregate level. Our findings are consistent with the notion that firms use import to match the foreign exchange exposure created by foreign sales activities.

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## 1. Introduction

Shapiro (1975) shows that one of the major factors affecting a multinational firm's exchange rate risk is sales in export markets. That export is a key element in determining the exchange rate exposure of a firm has been confirmed by numerous theoretical (e.g. Marston, 2001) as well as empirical studies (e.g. Allayannis and Ofek, 2001). Smith and Stulz (1985) show that corporate hedging can add value when firms face financial distress costs and/or progressive taxation. Froot et al. (1993) extend the conclusions reached by Smith and Stulz (1985) to a framework in which external financing is more costly than internally generated funds. Allayannis and Weston (2001) find a positive relation between

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firm value and the use of foreign exchange derivatives. Based on the above, it seems reasonable to suggest that hedging is linked to the export activities of a firm.

However, using foreign exchange derivatives is not the only avenue for foreign exchange risk management. Guay and Kothari (2003) find that the use of derivatives appears to be a small part of the overall risk profile of non-financial firms. As noted by Nance et al. (1993), one substitute for the use of financial derivatives is an alteration of the debt-equity ratio. Another substitute is to change operations, e.g. by matching exports and imports, and thus create off-setting cash flows in exposed currencies. A study of the automotive industry by Williamson (2001) illustrates the importance of including changes in operations when trying to understand the dynamics of exchange rate exposure management. Miller (1992, 1998) provides a framework for integrated risk management in international business and Bartram et al. (2010) quantify the reduction in foreign exchange exposure from pass-through, operational hedging, and financial hedging based on a sample of large global manufacturing firms.

Fundamentally, Meulbroek (2002) describes how firms have three ways of implementing risk management objectives: (1) modify operations; (2) adjust the capital structure; and (3) employ targeted financial instruments (financial hedging). Logue (1995) and Chowdhry and Howe (1999) show that very often operating exposures are not managed effectively by financial hedging. They suggest that longer term strategy adjustments involving operational hedges are the optimal way to manage longer term exposures. Consistent with this view, empirical evidence shows that transaction exposures are hedged extensively by financial derivatives while hedging of longer term operating exposures is undertaken more sporadically (e.g. Bodnar et al., 1998).

Pantzalis et al. (2001) document the importance of operational hedges for managing exchange rate risk in a U.S. setting. They find that the exposure of non-contractual cash flows is best managed through operational hedging. In their study, they focus on the subsidiary network for providing the means of operational hedging. In a U.K. perspective, Bradley and Moles (2002) find that occasionally or often, more than half of the surveyed firms source inputs in the same currencies as sales are made in order to manage exchange rate risk. In a Danish setting, Aabo and Simkins (2005) find that a firm's size, exports, and foreign subsidiaries are positively related to operational hedging.

This study uses an integrated foreign exchange risk management approach in order to understand the foreign exchange risk management strategies of medium-sized manufacturing firms. We go beyond the export ratio approach traditionally applied and specifically investigate the role of import that, due to data constraints, has often been neglected in previous studies. Following the reasoning of Graham and Harvey (2001), we use the survey approach in order to balance between the benefits and disadvantages of large sample analyses and clinical studies. Thus, we obtain and use information that would not be accessible in traditional, large sample analyses and, at the same time, we do not restrict ourselves to clinical studies that tend to produce unique results based on very small samples.

Numerous studies have used the questionnaire approach for analyzing exchange rate exposure management in non-financial firms (e.g. Bodnar and Gebhardt, 1999; Bodnar et al., 1998; Ceuster et al., 2000; Hakkarainen et al., 1998; Mallin et al., 2001; Marshall, 2000). The most cited of these studies is Bodnar et al. (1998), which covers publicly traded U.S. firms. In their study, Bodnar et al. ask firms about their percentage of consolidated operating costs in foreign currency; they find that many firms roughly balance out total foreign currency revenues with foreign currency expenses; and they note that their results may be indicative of firms using natural hedging as a way of managing foreign exchange exposures. However, in line with other empirical studies, Bodnar et al. do not investigate the aggregate impact of import on the use of foreign exchange derivatives. To the best of our knowledge, no study has empirically examined the simple but important question: what is the aggregate impact of import on the use of foreign exchange derivatives for managing exchange rate risk in manufacturing firms?

On the firm-specific level, import may either increase or decrease the need for financial hedging. If a firm has costs in the same currencies as it has revenues, the firm will experience a natural hedge by matching foreign currency costs with foreign currency revenues and a subsequent decrease in its need for financial hedging. However, if a firm has costs in currencies in which it has no revenues, the firm will experience an increase in its exposure and an increase in its need for financial hedging. Whether import increases or decreases the need for financial hedging on an aggregate level is an empirical question yet to be addressed and it serves as the primary motivation for this paper.

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