



MNEs and Local Linkages: Evidence from Taiwanese Affiliates

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Summary. — This paper, using Taiwanese firms as a case study, has identified several factors affecting the formation of local linkages, which has important implications for the embeddedness of MNEs in the host countries. It shows that while the ownership structure, the motivation of overseas investment, and the autonomy given to affiliates are all important, the production networks and experience of affiliates in the host country also play crucial roles in creating local linkage. In addition, country-specific factors (e.g., culture and ethnic ties, the presence of foreign MNEs, and the supply of key components) may be significant forces leading to large local linkages.
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1. INTRODUCTION

Governments at all levels of development have been making great efforts to attract foreign direct investment (FDI) in the belief that FDI can act as a catalyst for industrial development (Markusen & Venables, 1999; Scott-Kennel, 2004). One effective way to bring this about is through backward production linkages. Backward linkages are of great importance to the dynamic development of host economies because they not only help to raise output, employment (Lall, 1995; Zhao, 1998), exports (Aitken, Hanson, & Harrison, 1997), and national competitiveness (Gugler & Brunner, 2007) but also provide a powerful channel through which knowledge and skills can be diffused directly to the linked firms, or indirectly to local firms through spillovers (Jordaan, 2008; Kelegama & Foley, 1999; Rodriguez-Clare, 1996; Scott-Kennel, 2004).¹

However, studies have reached mixed conclusions regarding whether a significant extent of local linkages does exist. Most studies draw negative conclusions, pointing to rather limited linkage effects and a low level of integration with host economies. This has not only been observed in developed countries such as Ireland (Crone & Roper, 2001), Sweden (Brown, 2000), Scotland (Turok, 1993), and the United Kingdom (Crone & Watts, 2000; Phelps, 1997; Phelps, Mackinnon, Stone, & Braidford, 2003) but also has been reported in newly developed and less developed countries such as Costa Rica, the Dominican Republic, and Morocco (WIR, 2001), and Sri Lanka (Kelegama & Foley, 1999). There are some cases in which FDI has no ties at all to host countries other than employing cheap labor (Weisskoff & Wolff, 1977).² On the other hand, there is some anecdotal evidence that firms such as IBM and AT&T in Scotland (McCann, 1997) and Volkswagen-Skoda in Czech Republic (WIR, 2001) have made efforts to establish long-term contractual relationships with indigenous firms. Japanese affiliates are shown to have a large local-content ratio in North America and Asia,³ but they also procure an overwhelming share of local components from Japanese-owned component suppliers, including those within the same corporate group of vertical keiretsu (Belderbos, Capannelli, & Fukao, 2000; Belderbos *et al.*, 2001). Nevertheless, the insufficient propensity to source locally in general (especially from indigenous firms) has given rise to serious concerns as to whether an FDI-led enclave has been created as a result, and how it might affect the dynamic development

of host economies (Phelps *et al.*, 2003; Scott-Kennel, 2004; Young, Hood, & Peters, 1994).

This paper, using Taiwanese firms as a case, studies the global sourcing behavior of multinational enterprises (MNEs), with a special focus on local linkages. It departs from the current literature on local linkages in a number of respects. Different from most studies that look at linkages mainly from the perspective of the host country,⁴ this paper, by controlling for the home country (Taiwan), studies affiliates' linkage effects at various host locations. This helps us to address the issues of what countries are more likely to attract linkage-producing FDI and what firms tend to generate large local linkage effects. Affiliates' input sourcing decisions are divided into four parts: local sourcing from foreign affiliates or local firms, and import sourcing from the home country or third countries. As the four sourcing ratios add up to 100%, any change in one is reflected in the others. We therefore treat all the sourcing decisions as a simultaneous process, which enables us to gain more insight into how they are interrelated. This differs from most research in which the interrelation is inadvertently ignored and whose discussion primarily centers around local sourcing (in most studies mentioned above) or intra-firm trade in intermediates (e.g., Hanson, Mataloni, & Slaughter, 2005). Moreover, while most studies are limited to the explanation of small linkage effects, this paper intends to provide an account of large linkage effects. The local sourcing ratio, defined as the share of intermediate inputs procured locally, is about 32% for the Taiwanese affiliates as a whole, of which more than half (54%) goes to local firms. Compared with the average reported local sourcing ratio that ranges between 10% and 20% in most studies (WIR, 2001), Taiwanese affiliates appear to source a fairly large percentage of inputs locally. Therefore it is interesting to determine what triggers such large linkage effects, especially in terms of sourcing from local firms. Finally, previous studies on local sourcing typically are limited to a single industry or a country case study, and involve only a small number of surveyed firms. This is due in part to the unavailability of adequate data. While industry or country case studies give us a deeper insight into how the linkages are formed,

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many of them document a wide variation of linkage effects across different MNEs, industries, and countries. A more systematic study of MNEs' local sourcing behavior therefore is needed to derive more generalized results in a broader framework. In this research, we make use of a rich data set which includes 942 Taiwanese affiliates from 20 manufacturing sectors operating in both developed and developing countries. We also employ a methodology that reexamines the determinants of local sourcing, treating affiliates' input procurement from various sources as a simultaneous process.

The structure of the paper is as follows. Section 2 provides a summary of the sourcing patterns of Taiwanese firms in various industries and host countries. Section 3 discusses the factors determining the sourcing decisions of MNE affiliates from a network perspective, in which affiliate-specific characteristics are the focus of the study here.⁵ Section 4 presents an empirical model and discusses the regression results. Section 5 reviews the major findings and offers some explanations for why Taiwanese MNEs have fairly large local linkages in different FDI destinations.

2. INPUT SOURCING PATTERNS OF TAIWANESE AFFILIATES

The data used for this study are drawn from the survey "Taiwanese Firms' Outward Direct Investment, 2004," collected by Taiwan's Ministry of Economic Affairs in 2005.⁶ The firm-level data contain detailed information regarding Taiwanese firms' input sourcing ratios from various sources, including imports from Taiwan and third countries, and local sourcing from Taiwanese affiliates and local firms. As we are unable to distinguish non-Taiwanese foreign affiliates from indigenous firms, local firms here include both of them. Of the 942 surveyed affiliates studied here, about 78% are located in China,⁷ which is very close to the statistics collected by the Taiwanese government in 2004 (75.94%). While the investment of Taiwanese firms in China is broadly diversified across sectors, Taiwanese FDI in other countries is limited to some industries. In the United States, for example, ICT and electronics are most favored by Taiwanese investors, whereas in Thailand and Indonesia, metal products attract the most of investment. In the Philippines and Vietnam, labor intensive industries such as textile and apparel are the focus of investment.

Table 1 summarizes the input sourcing patterns of 942 MNEs included in this survey. The extent of input sourcing

is the mean share of intermediate inputs secured by Taiwanese affiliates,⁸ with the weight being the affiliate's sales. Table 1 shows that of the intermediate inputs procured by Taiwanese affiliates, 68.10% is imported from abroad and 31.90% is sourced locally. This local sourcing ratio is fairly large as compared with findings cited in the previous studies, for example 12% in Scotland (Turok, 1993), 14% in Wales (Phelps, 1997), and 23% in Yorkshire and Humberside (Crone & Watts, 2000). Within the category of local sourcing, local firms secure more than 54% of input contracts while Taiwanese affiliates obtain the rest. This suggests that local firms are the main source of local procurement, but the Taiwanese production network also is an important part. However, of the import sourcing, only 23.51% is from third countries, but the lion's share (76.49%) comes from Taiwan, supporting the argument that Taiwanese MNEs' overseas activities tend to be constructed to make use of the production network in Taiwan (Chen, 2003).

The extent of local sourcing varies across FDI destinations. Table 1 shows that local sourcing is the most prominent in Southeast Asia (37.31%) but is least in other regions (8.06%), with China and the United States falling in between. Even in the case of China and the United States, where local sourcing ratios are almost identical (35.30% *vs.* 35.45%), the sourcing structures are different. In the United States, sourcing from local firms is more than double that from other Taiwanese affiliates, while in China, the shares are almost equal. Taiwanese firms clustering and networking together in China may be reasons for the relatively high sourcing ratio from other Taiwanese affiliates. Similarly, the structures of import sourcing vary in different FDI locations. The amount of intermediated inputs being sourced from Taiwan by Taiwanese affiliates in China is only 2.3 times of that from third countries, but the corresponding figure is much larger (more than sevenfold) in the United States. Similarly, local sourcing structures in Southeast Asia vary across countries. The local sourcing ratios of Taiwanese MNEs in Malaysia, Thailand, and Indonesia are very high, accounting for 68.03%, 56.63%, and 56.03%, respectively, of total inputs. The presence of Taiwanese and foreign production networks in these countries, for example electrical and electronic home appliances in Malaysia (Felker, 2003), may provide some explanation.

Apart from regional differences, industries appear to have much more differentiated patterns, with the local sourcing ratio as high as 97.93% in furniture and as low as 3.97% in apparel. Rodriguez-Clare (1996) and Hanson *et al.* (2005), among others, point out that in industries such as machinery

Table 1. *Input sourcing by FDI destination, %*

	No. of firms	Import sourcing from			Local sourcing from		
		Taiwan (1)	Third countries (2)	(1) + (2)	Taiwanese affiliates (3)	Local firms (4)	(3) + (4)
United States	62	56.69	7.86	64.55	10.88	24.57	35.45
West Europe	6	97.21	0.05	97.21	0	2.74	2.79
Japan	6	87.01	0.73	87.01	0	12.25	12.99
China	740	45.20	19.50	64.70	17.17	18.13	35.30
Southeast Asia	89	35.56	27.13	62.69	18.56	18.75	37.31
Malaysia	16	17.94	14.03	31.97	37.11	30.92	68.03
Singapore	5	52.99	42.03	95.02	0.22	4.76	4.98
Thailand	23	33.12	10.25	43.37	13.97	42.66	56.63
Indonesia	11	40.68	3.29	43.97	9.16	46.87	56.03
Philippines	12	33.97	44.76	78.73	6.75	14.52	21.27
Vietnam	22	41.31	24.58	65.89	27.24	6.87	34.11
Others	39	87.29	4.45	91.94	5.21	3.05	8.06
Total	942	52.11	15.99	68.10	14.59	17.31	31.90

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