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Abstract

There is increasing growth in export platform foreign direct investment (EPFDI) globally, reflecting both the international fragmentation of production associated with globalisation and the adoption of policies to promote this type of investment as part of the "export led growth" strategies of developing economies. This paper explores the relationship between multinational enterprises (MNEs) and local enterprises (LEs) over the longterm, using data on two of the world's most active and persistent promoters of EPFDI, namely, Singapore and the Republic of Ireland. Our analysis finds evidence of a more dualistic relationship between MNEs and LEs in Ireland, as evidenced by the combination of relatively higher MNE and lower LE export ratios, and a greater and persistent disparity between MNE and LE labour productivities. In Singapore these differences are smaller and declining. We suggest that the contrast between the two countries reflects the greater success of Singapore in building globally competitive LEs and in creating linkages between MNEs and LEs.

Keywords: Export platform, FDI, Ireland, Singapore, productivity

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1. Introduction

There is increasing growth in the amount of foreign direct investment (FDI), which can be described as "export platform", i.e., where a locating multinational enterprise (MNE) exports most of its output so that the local market in the host country is of no significance to its location decision. This type of export-platform FDI (EPFDI) may have a home-country orientation (output exported back to the home country), a third-country orientation (output exported to destinations other than the home country) or a global orientation (output exported to home and third countries).[1]

The increasing importance of EPFDI reflects two distinct phenomena – the international fragmentation of production associated with globalisation/new technologies and the promotion of this type of investment by certain economies as part of their economic development strategies. The former phenomenon is particularly prevalent in the case of products that have high value-added relative to weight.[2] Many of these products are in high-tech sectors – electronics and pharmaceuticals. In such cases, transportation costs are low relative to output values and technology is such that production can be fragmented and hence benefit from differences in factor costs across economies.[3] The latter phenomenon of promoting EPFDI is most often found in countries that see their economic growth as being "export-led". Typically these are economies that seek access to international technology, have small domestic markets, and have a resource mix that makes them highly dependent on imports to provide balanced consumption possibilities.

[1] Here we follow the nomenclature in Ekholm, Forslid and Markusen (2003).
[2] Danny Quah's (1999) so called "weightless products".
[3] See Arndt and Kierzkowski (2001).

In effect, their small domestic markets provide little attraction for a potentially locating MNE. Furthermore, the lack of scale in these small domestic markets makes it difficult for local enterprises (LEs) to develop the scale necessary to become successful exporters.

Governments in some of these countries have, for several decades now, promoted their economies as international production/distribution bases for MNEs, without any emphasis on their local markets as an attraction. In such instances, little or no attempt is made to force such foreign companies to become involved in local joint ventures or even local content agreements, though in many cases linkages are facilitated with local enterprises, and joint ventures are encouraged.

In the case where countries systematically promote export platform FDI over a long period of time, a question that naturally arises is whether this policy generates a Lewis-type dualism in the economy, with little relationship/interdependence between the MNEs and the LEs and each developing according to its own pattern. Such dualism is most likely to occur when there are neither backward/forward linkages between the MNEs and the LEs nor spillovers occurring through product/factor market connections. One would expect such dualism to be reflected in differences in the types of sectors in which the MNEs and LEs are active. For example, the MNEs might operate in the modern/high-tech sectors while the LEs are active in the traditional sectors.[4] Where MNE and LE activities co-exist in the same sector, dualism would be reflected in the global perspectives of the enterprises (such as their export intensity patterns), in their productivities, and in their factor payments. For example, exceptionally high export

[4] This would accord strongly with the concept of dualism developed by Arthur Lewis (Lewis (1954)).

ratios by MNEs would suggest little interdependence with other entities within the economy, even among the cluster of MNEs.[5] The interpretation of correspondingly low export ratios by LEs is complex; they may be low because they have (a) strong sub-supply relationships with MNEs (i.e., MNE backward linkages), (b) highly profitable local domestic markets, or (c) no capacity to compete on international markets. To focus on dualism we ask whether, in sectors where MNE export ratios are high, do we find that LE export ratios are also high? In sectors where MNEs have high labour productivity, do LEs have high labour productivity also? Do MNEs and LEs pay similar wages when they operate in the same sector? And regarding any such differences – do they persist or diminish over time?

In this paper, we address the issue of dualism by looking at sectoral data for two countries that have very proactively built up their economies as export platforms for manufacturing production over the past 35 years, namely the Republic of Ireland (hereafter referred to as Ireland) and Singapore.[6] These countries were first movers in the development of export platforms and, as such, they provide an interesting study of what happens when MNEs and LEs exist side by side over time. The extent of MNE activity is evident in the fact that fifty percent of manufacturing employment in both countries is accounted for by MNEs.[7] In the case of both countries, the possibility of dualism as between MNE and LE activities has been recognised for some time. Among others,

[5] In many countries EPFDI is associated with the clusters of MNEs in the same sector.
[6] The coexistence of MNE and LE activities over the long term raises other issues, such as whether the presence of MNEs supports the development of LEs or leads to crowding out of LEs by MNEs. Consideration of such issues lies beyond the scope of the present paper.
[7] It is difficult to establish how exceptional Singapore and Ireland are as data on the employment share of MNEs are only gradually emerging as more countries are beginning to look systematically at the ownership composition of their industrial and service sectors.

Stewart (1975) noted this duality in the Irish manufacturing sector in the early 1950s, together with the lack of linkages between LEs and MNEs. More recently, Low (1993) noted that one of the potential difficulties with Singapore's strategy is that it may not be wise "to have a dualistic structure where what remains in Singapore are more likely the high technology, high value added multinational corporations (MNCs) while indigenous enterprises find themselves more compatible with other production bases and markets in ASEAN, China, Indochina and South Asia".[8]

In Section 2 of the paper we discuss briefly the theoretical and empirical literature on the relationship between trade, foreign direct investment and economic growth and in Section 3 we review the strategies that Ireland and Singapore have adopted to promote EPFDI. In Section 4 we outline the differences and similarities in the performance of the two economies over the last 40 years, by examining trends in growth, trade, employment and FDI. In Section 5 we analyse the manufacturing sectors in both countries since the early 1980s to establish whether either or both economies exhibit the type of duality that might be expected from export-focussed FDI. Specifically we look at whether LE and MNE export intensity ratios are correlated by sector, and at the differences in levels and trends of labour productivities and average wages in LEs and MNEs. Finally, Section 6 contains some concluding comments.

2. Trade, Foreign Direct Investment and Economic Growth

It is widely accepted among economists that economic growth is a complex process, which depends on many variables and the interactions between them. The 'new' growth

[8] See page 342.

theory, i.e., endogenous growth theory, has postulated several important dynamic factors, such as human capital accumulation and technological advance through research and development (R&D) activities, which can influence growth. It has also been suggested that technology diffusion plays an important role in economic development and, in this context, trade and FDI have been shown to be among the most important channels for developing countries in accessing advanced technologies.[9]

The general importance of trade in determining rates of economic growth features strongly in the endogenous growth theory literature, emanating from Romer (1986). Grossman and Helpman (1991) identify international trade in intermediate goods and capital equipment as one of the major sources of technology diffusion and hence economic growth. In a recent survey on international technology diffusion, Keller (2003) argues that the use of foreign intermediate goods in final output production can give enterprises access to new technology in embodied form. He also makes a case that trade in specialised inputs might enhance growth by facilitating learning about the products and imitation of the technologies developed in other countries.

It is also argued in the theoretical literature that economic growth can be enhanced through export-oriented policies and not surprisingly, a strategy of promoting growth through the expansion of exports has long been advocated in the policy literature. Krugman (1987) and Havyrlyshyn (1990) outline the main benefits arising from export-promoting policies as: increased real output through an increase in demand for country's output via exports, promotion of specialization in the production of export goods which

[9] See Barro (1999) for a review.

can increase the productivity level and general skill levels, and loosening of foreign exchange constraints which in turn can make it easier to import inputs and allow output expansion. According to its advocates, exports can perform as an "engine of growth" in an economy.[10] The experience of the so-called Asian Tigers (Hong Kong, Taiwan, Singapore and the Republic of Korea) is well documented in the literature as an example of export-led growth (see, e.g., World Bank, 1993).[11]

Foreign direct investment by MNEs is considered to be a major channel through which developing countries can gain access to advanced technologies, since MNEs account for a substantial part of the world's R&D investment. Findlay (1978) postulates that foreign direct investment increases the rate of technical progress in the host country through diffusion of the more advanced technology, management practices, etc. used by the foreign enterprises. Wang (1990) incorporates this idea into a model more in line with the neoclassical growth framework, and shows that FDI can increase the knowledge applied to production in host countries. Adopting the endogenous growth theory framework, Romer (1993) argues that there are important "idea gaps" between rich and poor countries and that foreign investment can ease the transfer of technological and business know-how to poorer countries. These transfers may have substantial spillover effects for the entire economy, so that foreign investment may boost the productivity of all enterprises, and not just those receiving foreign capital. During the last decade a number of macroeconomic studies, using aggregate FDI flows for a broad cross-section

[10] See Krueger (1997)
[11] Also see Giles and Williams (2000a) and (2000b) for a review of the empirical literature.

of countries on the role of foreign direct investment in stimulating economic growth has appeared. In a survey, de Mello (1997) identifies two main channels through which FDI may enhance growth. Firstly, FDI can encourage the adoption of new technology in the production process through capital spillovers and secondly, FDI may stimulate knowledge transfers, both in terms of labour training and skill acquisition and by introducing alternative management practices and better organizational arrangements. However, for such knowledge transfers to occur, there must be interdependency between MNEs and LEs.

Borensztein et. al. (1998) test for the effect of FDI on economic growth using data on 69 developing countries and find that FDI is an important vehicle for the transfer of technology, contributing to growth in larger measure than domestic investment. However they argue that the growth impact of FDI may depend on other characteristics of the developing country in which FDI takes place. For example, they find that FDI raises growth only in countries where the labour force has achieved a certain minimum level of education. By contrast, Blomstrom, Lipsey, and Zejan (1994) find no evidence that education is critical, but they argue that FDI has a positive growth-effect when the country has a relatively high per capita income. In turn, Alfaro et al. (2004) find that FDI promotes economic growth in economies with sufficiently developed financial markets, while Balasubramanyam, Salisu, and Sapsford (1996) stress that trade openness is crucial for obtaining the growth-effects of FDI. An OECD study (2002) concludes that developing countries must offer a supportive business environment and must have reached a minimum level of economic development before they can capture the growth enhancing effects of FDI.

Another strand of literature examining the impact of FDI on growth is based on micro studies at sectoral and enterprise levels. In this literature the main focus has been on the potential benefits to indigenous enterprises through spillovers with the entry and activities of MNEs in the host countries. Blomström and Kokko (1998) argue that the most important reason behind many countries' efforts to attract more foreign investment today is a desire to acquire modern technology. They and others suggest that the investments of MNCs generate important positive externalities or spillovers that enhance the productivity of indigenous enterprises in the economy. These spillovers arise because multinational companies in general bring with them some sort of enterprise-specific assets such as technological know-how and management skills. (For a review, see Dunning (1993) and Caves (1996))

There are different mechanisms through which FDI could generate positive production externalities and improve the productivity of domestic enterprises. Firstly, entry of MNEs can lead to increased competition in the host country markets and force domestic enterprises to improve their productivity. Secondly, the presence of FDI enterprises in the host economy may lead to diffusion of information on new technology and production process to the local enterprises. Thirdly, MNEs can enhance the development of LES through creating backward and forward linkages. It is argued that through backward linkages MNEs can help LEs to reduce costs by increasing the scale of production. Also through forward linkages, with cheaper intermediate products, final goods producers can decrease their cost base hence increase productivity (For a detailed analysis see

Rodriguez-Clare (1996) and Markusen and Venables (1997).[12] Finally, spillovers from MNEs to LEs can occur through labour mobility. Fosuri et. al (2001) show that local workers who get training in foreign enterprises can later join local enterprises or set up their own companies bringing with them technological, managerial or marketing knowledge that they previously acquired.

However, it is also suggested in the literature that foreign presence can reduce productivity of domestic enterprises, i.e., generate "negative productivity spillovers" especially if the foreign enterprises are producing for the local market. For example, Aitken and Harrison (1999) show that foreign entry, by disturbing the existing market equilibrium in the host country, could force domestic enterprises to reduce output and hence lower the productivity of these enterprises as their scale of production declines. If this negative productivity effect is large enough, net domestic productivity of LEs can decline despite the technology transfer from foreign enterprises.

The general approach in the literature to examining the productivity spillovers from foreign to local enterprises has been to relate the productivity of domestic enterprises to some measure of foreign presence, while controlling for industry and firm characteristics. This approach dates back to the papers by Caves (1974), Globerman (1979), and Blomström and Persson (1983), which focus on horizontal spillovers using cross-section industry level data. These early studies have found positive productivity spillovers from activities of MNEs in host countries.

[12] Rodriguez-Clare (1996) also argues that MNEs could generate a negative backward-linkage effect if they behave as enclaves, by importing all their inputs and restricting their local activities to hiring labor.

One drawback of these early studies was their use of cross section data sets at the sectoral level, which made it impossible to control for firm characteristics in different industries. Hence this initial approach has been refined and extended to use firm level panel data. Early empirical studies using firm level panel data, such as Haddad and Harrison (1993), Aitken and Harrison (1999), have found negative or no spillover effects of FDI and attribute this to market stealing or crowding out effects of FDI. Blomström et al. (1998) further argue that positive FDI spillovers are less likely in countries/industries where the gap between the technologies of domestic and foreign enterprises is large, and the absorptive capacity of LEs is low. A further explanation for the lack of evidence for spillovers from MNEs to LEs in these studies was that they only explore horizontal/intra-industry spillovers. (See Görg and Greenaway (2004) for a recent review on empirical studies in this literature.)

More recently it has been argued that if MNEs were to generate spillovers, they are more likely to be vertical rather than horizontal in nature since MNEs have the incentive to minimize technology leakages to competitors while improving the productivity of suppliers by transferring knowledge to them. Using firm level panel data for Lithuania from 1996 through 2000, Javorcik (2003) examines whether the productivity of domestic firms is correlated with the presence of multinationals in downstream sectors and finds evidence of productivity externalities from FDI taking place in upstream industries where local suppliers are in contact with MNEs. Similarly, using a panel dataset of Indonesian manufacturing establishments, Blalock and Gertler (2003) also find evidence of positive vertical externalities.

Overall, one conclusion that emerges from the empirical literature is that it is difficult to find robust evidence of positive productivity spillovers from MNEs to LEs in the same sector. In fact, many studies for developing countries have actually found evidence of negative horizontal spillovers arising from multinational activity while confirming the existence of positive spillovers from MNEs to LEs in upstream industries. The contrast between the findings of earlier cross-section and panel data studies and the later ones show the importance of interconnectivity and linkages between multinational and local enterprises for any spillovers effects to occur in the host countries. In this regard, by its nature export-platform FDI may create dualism in host countries whereby MNEs operate in enclaves, thus limiting any benefits that can flow to local enterprises through their activities.

3. EPFDI Strategies: Ireland and Singapore

In this section, we outline briefly how Ireland and Singapore have come to establish themselves as two of the world's major FDI export platforms. Though the time frames are different, the two countries have followed strikingly similar paths.

At Independence

Both Singapore and Ireland are former British colonies. A shared consequence of this colonial past is that English is spoken and many of the characteristics of United Kingdom (UK) public service prevailed in both following independence. Ireland was among the first colonies to become independent in the 20th century, separating from the UK in the

early 1920s when it obtained dominion status within the Commonwealth; it subsequently became a Republic in 1949. Prior to its independence Ireland had completely free trade within the Commonwealth and its major trading partner was the UK. Its exports to the UK were primarily agricultural produce and its imports were industrial goods and coal. Given its climate and land availability, Ireland operated like a region of the UK, supplying food to feed the much larger and more densely populated neighbouring island. At independence, the agricultural sector accounted for 54 per cent of all employment in Ireland, and over 80 per cent of its exports.

Singapore was among the earliest of the countries that received independence in the late 1950s / early 1960s. Prior to independence, Singapore operated as a major port and military base for the British Empire in Asia. In the interests of developing it as a major centre, the British operated the colony as a free trade island, and built a centre that was attractive for entrepôt trade because of the absence of tariffs and quotas. By contrast with Ireland, Singapore did not have an agricultural sector of any significance at independence.

Protectionist Trade Policy

Free trade with the UK continued for almost a decade following Irish independence but came to a sudden and dramatic end when political disagreement between the two countries resulted in very high rates of tariffs being levied on goods traded between the two countries. [13] Tariffs were imposed in 1932 and remained at exceptionally high levels

[13] See McAleese (1971)

until the 1960s.[14] Part of the reason for this lengthy period of protection was a belief in the "infant industry argument" – the idea that if Ireland was to build up an industrial sector, this sector needed protection at its fledgling stage.[15] An indigenous manufacturing sector did develop behind the tariff walls,[16] though this sector became stagnant and X-inefficient as the years of protection continued into the 1950s. Part of the problem, over and above the tariffs leading to rent-seeking behaviour on the part of indigenous industry, was that the local market was too small to realise the economies of scale that were possible with the new technologies of the post-war period. A further unique aspect of Irish policy was that, at the time protection was introduced, the government enacted the *Control of Manufacturers Acts*, which ensured that it was not possible for new foreign-owned companies to establish behind Ireland's protective tariffs. This had the effect of reducing competition behind the tariff barriers, so that Ireland's price and cost structures were very high. Thus the foreign-owned sector in the early 1960s comprised mainly UK enterprises that had established before independence, and consequently this sector had few of the characteristics we normally associate with FDI investments. There was little enthusiasm in government to remove tariffs because of the potential loss of revenue, the risk to the balance of payments of a flood of imports, and the possibility of increased unemployment as sectoral adjustment occurred.

[14] In the context of the world recession following the Wall Street crash in 1929, the decision to impose tariffs was not unique – but what became unique about Ireland in a European context was that these tariffs last so long.
[15] See Haughton (1995)
[16] Industrial output rose by forty percent between 1931 and 1936. See Haughton (1995)

Singapore also adopted protectionist policies at the time it became independent – in line with the prevailing policy orthodoxy for newly independent developing countries.[17] It provided protection to its "pioneer industries" and began to encourage FDI to flow into those industries, which again was a common strategy in most developing countries. However, in contrast with many developing countries and with Ireland, Singapore's protectionist period lasted little more than half a decade. Once the possibility of a Malaysian Federation disappeared, the government realised quickly that an economy with a small local market would not be large enough to provide the scale necessary for an import substitution growth strategy. By the mid-1960s Singapore had introduced export-promotion strategies, which were based on attracting FDI into industries that would employ low-cost labour and make full use of the port and network facilities established during the British colonial period. As the second most developed country in Asia (after Japan) in the 1960s, and without the huge agrarian populations of other developing countries to manage, Singapore was in a unique position to benefit from this strategy.

Outward Trade and FDI Policies

By contrast with Singapore's swift change of strategy, the change in Ireland from a protectionist, anti-FDI strategy to an export-led growth, pro-FDI strategy took place over 15-20 years. While major balance of payments crises and massive outward migration in the mid 1950s led to a realisation that protectionism could not achieve growth, the philosophy of "self-sufficiency" was deeply engrained in the political system. Furthermore, the *Control of Manufactures Acts* were still in place. The transition from protectionism to free trade occurred in a series of slow but steady steps. Starting in the

[17] See Hughes (1995).

early 1950s, policies were introduced to provide capital grants to newly-establishing export-orientated plants which located in the depressed areas of the country; these were areas where the decline in agriculture had led to the highest levels of unemployment and emigration. Gradually these capital grants became available to exporting plants throughout the country but at lower rates than applied in the more depressed areas. Rather than beginning the process of tariff reduction, very generous tax holidays were given from the mid-1950s onwards to profits associated with incremental exports in order to reduce the anti-export bias implicit in the tariff policy.[18] As a separate policy, the *Control of Manufactures Acts* were repealed in the late 1950s and early 1960s, on the basis that they were no longer necessary or appropriate. The new foreign enterprises that established were eligible for the same financial and fiscal incentives as indigenous enterprises, i.e., they received capital grants and tax holidays as long as they exported all of their output. Not surprisingly, this policy led to the location of FDI in Ireland that was completely export-driven in its orientation. A strong political and social consensus has underpinned the content and implementation of this development strategy, with the Industrial Development Authority (IDA) as a "one-stop shop" type agency assisting enterprises in making investment decisions.

Singapore used very similar types of incentives to encourage FDI plants to locate with an export-orientation, even ahead of the abolition of its protectionist strategy. As in the case of Ireland, it took a proactive approach, with the Economic Development Board (EDB) playing a role similar to that of the IDA in Ireland. Policy towards FDI has been

[18] This tax break was intended to encourage existing producers to switch from rent-seeking behaviour behind tariff walls to seeking out new markets and hence generating the scale of production required for survival.

consistently positive since the early 1960s and this has been possible since there has been only one party in power since then – the People's Action Party (PAP). Indeed, since the mid-1970s, the broad trade and FDI policies of the two economies have been very similar, as have the industrial policies, which have consistently promoted high-tech, high value-added sectors. In particular, both countries have promoted the electronics sector, as will be discussed further in Section 5. A final strong similarity between the two countries in recent times is the use of macro management policies to support the industrial development strategy. In both countries the labour market is managed in a rather centralised way - in Ireland it rests on social partnership agreements between the government, employers and unions while in Singapore similar tripartite arrangements are underpinned by the single-party political system. A consequence of this is that wage rate volatility in both countries is managed in a centralised system. [19]

There are some significant differences between the two economies. Firstly, Singapore has promoted joint-venture investments between the state and FDI enterprises, whereas Ireland's FDI enterprises are virtually entirely 100 percent foreign-owned. This difference may be significant as these joint-ventures provide Singapore with greater potential for integrating foreign and indigenous enterprises, and in effect, reducing duality within sectors. It also means that the differences between domestic and foreign companies are likely to be more marked in Ireland, as there are few enterprises that combine foreign and domestic ownership. A second significant difference is that Singapore has had a more focussed FDI development strategy with concentration on certain sectors (electronic products in particular) only whereas Ireland's development

[19] See Honohan and Walsh (2002) on Ireland and Pebbles and Wilson (2002) on Singapore.

strategy has combined a special focus on electronics and pharmaceuticals with broad support for FDI in all sectors.[20] This reflected the major focus in Ireland's development strategy on job creation, while Singapore has been close to full employment for decades and immigration is needed to meet is labour market demands. The third significant difference is that, for some time, Singapore has promoted actively and openly the development of LEs to grow into Singaporean MNEs as a counterbalance to the strong presence of foreign-owned MNEs in Singapore. Ireland has some major domestic MNEs at this point, but these have been developed outside of government policy for the most part, and the role played by the state in supporting this development is relatively small and certainly does not appear to play a major part of government policy as it does in Singapore.[21]

4. Economic Performance 1960-2000

Table 1 provides a picture of the demographics of Singapore and Ireland. Both, at around 4 million people, are small countries in terms of population. In historic terms, the growth in Ireland's population, while much lower than Singapore's, has been very considerable, following as it did on over one hundred years of population decline. During this period there was still considerable out-migration from Ireland, and only in the most recent period (since the mid 1990s) has there been very substantial immigration. By contrast,

[20] For example, Ireland supported FDI into the clothing industry as late as the early 1990s. Most of this industry has subsequently closed down.
[21] See Ruane (2001)

Singapore has enjoyed a much higher rate of population growth throughout the period, much of which has been due to a consistent inflow of migrants.[22]

Table 2 presents annual average growth rates of GDP for both countries and shows that Singapore has experienced nearly double the growth rates of Ireland in terms of GDP during the period 1960-1990. This pattern persisted into the early 1990s, but in the latter part of the 1990s, Irish growth far exceeds that of Singapore. In terms of per capita GDP the recent differences are even more marked, with the Irish growth per capita growth rate being double that of Singapore. This performance explains how Ireland came to be described as a Celtic Tiger during that period.

Next we turn to examine the changes in the structural composition of the two economies over the period 1980-2000. In both countries, the share of total employment accounted for by industry has decreased - from 32 and 35 per cent in Ireland and Singapore, respectively, to around 28 per cent in both. Table 3 shows that even in 1980, Singapore's agriculture sector was insignificant in employment terms and since 1990 it has been less than 3 per cent. As recently as 1980, employment in the Irish agricultural sector accounted for 18 per cent of total employment, which was an exceptionally high proportion by European standards at that time. Over the past twenty years, employment in agriculture has dropped by over fifty percent and continues to fall, as European agricultural policy promotes the consolidation of agricultural holdings and employers in that sector have to compete for labour with employers from other sectors. A further contrast between the two economies is that in 1980 Singapore had a much more

[22] See Peebles and Wilson (2002)

significant service sector, accounting for over 62 percent of total employment, and reflecting its important trading role in South East Asia.

Singapore's trading role is also reflected in Table 4, which shows data on trade intensity for the two economies, where trade intensity is defined as the ratio of average exports and imports to GDP. The ratio is significantly higher in Singapore, and while the gap has narrowed very considerably over the two decades, the rate in Singapore in 2000 was close to twice that in Ireland. Part of this difference is undoubtedly explained by the large amount of entrepôt trade that is still significant in Singapore, as an extension of its traditional trading role. On a world scale, both would be considered to be very open economies. Ireland and Singapore rank first and second respectively in the A.T. Kearney/ Foreign Policy Magazine Globalization Index (2004).

The scale of inward FDI into Singapore is evident in Table 4, which shows, for various years from 1974, that the ratio of FDI inflow to GDP in Singapore was almost 10 times that received by Ireland up to the 1990s. Ireland's success in winning increased FDI is attributed by many to the completion of the single market and there has been a rapid growth in the ratio over the 1990s. Table 4 shows the ratio as an extraordinary 28.1 per cent in 2000, which is in part due to exceptional clusterig of investment in that year. A more accurate view would be that found in Ruane and Sutherland (2002), who found that ratio averaged 8.1 in the five years 1995-2000.

In summary, both economies have experienced rapid growth in population, income, trade and FDI over the 40 years, with Singapore expanding at a more rapid pace throughout the

period. The exceptional performance of the Irish economy is, in effect, a 1990s phenomenon. Both countries now have similarly proportioned industrial sectors, with over 28 percent of employment in that sector. In the next section, we look in detail at the manufacturing sector which has been central to the development strategies of both economies over the past four decades.

5. Export Platform Development and Manufacturing Performance, 1983-1999

In this section we draw comparisons between the manufacturing industries of Ireland and Singapore using 2-digit industry level data. The data for Singapore come from the Economic Development Board, while the Irish data come from the Central Statistics Office, Ireland.[23] In both countries foreign-owned enterprises refer to companies with more than 50 % foreign equity. In the case of Irish manufacturing, most FDI during the period has been in the form of greenfield investment projects which are exclusively foreign-owned. In Singapore, on the other hand, there have been significant numbers of joint venture establishments with both majority and minority foreign equity participation. Such joint ventures have been actively promoted by policy.

Table 5 shows the overall picture for the manufacturing sector in terms of numbers of establishments, employment, gross output and exports for the two countries for the three years, 1983, 1991 and 1999. (The choice of 1991 reflects an appropriate mid-point in the

[23] The EDB is the official source for Singaporean data which decomposes manufacturing data by nationality of ownership.

data series available to us and also the approximate structural break in the series.) Ireland has a consistently larger number of manufacturing establishments but with a manufacturing workforce that is less than three quarters the size of the Singaporean workforce. Consequently average enterprise size in Ireland is significantly smaller than in Singapore. Irish gross output and manufacturing exports (measured in US$) have risen rapidly over the period, surpassing those of Singapore during the 1990s. Table 5 also shows the importance of the foreign-owned segment of the manufacturing sectors in the two countries. On every measure, with the exception of exports in 1999, the foreign share in Singaporean manufacturing matches or exceeds that of the foreign share in Ireland. This result is not surprising in the light of the enormous inflow of FDI into Singapore shown in Table 4.[24]

One striking difference between the two economies is in the pattern of employment growth across MNE- and LE-owned sectors during periods of cyclical growth and contraction in manufacturing employment. During the 1980s, as manufacturing employment in Singapore grew by over 30 percent, the share of employment accounted for by foreign-owned companies expanded by 15 percent, whereas in the 1990s the fall in Singapore's manufacturing employment of 5 percent was accompanied by a foreign share decline of almost three times that rate. This may reflect the impact of policy in Singapore to seek FDI that is more capital-, technology- and skill-intensive than the FDI secured in previous decades (Low, 1993, Chapter 3). In Ireland, by contrast, the share of employment in foreign enterprises continued to rise in both periods - by 35 percent in the

[24] The comparison is not straightforward as the data in Table 4 cover all sectors and not just manufacturing.

1980s, when total manufacturing employment fell by 5 percent, and over 10 percent in the 1990s, when it expanded by over 25 percent.

In order to look at the extent and nature of structural changes in the two economies over the period, we calculated Hirschman-Herfindahl (H-H) indices based on employment in each 2-digit manufacturing sector for the period 1983-1999.[25] These indices are charted in Figure 1. They show that the manufacturing sector in Singapore is much more concentrated than in Ireland and that this concentration has increased over the sixteen years while concentration in Irish manufacturing has decreased. Table A1 in the appendix, which shows employment shares by sector for 1983, 1991 and 1999, indicates that the increased sectoral concentration in Singapore came mainly through the expansion of the modern sectors (Electronic Products, Medical, Precision & Optical, and Chemicals). In the Irish case, there has been increased concentration in the modern sectors but this has been offset by the significant decrease in the share of the largest sector in 1983, namely Food and Drink.

What about foreign ownership? In 1999, foreign enterprises accounted for around 50 per cent of employment in the manufacturing sectors of both countries, but over the previous 16 years they rose by 17 percentage points in Ireland whereas in Singapore they were virtually unchanged. As Ireland had a significant pool of unemployment for most of the period as well as net outward migration, and because of the absence of competition on the domestic market, it is unlikely that this expansion of MNE employment led to a "crowding out" effect, especially as much of the expansion in MNE employment

[25] The HH index is written as Σs_j^2 where s_j is the share of employment in sector j in total employment.

occurred in the modern sectors while the contraction in LE employment occurred in the traditional sectors.

To examine the changing pattern of employment in more detail, we calculate H-H indices for the shares of total employment by sector accounted for by foreign and domestic enterprises, respectively for the period 1983-1999.[26] These indices (Figure 2) show that sectoral concentration is consistently much higher in MNEs than in LEs in Singapore and there is no evidence of any convergence between the two indices. The high H-H indices for MNEs reflect the strong sectoral focus of Singapore's industrial policy. In Ireland, by contrast, the difference in concentration levels between foreign and domestic enterprises in manufacturing sectors is much less marked and declining over the whole period. Furthermore, the H-H index has been higher for LEs than for MNEs for most of the period, which may be due to the significance of legacy enterprises among Ireland's MNEs (dating back to the pre-Independence period). However, it undoubtedly also reflects the less sectorally-focussed strategy in Ireland compared to Singapore during the 1960s and 1970s.

Table A1 shows the dominance of MNEs in employment in the modern sectors – Chemicals, Electronic Products and Medical, Precision and Optical – in both countries. The Chemicals sectors have expanded relatively, propelled particularly by MNEs whose shares have increased. The scale of the Electronic Products sector has increased in both countries, but the extent of specialisation in Singapore is far greater, reflecting its strong

[26] The HH index is written as where Σs_{nj}^2 where s_{nj} is the share of foreign (domestic) employment in sector j in total foreign (domestic) employment.

policy focus on this sector. Noteworthy is the growing LE share in its Electronic Products sector, where employment increased fourfold over the period, while it grew by under 25 per cent in Ireland. This suggests that LEs in this sector in Singapore may have reached a level of sustainability not yet achieved in Ireland.[27]

Since FDI in both countries is export platform in orientation, we would expect the export intensity of MNEs (share of total output exported) to be very high relative to those of LEs, and that a relatively lower MNE export intensity ratio would indicate greater linkages into the domestic market in the case of intermediate products. Unfortunately the data available to us do not allow us to dichotomise the products into final and intermediates, but we can compute average export intensity ratios by sector for MNEs and LEs for the period 1985-1999. Figure 3 shows that Irish MNEs have generally higher average export ratios than their counterparts in Singaporean manufacturing industry, while the reverse is the case for LEs. The high export intensity ratios of Singapore's LEs suggests that its more "hands on" policies have been much more successful than those in Ireland in promoting the development of its LEs.[28] The targeting of indigenous Irish manufacturing in developing its export markets is seen as one of the outstanding challenges facing policy makers in Ireland. (See Enterprise Strategy Group (2004).)

[27] For all these comparisons, a similar pattern emerges when we look at sectoral and foreign shares measured in terms of gross output.

[28] Ruane and Sutherland (2004a), using micro data on Irish manufacturing, find that a high proportion of LEs do not export and that those LE which export do not show improved performance, as measured by stronger enterprise characteristics, over time.

To consider whether EPFDI may have an impact on the export behaviour of LEs, we calculate correlation coefficients between the sectoral export intensity of LEs with that of MNEs. A large positive coefficient would imply that the share of output exported by LEs within a sector is likely to be greater when the export share of MNEs is higher. Figure 4 shows that the correlation coefficients in both countries are positive, but significantly lower in Ireland. This result for Ireland is consistent with research at enterprise level in Ireland which does not find significant export spillovers from MNEs to LEs, where MNE influence is measured through export-intensity ratios (Ruane and Sutherland (2004b).)

Next, we turn to examine foreign- and domestically-owned enterprises within individual manufacturing industries in Singapore and Ireland, using data on labour productivity and wages paid by MNEs and LEs. We look at two issues relevant to dualism. Do MNEs have higher labour productivity than LEs and is that productivity difference increasing or diminishing over time? Do MNEs and LEs pay similar wages when they operate in the same sector, and if different, is there evidence that the differences are narrowing or widening over time? Large and persistent differences between productivity levels of MNEs and LEs in the same sectors would suggest some degree of dualism, while a narrowing of these differences over time would suggest that linkages and spillovers are beginning to reduce that dualism.

We undertake our analysis for all sectors in the first instance and then for 'all excluding Chemicals', since this sector is one characterised by exceptionally high productivity

growth.[29] We use a basic regression framework in order to examine the convergence between MNEs and LEs in both economies using productivity and wage performance measures, utilising the following regression equation:

$$Y_{it} = a + T_t + T^2 + f_i + \varepsilon_{it} \qquad (1)$$

where i and t represent sector and year respectively, Y_{it} is the ratio of MNE productivity (wages) in sector i to LE productivity (wages) in the same sector, a is the intercept term and T is a time trend. We also include T^2 to capture any non-linear relationship in the time trend. The coefficient f in the equation captures the time invariant sector-specific effect, estimated as fixed effect, while ε denotes a random noise term. If the coefficient of the time dummy is negative and significant, we interpret this as evidence of convergence.

Table 6 shows the results of regression analysis examining labour productivity differences between MNEs and LEs in Irish and Singaporean manufacturing sectors. Columns 1 and 3 include all sectors, while Columns 2 and 4 exclude Chemicals from our analysis. The coefficient of the intercept terms indicates that, on average, labour productivity in MNEs is significantly higher than LEs in both countries, suggesting some degree of dualism; this result is especially marked in the Irish case. Turning to look at convergence/divergence, we see that in Singapore there is evidence of convergence taking place at decelerating rates when Chemicals are excluded from the data set. This implies that the productivity gap between MNEs and LEs is narrowing outside the

[29] Throughout we excluded the Petroleum Refining sectors because of its unique role in development.

Chemicals sector, suggesting that through linkages or spillovers, the productivity of LEs is rising towards that of MNEs. On the other hand there is no statistically significant evidence of convergence or divergence over time in the Irish case; in other words, the degree of dualism that is evident in the intercept constant has not changed over the period. This result is not surprising given that Ruane and Uğur (2004a) found no evidence of spillovers in their analysis of MNE/LE productivities using plant level data for the Irish manufacturing sector.

Table 7 examines average wages paid by MNEs and LEs. The regression results show that in both countries wages paid by MNEs are higher on average than those paid by LEs. However, the extent of the difference is much less for average wages than for labour productivity, which must in part reflect that wage setting behaviour is influenced by labour market conditions. While the wage differences between MNEs and LEs in Singapore are higher, they are converging at a decreasing rate over the period; this evidence is significantly stronger when we exclude chemicals. The narrowing of wage differentials may reflect spillover and linkage effects associated with the narrowing of labour productivity differentials in Table 6. In Irish manufacturing, the wage gap is less marked, which may reflect in part the greater centralisation in the system of wage setting in Ireland compared with Singapore.[30] It may also reflect a relatively more similar skill composition across the two sets of employers in the same sectors in Ireland. The positive and significant sign of the time trend variable and the negative sign on the squared term indicates that the divergence between MNE and LE average wages increased, albeit at a

[30] Centralised wage setting in Singapore has always been flexible to take account of industry and enterprise situations; such flexibility has only recently been part of the Irish system. MNEs in Ireland typically do not have unionised labour and the smaller difference may also reflect the ability of the MNEs to bargain strongly and with reference to prevailing rates in the unionised LE sector.

diminishing rate, over the period 1983-1999. This is consistent with increasing labour market pressures over the period and the ability of the MNE sector to pay higher wages in this context. It is also in line with the findings by Ruane and Ugur (2004b) of no evidence of wage spillovers in the Irish manufacturing sector in the period 1991-1999.

6. Conclusion

In the introduction we raised the issue of how MNEs and LEs relate over a prolonged period when the MNEs have located on an export platform basis. The focus of the paper is on whether in such circumstances the relationship between MNEs and LEs develops a persistent dualistic nature, with little interaction between them. This dualism would be evident in sectoral segmentation and in lower linkages and spillovers between MNEs and LEs in the same sector, so that differences in productivities and factor payments would persist. To consider whether this type of FDI induces dualism between the activities of local enterprises and multinational enterprises, we focused on four questions which we now revisit.

(i) Are there differences in the types of sectors in which the MNEs and LEs are active?

Our analysis showed that, in terms of employment, Singaporean manufacturing industry has become more sectorally-concentrated (Figure 1), driven by the increased importance of MNEs whose H-H index is more than twice that of its LEs (Figure 2).[31] In Irish manufacturing industry, by contrast, we found that levels of concentration were actually lower for MNEs than for LEs, with the difference between them narrowing over the

[31] For example, in 1999, over one third of its total manufacturing employment was in the Electronic Products sectors and over 80 percent of that employment was in MNEs.

period.[32] As noted in Section 5, these differences undoubtedly reflect the less strategic focus of Ireland's FDI promotional policy compared to Singapore's. Thus while both countries have fifty percent of their manufacturing employment in companies with over fifty percent foreign ownership, in the Singaporean case the greater sectoral concentration has facilitated the development of critical mass, making possible the growth of clusters and networks in these sectors.[33]

The differences in the H-H indices may also be a sign of the different position of each country in its geographic region. Singapore has been among the highest per capita income countries in South East Asia for several decades, while Ireland has only recently moved from being one of the lower to one of the higher income countries in Western Europe. Until recently, FDI projects were attracted to Ireland because of its relatively low labour costs (from a European perspective) and its plentiful supply of relatively skilled labour. Singapore, by contrast, has had full employment for decades and labour costs have been moderated by immigration of labour (both skilled and unskilled) to meet the needs of new establishing enterprises. In effect, the differences in sectoral segmentation are completely consistent with the differences in the FDI strategies pursued by both countries.

(ii) Do the MNEs and LEs have similar export patterns, i.e., where MNE export ratios are high, are LE export ratios also high?

[32] This reflected the increased importance of some of the high-tech sectors (especially Electronic Products) among MNEs at a time the traditional importance of some of the main traditional LE sectors (e.g., Food and Beverages) declined, with a net negative effect on the degree of sectoral concentration overall.
[33] Ireland is very concerned to build such clusters but has a limited base on which to try to build them. It has had virtually no success outside the electronics sectors, which were the target of policy toward linkages and clusters over the 1990s.

The contrast between export intensities for Irish and Singaporean LEs is strong and raises issues for other countries which seek to attract EPFDI on a large scale. As noted above, the Irish results are consistent with the micro data results from existing research by Ruane and Sutherland (2004a) and Ruane and Sutherland (2004b). The availability of similar micro data for Singapore would provide a fruitful research opportunity to explore what underpins the differences in export intensities of LEs in the two countries. The higher export ratios of Singaporean LE plants may be due in part to their larger scale (in terms of employees per plant), allowing more of them to export and those who export to achieve higher export intensity. The higher correlation between export intensities of LEs and MNEs across sectors points to the less dualistic nature of Singaporean development compared to Ireland.

Where MNEs have high labour productivity, do LEs have high labour productivity also and are any differences on a divergent or convergent course?

Our analysis of productivity levels between MNEs and LEs shows that MNEs have higher productivity levels than LEs in both countries, a result which is in line with experience elsewhere.[34] There is evidence of convergence between productivity levels of MNEs and LEs in Singaporean manufacturing whereas in Ireland the differences persist. This is consistent with the greater pro-activity of Singaporean policy in terms of developing LEs and their relationships with MNEs. Research using micro data would be needed to establish evidence of linkages and spillovers in Singapore.

[34] The sheer scale of MNE presence in these two countries might lead one to suspect that the differences would be lower due to factor market effects.

Do MNEs and LEs pay similar wages when they operate in the same sector? And if they pay different wages, do these differences show a tendency to persist or are they diminishing or increasing over time?

In both Singapore and Ireland MNEs pay higher wages than LEs – and this is perhaps not surprising given that the MNEs in both countries have higher productivity levels. However, the patterns in the two countries again are rather different – average wages in MNEs and LEs in Singapore are converging indicating a reducing degree of dualism whereas there is evidence of increasing greater dualism in the growing wage gap in Irish manufacturing sector.

In summary, while both Ireland and Singapore have adopted broadly similar strategies in promoting EPFDI, with more than half their manufacturing workforces employed in MNEs, we see greater evidence of dualism in Ireland than in Singapore. This result points to the greater success of Singapore in integrating MNEs into the economy (and hence generating more linkages and spillovers) and in developing LEs which are global players. The differences between MNEs and LEs may, however, also reflect the promotion of joint ventures in Singapore, so that the smaller differences in Singapore reflect the greater presence of these hybrid entities. A comparative study of Ireland and Singapore using enterprise level data would allow these differences to be explored in more depth.

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Tables

Table 1: Population in Ireland and Singapore 1960-2000					
	Population Levels		Annual Percentage Population Growth		
	Ireland	Singapore		Ireland	Singapore
1960	2,832,000	1,646,000	1960-1970	0.4	2.1
1970	2,950,000	2,075,000	1970-1980	1.3	1.4
1980	3,401,000	2,414,000	1980-1990	0.3	2.1
1990	3,505,800	3,047,000	1990-2000	0.7	2.5
2000	3,794,000	4,018,000	1960-2000	0.7	2.2
1960-2000	33%	59%			

Source: World Development Indicators 2002 CD-ROM, World Bank

Table 2: Annual Growth rates in GDP and GDP per capita in Ireland and Singapore (constant 1995 US $ prices)				
	GDP		GDP per capita	
	Ireland	Singapore	Ireland	Singapore
1960-1970	3.7	8.5	3.4	6.4
1970-1980	4.2	7.8	2.9	6.5
1980-1990	3.2	6.4	3.0	4.3
1990-2000	6.3	6.8	5.5	4.2
1990-1995	3.8	7.3	3.3	4.8
1995-2000	7.7	5.1	6.8	3.0

Source: World Development Indicators 2002 CD-ROM, World Bank

Table 3: Sectoral Shares in Total Employment in Ireland and Singapore, 1980-2000					
Ireland	1980	1985	1990	1995	2000
Agriculture	18.3	15.6	15.1	11.7	7.9
Industry	32.5	28.4	28.1	28.3	28.6
Services	48.5	55.6	56.4	59.6	63.5
Singapore					
Agriculture	1.3	0.7	0.3	0.2	0.3
Industry	35.7	35.7	35.2	31.0	28.5
Services	62.6	63.7	64.4	67.9	71.1

Source: World Development Indicators 2002 CD-ROM, World Bank

Table 4: Economic Openness in Ireland and Singapore, 1974-2000				
	Trade Intensity		FDI Intensity	
	Ireland	Singapore	Ireland	Singapore
1974	43.2	126.0	0.6	6.3
1980	48.5	174.5	1.6	10.3
1985	51.3	129.5	0.6	5.7
1990	45.1	144.7	1.3	14.5
1995	56.7	142.9	2.0	13.7
2000	81.1	146.8	28.1*	13.7

Notes: Trade intensity is defined as the ratio of average exports and imports of goods to GDP. FDI intensity is defined as the ratio of inward FDI to GDP

Source: International Financial Statistics, IMF

*The average ratio for 1995-2000 was 8.1 percent, which gives a more accurate reflection of the true picture.

Table 5: Manufacturing Sector Performance, 1983, 1991 and 1999						
Ireland	1983		1991		1999	
	Total	Foreign Share	Total	Foreign Share	Total	Foreign Share
Number of Establishments	5002	13	4,546	16	4,794	14
Employment	208,168	32	196,878	44	248,971	49
Output	14,733,628	41	33,758,154	53	79,789,205	76
Exports	10,568,268*	75*	20,980,907	74	61,810,068	90
Singapore	1983		1991		1999	
	Total	Foreign Share	Total	Foreign Share	Total	Foreign Share
Number of Establishments	3,616	22	3,785	23	3,928	21
Employment	271,106	52	358,274	58	338,885	50
Output	17,258,610	73	44,732,787	74	78,811,344	78
Exports	10,344,860	83	27,153,001	84	50,362,714	87

*Refers to 1986 figures (earliest date for computing these figures

Source: Own calculations from CSO and EDB. Value figures are in US dollars.

Figure 1: HH Index - Sectoral Concentration of Total Employment

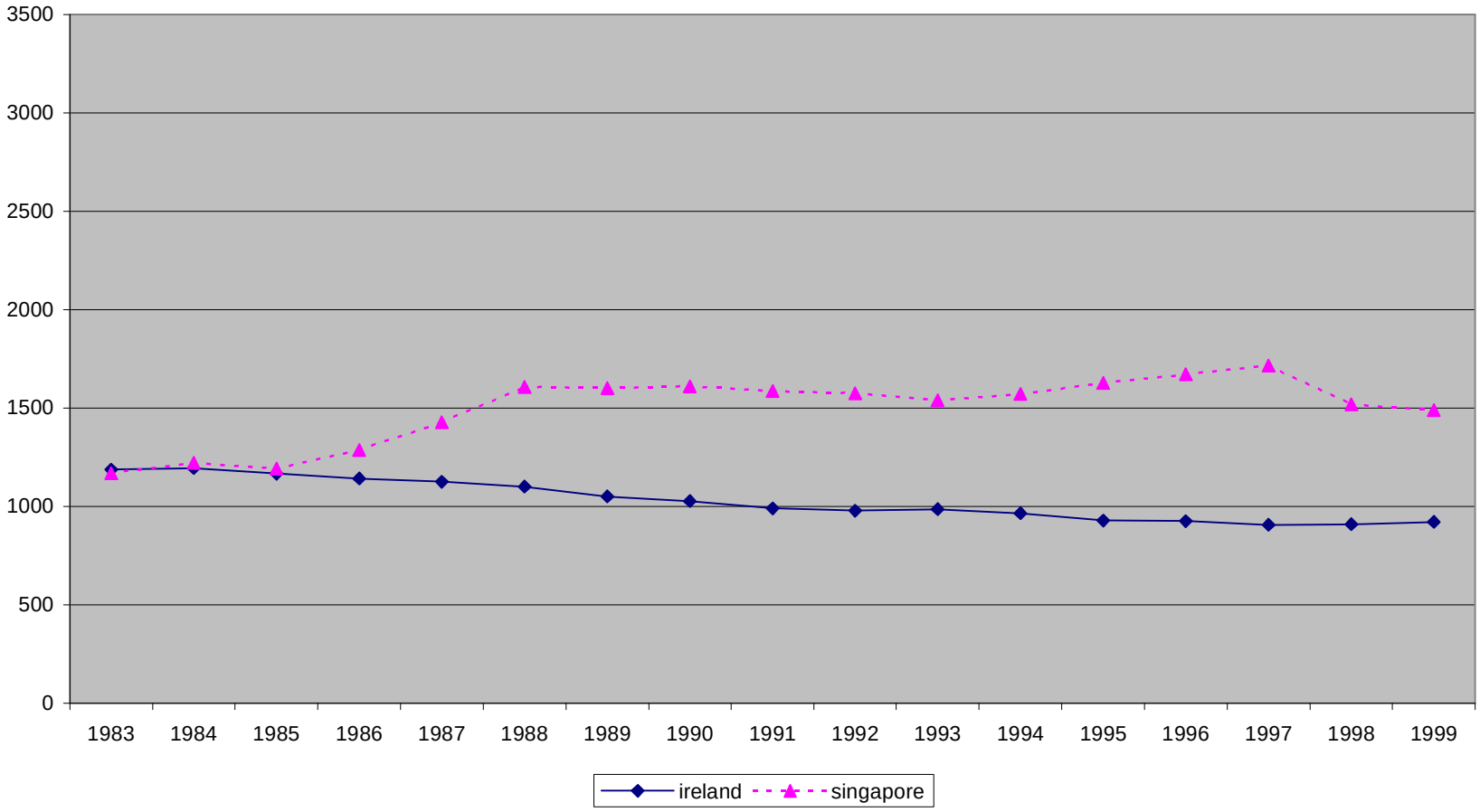

Figure 2: HH Index- Sectoral Concentration of Employment in MNEs and LEs

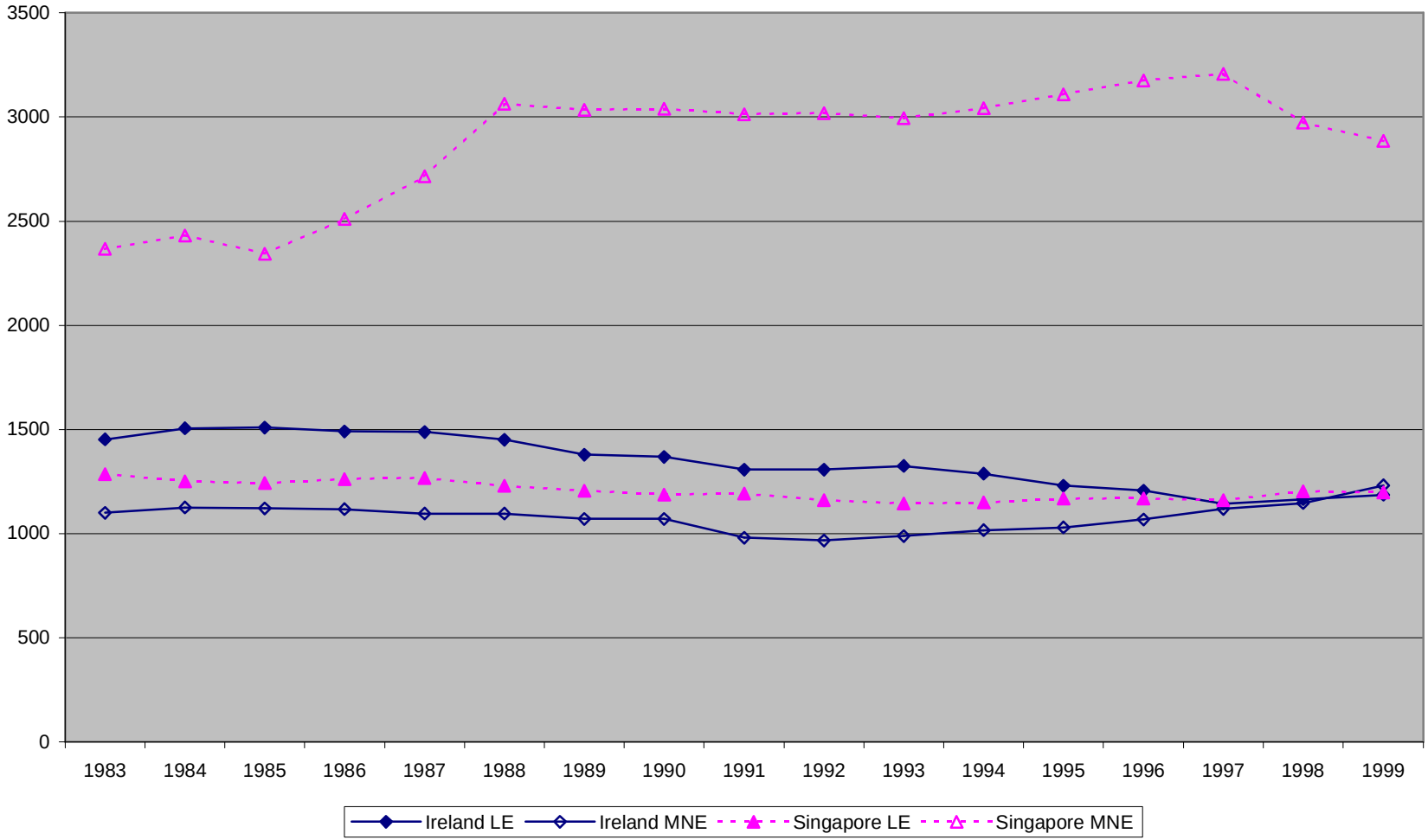

Figure 3: Export Intensity in Singaporean and Irish Manufacturing Sectors

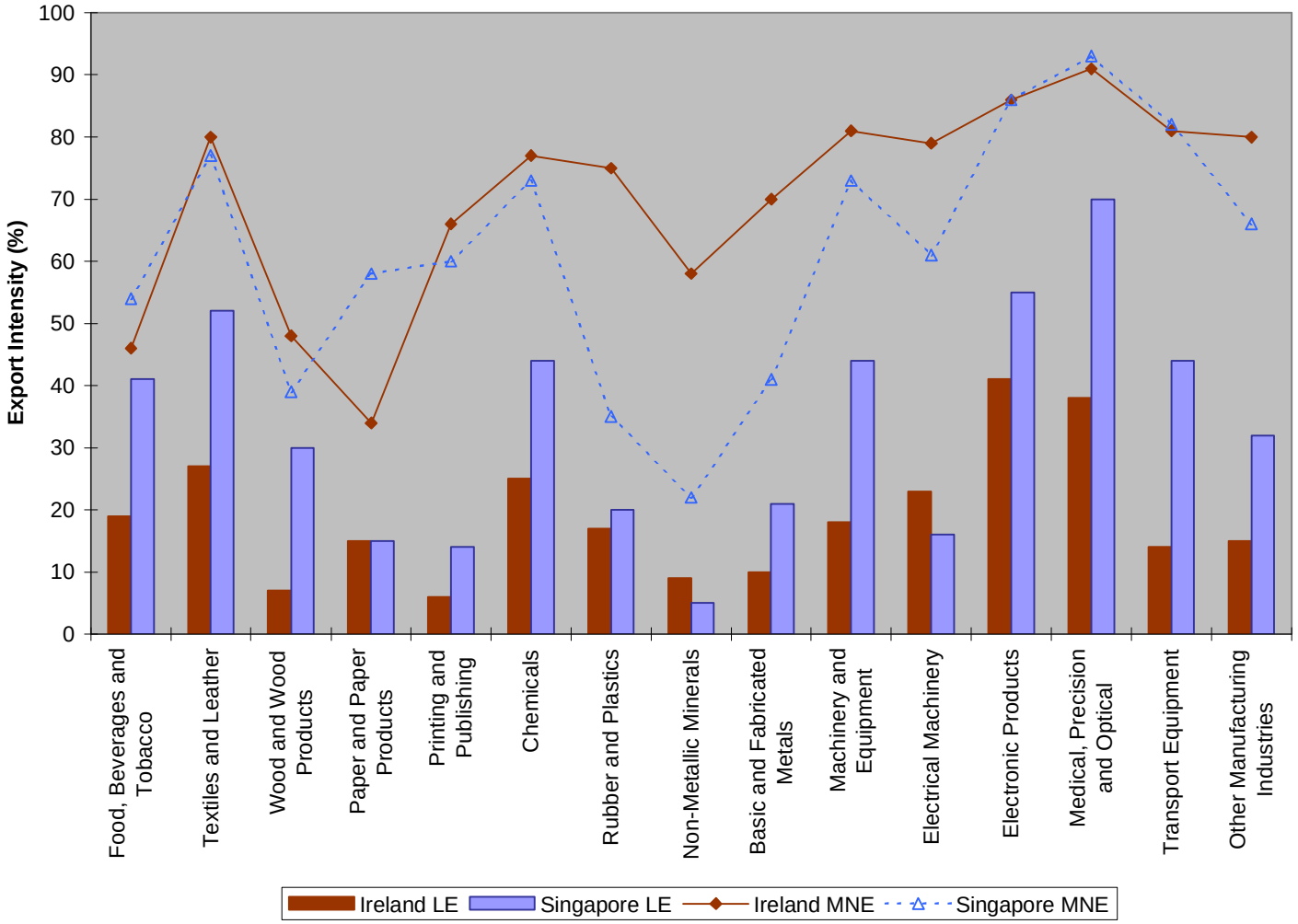

Figure 4: Correlation between LE and MNE Export Ratios

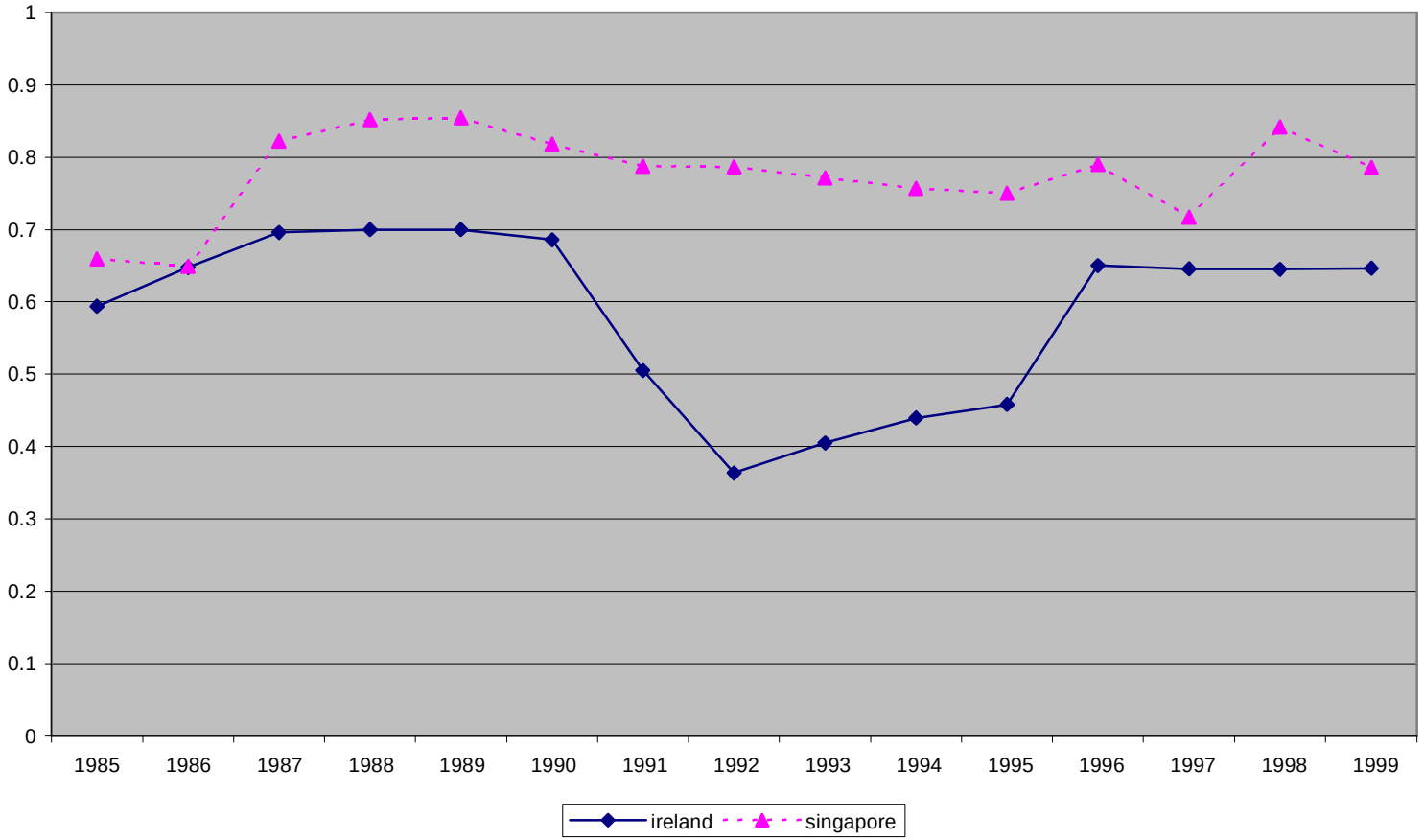

Table 6: Productivity Convergence between MNEs and LEs in Irish and Singaporean Manufacturing Sectors.				
	Ireland		Singapore	
	(1)	(2)	(3)	(4)
Constant	1.63****	1.62***	1.44***	1.51***
	(8.04)	(7.79)	(13.33)	(11.47)
T	0.002	-0.02	-0.006	-0.03**
	(0.75)	(-0.41)	(-0.24)	(-1.85)
T^2	0.003	0.001	0.002	0.002***
	(1.16)	(0.54)	(1.35)	(2.39)
No of Observations	255	238	221	204
R^2	0.09	0.06	0.08	0.05
Prob. F	0.00	0.00	0.00	0.00

Notes: t-values are in brackets.
*** 1%, ** 5%, * 1% statistical significance.

Table 7: Wage Convergence between MNEs and LEs in Irish and Singaporean Manufacturing Sectors				
	Ireland		Singapore	
	(1)	(2)	(3)	(4)
Constant	1.10***	1.11***	1.20***	1.21***
	(7.02)	(4.55)	(7.80)	(4.23)
T	0.03***	0.02***	-0.01*	-0.02***
	(4.89)	(4.60)	(-1.72)	(-2.68)
T2	-0.001***	-0.001***	0.001***	0.001***
	(-3.92)	(-3.76)	(2.20)	(2.76)
No of Observations	255	238	221	204
R^2	0.13	0.12	0.08	0.06
Prob. F	0.00	0.00	0.00	0.00

Notes: t-values are in brackets.
*** 1%, ** 5%, * 1% statistical significance.

Table A1 Significance of MNEs in terms of Employment in Irish and Singaporean Manufacturing Industries												
	Singapore						Ireland					
	Sector as % of Total			MNEs as % of Sector Share			Sector as % of Total			MNEs as % of Sector Share		
	1983	1991	1999	1983	1991	1999	1983	1991	1999	1983	1991	1999
Food, Beverages and Tobacco	5	4	4	28	32	27	25	23	19	22	28	26
Textiles and Leather	13	9	3	18	17	9	16	11	5	25	44	34
Wood and Wood Products	2	1	0	29	7	0	4	2	2	4	11	19
Paper and Paper Products	1	1	1	25	32	28	2	2	2	24	26	19
Printing and Publishing	5	5	5	9	18	14	5	6	8	5	18	34
Refined Petroleum	1	n.a	n.a	100	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Chemicals	3	3	5	63	76	83	6	7	9	65	77	80
Rubber and Plastics	4	5	6	24	38	28	4	4	4	35	54	40
Non-Metallic Minerals	3	2	2	37	35	35	6	5	4	21	18	15
Basic and Fabricated Metals	7	9	11	33	32	26	8	7	6	19	28	24
Machinery and Equipment	10	8	11	65	67	46	4	6	6	46	57	46
Electrical Machinery	5	5	3	85	88	69	6	5	6	78	76	70
Electronic Products	24	34	31	92	89	81	4	7	13	69	84	89
Medical, Precision and Optical	2	3	3	85	85	84	4	5	7	91	92	85
Transport Equipment	10	8	10	27	24	19	5	5	4	8	18	54
Other Manufacturing Industries	5	5	4	44	49	32	2	5	4	44	0	27
Total Manufacturing	100	100	100	52	58	50	100	100	100	32	44	49
Total Manufacturing, Levels	271106	358274	338885				208168	196878	248971			

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