

2017-06-02

Foreign direct investment as a catalyst for domestic firm development: The case of Sri Lanka

Konara, P

<http://hdl.handle.net/10026.1/9880>

10.18356/a4a49e57-en

Transnational Corporations

United Nations Publications

All content in PEARL is protected by copyright law. Author manuscripts are made available in accordance with publisher policies. Please cite only the published version using the details provided on the item record or document. In the absence of an open licence (e.g. Creative Commons), permissions for further reuse of content should be sought from the publisher or author.

Foreign Direct Investment as a Catalyst for Domestic Firm Development: The Case of Sri Lanka

ABSTRACT

Foreign direct investment (FDI) carried out by multinational enterprises (MNEs) is recognized as a mechanism through which domestic firms can learn and improve competitiveness. Different from the extant literature which tends to focus on the aggregate effects of FDI in Sri Lanka, we investigate the role of FDI for domestic firm development at the firm level. Using World Bank Enterprise Survey data supplemented by industry data, preliminary investigation reveals that, compared to domestic firms, MNEs are larger, more productive, more profitable, and more active in R&D. MNEs hire higher proportion of skilled workers and undertake more in-house training programs. They are also more export-oriented but rely more on inputs of foreign origin. The gaps between foreign and domestic firms indicate the potential that Sri Lankan firms can learn from MNEs/FDI. The econometric study on firm-level productivity indicates positive direct effects and negative spillover effects of FDI on domestic firms. The findings have important policy implications.

Keywords

Foreign Direct Investment, Multinational Enterprises, Sri Lanka, Productivity, Spillovers

1. Introduction

In recent decades, countries around the globe have been competing against each other to attract foreign direct investment (FDI) with a view that FDI is an engine of economic growth and FDI and its agent, multinational enterprises (MNEs), exert positive effects on domestic firms in a host country (Wei & Balasubramanyam, 2004). MNEs possess firm-specific assets such as advanced technologies, knowledge and know-how which are much desired by domestic firms, particularly those in developing countries. FDI is seen as the fastest and most efficient way to access these assets because domestic firms can be in direct contact with MNEs in the host country, which makes learning easier. FDI can potentially improve productivity of domestic firms through direct effects on MNE's local affiliates and indirect or spillover effects on other domestic firms. However, it is not without concern that MNEs/FDI may negatively impact on domestic firms (Nam & Young, 2004). A number of reasons have been put forward including MNEs extort high rents, generate negative competition and monopoly effects and bring resources, assets and practices into the host country that are inappropriate to the country context (Moosa, 2002).

There has been vibrant empirical investigation of the effects of FDI on domestic firms (see survey articles such as Iršová and Havránek (2013), Meyer and Sinani (2009) and Wooster and Diebel (2010)). The studies have produced a mixed bag of results. This has been partially attributed to different country context. Host country specific characteristics including country size, history, stage of development, quality of institutions and organizations, and structure and quality of resources and capabilities embrace the whole gamut of those affecting the role of FDI on domestic firm development. It is therefore essential to place the study of FDI in a specific country context. Against this background, we investigate FDI in Sri Lanka using firm-level data. The paper aims to answer the following question: to what extent, do domestic firms differ from MNE's local subsidiaries and benefit from FDI conducted by MNEs in Sri Lanka? Though a handful of studies

have looked at FDI in the context of Sri Lanka, there is no study that compares foreign and domestic firms and examines the impact of FDI on domestic firms in Sri Lanka using firm-level data. This paper aims to fill the research gap.

Sri Lanka was considered, and has continued to be considered, as a country with excellent prospects for economic development. Post-independent Sri Lanka was one of Asia's most promising new nations (UNCTAD, 2004). It was one of the early liberalizers in the developing world and embarked on an economic liberalization process in 1977 after a period of implementing inward-oriented policies (Athukorala, 2012; Athukorala & Rajapatirana, 2000). The reforms are fairly comprehensive, ranging from the dismantling of trade and foreign investment barriers, the unification of the exchange rate, the liberalization of interest rates, the removal of price and investment controls, to the restructuring of the tariff system and the tax system (UNCTAD, 2004). Thanks to these outward-oriented policies, the situation of FDI was turned around from a period of slow growth or even divestment during 1966-1976, according to data published by UNCTAD (Figure 1). In 1980s, FDI jumped to an average of about US\$ 40 million per year. This further increased to US\$ 158 million in 1990s. Unfortunately, the liberalization process suffered a significant setback when Sri Lanka Freedom Party (SLFP) came to power in 2004 and started to follow statist economic policies advocating more state involvement in economic activities (Athukorala, 2012). In 2011, the Sri Lankan government passed a controversial law in the parliament – The Revival of Under-Performing Enterprises and Under-Utilized Assets Act, and a few MNEs were expropriated (The Economist, 2011). This has clearly undermined Sri Lanka as an attractive location of FDI and may suggest discomfort and suspicion of the MNEs and FDI are regaining place in policy circle. It is therefore paramount to evaluate the role of MNEs and FDI in domestic firm development in Sri Lanka and draw policy implications based on empirical investigation.

The rest of the paper is organized as follows. The section below provides an overview of FDI in Sri Lanka. This sets up the context for descriptive and econometric analysis in sections 3 and 4. The final section offers discussions and conclusion.

2. FDI in Sri Lanka – An Overview

At the time of independence in 1948, Sri Lanka compared favorably to many of today's East Asian high performers (Hossain, et al., 1999). It had, still has, rich natural resources which are favored by manufacturing industry, tourism and related services. It had a vibrant export sector, good physical infrastructure and a broad-based and efficient administrative apparatus. To this day, Sri Lanka has maintained its high level of education with adult literacy rate of over 90%, indicating a potential supply of highly trainable workers. However, followed a period of inward-looking regime and pervasive government intervention in business activities, Sri Lanka faced slow economic growth and negligible FDI inflows. At times, there was even divestment by MNEs. In response to this dismal economic outcome, the government of Janius Jayawardena explicitly committed to reintegrating Sri Lanka into the world economy in 1977. Overall Sri Lanka has since taken a fairly liberal approach toward FDI, particularly in comparison to its South Asian neighbors (Pravakar, 2006). However, this economic liberalization process has not been smooth and has been experiencing setbacks in recent years.

During the first wave of liberalization between 1977 and early 1980s, an impressive list of measures was adopted including restructuring financial system, removing trade and investment barriers, lifting price controls, opening up the economy to FDI, and setting up export processing zones (EPZs) (Athukorala, 2012; Athukorala & Rajapatirana, 2000). What is particularly important to MNEs/FDI was the constitutional guarantee given to foreign investors against expropriation of foreign-owned assets without compensation (Athukorala, 1995), a privilege which foreign investors

enjoyed until the government expropriated 37 private enterprises (some of which are MNEs) in 2011 under the 'Revival of Underperforming Enterprises and Underutilized Assets Act'. These outward-oriented policy initiatives played a crucial role in attracting export-oriented FDI, helping Sri Lanka broaden export profile in light consumer goods such as garments, footwear, sport goods, and cutting and polishing imported diamonds. However, the initial process lost momentum in the early 1980s (Athukorala, 1995).

The second-wave of liberalization package was implemented in 1990s which focused more on export expansion and included further tariff cuts, simplification of tariff structure, opening up of the current account, and privatization of large state-owned enterprises (Athukorala, 1995; Athukorala & Rajapatirana, 2000; The World Bank, 2007). These reforms, for example, abolishing tariffs on textiles and substantially reducing the tariffs on clothing in 1997, were instrumental for the expansion of the export-oriented garment industry, a sector that subsequently expanded to account for more than 50% of exports by 2000s (Central Bank of Sri Lanka, 2001). A new Investment Policy Statement was announced which included the setup of a new Board of Investment (BOI), the principal government authority responsible for foreign investment. BOI approves FDI projects with the exception of major investments such as infrastructure projects which still require permission from cabinet. BOI has extensive authority of tax relief and administrative discretion in all matters related to FDI and can grant these concessions to firms fulfilling stipulated eligibility criteria on minimum investment, exports and employment. The establishment of BOI helped to facilitate and speed up investment approval within a unified policy framework.

The liberalization process suffered another setback with the change in government in 2004. There was a tendency of reverting back to dirigiste regime (Athukorala, 2012). The SLFP-led government espoused a shift to a mixed economy with calls for re-emphasizing the role of state and the protection of agriculture and small and medium-sized enterprises (SMEs). State control of strategic

enterprises was advocated and the role of the state was expanded by revitalizing previously closed down state-owned enterprises (SOEs), fresh nationalization and setting up of new ventures by the government (Athukorala, 2012; U.S. Department of State, 2015). The government also halted some of the privatizations that were in the process and reversed several previous privatization projects by re-nationalizing (Bureau of Economic Energy and Business Affairs, 2011). Privatization in such industries as banking, power, energy and transportation was ruled out. Finally it is also worth mentioning the new regulations prohibiting sale of state-owned and private-owned land to foreigners passed in February 2013 (Reuters, 2013). Until then, foreign investors could purchase land from private sellers subject to a 100% tax¹, although the government, which owns about 80% of the land in Sri Lanka, usually leased land on 50 year-term or on 99 year-term on a case-by-case basis (Bureau of Economic Energy and Business Affairs, 2012). These are obviously very concerning to foreign investors when making FDI decisions.

Against the above discussed policy framework for FDI, we can examine the pattern of FDI in Sri Lanka. According to data published by UNCTAD, FDI inflows between 1970 to 1976 were negligible or even negative. Performance has improved steadily since 1977 and the growth in FDI is considerable relative to pre-liberalization era (Figure 1). However, in a broad context, Sri Lanka's performance in attracting FDI has been low by the standards of the best performers in Asia (Table 1) and she is yet to regain the "investment-center-in Asia" image that prevailed in the aftermath of the 1977 reform (Athukorala, 1995). For example, Malaysia, a country with a population comparable to that of Sri Lanka, has attracted 12 times as much FDI inflows as Sri Lanka in 2011. Its FDI stock by 2011 is over 19 times more than that of Sri Lanka.

<FIGURE 1 & TABLE 1 HERE>

¹ This tax is applicable if the foreign stake of a venture is not less than 25%.

In the case of sectoral distribution, a majority of sectors are now open to FDI. However, Sri Lanka also maintains a list of sectors where FDI is completely restricted² or is only allowed with minority stakes³ (Bureau of Economic Energy and Business Affairs, 2012). Furthermore, FDI in several strategic sectors⁴ are regulated and subject to approval by the BOI and other government agencies (Bureau of Economic Energy and Business Affairs, 2012). Table 2 shows sectoral distribution of FDI in selective years published by the Central Bank⁵. FDI dominated manufacturing in the initial phase of post-liberalization era. By 1983 more than 90% of realized foreign investment in BOI-registered enterprises concentrated in manufacturing. FDI in services started picking up in 1990s, largely due to privatization (UNCTAD, 2004), and services has now become the most prominent sector. By 2011, services accounted for more than 70% of total FDI stocks. Agriculture, on the other hand, remains largely unexplored by foreign investors.

<TABLE 2 HERE>

Within manufacturing, FDI is narrowly concentrated in a few sectors. As per the ISIC Rev. 3 technology intensity definition (Economic Analysis and Statistic Division, 2011), a large share of FDI⁶ took place in either medium-low-tech or low-tech industries. Furthermore, export-oriented

² Areas of non-bank money lending, pawn-brokering, retail trade with a capital investment of less than \$1 million, and coastal fishing are completely restricted for foreign investments.

³ Foreign investments in growing and processing of primary commodities, production for export of goods are subject to international quotas. Timber based industries using local timber, deep sea fishing, mass communications, education, freight forwarding, and travel agency and shipping agency business are partially restricted, i.e. foreign investors are allowed to invest up to 40% or a higher percentage if approval of BOI is granted.

⁴ These sectors are air transportation; coastal shipping; large scale mechanized mining of gems; lotteries and manufacture of military hardware, military vehicles and aircraft, dangerous drugs, alcohol, toxic, hazardous or carcinogenic materials, currency and security documents.

⁵ We thank a reviewer for pointing out to us an issue related to FDI statistics reported by the Central Bank of Sri Lanka. From about 2005, the Central Bank has included bank loans by foreign firms as part of reported FDI. In other words, though UNCTAD's FDI statistics only include equity capital, reinvested earnings and intra-company loans, those published by the Central Bank also contain bank loans. For example, UNCTAD reported Sri Lanka's FDI inflows in 2014 was US\$ 944.247 million but Central Bank reported US\$ 1,685 million, among which US\$ 740 million were bank loans. Therefore we interpret Central Bank's FDI data with caution.

⁶ The only exception is chemical sector, which is categorised as a medium-high-tech industry. However, FDI in chemical sector is not reported separately, but as part of petroleum, coal, rubber and plastic products.

manufacturing FDI is largely concentrated in low-tech, labor-intensive industries. A majority was in textile, wearing apparel and leather industry, which accounted for about one third of total realized manufacturing FDI in 2011, followed by food, beverages and tobacco industry (15%). However, it is worth noting here that the UN factor intensity classification is rather based on product nomenclatures, and does not take into account the production process involved⁷. There are cases that some industries that are traditionally considered to be low-tech increasingly need advanced technologies for production. A case in point is the garment sector. Sri Lankan garment industry had made a shift from producing low-value added garments to producing specialized, high quality up-market garments by investing in machinery and equipment and adopting new and efficient technologies (Dheerasinghe, 2003; Kapuge & Smith, 2007).

In terms of entry mode, wholly owned subsidiaries (WOS) have been preferred to other forms. According to Investment Policy Review of Sri Lanka by UNCTAD (2004), between 1979 and 2000, WOS accounted for about 60% of estimated FDI by value and 45% by the number of projects. This pattern may influence the benefits that domestic firms can derive from FDI. It is generally believed that domestic firms benefit more from joint ventures (JVs) than from WOS. JVs are considered as a more efficient mechanism than WOS for the transfer and learning of technology and knowledge, particularly for knowledge that is organizationally embedded and tacit (Wei & Balasubramanyam, 2004). JVs allow local and foreign partners to work together and exploit each other's strengths with local partners usually contributing local knowledge and foreign partners providing advanced knowledge-based assets. It is the close interactions between two parties and the transfer of knowledge-based assets from MNEs that give rise to mutual learning between foreign and domestic firms.

⁷ We thank a reviewer for suggesting this point.

3. A Preliminary Investigation of Foreign vs. Sri Lankan Firms

Data used in this empirical study came from Sri Lanka 2011 Enterprise Survey dataset published by World Bank (<http://www.enterprisesurveys.org/data>). The sample frame used is the database of firms obtained from the Department of Census and Statistics of Sri Lanka covering the non-agricultural economy and comprising manufacturing (group D), construction (group F), services (groups G and H), transport, storage, and communications (group I) and IT (sub-sector 72 of group K).⁸ In the survey, firms were randomly selected from the population of registered businesses based on stratified random sampling approach at three levels: industry, size, and region. Thereafter, private contractors personally visited the chosen sample firms and collected a range of quantitative and qualitative information through questionnaire. This dataset therefore is expected to have the characteristics of representativeness and reliability (<https://www.enterprisesurveys.org/methodology>). However as pointed out by a reviewer who is familiar with the World Bank firm level database for Sri Lanka that some local contractors simply covered only the “easy-to-approach” foreign firms whose head offices are in and around the central business district of Colombo. This weakens World Bank’s claim regarding sample representativeness. We do not have evidence whether the sample biases systematically affect the results. Due caution is needed in this regard.

This dataset contains 610 firms in both manufacturing and services sectors. In the questionnaire, the firms are asked to self-identify whether they are domestic or foreign firms. For certain objective questions, such as sales and employment, firms are asked for information for 2007/2008 (three fiscal years before the sampling period). While the data are short along the time dimension, there is abundant information at the firm level, which gives us an opportunity to compare and contrast the characteristics of foreign and domestic firms. Table 3 presents the breakdown of foreign and Sri

⁸ Group classification is based on ISIC Revision 3.1.

Lanka firms in each sector. One salient limitation of this sample is that only a few foreign firms are included in some sectors, particularly in Textile, Wearing Apparel and Leather Products category. Available evidence shows that although the number of foreign firms is low in this sector, they account for a larger share of output (Kelegama & Foley, 1999).

<TABLES 3 & 4 HERE>

Table 4 reports firm characteristics differentiated by foreign and domestic ownership. In order to observe the differences between foreign and domestic firms, we regressed each characteristic on a dummy variable (FOR) that identifies whether a firm is a MNE's affiliate or a domestic firm and sector-specific dummy variables which account for sector-specific differences. When dependent variable is a binary variable, Probit estimation is used. When dependent variable is a continuous variable, OLS is employed. A statistically significant FOR variable indicates the differences between foreign and domestic firms. The test results are reported in the last column of Table 4.

Foreign firms were considerably larger in size measured by either sales or employment than domestic firms. They also enjoyed a substantially higher labor productivity and profitability. From the perspective of factor inputs, capital intensity, measured as energy consumption per employee⁹, was higher in foreign firms relative to domestic firms, though such difference between foreign and domestic firms is not statistically significant. While only a quarter of domestic firms undertook formal training programs, more than 83% of foreign firms did so. From the aspect of staff turnover, foreign firms though have lower mean value than domestic firms, the difference is not statistically

⁹ Net assets per worker, a popular measure of capital intensity in previous studies cannot be computed, since a majority of firms have not reported their net assets value. Energy consumption per worker is chosen as an alternative measure. This is because that capital and energy are complementary inputs in manufacturing (Globerman, et al., 1994) and energy consumption per worker has been used in several studies as a measure of capital intensity (Globerman, et al., 1994; Lipsey & Sjöholm, 2004a; Lipsey & Sjöholm, 2004b; Lipsey & Sjöholm, 2004c). Energy consumption is taken as the total cost of fuel and electricity for the manufacturing sector and cost of electricity for the services sector.

significant. In terms of wage rate and human capital, foreign firms paid a higher nominal wage rate and employed a higher percentage of educated employees compared to domestic firms. However, the effective wage rate measured by skill adjusted wage rate was lower for foreign firms, though such difference between the two groups of firms is not statistically significant, suggesting foreign and domestic firms pay similar level of wage for a given level of human capital.

Out of the total foreign firms, 30% and 26.7% engaged in exporting and importing, respectively, in comparison to around 8% and 10% of domestic firms. On average, foreign firms' export intensity and import intensity were noticeably higher, indicating foreign firms were more export-oriented and relied more on import of foreign inputs for local production. Considering both direct and indirect exporting, foreign firms significantly outperformed local firm, with 47% of foreign firms, in contrast to 16.6% of domestic firms, engaged in exporting directly or indirectly. Since foreign firms were active in both direct and indirect exporting, it might be the case that foreign firm exported via other foreign firms. This speculation coupled with higher import propensity of foreign firms might suggest that foreign firms sourced a large proportion of their inputs either abroad or from other foreign firms in the host country. However, this speculation cannot be confidently ascertained without observing the dyadic sourcing relationships between sourcing and supplying firms.

Foreign firms tend to engage in R&D activities much more than domestic counterparts. 41.4% of foreign firms incurred R&D expenditure compared to 11.2% of domestic firms that did so. Foreign firms also displayed higher propensity in introducing new products/services, new or significantly improved methods, new or significantly improved logistic or business support processes, new or significantly improved organizational structures or management practices, and new or significantly improved marketing methods.

Our results are largely consistent with empirical studies conducted on other countries (Chudnovsky, et al., 2008; Domes & Jensen, 1998; Yasar & Paul, 2007). However, it is important to highlight one limitation of these comparisons. Except for sector-specific effects, we do not separately account for other factors that might be relevant to explaining each type of characteristics observed. For example, differences in labor productivity may be due to other factors that can affect labor productivity, such as capital intensity and skill intensity of the workforce. Bearing this caveat in mind we shall investigate whether gaps between foreign and domestic firms translate to direct and spillover effects that benefit the productivity of firms in Sri Lanka.

4. Direct and Spillover Effects of FDI on Labor Productivity

How does FDI affect productivity of firms in a host country has been widely studied (see survey articles such as Iršová and Havránek (2013), Meyer and Sinani (2009), Wooster and Diebel (2010) and Blomström and Kokko (1998)). The effects of FDI can materialize as direct effects (or own-firm effects) or indirect (or spillover) effects (effects on other domestic firms in the host country). Direct effects capture the direct results arising from the MNE ownership of its affiliates in the host country. MNEs, through their active role in R&D, produce, own and control a majority of the world's advance technologies, knowledge and know-how. Therefore, FDI can be a major channel through which technology transfer from advanced countries to developing countries takes place. Local MNE affiliates can enjoy higher productivity thanks to the resources, technology, and management know-how transferred from the MNE headquarters and other subsidiaries. Local affiliates can also benefit from employee training provided by MNEs and the supports they receive in undertaking local R&D.

The presence of MNEs/FDI in the host country can also have an impact on other domestic firms. Positive indirect/spillover effects on productivity can take place through channels such as

demonstration and imitation effects (foreign firms demonstrating the use of new products/processes, organizational innovation and superior management practices to other domestic firms and other domestic firms reverse engineering foreign firm's R&D), competition effects (foreign firms competing against other firms which leads to reduction in X-inefficiency and faster adoption of new technology, knowledge and know-how), and labor turnover effects (other firms recruiting former employees of foreign firms, and the former employees of foreign firms setting up their own domestic firms) (Blomström & Kokko, 1998).

On the other hand, there are concerns about negative effects that FDI/MNEs may cause domestic firms (Nam & Young, 2004). Unlike demonstration and labor turnover effects that are presumably positive, MNE presence in the host country may affect competition negatively. Increased competition from foreign firms may compel domestic firms to operate in less-efficient scales of production which has implications on productivity for at least two reasons. First, when domestic firms lose market share, lower productivity can be the result of spreading fixed costs over smaller output or diseconomies of scale (Aitken & Harrison, 1999; Lipsey, 2004). Second, larger and profitable firms are in a better position to undertake R&D (Blomström & Kokko, 1998) and shrinking profit would inhibit firms from taking R&D to gain competitive advantages. MNEs undertaking import-substituting FDI, which take place due to tariff and non-tariff barriers, may increase their lobbying efforts to maintain such barriers for their own advantages/survival (Loungani & Razin, 2001) and domestic firms may see their productivity decrease, as a result. Overall whether spillover effects are positive or negative is an empirical question.

Direct and spillover effects of FDI on firm level productivity are usually estimated based on the production function. In line with the previous literature (e.g. Aitken and Harrison (1999) and Vahter (2004)), we estimate the effects of FDI on labor productivity^{10,11} using the following model:

$$LP_{ij} = \beta_0 + \beta_1 FOR_{ij} + \beta_2 FOR * FP_j + \beta_3 DOM * FP_j + \beta_4 SIZE_{ij} + \beta_5 SIZE_{ij}^2 + \beta_6 WAGE_{ij} + \beta_7 TRADE_{ij} + \beta_8 STATUS_{ij} + \beta_9 EC_{ij} + \beta_{10} RD_{ij} + \varepsilon_{ij} \quad (1)$$

where LP_{ij} is labor productivity of firm i that belongs to industry j . FOR_{ij} is a dummy variable identifying whether firm i is a foreign affiliate. DOM_{ij} is a dummy variable identifying whether firm i is a domestic firm. FP is foreign presence in industry j . FOR assesses direct effects and FP spillover effects of MNEs. FP is interacted with both FOR and DOM in order to differentiate the spillover effects of MNEs on other foreign firms and other domestic firms, respectively. This approach is used in several previous studies, see for example Smarzynska (2002) and Chudnovsky, et al. (2008). To ensure the appropriate assessment of FDI effects, we also include a few firm- and industry-level control variables. Appendix A presents the rationale for including control variables.

$SIZE$ and $SIZE^2$ are firm size and its squared term. $WAGE$ is the average wage rate. $TRADE$ is a dummy variable indicating whether firm i carries out international trade (both export and import). $STATUS$ differentiates firms between a shareholding company and a sole proprietorship or a partnership company. EC and RD are capital intensity and R&D respectively. Also included as control variables are industry dummies for the following 21 sectors: food (15), tobacco (16), textiles (17), garments (18), leather (19), wood (20), paper (21), recorded media (22), chemicals

¹⁰ Due to data limitations on input costs and capital employed, total factor productivity cannot be accurately measured, and therefore, labour productivity was chosen as the measure of productivity.

¹¹ The linkage effect of FDI to downstream and upstream sectors could not be investigated due to the unavailability of input-output data. However, this study uses a broad sectoral classification, i.e. a classification that is largely based on 2-digit sectoral classification and some of the 2-digit sectors are grouped into broader categories, therefore some vertical relationships between 3-digit or more disaggregated sectors are included within each of the 2-digit sector (Vahter & Masso, 2006). For example 2-digit sectors 17 to 19 i.e. textiles (17), garments (18) and leather (19) are considered as a one category, and therefore, vertical relationships among these three are included within the considered category. Therefore, although the measured spillover effects largely represent horizontal effects, they may capture some vertical effects.

(24), plastics & rubber (25), non-metallic mineral products (26), medical and optical precision instruments (33), transport machines (34), furniture (36), recycling (37), construction (45), sales, repairs, and service of motor vehicles (50), wholesale (51), retail (52), hotel and restaurants section H (55), transport (60), and IT (72). Detailed information on variable measurements and data sources is provided in Table 5.

<TABLE 5 HERE>

Non-random selection of FDI recipients is a major concern in estimating Eq. 1 (Vahter, 2004). It is often highlighted that MNEs tend to acquire stakes in domestic firms that have better performance or/and better assets/capabilities¹² or be drawn towards more productive industries (Smarzynska, 2002). Also, it is recognized that only the most productive firms can engage in FDI (Helpman, et al., 2004). Many studies have indicated the existence of this self-selection bias (Vahter & Masso, 2006). Assuming MNE's FDI entry decision is dependent on certain firm characteristics, the following dichotomous choice model can be formulated:

$$FOR_{ij} = 1 \text{ if } FOR^*_{ij} > 0$$

$$FOR_{ij} = 0 \text{ otherwise}$$

$$\text{where } FOR^*_{ij} = \alpha_0 + \alpha_1 L3.LP_{ij} + \alpha_2 L3.SIZE_{ij} + \alpha_3 EXP_FIRM_{ij} + \alpha_4 SKILL_{ij} + e_{ij} \quad (2)$$

L is the lag operator. The prefix L3 indicates that the variable is lagged by three years. Using lagged variables helps mitigate endogeneity problem (see Appendix A). EXP_FIRM identifies whether firm i exports or not. SKILL captures skill intensity of workforce.

FOR^*_{ij} is a latent variable measuring MNE's underline propensity to invest in firm i that belongs to industry j. FOR_{ij} is a dichotomous variable indicating whether the firm received FDI or not, taking

¹² This is only applicable for acquisitions, however, foreign firms also engage in greenfield investments where they set up new firms from scratch.

the value of 1 if the latent variable FOR^*_{ij} is positive and taking 0 otherwise. While the latent variable FOR^*_{ij} is not directly measurable, the indicator variable FOR_{ij} can be directly measured. Disregarding the selection model (Eq. 2) when the outcome model (Eq. 1) is estimated can lead to biased estimates for direct effects and spillover effects. Two-stage Heckman selection model is therefore used to account for selection issue.

This treatment procedure involves two steps. First, Eq. 2 is estimated using a Probit estimation to obtain estimate of α s and compute inverse mills ratio (INVMILLS) which is thereafter included as an additional regressor in Eq. 1 to control for selection bias and obtain estimate for β s. Eq. 1 is estimated using OLS. See Heckman (1979) and Smarzynska (2002) for further explanation on this procedure. Residuals of Eq. 1 were tested for heteroskedasticity. As the results indicate heteroskedasticity, robust standard errors are employed.

Table 6 presents the descriptive statistics and correlation coefficients for the variables used in the estimations. The correlation coefficients are low among variables in Eq. 1 and those in Eq. 2, therefore, multicollinearity is unlikely to be an issue of concern. Tables 7 and 8 show the results of the selection model (Eq. 2) and the outcome model (Eq. 1), respectively. Table 7 reveals that labor productivity is not the main driving factor in FDI entry decision; instead skill intensity, firm size and export orientation are more important.

<TABLES 6, 7 & 8 HERE>

Table 8 presents the results that of particular interest to us. Columns 1 and 2 show results without accounting for the self-selection issue for comparison. In columns 2-4, industry and/or region fixed effects are included to control for unobserved industry-specific and/or region-specific effects. Note that the estimated coefficients of inverse mills ratio are negative and significant in columns 3 and 4

indicating that self-selection is prevalent and highlights the importance of correcting for the selection bias. Previous studies, for example, Aitken and Harrison (1999) and Marin and Bell (2006) have warned that when FDI takes place in highly productive sectors, there can be a positive association between foreign presence in the sector and the productivity of domestic firms in the same sector. Our results, thus, reiterate the importance of controlling for industry specific effects and addressing the self-selection issue. Comparing columns 3 and 4 that present results without and with regional dummies, the results are qualitatively similar. This is unsurprising because Sri Lanka is a relatively small country. Therefore, firms are likely to consider entire Sri Lanka as one market and pay little attention to the regional differences.

FOR is positive and significant in all specifications in columns 1-4, indicating the direct effects of FDI. The finding is consistent with previous studies of other countries (Chudnovsky, et al., 2008; Domes & Jensen, 1998; Lipsey, 2004; Yasar & Paul, 2007). Given the importance of technological progress to individual firm for its competitiveness and country for its development, it might be cost-effective for Sri Lankan firms to use existing technologies in the developed world. Through directly working with MNEs, firms in Sri Lanka are exposed to foreign technologies, thus their productivity improves as a result.

FDI*FP is negative and significant in all specifications indicating negative intra-industry FDI spillover effects on other foreign firms. This result is broadly consistent with the findings of past empirical studies. For example, Chudnovsky, et al. (2008), based on firm level data on Argentina, find that foreign firms have negative spillovers on other foreign firms. Chuang and Lin (1999) also show weak spillovers on other foreign firms using Taiwanese firm-level data. DOM*FP is positive and significant for the specifications that do not control for self-selection and industry fixed effects (column 1). In contrast, when industry fixed effects are included (columns 2-4), this interaction

term turns negative and highly significant. Given the significance of INVMILLS, we infer foreign firms have a negative spillover effect on the productivity of domestic firms.

We turn our attention to control variables and summarize findings briefly. As expected, SIZE is positive and SIZE² is negative in all specifications, however they are statistically insignificant. WAGE and R&D are positive and significant in some specifications, indicating the importance of firm-level labor quality and R&D activity on productivity. TRADE is positive in all specifications but statistically insignificant. EC and STATUS are both positive and statistically significant in all specifications. Thus capital-intensive firms are more productive. Shareholding companies are more productive than firms of sole proprietorships or partnerships.

Some of the recent studies on productivity spillovers have emphasized the importance of accounting for the non-normal distribution of firm productivity in the sample (Damijan, et al., 2013; Dimelis & Louri, 2002; Girma & Görg, 2007). If firm productivity in the sample is not normally distributed, which is usually the case because there is large and persistent heterogeneity in labor productivity across firms even within narrowly defined sectors (Girma & Görg, 2007), quantile regression that allows the examination of the FDI effects at different points of the conditional distribution of labor productivity would be preferred to standard least squares. In other words, quantile regression permits the investigation of the relative importance of explanatory variables across the whole distribution of the labor productivity variable in comparison to the central tendency of the variable by taking into account the large and persistent heterogeneity in productivity across firms. Formal testing for normality using Shapiro-Wilk normality test and Shapiro-Francia normality test leads to a rejection of the null hypothesis of normality. Quantile regressions are estimated and the results are reported in table 9.

<TABLE 9 HERE>

The results largely remain intact except for a few minor differences in some quantiles. FOR remains positive for all quantiles except for the 10th quantile where the coefficient estimate is negative but insignificant. This is unsurprising because MNE's participation is likely to be low in very low productivity industries. For those who do participate in such industries, they are unlikely to be superior to their domestic counterparts. Compared to other quantiles, the coefficient estimate of FOR for the 90th quantile is very large and highly significant. This shows that foreign firms enjoy a high productivity relative to domestic firms in the upper end of the distribution.

In line with the results in table 8, FDI*FP remains negative for all quantiles except for the 75th quantile where the coefficient estimate is positive but insignificant. DOM*FP is negative in all estimations. However, interestingly, the negative coefficients are significant in median and higher quantiles but insignificant in lower quantiles. This clearly indicates that negative spillovers are stronger in higher quantiles. With respect to control variables, all results remain consistent with those in table 8. Inverse mills ratio is negative in all quantiles, but only significant in the 90th quantile. This implies that self-selection is more prevalent in the upper end of the distribution.

5. DISCUSSIONS AND CONCLUSION

With regard to the role of FDI in a host developing countries, broadly speaking, there are three perspectives: "Washington Consensus" Enthusiasm, Academic Skepticism and Dirigisme Resurrected (Moran, et al., 2005). The first considers FDI as a major channel for host country development, therefore, holds a view that host country governments should attract and incorporate FDI into its development strategy. To academic skeptics, the nature of FDI is no different to other kind of investments, therefore, there is no point of devoting scarce domestic resources for FDI promotion. The third perspective sees that "host country development objectives can be achieved

only by imposing performance requirements on multinational investors” (Moran, et al., 2005). According to Athukorala (2012), recent developments in the Sri Lankan policy scene shows a pattern of reverting to dirigisme. It is therefore timely to empirically assess FDI in Sri Lanka.

In line with previous empirical studies conducted on other countries (e.g. Yasar and Paul (2007), Chudnovsky, et al. (2008) and Domes and Jensen (1998)), comparison of foreign and domestic firms in Sri Lanka reveals that foreign firms are distinctive from domestic firms. Compared to domestic firms, foreign firms are larger, more productive, more profitable, and more active in R&D. Foreign firms tend to hire higher proportion of skilled workers and undertake more in-house training programs. They are more export-oriented but rely more on inputs of foreign origin. These findings therefore indicate the potential that firms in Sri Lanka can learn from MNEs, challenging the wisdom of Academic Skepticism.

The results of econometric study based on World Bank Enterprise Survey data provide strong evidence of positive direct effects of FDI, but negative spillover effects on domestic firm productivity. Given the Sri Lankan context, this might not be surprising due to several reasons. First, literature on productivity spillovers recognizes that the extent of spillovers depends on the degree to which foreign affiliates are technologically active in the host country (Marin & Bell, 2006). As shown in section 2, FDI in Sri Lanka has primarily taken place in low-tech sectors. Therefore, potential for spillovers may be limited.

Second, the extent of spillovers depends on the degree to which foreign affiliates expose their technologies (technology leakage) to other domestic firms (Marin & Bell, 2006). Available evidence on textiles and clothing industry shows that domestic firm’s linkages to MNEs are weak (Kelegama & Foley, 1999). Moreover, higher import propensity of foreign firms and higher import

content of the inputs used by foreign firms, as shown in section 3, could limit the opportunities for domestic suppliers to learn from MNEs and benefit from potential positive spillovers.

Third, the literature on productivity spillovers recognizes that spillover effects depend on the level of absorptive capacity of domestic firms (Damijan, et al., 2013; Marin & Bell, 2006). Industrial structure in Sri Lanka is narrowly concentrated in a few sectors with little participation in technological-intensive sectors, which indicate that the overall technical knowledge of domestic firms is low. Available evidence also demonstrates that, although Sri Lanka enjoys very good human capital indicators (e.g. secondary education attainment and literacy), only a few technical graduates are produced and retained in the country. There is a mismatch between the skills needed by employers and the education provided by secondary school system and public universities (Ganegodage & Rambaldi, 2011). Our discussion in section 3 shows that compared to foreign firms, only a smaller percentage of domestic firms undertake R&D or in-house training programs. These factors indicate a low absorptive capacity of local firms. Finally, discussion in section 3 also reveals that foreign firms experience low staff turnover, which again lessens the extent to which foreign affiliates expose their firm-specific assets to domestic firms.

In summary, given Sri Lanka context, it is unsurprising to see that MNEs help improve productivity of their affiliates in Sri Lanka but they exert competition effects on other domestic (and foreign) firms, while at the same time, generate limited positive spillover effects through the channels of demonstration, linkage and labor turnover. As the result of dominant negative competition effects over other spillover effects, we observe the negative impact of FDI on productivity of other domestic firms¹³.

¹³ The negative coefficient on FP could also be interpreted as the result of self selection. However, the lack of panel data with longer time dimension prevents us from further testing the idea.

Findings of this study have important implications on the development of domestic firms. Foreign firms, through their distinctive characteristics, are likely to bring in much needed expertise and skills that could help to overcome the structural deficiencies of the country's industrial structure. However, Sri Lanka's mediocre performance in attracting FDI, particularly FDI in technological-intensive sectors, and the absence of positive spillovers from MNEs to domestic firms may all have resulted in poor performance of domestic firms in upgrading firm-specific capabilities. The goals of the national FDI policies are twofold. First a country should attract the right type of FDI. Second, a country should devise appropriate policies to extract benefits from foreign presence. It appears that Sri Lanka has performed poorly in both of these aspects, and this has in turn, deprived the country the much needed skills and technologies, and decelerated the development of the country.

Despite its merits, the study is not without limitations, mainly due to a few inherent issues in the Enterprise Survey data. We relied largely on cross-sectional data due to the unavailability of panel data. However, using responses received from respondents about past data, several tactical measures were taken to minimize endogeneity and self-selection bias, and thereby, largely minimizing the well-known limitations of using cross-sectional econometrics. Secondly, the number of foreign firms is limited and survey for some firms may be collected in an "easy-to-approach" way, and therefore, foreign firms might not be well represented in some of the sectors. We tried to minimize the effect of this limitation by measuring foreign presence by cumulative realized foreign investment instead of calculating foreign presence based on the sample. Another limitation is that there seems to be an under-representation of exporting firms in the sample for some industries, for example, only 9.2% of firms were exporting firms in the 'Textile, Wearing Apparel and Leather Products' sector, a sector which is largely export-oriented. Therefore, the findings of this study might have more relevance to the import-substitution type (market-seeking) FDI than to export-oriented FDI.

Appendix A: Control Variables in Outcome and Selection Equations

Guided by previous literature, we choose control variables in outcome equation (Eq. 1) and selection equation (Eq. 2).

SIZE and SIZE² are included in Eq. 1 as economies of scale can affect productivity positively and diseconomies of scale can affect productivity negatively, thus, the relationship between SIZE and productivity can be non-linear (Ganotakis & Love, 2012). WAGE is a proxy for the skill intensity of a firm's workforce and is commonly used as a measure of labor quality (Blomström, 1988).

TRADE is included because technology transfer and diffusion can take place through not only FDI but also international trade linkages (Smarzynska, 2002). This is because firms that export and import come into contact with new technologies. Exporting firms have to compete with firms with world-class practices and therefore need to be more efficient. Exporting firms may also have a better opportunity to achieve economies of scale and to better utilize internal capacity, which could lead to increase in productivity (Makki & Somwaru, 2004). On the other hand, firms that solely depend on domestic market may not be able to achieve optimum productive efficiency because of the small market size of Sri Lanka. Importing firms can acquire intermediate goods of high quality which in turn improve their productivity. Importing firms can also carry out reverse engineering of technologies that they come across when interacting with foreign suppliers. As existing research shows that ownership structure can have implications on firm productivity (Barth, et al., 2005; Hill & Snell, 1989), we include STATUS. The rationale for including EC is that, as capital available for each unit of labor (capital intensity) increases, labor productivity increases (Hill & Snell, 1989).

R&D activities contribute to the firm's existing stock of accumulated knowledge and thus contribute to improvements in product/service quality and reduction in production/operation cost of the firm, and thereby, improving the productivity of firms (Hill & Snell, 1989).

In line with previous studies (e.g. Vahter (2004)), four explanatory variables are included in the Eq. 2: L3LP, L3SIZE, SKILL, and EXP_FIRM. Foreign firms are inclined to invest in local firms that are more productive ex ante, which is commonly referred in the literature as the cherry-picking phenomenon (Hanousek, et al., 2011). However, some previous studies tend to use the same variables in both the outcome and the selection equation. For example, Vahter (2004), studying the effects of FDI on labor productivity, uses the same labor productivity measure in both selection equation and the outcome equation. This can create an endogeneity issue. World Bank Enterprise Survey includes two questions where respondent firms are asked for the amount of sales generated and the number of workers employed in 2007/2008 (three fiscal years before sampling period). Using this information, L3.LP, i.e. three year lagged labor productivity, is constructed and used in the selection equation, instead of contemporaneous labor productivity. This approach can help mitigate the endogeneity problem. Along similar considerations, instead of including the variable SIZE in the selection equation, L3.SIZE is included. Some studies point out that foreign firms can also self-select into more capital-intensive firms or industries (E.g. Domes and Jensen (1998)). Therefore, energy consumption per worker (EC) was initially used in Eq. 2. However EC was statistically insignificant, it was subsequently dropped from the selection equation.

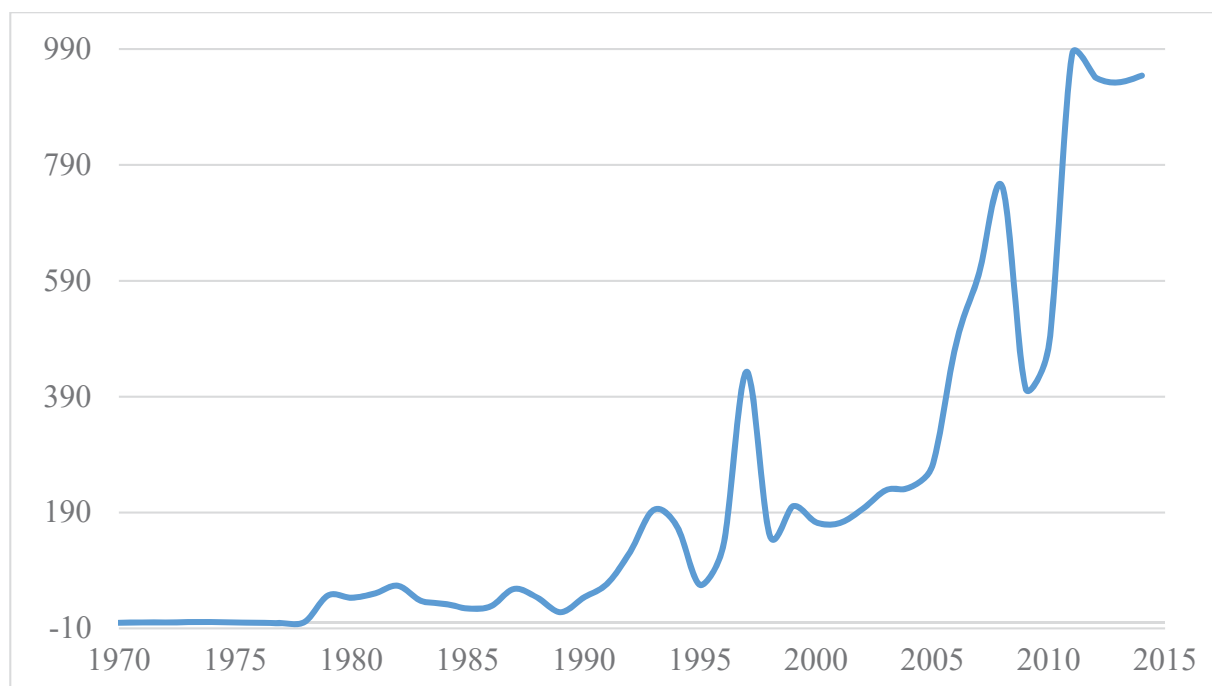
REFERENCES

- Aitken, B. J., & Harrison, A. E. (1999). Do Domestic Firms Benefit from Direct Foreign Investment? Evidence from Venezuela. *American Economic Review*, 89, 605-618.
- Athukorala, P. (1995). Foreign Direct Investment and Manufacturing for Export in a New Exporting Country: The Case of Sri Lanka. *World Economy*, 18, 543-564.
- Athukorala, P. C. (2012). Sri Lanka's Trade Policy: Reverting to Dirigisme? *World Economy*, 35, 1662-1686.
- Athukorala, P. C., & Rajapatirana, S. (2000). Liberalization and Industrial Transformation: Lessons from the Sri Lankan Experience. *Economic Development and Cultural Change*, 48, 543-572.
- Barth, E., Gulbrandsen, T., & Schønea, P. (2005). Family Ownership and Productivity: the Role of Owner-management. *Journal of Corporate Finance*, 11, 107-127.
- Blomström, M. (1988). Labor Productivity Differences between Foreign and Domestic Firms in Mexico. *World Development*, 16, 1295-1298.
- Blomström, M., & Kokko, A. (1998). Multinational Corporations and Spillovers. *Journal of Economic Surveys*, 12, 247-277.

- Bureau of Economic Energy and Business Affairs. (2011). Sri Lanka Investment Climate Statement 2011. In.
- Bureau of Economic Energy and Business Affairs. (2012). Sri Lanka Investment Climate Statement 2012. In.
- Central Bank of Sri Lanka. (2001). Central Bank Annual Report 2001. In.
- Chuang, Y.-C., & Lin, C.-M. (1999). Foreign Direct Investment, R&D and Spillover Efficiency: Evidence from Taiwan's Manufacturing Firms. *Journal of Development Studies*, 35, 117.
- Chudnovsky, D., López, A., & Rossi, G. (2008). Foreign Direct Investment Spillovers and the Absorptive Capabilities of Domestic Firms in the Argentine Manufacturing Sector (1992–2001). *Journal of Development Studies*, 44, 645-677.
- Damijan, J. P., Rojec, M., Majcen, B., & Knell, M. (2013). Impact of Firm Heterogeneity on Direct and Spillover Effects of FDI: Micro-evidence from Ten Transition Countries. *Journal of Comparative Economics*, 41, 895-922.
- Dheerasinghe, R. (2003). Garment Industry in Sri Lanka Challenges, Prospects and Strategies. *Staff Studies, Central Bank of Sri Lanka*, 33, 33-72.
- Dimelis, S., & Louri, H. (2002). Foreign Ownership and Production Efficiency: A Quantile Regression Analysis. *Oxford Economic Papers*, 54, 449-469.
- Domes, M. E., & Jensen, J. B. (1998). Comparing Wages, Skills, and Productivity between Domestically and Foreign-Owned Manufacturing Establishments in the United States. In R. E. Baldwin, R. E. Lipsey & J. D. Richards (Eds.), *Geography and Ownership as Bases for Economic Accounting* (pp. 235 - 258): University of Chicago Press.
- Ganegodage, K. R., & Rambaldi, A. N. (2011). The Impact of Education Investment on Sri Lankan Economic Growth. *Economics of Education Review*, 30, 1491-1502.
- Ganotakis, P., & Love, J. H. (2012). Export Propensity, Export Intensity and Firm Performance: The Role of the Entrepreneurial Founding Team. *Journal of International Business Studies*, 43, 693-718.
- Girma, S., & Görg, H. (2007). The Role of the Efficiency Gap for Spillovers from FDI: Evidence from the UK Electronics and Engineering Sectors. *Open Economies Review*, 18, 215-232.
- Globerman, S., Ries, J. C., & Vertinsky, I. (1994). The Economic Performance of Foreign Affiliates in Canada. *The Canadian Journal of Economics / Revue canadienne d'Economique*, 27, 143-156.
- Hanousek, J., Kočenda, E., & Maurel, M. (2011). Direct and indirect effects of FDI in emerging European markets: A survey and meta-analysis. *Economic Systems*, 35, 301-322.
- Havranek, T., & Irsova, Z. (2012). Survey Article: Publication Bias in the Literature on Foreign Direct Investment Spillovers. *The Journal of Development Studies*, 48, 1375-1396.
- Helpman, E., Melitz, M. J., & Yeaple, S. R. (2004). Export versus FDI with Heterogeneous Firms. *The American Economic Review*, 94, 300-316.
- Hill, C. W. L., & Snell, S. A. (1989). Effects of ownership structure and control on corporate productivity. *Academy of Management Journal*, 32, 25-46.
- Hossain, M., Islam, I., & Kibria, R. (1999). *South Asian Economic Development: Transformation, Opportunities and Challenges*. London and New York: Routledge.
- Iršová, Z., & Havránek, T. (2013). Determinants of Horizontal Spillovers from FDI: Evidence from a Large Meta-Analysis. *World Development*, 42, 1-15.
- Kapuge, A. M., & Smith, M. (2007). Management practices and performance reporting in the Sri Lankan apparel sector. *Managerial Auditing Journal*, 22, 303-318.
- Kelegama, S., & Foley, F. (1999). Impediments to Promoting Backward Linkages from the Garment Industry in Sri Lanka. *World Development*, 27, 1445-1460.
- Lipsey, R., & Sjöholm, F. (2004a). FDI and Wage Spillovers in Indonesian Manufacturing. *Review of World Economics*, 140, 321-332.

- Lipsey, R. E. (2004). Home- and host-country effects of foreign direct investment. In R. E. Baldwin & L. A. Winters (Eds.), *Challenges to Globalization: Analyzing the Economics* (pp. 333 - 382): University of Chicago Press.
- Lipsey, R. E., & Sjöholm, F. (2004b). Foreign Direct Investment, Education and Wages in Indonesian Manufacturing. *Journal of Development Economics*, 73, 415-422.
- Lipsey, R. E., & Sjöholm, F. (2004c). Host Country Impacts of Inward FDI: Why Such Different Answers? In T. H. Moran, E. M. Graham & M. Blomström (Eds.), *Does Foreign Direct Investment Promote Development?* Washington, DC: Institute for International Economics.
- Loungani, P., & Razin, A. (2001). How Beneficial Is Foreign Direct Investment for Developing Countries? *Finance and Development*, 38.
- Makki, S. S., & Somwaru, A. (2004). Impact of Foreign Direct Investment and Trade on Economic Growth: Evidence from Developing Countries. *American Journal of Agricultural Economics*, 86, 795-801.
- Marin, A., & Bell, M. (2006). Technology spillovers from Foreign Direct Investment (FDI): the active role of MNC subsidiaries in Argentina in the 1990s. *Journal of Development Studies*, 42, 678-697.
- Meyer, K. E., & Sinani, E. (2009). When and Where Does Foreign Direct Investment Generate Positive Spillovers? A Meta-Analysis. *Journal of International Business Studies*, 40, 1075-1094.
- Moosa, I. A. (2002). *Foreign Direct Investment: Theory, Evidence and Practice*: Palgrave Macmillan.
- Moran, T. H., Graham, E. M., & Blomström, M. (2005). *Does FDI Promote Development?* : Peterson Institute for International Economics, Washington, DC.
- Nam, J. B., & Young, A. S. (2004). Multinational Corporations and Host Country Receptivity: Perceptions from Three Asian Countries. *Multinational Business Review*, 12, 17-36.
- Pravakar, S. (2006). Foreign Direct Investment in South Asia: Policy, Trends, Impact and Determinants. In: ADB Institute Discussion Paper No. 56.
- Reuters. (2013). Sri Lanka bans land sales to foreigners. In: Thomson Reuters.
- Smarzynska, B. K. (2002). Spillovers from Foreign Direct Investment through Backward Linkages: Does Technology Gap Matter? mimeo. World Bank.
- The Economist. (2011). Sri Lanka regulations: Expropriation law raises investor concerns. In.
- The World Bank. (2007). Sri Lanka Development Forum: The Economy, Regional Disparities, and Global opportunities, Poverty Reduction and Economic Management Unit South Asia Region.
- U.S. Department of State. (2015). Sri Lanka Investment Climate Statement 2015. In.
- UNCTAD. (2004). Investment Policy Review Sri Lanka. In. New York and Geneva: United Nations Conference on Trade and Development (UNCTAD).
- Vahter, P. (2004). The Effect of Foreign Direct Investment on Labour Productivity: Evidence from Estonia and Slovenia. In: Tartu University Press. Retrieved from <http://www.mtk.ut.ee/sites/default/files/mtk/toimetised/febawb32.pdf>.
- Vahter, P., & Masso, J. (2006). Home versus Host Country Effects of FDI: Searching for New Evidence of Productivity Spillovers. In *William Davidson Institute Working Paper Number 820*: William Davidson Institute At the University of Michigan.
- Wei, Y. A., & Balasubramanyam, V. N. (2004). *Foreign Direct Investment: Six Country Case Studies*. Cheltenham, UK: Edward Elgar.
- Wooster, R. B., & Diebel, D. S. (2010). Productivity Spillovers from Foreign Direct Investment in Developing Countries: A Meta-Regression Analysis. *Review of Development Economics*, 14, 640-655.
- Yasar, M., & Paul, C. J. M. (2007). Firm Performance and Foreign Direct Investment: Evidence from Transition Economies. *Economics Bulletin*, 15, 1-11.

Figure 1: FDI in Sri Lanka, US\$ million



Source: <http://unctadstat.unctad.org>.

Table 1: Comparative FDI Performance in 2011

Country	FDI Inflow (US\$ million)	FDI Inflow per capita (US\$)	FDI Inflow as a % of GCF	FDI Stock (US\$ million)	FDI Stock per capita (US\$)	FDI Stock as a % of GDP
South Asia						
<i>Sri Lanka</i>	981.10	46.62	6.12	5989.50	284.60	10.12
India	36190.40	29.15	5.90	206434.60	166.28	10.88
Pakistan	1327.00	7.51	5.54	20916.00	118.34	10.01
Bangladesh	1136.38	7.55	4.33	6165.81	40.97	5.81
Nepal	95.49	3.13	2.43	348.10	11.42	1.88
East Asia						
China	123985.00	92.01	3.72	711802.00	528.21	9.88
Hong Kong	96125.39	13496.61	180.51	1184511.36	166312.87	486.85
Korea, Rep.	10246.50	211.74	3.35	133660.00	2762.06	11.97
Southeast Asia						
Malaysia	12197.58	422.66	19.14	115063.98	3987.09	39.96
Singapore	55922.66	10779.37	91.89	625744.75	120615.43	240.81
Thailand	7778.68	111.89	8.39	150517.17	2165.14	40.71
Vietnam	7430.00	83.68	20.44	64162.30	722.61	51.91
Philippines	1816.00	19.15	4.18	28230.00	297.62	12.56
Indonesia	19241.25	79.40	7.10	185803.73	766.75	21.94

Sources: World Development Indicators, 2013 and UNCTAD, 2013

Table 2: The Sectoral Distribution of Realized FDI in BOI-registered Enterprises in Sri Lanka

Sector	1983		1991		2001		2011	
	US\$ million	% of total	US\$ million	% of total	US\$ million	% of total	US\$ million	% of total
Manufacturing	54.3	92.4	210.3	77.3	581.1	36.8	1760.9	29.6
Food, Beverages and Tobacco Products	0.3	0.6	2.3	0.8	56.6	3.6	262.5	4.4
Textile, Wearing Apparel and Leather Products	27.2	46.3	76.5	28.1	246.3	15.6	568.7	9.6
Wood and Wood Products	0.4	0.7	0.1	0.0	14.5	0.9	76.0	1.3
Paper Products, Publishing and Printing	0.0	0.0	1.9	0.7	5.8	0.4	38.9	0.7
Chemical, Petroleum, Coal, Rubber and Plastic Products	10.8	18.3	67.5	24.8	113.9	7.2	355.8	6.0
Non-metallic and Mineral Products	2.0	3.4	11.7	4.3	34.9	2.2	115.0	1.9
Fabricated Metal Products, Machinery and Transport Equipment	2.6	4.5	29.2	10.7	42.8	2.7	142.5	2.4
Manufactured Products (n.e.s)	11.0	18.7	21.2	7.8	66.3	4.2	201.6	3.4
Services	4.5	7.6	61.6	22.7	999.6	63.2	4187.5	70.4
Total	58.7	100	271.9	100	1580.7	100	5948.4	100

Source: Central Bank Annual Reports, various years

Table 3: The Distribution of Foreign and Domestic firms by Sector

Sector	No of Firms		
	Total firms	Domestic firms	Foreign affiliates
Manufacturing			
Food, Beverages and Tobacco Products	130	124	6
Textile, Wearing Apparel and Leather Products	130	129	1
Wood and Wood Products	34	34	0
Paper Products, Publishing and Printing	6	5	1
Chemical, Petroleum, Coal, Rubber and Plastic Products	20	17	3
Non-metallic Mineral Products	30	28	2
Fabricated Metal Products, Machinery and Transport Equipment	4	4	0
Manufactured Products (n.e.s)	2	2	0
Services	246	229	17
Total	602	572	30

Source: Sri Lanka 2011 World Bank Enterprise Survey

Table 4: The Comparison of the Characteristics of Foreign and Domestic Firms in Sri Lanka

Characteristic	Foreign affiliates	Domestic firms	Estimated coefficient of FOR ^a
Sales (Rupees million)	1006.1	199.2	762.5*** (217.1)
Employment	240	88	144.9** (60.79)
Profit (Rupees million)	313.66	62.68	187.8* (101.8)
Labor productivity (Rupees million per employee)	7.03	2.34	4.345*** (1.361)
Capital intensity (Energy consumption per employee)	188.02	106.99	87.79 (168.2)
Wage rate (Rupees, 000 per employee)	692.8	197.2	471.8*** (77.79)
Training firm (% of firms with formal training programs for its full-time permanent employees)	83.3	25.4	1.63*** (0.29)
Staff turnover (%)	14.4	22.3	-4.976 (6.410)
Secondary education level (% of full-time permanent employees who completed secondary school)	67.3	52.3	12.56* (6.432)
Skills adjusted wage rate (wages per worker / % of full time permanent employees who completed secondary school)	9.6	14.5	-799.4 (11,964)
Exporting (% of firms exported)	30	7.9	0.86*** (0.25)
Direct or indirect ^b exporting (% of firms exported both directly or indirectly)	46.7	16.6	0.996*** (0.249)
Importing (% of firms imported)	26.7	10.2	1.23*** (0.38)
Import intensity (% of inputs of foreign origin)	35.6	10.2	24.21*** (7.364)
R&D (% of firms incurred R&D expenditure during past 3 years)	41.4	11.2	0.909*** (0.249)
New Product (% of firms introduced new products or services during past 3 years)	63.3	29.4	0.831*** (0.244)
New Methods (% of firms introduced new or significantly improved methods during past 3 years)	69	42.2	0.59** (0.25)
New Logistic or Business Support Process (% of firms introduced new or significantly improved logistic or business support processes past 3 years)	65.5	37.7	0.58** (0.25)
New Management (% of firms introduced new or significantly improved organizational structures or management practices during past 3 years)	70	34.4	0.79*** (0.25)
New Marketing (% of firms introduced new or significantly improved marketing methods during past 3 years)	75.9	38.7	0.93*** (0.26)

Notes:

FOR is a dummy variable reflecting whether a firm is a MNE's affiliate or domestic firm. Standard errors in parentheses in the last column. *** p<0.01, ** p<0.05, * p<0.1.

^aRegressions with sector specific dummies included as control variables.

^bIndirect exporting is about selling the products domestically to a third party that then exports these products to foreign countries.

Table 5: Variable Measurement and Data Sources

Variable	Measurement	Source
LP (Labor productivity)	Output per employee in rupees millions	Sri Lanka 2011 World Bank Enterprise Survey Dataset
FOR (Foreign firms)	Whether or not a firm has foreign ownership. 1 if the firm's foreign equity is more than 10%, 0 otherwise.	
DOM (Domestic firms)	Whether or not a firm is domestically-owned. 1 if the firm's foreign equity is less than 10%, 0 otherwise.	
SIZE (Firm size)	Categorical variable representing how large the firm is: 1 if a firm is a micro-firm employing less than five employees; 2 if a firm is a small firm employing between 5 and 19 employees; 3 if a firm is a medium firm employing between 20 and 99 employees; and 4 if a firm is a large firm employing more than 99 employees	
WAGE (Wage rate)	Average wage rate in rupees thousand	
SKILL (Skill intensity)	% of full-time permanent workers who completed secondary school education	
TRADE	Whether a firm engages in international trade. 1 if the firm either exports or imports and zero otherwise.	
STATUS	Firm's status. 0 if a firm is a sole proprietorship or a partnership; 1 if a firm is a shareholding company.	
EC (Capital intensity)	Energy consumption per employee in rupees millions	
EXP_FIRM	Whether a firm exports or not. 1 if the firm exports, 0 otherwise.	
RD (R&D)	Whether a firm undertakes R&D or not. 1 if the firm has spent on formal R&D activities during the last three years, 0 otherwise.	
FP (Foreign presence in the industry)	Cumulative realized FDI stock in each sector as at the end of 2010 measured in US\$ million. Different measurements of foreign presence have been used in the literature including the share of the capital, employment, output and sales of foreign firms in the sector and many studies use the sample to calculate FP (Havranek & Irsova, 2012). We choose to use the cumulative realized FDI stock which should capture all foreign firms, not a sample of foreign firms in a sector.	Central Bank of Sri Lanka, 2010

Table 6: Descriptive Statistics and Correlation Matrix

Variable	Descriptive statistics				Correlation Matrix									
	Mean	s.d.	Min	Max	1	2	3	4	5	6	7	8	9	10
1 LP	2.58	6.98	0.025	80										
2 FOR	0.05	0.22	0	1	0.15									
3 FP	1494.97	1443.11	35	3221.9	0.08	0.06								
4 SIZE	1.67	0.77	1	3	0.06	0.23	-0.02							
5 SKILL	53.08	34.09	0	100	0.08	0.07	0.24	0.08						
6 WAGE	220.72	407.60	5.455	5333.3	0.22	0.20	0.08	0.08	0.04					
7 TRADE	0.16	0.37	0	1	0.11	0.20	-0.22	0.40	0.05	0.11				
8 EXP_FIRM	0.09	0.29	0	1	0.06	0.18	-0.09	0.36	0.08	0.12	0.72			
9 STATUS	0.20	0.40	0	1	0.20	0.22	0.03	0.39	0.08	0.18	0.25	0.20		
10 EC	110.92	836.14	0	18157.8	0.25	0.03	-0.06	0.04	-0.07	0.16	0.13	0.02	0.01	
11 RD	0.13	0.33	0	1	0.15	0.22	0.02	0.36	0.05	0.12	0.20	0.22	0.21	0.14

Table 7: Results of the Probit Estimation of the Selection Model for FDI

Dependent variable: FDI	
L3.LP	0.00542 (0.00485)
L3.SIZE	0.291** (0.133)
EXP_FIRM	0.552* (0.289)
SKILL	0.00717** (0.00339)
Prob > chi2	0.0003
Pseudo R-squared	0.1177
Number of Observations	476

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 8: Results of the Outcome Model for Labor Productivity

	(1) OLS	(2) OLS	(3) Heckman	(4) Heckman
FOR	7.407** (3.336)	7.950** (3.399)	8.537* (4.449)	8.709* (4.306)
FOR*FP	-0.00219* (0.00113)	-0.00386*** (0.00104)	-0.00420*** (0.00135)	-0.00425** (0.00173)
DOM*FP	0.000503* (0.000248)	-0.00105*** (0.000116)	-0.00140*** (0.000212)	-0.00134** (0.000523)
SIZE	3.507 (3.270)	3.236 (3.816)	4.117 (3.833)	3.975 (3.884)
SIZE ²	-1.096 (0.942)	-1.035 (1.108)	-1.598 (1.112)	-1.513 (1.088)
WAGE	0.00259** (0.000953)	0.00274** (0.00111)	0.00309 (0.00182)	0.00263 (0.00190)
TRADE	1.141 (0.894)	1.284 (1.086)	0.406 (1.141)	0.218 (1.204)
STATUS	2.480** (0.888)	2.431** (0.974)	2.991** (1.168)	2.423* (1.253)
EC	0.00170*** (0.000187)	0.00168*** (0.000189)	0.00188*** (0.000138)	0.00188*** (0.000135)
RD	1.402 (0.991)	1.517 (0.932)	1.691** (0.803)	1.536* (0.749)
INVMILLS			-3.990*** (1.379)	-3.795** (1.521)
Industry fixed effects	NO	YES	YES	YES
Regional effects	NO	NO	NO	YES
R-squared	0.165	0.192	0.216	0.235
Number of Observations	525	525	454	454

Notes: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 9: Results of the Quantile Regressions with Heckman Treatment Effects

	(1) 10 th quantile	(2) 25 th quantile	(3) 50 th quantile	(4) 75 th quantile	(5) 90 th quantile
FOR	-0.0330 (0.144)	0.0228 (0.450)	1.844** (0.871)	0.626 (1.523)	71.50*** (2.515)
FOR*FP	-0.00003 0.00006	-0.000129 (0.000144)	-0.00105*** (0.000338)	0.000323 (0.000627)	-0.0239*** (0.000843)
DOM*FP	-0.00002 0.00003	-0.00004 0.00004	-0.000353*** (0.000136)	-0.000437*** (5.58e-05)	-0.00152*** (0.000534)
SIZE	0.0656 (0.0681)	0.102 (0.178)	0.0599 (0.331)	0.832 (0.808)	6.209 (4.018)
SIZE ²	-0.0277 (0.0202)	-0.0573 (0.0602)	-0.0789 (0.0715)	-0.334 (0.227)	-2.016* (1.082)
WAGE	0.00103*** (0.000394)	0.00166*** (0.000307)	0.00260*** (0.000582)	0.00391** (0.00160)	0.0101 (0.0106)
TRADE	0.0111 (0.0345)	-0.0211 (0.0718)	0.161 (0.200)	0.325 (0.430)	-0.273 (1.337)
STATUS	0.0487 (0.0526)	0.125 (0.103)	0.681* (0.357)	1.367 (1.288)	4.080** (2.047)
EC	0.00184*** (0.000318)	0.00196*** 0.00002	0.00189*** 0.00002	0.00177*** (0.000115)	0.00136** (0.000543)
RD	0.0207 (0.0518)	0.00859 (0.0898)	0.188 (0.283)	0.795 (0.872)	1.176 (1.202)
INVMILLS	-0.0387 (0.0588)	-0.185 (0.120)	-0.388 (0.334)	-0.781 (0.518)	-3.827** (1.799)
Industry fixed effects	YES	YES	YES	YES	YES
R-squared	0.084	0.098	0.140	0.159	0.119

Notes: Sample size = 454; Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1