



Does exporting increase
productivity of Thai firms
via linkage spillovers?



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Abstract: Several studies using firm-level data could not find significant evidence to support that exporting activities promote productivity growth. However, few studies have considered whether exporting companies can create spillovers to domestic firms. In fact, exporting companies create positive productivity spillovers to their domestic peers (horizontal spillovers), suppliers (backward linkage spillovers) and buyers (forward linkage spillovers). This paper investigates the existence of productivity spillovers via backward, forward and horizontal linkages from exporting firms to other firms, based on Thai firm-level data. In contrast to existing literature on firms' productivity, which uses a firm-level dataset to conclude that exporting activities make no contribution to productivity growth of firms, the authors find that backward linkages are the most important spillover channel for exporting firms. Also, the current study finds that export destinations are an important factor in supporting linkage spillovers; only exporting to developed countries creates backward linkage spillovers. Moreover, exporting firms gain most spillovers from backward linkages. Finally, the authors show that productivity spillovers from domestic suppliers are more important than outsourcing.

JEL Classification: F14, F61

Keywords: Exports, Forward linkages, Backward linkages, Productivity, Spillovers

Contents

1. Introduction.....	1
2. Baseline estimation model	3
3. Data description and descriptive statistics.....	5
4. Estimation results.....	7
4.1. <i>Basic estimation results</i>	7
4.2. <i>Export destinations and linkage spillovers</i>	9
5. Conclusion.....	11
References	12

List of tables

Table 1. Number of firms in each sector.....	6
Table 2. Sectors with highest and lowest ROA.....	6
Table 3. Linkage spillovers and productivity – equation (1) estimation results.....	8
Table 4. Linkage spillovers and productivity	8
Table 5. Export destinations and linkage spillovers: Aggregate model	9
Table 6. Export destinations and linkage spillovers	10

1. Introduction

It is widely believed that international trade is an important instrument in the promotion of economic growth via knowledge and technology spillovers as well as technology upgrading. The theoretical development for trade-led growth via international spillovers is based on endogenous growth models such as Helpman (1981) and Grossman and Helpman (1991). Such models broadly explain how trade and international spillovers promote productivity on the aggregate level. However, these models do not specify micro channels through which the international spillovers occur.

Empirical literature investigates the relationship between trade and technology spillovers on various levels. Studies using country-level and industry-level data, such as those by Coe and Helpman (1995), Eaton and Kortum (1997), and Keller (2004), support the trade-led productivity growth hypothesis. These studies show that international trade increases technology transfers, knowledge spillovers, innovation stimulation and learning-by-doing process. As a result, trade liberalization brings about higher productivity growth.

However, studies using firm-level data report ambiguous results. Bernard et al. (2003) as well as Clerides et al. (1998) found no evidence to support that exporting activities promoted productivity. Melitz (2003) proposed a theoretical model that could reconcile the different results from the studies using firm-level and aggregate level data. According to Melitz, although exporting did not increase firm-level productivity, it could increase productivity at the industry level. In his model, it is only profitable for firms with high productivity to export. When a country is more open to trade, high productivity firms produce and export more. Consequently, the productivity of industry increases. It is therefore important to understand the heterogeneity of firms in order to understand how exporting activities affect productivity.

Another strand of literature studies the channel by which trade and openness affect firms' productivity. International production networks are regarded as one of the spillover channels. Various studies of international production networks support the fact that production fragmentation promotes productivity growth in home countries. Feenstra and Hansen (2001) as well as Egger and Egger (2006) showed that production fragmentation shifted a demand for unskilled labour to higher-skilled labour within manufacturing sectors. Such movement in demand leads to improvement in wages for skilled labour and higher productivity. In the long term, an increase in the wage gap causes a country to specialize in higher value-added sectors and relocate unskilled labour-intensive sectors abroad, resulting in firms' productivity upgrading.

Other studies, such as Kasahara and Rodrigue (2008) and Gorget al. (2008), have indicated that international outsourcing via imports of intermediate goods can improve productivity of firms. However, Gorget al. (2008) showed that the positive effect of productivity upgrading occurred only with firms who engaged in exporting activities, either domestically-owned or foreign-owned. If the firms do not enter the export market, outsourcing activities cannot improve their productivity. As a result, exporting activities are an important channel through which the firms in international production networks acquire productivity improvement.

In addition to importing and exporting, recent studies have focused on the role of foreign direct investment (FDI) in productivity spillovers. Studies of FDI spillovers to local firms in the

same sectors have provided ambiguous results. Using Malaysian data, Menon (1998) showed that foreign firms created technological spillovers to local firms in the same industry. However, Aitken and Harrison (1999) as well as Djankov and Hoekman (2000) did not find any significant effect of FDI spillovers in Venezuela and the Czech Republic, respectively.

Other recent studies consider the importance of backward linkages in the productivity spillovers of FDI. Backward linkage spillovers occur when a firm generates positive productivity spillovers to its suppliers. Although intra-industry spillovers might not be strong, there are spillovers from multinational enterprises to their local suppliers in upstream sectors. Javorcik (2004), Girma et al. (2008) as well as Barrios et al. (2011) noted that backward linkages were the explanation of productivity spillovers from FDI to domestic firms while horizontal spillovers, i.e., spillovers from multinational enterprises to their local peers were not significant. Javorcik (2004) also compared backward FDI spillovers between export market-oriented firms and domestic market-oriented firms. In contrast to previous literature that indicated exporting activities were a channel of backward spillovers via international production networks, Javorcik (2004) found that domestic market-oriented affiliates had larger backward spillovers than the export market-oriented ones. Nonetheless, the FDI backward spillovers of domestic market-oriented affiliates are statistically insignificant. Similarly, Kohpaiboon (2009) examined FDI spillovers using Thai manufacturing data. Unlike previous studies, he found that neither backward FDI linkages nor forward FDI linkages played a role in productivity spillovers.

In addition to linkage spillovers via FDI, spillovers from exporting firms to local firms are also important. One reason why international production networks can improve productivity of local firms is that such networks allow small and medium-sized enterprises (SMEs) to participate in exporting activities with large firms or multinational enterprises as lead firms. For example, almost 2,000 Thai SMEs engage in export activities or are suppliers in international production networks of the automobiles and automotive parts industry in Thailand, according to the Thailand Automotive Institute. The participation in a production network leads to better technology and productivity. Lead firms may directly transfer knowledge and technology to the suppliers in their network. One example is the Toyota Supplier Club (TSC), which shares its manufacturing practices with the members in the club. The establishment of such clubs results in technology and knowledge transfers to Toyota's suppliers, especially the local small and medium enterprises in the automotive parts industry, as the club provides production and management training for its members. According to Hines (1994), developing suppliers' performance and integrating suppliers into product development process were the key success factor in Japanese final assembly firms.

Another explanation of productivity improvement from international production network comes from higher standards and requirements in terms of timely delivery and product quality, which force local SMEs to improve their technology and skills. According to Krause (1997) as well as Krause and Ellram (1997), they are part of the many strategies that lead firms can use to improve suppliers' performance, including the creation of competition among suppliers, training programmes and suppliers' performance assessment. All these supplier development strategies lead to higher productivity by the local firms engaging in international production networks.

The case studies mentioned above point out the importance of backward linkages in productivity spillovers of exporting activities. However, although many studies have

investigated backward linkage spillovers from FDI, few empirical studies have considered backward linkages from exporting activities. For example, Javorcik (2004) compared backward spillovers of export-oriented firms with those of domestic-oriented firms. However, she only considered backward spillovers from FDI, but not from exporting activities. To fill this gap in the literature, this study investigates the existence of productivity spillovers via backward linkages, forward linkages and horizontal spillovers from exporting firms to the local firms. Forward linkage spillovers occur when a firm generates positive productivity spillovers to its buyers. Horizontal spillovers occur when a firm generates positive productivity spillovers to competitors in the same industry.

Unlike Javorcik (2004), the authors of the present study have also considered forward spillovers from exporting companies to their customers. Logically, exporting companies that have higher productivity and quality might also create a spillover effect among their customers. Therefore, it is also interesting to investigate the existence of spillovers from forward linkages. However, the authors are unaware of the existence of any studies on linkage spillovers from exporting activities.

Another important contribution by this paper is that it considers the role of export destinations in productivity spillovers. Apparently no studies have been made on how export destinations affect linkage productivity spillovers. However, if linkages do exist in technology transfers and spillovers from exporting activities, it is likely that export destinations matter. The more developed the export destinations, the higher would be the rate of technology transfers that firms would gain from exports. Exporting to highly-developed countries requires higher standards in the production process and product quality than when exporting to developing countries. Therefore, this study also investigates how export destinations affect productivity spillovers.

The study focuses on firms in Thailand as the existence of international production networks is solid in the ASEAN region according to Ando and Kimura (2003), Asian Development Bank (2007), Athukorala (2010), and Cheewatrakoolpong et al. (2010). As a result, the effect of spillovers from international production networks might be distinctive among Thai firms.

This paper is divided into four sections. Section 1 describes the estimation model. Section 2 provides description of data and some selected descriptive statistics. Section 3 details the results of the analysis while section 4 provides the conclusion.

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