

The Determinants of Foreign Direct Investment in Services

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1. INTRODUCTION

AN important feature of FDI highlighted in recent *World Investment Reports* (for instance, the 2004 and 2005 issues) has been the shift towards services. In 1970, for example, services FDI accounted for a quarter of global FDI stock. In 1990, the share increased to about half, while in 2005, the share of services FDI to global stock rose to nearly two-thirds (UNCTAD, 2007). The dramatic increase in the shares of FDI (and trade) in services plus rapid changes in services-related technology, is forcing international agencies (like the United Nations) to reconsider the definition of services.

Despite the increase in services FDI over the last decade, literature on the determinants of FDI tends to focus on manufacturing FDI. Agarwal (1980), Lizondo (1990) and Chakrabarti (2001), in reviewing the determinants of FDI over the last 40 years, have either ignored the role of services FDI or considered these as part of manufacturing FDI. Previous literature on services FDI tend to be sector-specific: for instance, banking (Moshirian, 2001; Buch and Lipponer, 2004), insurance (Moshirian, 1997), advertising (Terpstra and Yu, 1988) and legal services (Cullen-Mandikos and MacPherson, 2002). The main reason for this is perhaps the lack of aggregate data for FDI in services in the past. The purpose of this study is to fill this gap in FDI literature.

The works of Dunning, Buckley, Casson, Markusen and others have contributed much to the discussion of FDI in mainstream journals. Relying on their work as a firm theoretical foundation, this paper makes four contributions to the literature on FDI. First, it considers country-specific determinants that attract services FDI. Second, it provides empirical evidence to confirm that no new theories are required to model the determinants of FDI in services. Third, it compares the relative importance of service FDI determinants vis-à-vis the traditional determinants that attract manufacturing FDI. Fourth, the study

serves as a basis for future research in services FDI among developing countries, particularly as a result of the emergence of the outsourcing of business services.

We use macro-level variables to identify these determinants, although we acknowledge that analysis of FDI decisions at a firm level would be ideal. The interest in exploring FDI decisions at the firm level has grown in recent years.¹ However, country-level assessments are equally important as these macro-level factors influence multinational enterprise (MNE) decisions, particularly location choices, notwithstanding the idiosyncratic variations that exist among firms (Sethi et al., 2003; Zhao, 2003). The study focuses on the inward investment in services among the Organisation for Economic Co-operation and Development (OECD) countries for which reasonable time series data are available. The OECD comprises a good selection of high- and middle-income countries and accounts for nearly 70 per cent of global inflow of FDI (UNCTAD FDI Database and SourceOECD). Given the recent volatility in FDI inflows worldwide and the shift towards the services sector, the implications of this study could be far-reaching. Enhancing location-specific factors which favour services FDI as highlighted in this study, increases the probability of a country being favoured over its competitors in the FDI tournament.

The following section provides some stylised facts on services FDI. Section 3 reviews previous literature on FDI and provides theoretical arguments for the determinants considered in this study. Section 4 describes the data and methodology of the study, while Section 5 discusses our results and findings. The paper ends with a conclusion and ideas for further research.

2. FDI IN SERVICES: SOME STYLISTED FACTS

The services sector is today the most important sector for FDI, accounting for nearly two-thirds of FDI stock in 2005 (UNCTAD, 2007). Table 1 shows the rate at which FDI has grown in the last 15 years. Despite a decline in global FDI in the early years of this decade, between 1990 and 2005, world inward FDI grew by 474 per cent, 408 per cent and 703 per cent in the primary, manufacturing and services sectors, respectively (UNCTAD, 2007). FDI in services is dominated by developed countries, accounting for about 77 per cent of total inward investment and 88 per cent of total outward services FDI. However, the growth in FDI services in this period was more prominent among developing countries. *Inward* FDI in services grew more than nine-fold among the developing countries compared to about 6.5 times among developed countries. Outward FDI also saw a major jump. Among developed countries, outward

¹ See, for example, Gorg and Greenaway (2004) and Greenaway and Kneller (2007).

TABLE 1
Estimated World Inward and Outward FDI Stock, by Sector

<i>Outward FDI (millions USD)</i>						
	<i>Developed Countries</i>		<i>Developing Countries</i>		<i>World</i>	
	<i>1990</i>	<i>2005</i>	<i>1990</i>	<i>2005</i>	<i>1990</i>	<i>2005</i>
Primary	161,564	584,093	2,219	34,475	163,783	618,569
Manufacturing	793,573	2,655,294	6,452	119,018	800,025	2,774,283
Services	834,927	6,264,020	11,623	831,542	846,550	7,095,562
<i>Inward FDI (millions USD)</i>						
	<i>Developed Countries</i>		<i>Developing Countries</i>		<i>World</i>	
	<i>1990</i>	<i>2005</i>	<i>1990</i>	<i>2005</i>	<i>1990</i>	<i>2005</i>
Primary	139,013	551,202	27,847	239,276	166,860	790,478
Manufacturing	584,069	2,196,968	144,996	778,551	729,065	2,975,519
Services	713,721	4,683,574	155,123	1,427,187	868,844	6,110,761

Note:

Developing countries include Central and Eastern Europe as well.

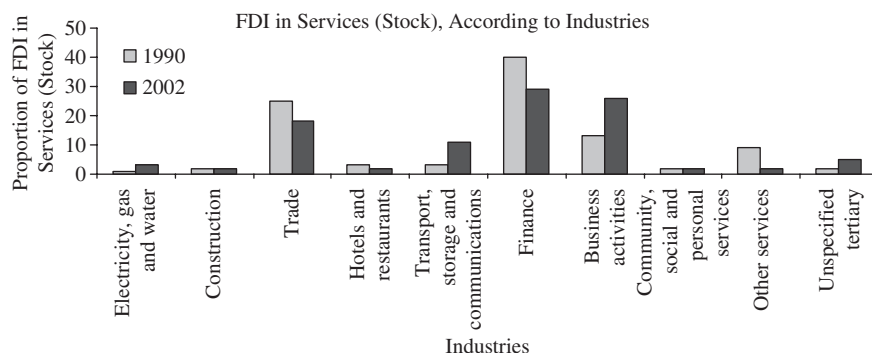
Source: UNCTAD (2007, pp. 225–26).

FDI increased by more than 7.5-fold, while among developing countries the increase was a staggering 72 times (UNCTAD, 2007).

The UN (UNCTAD, 2004) provides several reasons for the sharp increase in services FDI. First, it relates to the increasing importance of the services sector in individual economies.² Since FDI in services is generally market seeking, there is a need to produce the service at the place of consumption. Thus, FDI is a more natural way of producing services in a foreign market compared to trade. An expanding services sector opens greater opportunities for foreign investors. Second, the privatisation of public utilities which in the past were owned and operated by government agencies or state-owned monopolies, and further, the liberalisation of these sectors to foreign ownership motivated cross-border investment. This is particularly true for developing countries. Third, among developed countries, the shift to services FDI was due to the large number of cross-border mergers and acquisitions (M&As) in the telecommunications, banking, water supply and other related industries. UNCTAD (2007, p. 22) report that the share of the services sector in cross-border M&A rose from 37 per cent in 1987–90 to 58 per cent in 2002–06. Fourth, the growing importance of offshoring and/or outsourcing of services to low-cost locations is

² On average, the services sector accounts for about 72 per cent of GDP in developed countries, and 52 per cent in developing countries.

FIGURE 1
Inward FDI Stock in the Services Sector, by Industry, 1990 and 2002



Source: UNCTAD (2004).

beginning to make a mark. This is mainly due to new information and communication technologies (ICTs) which have changed the tradability of the information-based services (Sauvant, 1990; Zimny and Mallampally, 2002). Various services are now either offshored to a foreign affiliate located thousands of miles away, or outsourced to third-party service providers overseas.

A significant change is also evident in the pattern of FDI in services. In the past, finance and trading activities dominated services FDI. In 1990 for example, these two sectors accounted for approximately 66 per cent of the stock of inward FDI in services (UNCTAD, 2004). See Figure 1. By 2002, the proportion of these industries had dropped to 47 per cent. New industries have begun to emerge including business activities; transport, storage and communications; and electricity, gas and water. These new industries accounted for 40 per cent of total inward services FDI stock in 2002 (UNCTAD, 2004, p. 99).

3. THEORIES OF FDI: DETERMINANTS AND VARIABLES SELECTION

Since the upsurge of world FDI after the Second World War there have been several lines of thought that have attempted to explain the motives for international production. Macdougall (1960) used the concept of capital arbitrage in a perfectly competitive environment to explain the transfer of capital across borders. Hymer (1960) then suggested that multinational corporations (MNCs) are oligopolistic firms that need to produce in various countries to compete against rivals. Later, Vernon (1966, 1979) introduced the product

life-cycle concept to explain the movement of production operations from one country to another in search of markets and lower-cost production bases. In the late 1970s and 1980s, Buckley and Casson (1976) and Rugman (1981) extended the Coasian theory of the firm to explain the why and how of production decisions among international firms. Location theory, on the other hand-provided answers to where production would be located. Buckley and Casson (1991) explained that market failure is more prevalent in an international framework (due to tariffs, restrictions on capital flows, differences in taxation regimes and legal framework), and so multinational firms organise an internal market to avoid excessive transaction costs (Williams, 1997). Through internalisation, the multinational is able to protect and retain control of its tangible and intangible assets, while at the same time, earn an economic rent on these assets.

Dunning's (1977, 1981, 1993) eclectic paradigm is probably, by far, among the most comprehensive frameworks that explain the reasons for FDI. The paradigm or otherwise known as the OLI framework has been explained in detail in most FDI literature (Dunning, 2000). Briefly, the Ownership advantage (O) explains who will undertake FDI; the Location advantage (L) explains where FDI flows to; and the Internalisation advantage (I) explains the how of FDI or the mode in which international production will take place.

The applicability of the internalisation theory and the eclectic paradigm in explaining the motivation for services FDI is taken up by Boddewyn et al. (1986) and Williams (1997). They conclude that no services-specific theories are necessary. More recently, Markusen and Strand (2009) used the knowledge-capital model (Markusen, 2002) to explain the motivations behind trade and investments in business services. Dunning and Norman (1987) explain that the *ownership* advantage of services firms arise from their access to information and markets; economies of scales from spreading organisational and managerial costs over a larger market; and the goodwill that they possess from their brand names. Like their manufacturing counterparts, services MNCs are also subjected to the same motivation and limitations that a *location* may offer including market size and quality of resources. As for *internalisation* theories, Buckley (1988, p. 182) argues that transaction costs are higher in '... vertically integrated process industries, knowledge intensive industries, quality assurance-dependent products and communications intensive industries'. These attributes are typical of the service industry. Hence, internalisation theories are applicable for FDI in the services industry as well (Casson, 1990). The fact that services are an intangible good, whose quality cannot be judged prior to consumption, increases the information asymmetry that follows. In like manner, services MNCs with world-renowned brand names would be sceptical about parting with management control; they would prefer to internalise the operations instead.

This paper seeks to isolate and compare the locational advantages that a country possesses which would make it an attractive location vis-à-vis manufacturing and services FDI. Since the fundamental theories of FDI in manufacturing could be used to explain FDI in services as well, most of the determinants tend to be similar (Dunning and McQueen, 1982). However, Boddewyn et al. (1986) highlight several distinct characteristics of the services sector. First, with respect to FDI, the services sector is usually more restrictive than the manufacturing sector (UNCTAD, 2004).³ Second, the need to adapt services to meet local responsiveness due to differences in culture and language could be greater than in the manufacturing sector. Third, some services are location bounded – non-tradable and require face-to-face contact between the service provider and customer – which forces parent firms to establish a local facility in the host country. Finally, service operations lack the technological specification and legal protection (e.g. patents) commonly available to goods production (Chase et al., 2005). These factors increase the difficulties of selecting the right country for investment in services.

Four main reasons have been identified as motives for MNCs to undertake international production activities – market seeking, resource seeking, efficiency seeking and strategic asset seeking (UNCTAD, 1998; Mallampally and Sauvart, 1999; Dunning, 2000). MNCs that are market seeking emphasise the size of the market, the buying power of the domestic market as well as growth potential of the market (Scaperlanda and Balough, 1983; Lucas, 1993; Love and Lage-Hidalgo, 2000; Yang et al., 2000). Chakrabarti (2001) states that market factors is the single most widely used determinant of manufacturing FDI flows. It is logical to assume that a larger market size, an increased purchasing power and a high growth potential attract greater amounts of FDI. The rationale for the positive relationship is that a reduction in the cost of entry through economies of scale can be exploited in larger markets. At the same time an increase in purchasing power allows greater product differentiation to take place that may result in the localisation of the product/service. As FDI is a long-term commitment, naturally, a promising future for the host country attracts MNCs to invest.

Similar determinants under the market-seeking category also exist for services FDI. Raff and von der Ruhr (2001) find that producer services tend to be located in areas with a large customer base. Since investment in some services requires large initial investments with low marginal costs, scale economies play an important role in services. In identifying the determinants of FDI in banking, insurance and advertising services, market size and market potential tend

³ In a study on FDI restrictions among the OECD countries, Golub (2003) found that while industries like restaurants, hotels, construction and business services are fairly open, the level of restriction rises considerably in the transportation, telecommunication and electricity industries.

to significantly contribute to FDI inflow (Terpstra and Yu, 1988; Moshirian, 1997, 2001; Buch and Lipponer, 2004). Nigh et al. (1986), however, find no significant relationship between local market opportunity and US branch banking involvement in foreign countries. They conclude that serving the needs of US-based MNCs is a more compelling reason for US banks to move abroad. Based on previous industry-level studies, we propose that:

Proposition 1: *Market size and growth potential are significant determinants of both manufacturing and services FDI inflows.*

In this study, we consider two measures of the domestic market that influence inward FDI, namely, GDP and GDP growth.

MNCs that are resource seeking tend to locate their investments in countries which are able to provide them with relatively cheap and abundant productive scarce resources. Although historically, natural resources have been the most important reason for FDI, by the 1990s, the proportion of outflows from major OECD countries in search of natural resources had decreased to below 5 per cent (UNCTAD, 1998). In a study on inward FDI in Canada, for instance, Hejazi and Pauly (2003) found that natural resources played a decreasing role as an attractive feature. As resource-seeking motivations are minor and since this paper focuses on the comparison between manufacturing and services FDI, we shall ignore this motivation for FDI.

Efficiency-seeking FDI tends to locate itself in countries that provide cost advantages. Lall et al. (2003), in a study on the determinants of FDI among the Caribbean countries, found that having relatively lower local costs provides an environment that is conducive to FDI both in the long and short run. Based on Hymer's (1960) hypothesis that MNCs operate in an oligopolistic market structure where competition is intense, locating production and service operations at lower-cost locations may provide the firm with the advantage it needs. Thus,

Proposition 2: *Manufacturing and services FDI are attracted to locations that offer a lower cost of doing business.*

An important determinant that motivates efficiency-seeking manufacturing FDI is differences in labour cost between home and host country (Love and Lage-Hidalgo, 2000; Yang et al., 2000; Thomas and Grosse, 2001; Sethi et al., 2003). Low wage rates in host countries should attract FDI, especially from those MNCs that are seeking greater efficiency in producing labour-intensive goods. This is corroborated with empirical evidence. Love and Lage-Hidalgo (2000) found a positive relationship between the wage differential between Mexico and the US and FDI inflows to Mexico. Using a multilateral panel approach, Bevan and Estrin (2004) found a negative relationship between wage

rates and FDI inflows among the European transition countries. Thomas and Grosse (2001) concluded that a negative relationship exists but only for efficiency-seeking FDI. However, Lucas (1993) and Yang et al. (2000) found a positive relationship between increase in wage cost in the host country and FDI inflow. The explanation here is that increasing wages raise the tendency for labour to be substituted with capital, which results in an increase in FDI.

Previous literature on services FDI does not emphasise labour cost as an important determinant, except Moshirian (1997) who found a non-significant relationship. It is thus possible to conclude that cost of capital might be a more important factor (Moshirian, 2001). However, the emergence of services outsourcing could bring labour costs back into the limelight. In a survey by A. T. Kearney, India, China and Malaysia took the top three spots in the off-shore location attractiveness index 2004 primarily due to their low compensation costs (A. T. Kearney, 2004). Therefore:

Proposition 2a: *Cost of labour is a significant determinant of FDI, be it manufacturing or services. There is a negative relationship between host country wages and FDI inflow.*

Labour compensation per unit of output among the OECD countries is used to measure labour cost in this study.

The cost of capital, interest rates, is yet another cost component that could influence the flow of FDI. Petrochilas (1989) and Zhao (2003) found a negative relationship between the discount rate and FDI inflow in Greece and China, respectively. A high discount rate reflects a higher cost of borrowing in the host country relative to the cost in the home country. Given that a large amount of funds could be raised from the financial system of host countries, a high interest rate could negatively influence the extent of FDI inflow. In considering the determinants of FDI in insurance services in the US, Moshirian (1997) finds a negative relationship between long-term interest rates (proxied by real government bond yield corrected for corporate tax) and FDI inflow. In this study, we also use long-term interest rates – that is, the average bond yield of different maturities corrected for corporate tax – as a proxy for measuring the average cost of borrowing for companies (see Kim and In, 2007). We expect a negative relationship with FDI inflow. We propose that:

Proposition 2b: *A higher cost of capital in the host country deters both services and manufacturing FDI inflow. Thus, a negative relationship is expected between FDI inflows and long-term interest rates.*

A lower cost of doing business in a foreign location does not only occur due to low wages or low cost of capital. Availability of skilled labour and a reliable

infrastructural system are equally important in attracting efficiency-seeking FDI. Marketing, manufacturing, R&D, finance and administrative activities require capable people. The availability of skilled labour allows MNCs to strengthen the ownership advantage they possess and adapt these to the local environment using local talents. This would allow them to expand their market, not only in the host country but the region as well. Among developing countries in particular, reliance on low wages and low skills might be detrimental in attracting FDI into higher value-added industries (Noorbakhsh et al., 2001). Dunning (1980), Kumar (1987), Cheng and Kwan (2000), Noorbakhsh et al. (2001) and Kyrkilis and Pantelidis (2003) found a positive relationship between various measures of education levels (which act as proxies for skilled labour) and FDI inflow. Although previous studies in services FDI have not considered skilled labour as an important determinant, one cannot deny its role. Capable people are required to deal with customers in areas such as banking, insurance, law, accounting and tourism. The ability to exploit knowledge (Williams, 1997) and capitalise on personal contact (Casson, 1990) is critical in the services sector. Hence, the need to include a skilled labour variable in our equation is imperative. We use the number of secondary school enrolment as a proportion of population as an indicator of labour quality. Given the above, we propose that:

Proposition 2c: *A larger pool of skilled labour would attract greater amounts of manufacturing and services FDI.*

A reliable infrastructural system needs to be in place to allow the movement of input/output from source to plant to port. Several studies have found a significant positive relationship between the level of infrastructure and inward FDI. These include Coughlin et al. (1991), Cheng and Kwan (2000), Zhao and Zhu (2000) and Lall et al. (2003). We consider this variable to be important in the case of FDI in services, particularly with the emergence of the services outsourcing industry. Following the approach in Gwartney et al. (2002) and Li (2004) we created a composite measure of infrastructure comprising electricity supply per capita, number of telephones per 1,000 people and road mileage per capita. The three components were mean standardised and equally weighted. Our proposition is:

Proposition 2d: *Host locations which have established infrastructural systems tend to attract a greater amount of both manufacturing and services FDI.*

Finally, under the efficiency-seeking FDI category, foreign capital will tend to flow into countries which are more open to international trade. Since a large

portion of investment is trade related – either involving exporting the output or importing input components – a country that has fewer restrictions on international trading activities, would be more attractive (Pistoresi, 2000; Chakrabarti, 2001). In services FDI, the extent of bilateral trade turns out to be a significant determinant, particularly in financial services (Gray and Gray, 1981; Nigh et al., 1986; Moshirian, 2001; Buch and Lipponer, 2004). Gage and Leshner (2005) further show that as a result of fragmentation of production processes and the concentration of multinationals in their core competencies, trade in services is becoming more popular. This degree of openness to trade could also measure the national regulatory patterns and controls that exist in host countries (Li and Guisinger, 1992). Hence we propose that:

Proposition 2e: *The degree of international openness is a significant determinant of FDI inflows. The larger the degree of openness, the lower the degree of restrictions imposed by the host location on international trade, thus the lower the cost of doing business. A positive relationship between the degree of openness and FDI inflow is expected.*

In this study, we use the proportion of sectoral trade to GDP to measure the extent of restrictions in the respective countries. In particular, for the manufacturing FDI model, we use the proportion of manufactured exports and imports as a proportion of GDP while in the case of services FDI, the proportion of services trade has been used instead.

There are strategic reasons for engaging in FDI. In certain cases, FDI could be seen as an extension of exporting activities (Vernon, 1966). FDI may flow into a country not for its own market nor to capture the locational advantage of the country *per se*, but rather to use it as a springboard into other countries in the region. Investment could also flow purely to follow competitors or to follow clients. This is referred to as the agglomeration effect (Mallampally and Sauvart, 1999). In the US, for example, it has been found that MNCs tend to base their location decisions on the actions of previous foreign investors (Kotabe, 1993; Wilkinson and Brouthers, 2000). In services FDI, the strategic intent has been dealt with extensively. UNCTAD (1989) states that the most important factor determining whether a foreign service producer can compete with local firms depends on the quality of service. However, it is difficult to ascertain the quality of service at the point of purchase. Customers may prefer to use services provided by incumbent firms, although MNCs may promise higher quality service. Under such circumstances, it would be better for an MNC to follow downstream firms from one's own country, as these firms may be more familiar with the MNC provider. It was found that 'the stock of producer service FDI in equilibrium increases more quickly with local market size if the ratio of downstream investors from the service firm's home country

to all potential customers exceed a critical level' (Raff and von der Ruhr, 2001, p. 3). Nigh et al. (1986) and Moshirian (2001) found a positive relationship between FDI in non-finance activities and FDI in banking leading them to conclude that these two categories of FDI are complementary in nature. Similar results were found in the case of advertising firms and legal services (Terpstra and Yu, 1988; Cullen-Mandikos and MacPherson, 2002). The benefit of following existing home country customers is that a pool of customers can be created easily to showcase the quality of service with the intention of attracting host country clients (Li and Guisinger, 1992). We evaluate the strategic intent of international firms by considering previous year's FDI. In particular, we include manufacturing FDI in $t - 1$ in the manufacturing FDI equation to examine the agglomeration effect. For the services FDI equation, we include previous year's manufacturing FDI as an independent variable to check for the complementary nature of services and manufacturing FDI. Furthermore, services FDI in $t - 1$ is also included as an additional variable to evaluate if the agglomeration effect is also present in services FDI. Given the strategic reasons for engaging in FDI, we propose:

Proposition 3: *Servicing home-based customers in host countries is an important reason for services FDI inflow. Thus, services FDI is strategic in nature because it tends to follow manufacturing FDI. Furthermore, both services and manufacturing FDI are subject to the agglomeration effect in that FDI attracts FDI.*

Several other determinants also influence inward FDI irrespective of the four motives described above. These include cultural distance and geographic proximity which may be more appropriate in studies that consider inward investment from particular countries. In our study, we concentrate on general risk factors like political and economic risks that affect the choice of investment locations. Jensen (2003) states that political risks could come from various sources like nationalisation and expropriation of revenue streams of the MNC. Changes in policies dealing with tax rates, depreciation schedules, tariff rates, capital controls and exchange rates for instance, pose a direct risk on multinationals. Habib and Zurawicki (2002) further examine the effect of corruption on FDI and find a significant negative relationship. In this study we use a risk index built by International Country Risk Guide (ICRG), which is a composite of political, economic and financial risks.⁴ The higher the ICRG's risk index,

⁴ ICRG's website claims that its ratings have been used by the International Monetary Fund (IMF), the World Bank and the United Nations. In a recent article in this journal, Click (2005) utilises the ICRG as a proxy for risk rating.

the lower the risk factor. Thus we expect a positive relationship between risk index and FDI inflows and we propose:

Proposition 4: *Since the inflow of manufacturing and services FDI is guided by the degree of risks in host locations, a lower risk factor attracts larger amount of FDI.*

The aforementioned arguments and propositions guide us to identify the determinants of FDI for both manufacturing and service sectors. Although one may expect that the lists of determinants are similar for the two sectors in general, given the differences between manufacturing and service operations, the orders of importance among the significant factors are expected to be different. The following sections provide empirical evidence that tests the propositions proposed.

4. THE EMPIRICAL DATA AND MODEL

Data for the empirical analysis used in this study are yearly observations of OECD countries. As some selected data sources report Belgium and Luxembourg as a single entity, we had to exclude both countries from our analysis. Further, Hungary and the Slovak Republic reported fewer than five data points over the specified time period and had to be excluded as well. Since the time period for the analysis was between 1980 and 2003, this is effectively a longitudinal study.

The effects of past FDI on the present FDI are considered under the strategic asset-seeking motive in the present study. In order to test the presence of these effects, the dynamics are included. However, the inclusion of dynamics in a panel data model disallows consistent estimations by using the usual estimators (e.g. ordinary least squares, fixed effects, random effects). In such cases, generalised method of moments (GMM) estimators proposed by Arellano and Bover (1995) are feasible and can be used to obtain consistent parameter estimates in a wide range of microeconomic applications. Given the earlier discussion, the following dynamic panel data models are fitted to guide the rest of the analysis.

Model 1:

$$mFDI_{it} = \beta_0 mFDI_{it-1} + \beta_1 GDP_{it} + \beta_2 GDPG_{it} + \beta_3 mOPEN_{it} + \beta_4 LAB_{it} \\ + \beta_5 EDU_{it} + \beta_6 INFRA_{it} + \beta_7 RISK_{it} + \beta_8 NRATE_{it} + (m\eta_i + m\varepsilon_{i,t}).$$

Model 2:

$$\begin{aligned} sFDI_{it} = & \beta_9 sFDI_{it-1} + \beta_{10} mFDI_{it-1} + \beta_{11} GDP_{it} + \beta_{12} GDPG_{it} + \beta_{13} sOPEN_{it} \\ & + \beta_{14} LAB_{it} + \beta_{15} EDU_{it} + \beta_{16} INFRA_{it} + \beta_{17} RISK_{it} + \beta_{18} NRATE_{it} \\ & + (s\eta_i + s\varepsilon_{i,t}), \end{aligned}$$

where $i = 1, 2, \dots, N$ (countries) and $t = 1, 2, \dots, T$ (time periods); $m\eta_i$ and $s\eta_i$ denote a fixed effect and $m\varepsilon_{i,t}$ and $s\varepsilon_{i,t}$ denote a random disturbance of the corresponding equation, respectively. The rest of the variables in the equations are described in Table 2.

For dynamic panel data models like the above, in which the lagged dependent variable is included as a predictor, there is persistence through the fixed effect and partially through the lagged dependent variable. As the persistent error terms are correlated with the lagged dependent variable through the fixed effects, the within-group estimator (for the fixed effects models) and the GLS estimator (for the random effects model) may be inapplicable and could lead to inconsistent estimations (see Hsiao, 1986, for details). Given such technical difficulties, the GMM estimator with orthogonal deviations suggested by Arellano and Bover (1995) is used to estimate Models 1 and 2. With greater numbers of moment conditions, the method is able to handle some missing data and could attain gains in efficiency as long as there are three or four periods of data (Greene, 2002). The estimations are reported in Table 3.

5. RESULTS OF ANALYSIS AND DISCUSSION

The results of estimation for the sample OECD countries are shown for both models – Model 1 with manufacturing FDI and Model 2 with services FDI as dependent variables, respectively (Table 3).⁵ To confirm correct model specification, we used the Sargan tests, which did not reject the null hypothesis of validity of the over-identifying restrictions. The coefficients of the lagged dependent variables were both found to be greater than zero, providing some rough intuition that the fitted model is stable. While there is no established procedure known to the authors to examine the vigour of the estimations in dynamic panel data models, the robustness of the fitted coefficients were checked by re-estimating the models with some panels dropped. However, we did not observe any unusually large deviations from the results reported earlier

⁵ A dynamic panel data model is said to be correctly specified if it satisfies the following conditions: it does not reject the null hypothesis of the validity of instruments; it rejects the null hypothesis of no first-order serial correlation in the differenced residuals; it does not reject the null hypothesis of no second-order serial correlation in the differenced residuals (see Doornik and Hendry, 2001, p. 69). The two estimated models fit all of these three criteria.

TABLE 2
Variables – Description and Sources

<i>Variables</i>	<i>Types</i>	<i>Descriptions</i>	<i>Proxy for/Actual Measure</i>	<i>Sources</i>
$mFDI_t$	Dependent Variable	Inward manufacturing FDI flows	Actual Measure	1
$SFDI_t$		Inward service FDI flows	Actual Measure	
$mFDI_{t-1}$	Strategic Asset Seeking	Lagged inward manufacturing FDI flow	Actual Measure	
$SFDI_{t-1}$		Lagged inward service FDI flow	Actual Measure	
$RISK_t$		A composite risk index comprising political, economic and financial risks. The larger the index, the lower the risk it represents and vice versa	Proxy for risk levels	5
$mOPEN_t$		Manufacturing trade to GDP ratio	Proxy for trade openness of the manufacturing sector	2
$sOPEN_t$		Services trade to GDP ratio	Proxy for trade openness of the service sector	
GDP_t	Market Seeking	Gross domestic product	Actual Measure	
$GDPG_t$		The annual real growth of gross domestic product	Actual Measure	
LAB_t	Efficiency Seeking	The unit labour cost which is defined as labour compensation (including wages, salaries employers' contributions to social security and pension schemes) per unit of output produced	Proxy for cost of labour	3
EDU_t		The secondary education enrolment to population ratio	Proxy for a country's education levels and, thus, labour quality	2
$INFRA_t$		An equally weighted composite index of electricity supply per capita, number of telephones 1,000 per capita and road mileage per capita	Proxy for the levels of infrastructure	6
$NRATE_t$		Long-term interest rate	Proxy for cost of capital/borrowing	2

Sources:

1. OECD International Direct Investment Statistics Database.
2. OECD Statistics v3.0 (<http://stats.oecd.org/wbos/default.aspx>).
3. United Nations Common Database.
4. Key Indicators of the Labour Market Database compiled by the International Labour Organization.
5. *International Country Risk Guide*.
6. World Bank's *World Development Indicators*.

TABLE 3
Results of Analysis

	Model 1: Manufacturing FDI					Model 2: Services FDI				
	Variable	Coefficient	Std. Error	t-Statistic	p-Value	Variable	Coefficient	Std. Error	t-Statistic	p-Value
Strategic Asset Seeking	$mFDI_{t-1}$	2.86E-01	2.26E-02	12.647	(0.000)	$sFDI_{t-1}$	5.79E-01	4.90E-02	11.820	(0.000)
	$mOPEN_t$	1.12E+08	3.83E+07	2.912	(0.004)	$mFDI_{t-1}$	1.24E+00	8.01E-03	154.330	(0.000)
	$RISK_t$	3.33E+07	1.27E+07	2.628	(0.010)	$sOPEN_t$	1.31E+11	1.30E+10	10.129	(0.000)
	GDP_t	1.41E-02	5.95E-04	23.760	(0.000)	$RISK_t$	8.86E+07	8.64E+06	10.256	(0.000)
Market Seeking	$GDPG_t$	1.45E+08	8.23E+07	1.764	(0.080)	GDP_t	3.21E-03	1.12E-03	2.875	(0.005)
	EDU_t	3.79E+10	6.83E+09	5.547	(0.000)	$GDPG_t$	1.74E+08	6.19E+07	2.812	(0.006)
Efficiency Seeking	LAB_t	-2.78E+09	1.14E+09	-2.429	(0.017)	EDU_t	5.88E+10	1.47E+10	3.993	(0.000)
	$NRATE_t$	-2.87E+08	5.97E+07	-4.811	(0.000)	LAB_t	-2.98E+09	1.42E+09	-2.092	(0.039)
	$INFRA_t$	2.36E+08	9.21E+07	2.567	(0.012)	$NRATE_t$	-2.30E+08	7.94E+07	-2.895	(0.005)
						$INFRA_t$	1.68E+08	1.00E+08	1.677	(0.096)
$R^2 = 59.3\%$ $AR(1) = -7.69$ (0.00); $AR(2) = 1.31$ (0.19) Sargan test = 11.17 (0.47)										
$R^2 = 68.9\%$ $AR(1) = -5.63$ (0.00); $AR(2) = 0.35$ (0.72) Sargan test = 13.04 (0.37)										

Note:

In Model 1, the total unbalanced panel observations is 232 and $N = 23$; in Model 2, the total unbalanced panel observations is 226 and $N = 22$. Values in parentheses are the corresponding p -values to the test statistics.

in Table 3. It should be noted that the two models were estimated separately since in Model 1, $sFDI_{it}$ does not appear as an independent variable.

Both fitted equations yielded a reasonable fit, as indicated by the size of the R^2 's. In Model 1, the selected nine independent variables explain 59.3 per cent in variations of the dependent variable. All selected independent variables were found to be significant at least at the 10 per cent significance level. In Model 2, the selected 10 independent variables explain 68.9 per cent in variations of inward service FDI. Again, all selected independent variables were found to be significant at least at the 10 per cent significance level.

Our results confirm all four propositions posited above. The two variables used to examine the market-seeking nature of inward FDI produces significant results for the first model. Our analysis finds that GDP and GDP growth are positively related to inward manufacturing investment, concurring with other similar studies (Pistoresi, 2000; Globerman and Shapiro, 2002; Lall et al., 2003, and others). Countries with a large market base that show potential for further growth are preferred by investors. As for services FDI, the market size and growth are also important, as our results are positive and significant. This concurs with previous studies on particular industries within the services sector like banking (Buch and Lipponer, 2004) and advertising (Terpstra and Yu, 1988). Thus, Proposition 1 is accepted.

The variables under the efficiency-seeking category are also well behaved and in line with previous studies. The cost of labour (*LAB*) is negative and significant, indicating that countries with higher wages tend to attract less FDI, in line with Proposition 2a. On the other hand, countries that are able to provide a larger pool of capable human resources (*EDU*) tend to be favoured by investors. This finding appears in both our models, indicating an acceptance of Proposition 2c. Our results show the demanding nature of inward FDI, in that a relatively qualified labour force at a reasonable price is expected. Our results for the services sector is different compared to those of Moshirian (1997) who could not validate the labour cost argument for the insurance sector in the US. The services sector is mainly a labour-intensive industry and hence low labour cost becomes a determining factor for profitability. However, the quality of labour that is required – whether as banking officers or call centre executives – deserves equal attention.

We are also able to confirm proposition 2b. The cost of capital (*NRATE*), represented in the models by long-term interest rates, is negative and significant for *both* the manufacturing and services FDI equations. Thus, the cost of capital in host locations plays a significant role in attracting FDI. This further implies that MNCs rely on the host country's financial systems to raise the capital that is required for the investment. Our results are also in line with other FDI studies as far as infrastructure (*INFRA*) is concerned (Coughlin et al., 1991; Loree and Guisinger, 1995; Zhou et al., 2002). Confirming Proposition 2d, our results show a positive and significant result proving that countries that

have an established infrastructure would attract greater amounts of FDI, both in services and manufacturing. Lall et al. (2003) go further to explain that physical infrastructure attracts FDI particularly in the long run. The services sector, in particular, relies on the infrastructural networks in the host country to serve its customers at home and abroad. The need for an efficient transportation and communication system is a necessary condition to attract services FDI.

Finally, we accept Proposition 2e in that the degree of openness (*OPEN*) is positive and significant for both manufacturing and services FDI. The extent to which a country allows free movement of goods and services determines the level of inward FDI. Our findings indicate that countries that have opened their borders more recently for services FDI inflow, either through privatisation or acquisition, will need to show a continuous degree of liberalisation if they expect to attract more investment. Furthermore, since services FDI is more related to international services trade (for example, through tourism), the degree of openness is crucial. Similar results have been recorded by Gray and Gray (1981), Nigh et al. (1986) and Moshirian (2001).

Strategic reasons for attracting FDI are among the most robust results we find in our models. For manufacturing FDI, the lagged FDI variable [$mFDI_{t-1}$] produces a significant positive coefficient, thus supporting the agglomeration effect. Previous inflow of FDI by other MNCs provides an assurance for current investors of their decisions in terms of availability of resources, profitability and stability of the business and economic environment of the host country (Sethi et al., 2003). The positive results could also indicate that MNCs tend to follow their competitors, afraid that they might lose market shares and competitive advantage in host countries. Similar explanation could be offered in the services FDI model where a positive significant coefficient appears for previous year's FDI in services ($sFDI_{t-1}$). Our services FDI model also provides strong empirical support for the complementarity between services FDI and manufacturing FDI [$mFDI_{t-1}$] argument (Terpstra and Yu, 1988; Raff and von de Ruhr, 2001, and others). While Li and Guisinger (1992) were unable to find significant results for this finding, they concluded that the shift in the target market of services FDI from home country clients to host country clients had already taken place among the Triad countries in the 1980s. The inclusion of non-Triad economies in our sample clearly shows that servicing home country clients is still an important determinant of inward FDI in services. In accepting Proposition 3, one should note that in our model, we have used total services FDI as our dependent variable. Services FDI, as categorised by GATS, need not always be manufacturing related. However, given that the three largest components of services FDI – trade, finance and business services – could be manufacturing related, our findings that services FDI and manufacturing FDI are complementary is plausible.

Finally, we accept Proposition 4 since in both the services and manufacturing FDI models, the *RISK* factor is positive and significant pointing to the attraction of FDI to countries that portray a lower risk level. Obviously, higher risk levels increase the cost of doing business in a country and discourage FDI. Our results tend to support the findings of other related studies like Habib and Zurawicki (2002) and Jensen (2003).

Absolute beta weights (standardised coefficients) as shown in Table 4 are used to compare the relative importance of the selected determinants that affect FDI in services on the one hand, and FDI manufacturing on the other. One must note that standardised coefficients must be interpreted with caution. Given that the beta weights indicate 'relative' importance among variables in the corresponding equation, and a zero beta weight does not mean the corresponding variable has no impact on the dependent variable, a direct comparison between manufacturing and services may not be appropriate here. We highlight five points from the rankings of determinants using the beta weights.

First, for manufacturing FDI, market size is the most important determinant relative to other factors. If there is a trade-off between market size and market growth, manufacturing investors would prefer market size. However, for services FDI, market-seeking factors are relatively less important, ranking fifth and tenth in the list.

Second, for *sFDI*, as described earlier in this paper, strategic reasons are critical for foreign investment. On the one hand, *sFDI* complements *mFDI*, while, on the other hand, it is attracted by other similar services FDI. Strategic reasons are also relatively important for manufacturing FDI as *mFDI*_{*t*-1} ranks highly in our beta coefficients.

Third, the quality of labour is relatively more important than mere cheap labour. In both models, the labour quality proxy is ranked higher than the

TABLE 4
Standardised Beta Coefficients

<i>Manufacturing FDI</i>			<i>Services FDI</i>		
<i>Variable</i>	<i>Relative Importance</i>	<i>Rank</i>	<i>Variable</i>	<i>Relative Importance</i>	<i>Rank</i>
<i>GDP_t</i>	0.933	1	<i>mFDI_{t-1}</i>	0.700	1
<i>EDU_t</i>	0.562	2	<i>sFDI_{t-1}</i>	0.579	2
<i>mFDI_{t-1}</i>	0.286	3	<i>EDU_t</i>	0.493	3
<i>INFRA_t</i>	0.262	4	<i>sOPEN_t</i>	0.491	4
<i>mOPEN_t</i>	0.206	5	<i>GDP_t</i>	0.262	5
<i>NRATE_t</i>	0.193	6	<i>INFRA_t</i>	0.097	6
<i>LAB_t</i>	0.057	7	<i>NRATE_t</i>	0.068	7
<i>RISK_t</i>	0.042	8	<i>RISK_t</i>	0.064	8
<i>GDPG_t</i>	0.041	9	<i>LAB_t</i>	0.034	9
			<i>GDPG_t</i>	0.024	10

labour cost proxy. The implication to policymakers is clear: both labour cost and labour quality are significant factors that attract foreign investors into the OECD countries. However, if there is a trade-off, investors prefer labour quality. Thus, an emphasis on education and training will attract greater FDI inflow compared to promotion based on low wages.

Fourth, interestingly for *sFDI*, infrastructure is not highly ranked. This may imply that basic infrastructure is a sufficient attraction for service-based MNCs. In other words, infrastructure is an order qualifier criterion rather than an order winner criterion. In comparing China and India, for example, Khanna (2004) explains how the latter is able to attract services FDI despite having deplorable infrastructure. The soft infrastructure, particularly people skills, becomes relatively more critical.

Finally, risk factors emerge low on the list for both FDI. Given that our sample comprises the OECD countries, many of which are known for their political and economic stability, the results may not be surprising. However, this may not be true for the case when one considers a larger number of developing countries. The liberalisation of financial markets in such countries for example, has taken place only over the last two decades. The reversal of policies as a result of political and social changes is not uncommon, and thus poses risks on foreign investment.

Although the models presented above yielded high levels in the goodness of fit, some extensions may be worth considering. We attempted to include a time dummy to represent the peak in FDI inflow experienced by many of the OECD countries during the period 1999–2003. We found the dummy to be neither statistically insignificant nor did it improve the overall fit of the model.

Having identified the determinants of FDI inflow, we further attempted to test if the impact each individual variable makes on the two types of FDI were similar. We re-estimated Model 2 but excluded $mFDI_{t-1}$ so that Model 1 and the newly estimated Model 2 both contained an identical set of independent

TABLE 5
Wald Test Statistics

<i>Coefficients</i>	<i>Wald Test Statistics</i>	<i>p-Values</i>
$INFRA_t$	0.459	(0.499)
EDU_t	2.020	(0.157)
LAB_t	16.366	(0.001)
$GDPG_t$	26.591	(0.000)
$NRATE_t$	42.377	(0.000)
$OPEN_t$	102.423	(0.000)
$RISK_t$	198.933	(0.000)
GDP_t	241.157	(0.000)

variables. This allowed us to test the coefficients of independent variables across the two models. The Wald test statistics are reported in Table 5. Our results suggest that the magnitude of impact by labour quality and infrastructure development is similar on both types of FDI, while a significant difference exists for other variables. This implies that labour quality and infrastructure development are equally important for both services and manufacturing FDI and no country can afford to ignore these determinants.

6. CONCLUSION

Recent revelations on the importance of FDI in services by the United Nations has prompted this study. The decline in FDI levels worldwide, the opening up of the services sector in more countries and the shift in the pattern of services FDI – all point to the need to reconsider the determinants of cross-border investments. In particular, countries need to reassess if the determinants that were instrumental in attracting manufacturing FDI would be as effective in the new environment. This study examines and compares the determinants of inward FDI in the manufacturing and services sectors.

All our selected variables in the market-seeking, efficiency-seeking and strategic reasons categories were significant. Based on this finding, we concur with Dunning and McQueen (1982), Boddewyn et al. (1986) and Williams (1997) that the existing theories of FDI are sufficient to explain the determinants of services FDI. We conclude that manufacturing FDI is the single most important determinant of services FDI. Although this finding may not be novel as similar results have appeared in other industry-specific studies, our results provide empirical support at the aggregate services FDI level. It implies that policy-makers, by strengthening their location-specific advantages to attract manufacturing FDI, would receive a bonus by receiving services FDI as well. Market and efficiency reasons are significant, although these are more prominent for manufacturing FDI than services FDI. The implication is important to economies that compete in the tournament to attract FDI. For the efficiency-seeking FDI, labour quality is of particular importance for services FDI and hence investing in education and training is crucial. The attraction of low-cost labour alone is insufficient in this new environment.

Our findings are based on data collected among the OECD countries. Whether our findings are also applicable among many developing countries, particularly in Asia and Latin America, would be well worth researching. As this study does not take into account important developing recipients of FDI, i.e. China, India and Malaysia, an extension to this study is proposed. Finally, similar studies using data at the sub-sector level, e.g. finance, trade and business services, to identify and compare significant determinants would be

useful for countries that intend to focus their attention on industry-specific FDI. The effects of services privatisation could be captured more directly when proxies are used at the industry level. Similarly, the effects of changes in industrial policies and technological innovations could also be considered in future research.

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