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Frank Barry, Trinity College Dublin
and

Adele Bergin, Economic and Social Research Institute



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Frank Barry
Trinity College Dublin
and
Adele Bergin
Economic and Social Research Institute

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Abstract

Ireland is one of the most FDI-intensive economies in the OECD and is a significant export platform for both manufacturing and internationally traded services. This chapter provides case studies of three of the most important FDI-intensive manufacturing sectors – ICT, pharmaceuticals and medical devices – and two of the substantially foreign-owned internationally traded services segments – software & IT and international financial services. It also updates earlier analyses of how Ireland's inward FDI sectors have fared over the course of the global financial crisis.

Introduction

Ireland is one of the most FDI-intensive economies in the OECD and beyond. Foreign affiliates account for almost 50 percent of manufacturing employment and 80 percent of manufacturing value added, around twice the equivalent EU shares. Though services are much less FDI intensive, in this case also the Irish proportions are around twice the EU average (OECD; 2010). McKinsey Global Institute (2003) ranked Ireland, with 8.3 percent of the global market, above India, with 7.7 percent, as the most popular destination for offshored business services, comprising both information technology and other business processes. Within IT, Ireland is reported to be one of the world's largest exporters of computer software. Foreign affiliates, furthermore, account for almost 80 percent of Irish exports. These various characteristics highlight Ireland's claim to attention in any discussion of globalisation, offshoring and export-platform foreign investment.

Ireland was one of the first countries to adopt a development strategy that would lead to its emergence as a significant export platform for foreign multinational corporations. The move to attract outward-oriented foreign direct investment (FDI) dates back to the 1950s, even before protectionist tariff barriers began to be dismantled. The Industrial Development Authority (IDA) began in the early years of that decade to establish contacts with UK, Continental European and US firms with a view to attracting them to Ireland. Extensive capital grants and corporation tax concessions for exporting activities were introduced in 1956, and a low corporation-tax regime remains to this day one of the cornerstones of the country's inward FDI strategy.

Export platform investments boomed upon Ireland's accession to the EU in 1973 and again in the 'Celtic Tiger' era of the 1990s. Globalisation and the Single European Market saw US investments in Europe increase substantially in the latter period (Barry, 2004). The outlawing of restrictive public procurement policies under the Single Market initiative levelled the playing field for smaller export platform locations (MacSharry and White, 2000), allowing Ireland to capture a sharply increased share of FDI inflows.

The increased globalisation of recent decades is manifested in various ways, each of which is mirrored in the Irish experience. The number of transnational companies across the globe doubled to 70,000 between 1990 and 2005, the number of TNC affiliates grew more than fourfold, and the number of countries in which the average TNC operated increased from four to ten (UNCTAD, 2006). Developments in Ireland in these respects are analysed by Pavelin and Barry (2005). The inward FDI stock in Ireland increased five-fold over the twenty-year period from 1987, though this was less than the increase in the global FDI stock, which was increasingly drawn to emerging markets.

Technological change in air shipping and the declining cost of rapid transit have seen parts and components grow as a share of international trade (Hummels, 2007; Yeats, 2001; OECD, 2010). Evidence on the extent and growth of vertical fragmentation in Irish trade is provided by Gorg (2000), while Ruane and Gorg (2001) trace the growth of fragmentation within the Irish computer hardware sector.

Advances in information technology have seen formerly non-tradable services become increasingly tradable, as reflected in services offshoring and the emergence of “trade in tasks” (Baldwin, 2006). World services exports as a share of all exports grew from 15 percent to 19 percent between 1980 and 2005. Ireland’s share of world services exports increased from 0.36 percent to 2.2 percent over the period, making Ireland the 13th largest exporter of services in the world. Services as a share of Irish exports increased from 22 percent to 35 percent between 2000 and 2005 alone. In Ireland, as elsewhere, the increase was driven by Computer & Information Services and Finance & Insurance (Forfás, 2006).

A further component of the globalisation of recent decades has been the increased offshoring of R&D functions by multinational companies (UNCTAD, 2005). Foreign corporations account for some 70 percent of business expenditures on R&D in Ireland, and both gross expenditures and business expenditures on R&D in Ireland have increased far more rapidly than in the case of Western Europe or the OECD since the late 1980s (Barry, 2008).

The present study is structured as follows. The next section focuses on Ireland’s emergence and evolution as a manufacturing export platform and includes case studies of three of the most important FDI-intensive manufacturing sectors of recent times: ICT, pharma-chem and medical devices. The following section focuses on foreign-owned internationally traded services, which are of more recent provenance, and includes case studies of software & IT services and international financial services. Section 4 analyses how Ireland’s inward FDI sectors have fared over the course of the current global recession and the paper concludes with a discussion of the factors that account for Ireland’s success in attracting foreign direct investment.

2. Ireland as an Export Platform for Foreign-Owned Manufacturing MNCs

Though it remained protectionist into the 1960s, substantially later than most of the rest of Western Europe, Ireland began to attract export-oriented FDI from the mid-1950s, when generous tax relief for profits derived from increased manufacturing exports was introduced. Foreign firms – initially British and German – began to adopt Ireland as an export platform. With time, US firms became increasingly important, and these tended to be larger than firms of other nationalities. The total stock of US FDI in Ireland was USD 6 million in 1958, with over 80 percent of it located in the petroleum sector and none in manufacturing. By 1973, when Ireland joined the EU, the stock had risen to USD 269 million (in nominal terms), of which 90 percent was in manufacturing, with the bulk of output exported (Lipsey, 2003b).

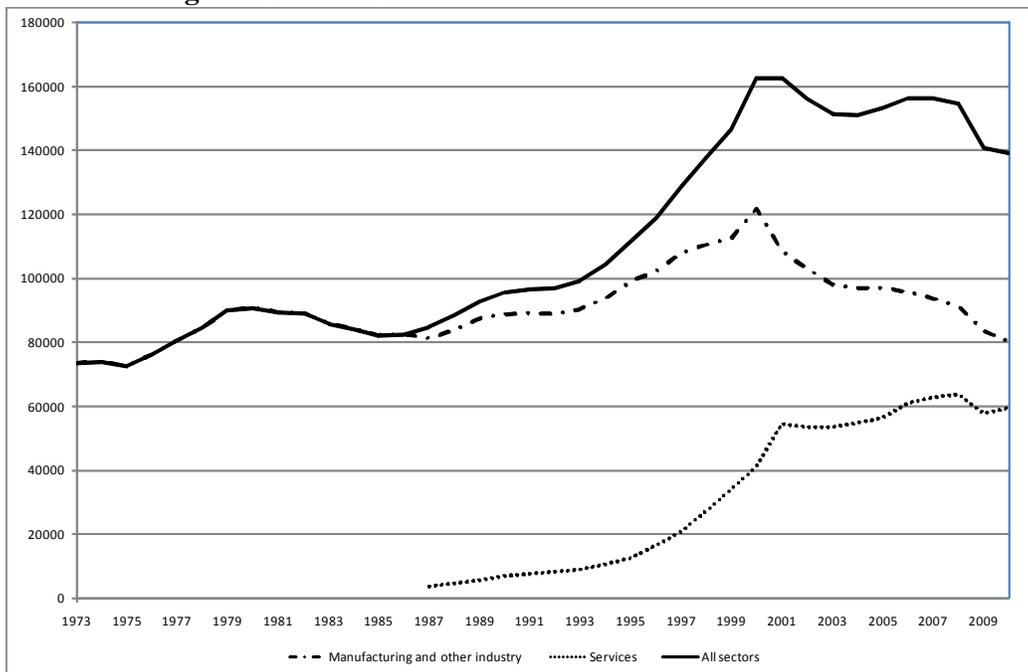
As Ireland at the time was a low-wage country with relatively poor educational attainment levels by Western European standards, it is not surprising that employment in the new export-oriented foreign firms attracted prior to 1973 tended to be in traditional or low-tech sectors such as Textiles and Clothing, Metals Industries (such as aluminium extrusions, shipbuilding and cranes), Pulp and Paper, and Rubber and Plastics (O’Hearn, 1987). FDI inflows also however led to rapid output growth in the chemicals sector, whose share of exports grew from less than half of 1 percent at the end of the 1950s to 6 percent at the time of EU entry (Lipsey, 2003b).

The growth in foreign industry also contributed to a substantial diversification of Irish exports away from the UK market, with the then 6-country EU share of

manufacturing exports rising by 10 percentage points between the late 1950s and the early 1970s.

Figure 1 plots developments in foreign-owned manufacturing firms and in all foreign-owned exporting firms from EU accession to the present. The broad parameters of the trends can be understood as follows. The growth in employment consequent upon EU entry was reversed by the deep fiscal and debt crisis of the 1980s. The Single Market programme of the 1990s and the confluence of factors that ushered in the “Celtic Tiger era” saw a massive increase in foreign-sector employment. This was partly crowded out by the property and construction bubble of the early years of the new millennium, however, while employment in these sectors, as in the economy at large, went into decline over the course of the current global crisis.

Figure 1: Employment in Foreign-Owned Internationally-Tradable Manufacturing and Services Sectors



Source: Forfás Annual Employment Surveys (various years); full-time employment. Note: there was a substantial reclassification of employment from manufacturing to services in 2000.

The employment data from 1973 onwards show a progressive movement into higher-technology sectors such as computers and electronic components, pharmaceuticals, and medical and optical devices, driven by continuing decline in British protectionist-era firms as well as expansion in newer firms which came primarily from the US.

Table 1:
Sectoral allocation of manufacturing-sector foreign-firm employment (%)

| | 1973 | 1987 | 2000 |
|--------------------------------------|------|------|------|
| Food, Beverages and Tobacco | 24 | 18 | 11 |
| Textiles, Clothing and Footwear | 19 | 14 | 3 |
| Chemicals (excl. pharma) | 6 | 7 | 5 |
| Pharmaceuticals | 2 | 6 | 11 |
| Machinery and Equipment | 4 | 6 | 5 |
| Office and Data Processing Equipment | 1 | 7 | 19 |
| Electrical and electronic components | 4 | 10 | 14 |
| Medical and Optical Instruments | 4 | 8 | 11 |
| Transport Equipment | 11 | 7 | 7 |
| Remainder | 24 | 17 | 12 |

Note 1: Remainder comprises Wood, Pulp, Paper and Printing; Rubber and Plastics; Non-Metallic Materials; Basic and Fabricated Metals; Coke and Refined Fuels, and Miscellaneous Manufactures
Source: Forfás. (Totals may not sum to 100 due to rounding errors)

The movement into higher technology sectors reflects the changing comparative advantage of the country, driven not just by the entry into the global economy of the lower-wage regions of East Asia and Central and Eastern Europe but also by the increasing educational attainment of the Irish workforce. Over the decades this converged on and eventually surpassed that of the rest of Western Europe. Ireland now has one of the highest proportions of the 25 to 34 year-old population in the OECD with a third-level educational qualification and a very high proportion of these have science and engineering degrees (Barry, 2007).

Table 2, which uses slightly different aggregates from the previous table, shows that the restructuring of foreign-firm employment into higher-technology sectors has continued into the current millennium.

Table 2:
Sectoral allocation of manufacturing-sector foreign-firm employment (%)

| | 2001 | 2010 |
|--|------|------|
| Food, Beverages and Tobacco | 13 | 11 |
| Textiles, Clothing and Footwear | 3 | 0 |
| Chemicals (including Pharma) | 18 | 24 |
| Machinery and Equipment | 7 | 5 |
| Computer, Electronic, Optical and Electrical Equipment | 26 | 21 |
| Medical and Dental Instruments and Supplies | 14 | 25 |
| Transport Equipment | 5 | 3 |
| Remainder | 13 | 11 |

Source: Forfás Annual Employment Survey (2010). Totals may not sum to 100 due to rounding errors.

These inflows of export-oriented foreign investment have had a strong impact on Ireland's measured comparative advantage. Revealed comparative advantage (RCA) indicators for manufacturing showed Ireland in 2000-04 to have a strong RCA in pharmaceuticals and other chemicals, medical and surgical equipment, office and computing machinery, a number of food and drink sub-sectors, and recorded media (Amador et al., 2007). Other than some of the food and drink sub-segments, these other sectors are all FDI-dominated.

Manufacturing Sector Case Study: Information and Communications Technology
By the late 1990s Ireland had become one of the major European centres of computer hardware production, accounting for 5 per cent of global computer exports and about one-third of all personal computers sold in Europe. Ireland at this stage also accounted for around 6 per cent of global exports of electronic components. Employment in computers and components hit a high of around 30,000 in the year 2000. The sector has experienced a sharp decline since then as production relocated eastwards to China and Central and Eastern Europe.¹

Barry and Curran (2004) provide data on the evolution of world computer hardware exports, charting the decline in importance over the 1990s of the more advanced countries in each of the triad regions (Europe, Asia and the Americas) and the increase in export shares emanating from the periphery. Ireland's share of world exports more than doubled before declining again over the new millennium. Even over this latter period, however, its share of high-value digital integrated circuit exports (of the type produced by Intel) expanded.

In 1971 Digital Equipment Corporation, one of the pioneers in the minicomputer industry, set up a large-scale manufacturing plant in Ireland. This was followed by a number of other minicomputer and mainframe assembles, which were replaced in the 1980s by PC manufacturers, beginning with Apple in 1980. Digital closed its Irish assembly operations in 1993 but associated job losses were more than offset by the arrival of three new PC assemblers, including Dell.

The closure, furthermore, did not lead to the dissipation of the skills pool. Several successful indigenous firms were established by former employees, existing firms such as Nortel and Compaq – which absorbed the software and computer engineering areas of Digital – expanded their operations, and the talent pool contributed to the emergence in the region of Europe's leading medical devices cluster. A year after the closure of its manufacturing operations, Digital opened a PC support centre and a multi-million euro call centre at new sites in the country.

By 2001, less than 400 of Apple's Irish workforce of 1,200 were involved in manufacturing. European customer support services and finance functions had been recently transferred to Ireland and the company's facilities in the south of the country had been transformed from a manufacturing base to a services campus. Local management had responsibility for sourcing and logistics and acted as landlord for R&D groups engaged in localisation and software, with the latter managed from the US.

Similar processes operated in the case of Dell. Production was shifted out of Ireland in 2009, with the loss of around 2,000 jobs. Crucially, however, the company was to maintain its Global Innovation Solutions Center, its European Command Center and its sales and marketing support functions in the country, retaining a further 2,000-2,500 jobs. According to the company, its Irish operations would "continue to co-ordinate EMEA manufacturing, logistics and supply-chain activities across a range of functions including product development, engineering, procurement and logistics."

¹ This account is based largely on Barry and van Egeraat (2008).

Apple, Digital, Dell and IBM had hence all followed similar paths, remaining in the country and upgrading from hardware assembly into higher value services.

The computer components and peripherals sectors in Ireland experienced similar churning. IDA-Ireland in the mid 1990s began to discourage large companies from locating certain manufacturing operations in Ireland due to increasing competition from low-wage economies. New sub-sectors that began to be targeted included software development, contract manufacturing and computer networking/data-communication.

A major breakthrough in ICT hardware came in 1989 with the decision of Intel to invest in a sophisticated microprocessor wafer manufacturing plant as well as a PC and motherboard assembly plant. In line with the rest of the sector, the labour-intensive assembly activities were later shifted to Puerto Rico and the Far East, and the Irish plant was refitted for much higher-level wafer production. The company has by now invested over \$7 billion in its Irish plants, which have strong records within the company in terms of process development, compliance auditing etc. Barring some unanticipated firm- or sector-specific shocks, Intel's continuing presence in Ireland into the medium term seems secure.

Manufacturing Sector Case Study: Pharmaceuticals

The pharmaceutical industry has been one of the strongest performing sectors of the Irish economy over recent decades, and is one of the highest-skill sectors within Irish manufacturing, whether proxied by the share of third-level graduates in sectoral employment or by wage levels per employee. Subsidiaries of foreign companies account for more than 90 percent of employment in the sector.²

Until the 1960s there was virtually no pharmaceutical industry in Ireland (Galvin, 1998). The sector really took off in the 1970s following the IDA's adoption of fine chemicals as one of its target sectors (Childs, 1996). Pfizer had established a plant in Ireland the previous year. It was followed within a short period of time by Merck Sharpe and Dohme and the forerunner of GlaxoSmithKline (MacSharry and White, 2000).

Henceforth, Irish employment grew strongly, from just over 1,300 in 1972 to 4,500 in 1985 to over 20,000 in 2006, by which time pharmaceuticals had become one of the country's leading industrial sectors. The increased harmonisation of regulatory regimes and reduction in other non-tariff barriers facilitated the offshoring of the industry from the former major drug-producing countries.

While the shares of world exports accounted for by traditional pharma exporting countries such as the US, the UK, Switzerland and Germany all shrank substantially since the mid-1960s, Ireland's market share in pharma has grown to now account for around 7 percent of world exports. The shares of India, China, Israel and Singapore, by contrast, each stand at 1 percent or less of the world market.

A basic model of the value chain of the pharmaceutical industry includes: discovery, product development or clinical trials, process R&D, active ingredient manufacturing,

² This account is drawn largely from Van Egeraat and Barry (2008).

drug product (formulation) manufacturing; sales and marketing; and corporate functions. Discovery covers the initial product R&D activities, i.e. research into the causes of diseases and the identification of compounds that have a pharmacological effect. Product development includes the further development of these compounds, and notably their testing in pre-clinical and clinical trials. Process R&D is concerned with the development of safe and efficient manufacturing processes at commercial scale. Manufacturing encompasses the production of raw materials, intermediates, active ingredients and drug products (formulations). All of these activities are in turn supported by corporate functions such as strategic management, finance, supply chain management etc.

Discovery, clinical trials and corporate functions are generally considered to be high value added activities (Forfás, 2003). Manufacturing is seen as a lower value added activity, though the level of value added in active ingredients is higher than in drug formulations. Process R&D and sales and marketing are in turn generally characterised as medium-level.

The available data allow us to explore the qualitative changes in the types of activities that are conducted in Ireland, within both manufacturing (active ingredients and drug formulations) and R&D (discovery, clinical trials and process development).

Within manufacturing, there has been very little growth in the (relatively) low value generating activity of basic chemicals. Employment growth instead occurred mainly in drug formulation and the higher-value-generating active ingredients sub-sector. Alongside this, Irish plants have assumed a greater role in launch activities, an increased focus on the later stages of the chemical synthesis cycle, and a geographical widening of product mandates. All these developments have substantially increased the level of value creation.

Ireland's role in pharmaceutical R&D differs considerably from activity to activity. Notwithstanding recent developments in Irish third-level institutions and the growing number of indigenous research-based companies, Ireland's role in the high value generating drug discovery field remains limited. Similarly, in spite of efforts to upgrade the necessary infrastructure, high value generating clinical trials activities remain under-represented in Ireland. Ireland's role in medium value process R&D activities has increased substantially however, with a doubling of the number of people involved over the period 2000-2006, though even in this area, Ireland's involvement is concentrated in the (relatively) lower value generating down-stream phases of the cycle.

Although the picture is complex and differentiated, it is clear that the level of value creation in the Irish pharmaceutical industry has increased substantially over recent decades.

Manufacturing Sector Case Study: Medical Devices

The first wave of medical devices companies, including Abbott Laboratories, came largely from the US in the early 1970s. Several further important companies, including CR Bard, arrived in the 1980s. One of the coups of the 1990s was the

attraction of US company Boston Scientific in 1994, while another leading American MNC, Medtronic, took over the CR Bard subsidiary in 1999.³

Boston Scientific is the largest medical device company in Ireland, employing almost 5,000 people in four manufacturing sites. In 2008 it announced a €50 million strategic R&D investment at its main Irish facility. Medtronic employs over 2000 people in Ireland, including over 100 dedicated to research and development. Its main Irish site is a centre of excellence for the development and manufacture of a number of the company's key medical technologies. The company also has a sales and shared services office elsewhere in the country.

Fifteen of the world's top twenty-five medical technology companies now have operations in Ireland and these, together with a smaller base of indigenous companies, employ an estimated 25,000 people in approximately 250 companies.⁴ Among the other world class firms with Irish operations are Johnson & Johnson, Stryker, Vistakon and Tyco Healthcare. Ireland is now the second largest exporter of medical products in Europe, after Germany, and records the highest employment level in the industry in Europe per head of population. The sector is now developing beyond manufacturing and becoming more R&D-driven.

3. Ireland as an Export Platform for Foreign-Owned Tradable Services MNCs

The increasing relative and absolute employment levels of internationally tradable services within the foreign-owned export sector in Ireland are apparent in Figure 1. From providing very few jobs in the early 1980s, tradable services now represent more than 40 percent of the total.

Services data are of course more difficult to categorise than those pertaining to manufacturing.⁵ We provide case studies below on IT services and international financial services, but many services activities defy straightforward sectoral classifications. Such activities might include call centres, shared services, supply chain management, sales and marketing, intellectual property licensing, professional consulting and internet-based business. We begin by saying a little about some of these activities before turning to the sectoral case studies.

UNCTAD (2004, p 161) assesses Ireland to be the leading location for shared service centres among developed countries. Shared services centres (known as managed services centres in the United States) perform key functions for global corporations. They deal with technical support for staff and business customers as well as human resources, payroll, accounting, insurance and legal services, and internal communications (such as running companies' inter and intranet sites). Some are operated by outsourced suppliers, but most in Ireland are managed by the companies they serve.

The IDA has promoted the low-level call centre sector in order to encourage firms which have established such operations in Ireland to add on additional functions such

³ Much of this material is based on Giblin and Ryan (2011).

⁴ http://www.imda.ie/Sectors/IMDA/IMDA.nsf/vPages/About_us~sector-profile?OpenDocument

⁵ The distinction between manufacturing and services is becoming increasingly blurred. In Ireland, over 30 percent of workers employed in the manufacturing sector are engaged in services-related activities, and this percentage is increasing over time (Forfás, 2006).

as financial management and software development. Already Ireland has achieved some substantial success in these “shared services” back-office activities.

The term ‘call centre’ generally embraces sales and marketing shared services and IT shared services such as online technical assistance. Among the major firms which have established call centres in Ireland (in areas outside finance and sales and marketing of IT) are American Airlines, Best Western, ITT Sheraton, Global Reservations, Korean Air, Radisson Hotels, Rand McNally and UPS. Among companies which have located elements of their financial administration in Ireland are Merrill Lynch, Microsoft, Morgan Grenfell, National Instruments, Novell, Scottish Amicable, advanced storage and retrieval firm EMC, and home appliances firm Whirlpool.

Call-centre employment in the early years of the new millennium stood at a level somewhere between 12,000 and 19,000. On the basis of the latter number CM Insight (2004) calculates that Ireland has the highest proportion of call centre staff of any European country as a proportion of its working population, at 3.6 percent, compared to its nearest competitors, the UK at 2.8 percent and the Netherlands at 2.5 percent.

The breakdown of the Irish call centre sector at the beginning of the millennium is shown in Table 3.

Table 3: Sectoral breakdown of firms in the Irish call centre industry

| Sector | % |
|---------------------|------------|
| Technology | 35 |
| Travel & tourism | 16 |
| Financial services | 12 |
| Outsourcing bureaus | 12 |
| Other | 25 |
| Total | 100 |

Source: TMA (2002), from Datamonitor (November 2000).

The educational requirements of the various segments of the call-centre sector differ substantially. The low-skill segments of tele-business activities are in Reservations and Financial Services. These comprise less than one-third of firms in the Irish sector however. The other two segments – comprising tele-business in the computer and professional services sectors – are, on the basis of the available evidence, more high-skill than the average for the economy. Given the make-up of Irish call centres, there is a possibility that even within this globally fairly low-skill sector, the Irish segment may be more education-intensive than the average for the entire economy.

CM Insight (2004, p 160) concludes that Ireland attracts more high-value, less price-sensitive contact centre activity than other offshore locations. The report remarks on the substantial element of technical and software support in the Irish sector as well as a relatively high ratio of team leaders to agents, suggestive of a focus on quality and on more complex and less scripted contact centre functions.

Turning now to the sectoral case studies, Siedschlag’s (2008) estimates of revealed comparative advantage (RCA) in services, based on 1998-2006 data, show Ireland developing a strong and increasing RCA in computer and information services (into

which ‘recorded media’ has merged) and in insurance and financial services. About one quarter of tradable services employment in foreign-owned firms in Ireland is in international financial services and the remainder of the jobs are divided between various forms of IT services, whether directly in the IT industry – in firms such as Apple, IBM, Microsoft, Google etc. – or in IT-enabled business process services.

Services Sector Case Study: Software and IT Services

Software and IT services are quite distinct sectors though they are grouped together here because the Irish employment data do not allow us to distinguish between them. Employment in foreign software firms was recorded as rising from around 4,000 in 1991 to some 16,000 in 2000, while employment in all foreign-owned computer and IT services activities hovered around 46,000 from 2001 to 2008 before declining somewhat over the global financial crisis.⁶

Within the narrow software component, around half of the jobs in the foreign-owned segment are in manufacturing, localisation and distribution (MLD) activities, while the other half are in software development, which is much more highly skilled.

Most of the localisation of mass-market software for the EMEA region takes place in the country, while Singapore has traditionally performed a similar function for the Asian market (Coe, 1999).⁷ While the figures for Irish output are arguably inflated by the transfer pricing practices of multinational corporations, even in employment terms the mass market software sector has long been more important in Ireland than in other EU economies (Barry and Curran, 2004).

The key players in the software sector (including Microsoft, Lotus, Oracle, Symantec, Informix and Corel) first established software manufacturing facilities in Ireland around the mid-1980s, duplicating and shrink-wrapping disk copies of the software programmes developed by the parent company and arranging for the printing and assembly of manuals. This work was not in general very highly skilled, though the sector has moved up the value chain over time. The second phase, again beginning with Lotus and Microsoft, saw these companies adding localisation to the process. This involves translating the original products into other languages and different cultural and technical formats appropriate to the destination markets. There is some programming involved in preparing the text to be translated and then reincorporating it back into the programme. The third phase of the sector’s development saw the transfer of the responsibility for distribution, which had previously been handled by local distributors, to the Irish operations themselves. Thus Ireland became an operations hub; Ó Riain (2004).

Many of the remaining jobs in the broader software and IT services sector are in what have traditionally been thought of as computer hardware firms. In the earlier discussion of the computer hardware sector, it was pointed out how most of the key international firms remained in Ireland, switching their Irish operations to IT services delivery as the country transitioned out of hardware production.

⁶ Sources: National Software Directorate for the early years; Forfás Annual Employment Survey for the more recent period.

⁷ Ireland and Singapore share many similarities as advanced export platforms, though the state plays a more active role in enterprise in the latter case (Low, 2005). Ó Riain (2004) characterises Ireland as a developmental network state and Singapore as a developmental bureaucratic state.

IBM represents an interesting case study as the entire company has shifted its focus globally from products to services and solutions. It was one of the first companies to establish an international software facility in Ireland in the early 1980s but its acquisition of Lotus in 1995 (with the Irish facility re-named the Dublin Software Lab) added a significant software development component to its portfolio. The company started to invest heavily in Ireland from that point as EU developments allowed it to rationalise its European operations. It first opened a PC customer support centre, catering for 29 countries (including the US). The same year it began to develop a technology campus in Ireland with some high-end manufacturing operations, including the manufacturing and testing of logic chips, production of disc drive platters in a clean room environment and production of customised high-end network servers.

In 2001, part of IBM's manufacturing operations were relocated from Ireland but there was new investment in areas such as supply chain management. Call centre support for personal computers re-located to lower cost regions and the technical support call centre was transformed into a "dotcom centre" with staff selling services directly to clients rather than simply offering support. The Dublin Software Lab has been expanded and in 2004 the Dublin Centre for Advanced Studies, one of seven such centres run by IBM worldwide, was launched. Most recently the company established three Competency Centres developing software in areas such as biomedical search and service-oriented architecture, an IBM Business Incubation Centre, a European Venture Capital Centre, an Innovation Centre and new supply chain operations.

As Barry and van Egeraat (2008) show, the decline in computer hardware jobs in Ireland since the late 1990s has been associated with a progressive increase in jobs in business process export activities.

Services Sector Case Study: International Financial Services

The International Financial Services Centre (IFSC), established in Dublin in 1987, has achieved notable success in attracting financial services FDI to Ireland. As MacSharry and White (2000, 318) note, "a combination of factors created an opportunity for a regional location like Ireland to become a player in the international financial services industry. First, world financial markets had become highly interdependent and operated on a round-the-clock basis. Second, the technology to set up and run international data- and fund-management centres was, in turn, creating an electronic market place, thanks to improvements in international telecommunications. And, third, global deregulation of financial services meant that an increasing range of these services were provided from beyond national boundaries".⁸

In response to these developments, the Irish Government in 1987 launched the IFSC. Licensed companies were initially subject to a special low rate of corporation tax of

⁸ Even before the establishment of the IFSC, Ireland had drawn sixteen major international banks to its shores, as they entered to service the needs of the large multinational manufacturing corporations which had chosen Ireland as an export platform to serve the broader EU market (Reddan, 2008, 59-62).

10 percent but corporation tax rates were later harmonised across the economy at 12.5 percent from 2003.

Around 450 international financial institutions now operate from Dublin, including half of the world's top 50 banks and half of the top 20 insurance companies. Over 80 percent of the financial institutions are non-Irish, with American companies representing the largest segment. The sector pays an estimated 15 percent of all corporation taxes collected.

Dublin specializes in back office activities, and has a particular specialisation in four niche areas—fund administration, treasury operations, corporate banking and insurance. While the marketing and management of funds is handled from the world's major financial centres, the associated administration is frequently offshored. Ireland now rivals Luxembourg in the area of fund administration, while FÁS (2005) reports a slow movement up the value chain towards fund management.

Similar to fund administration, treasury management involves routine back-office tasks like handling payments and receipts and coordinating lending and borrowing between different divisions of a company. Many IFSC-based treasury operations are recognizable names in other industries, e.g. companies such as Bristol-Myers Squibb, Ericsson and Volkswagen. The Netherlands and Belgium are seen as the main competitors in the area of treasury operations

The IFSC is also a corporate banking center, providing loans to corporations and governments for very large purchases. Here Ireland competes with Luxembourg, the Isle of Man and Jersey, while Dublin has come to rival London as a leading center for aircraft leasing.

Finally, the IFSC houses a significant number of life and non-life insurers. EU regulatory changes enacted during the mid-1990s allowed life insurers headquartered in one EU country to sell insurance elsewhere in the EU. This provides the IFSC with an advantage over other offshore centres such as Guernsey and the Isle of Man, which also specialise in insurance, since these are not within the EU. Ireland's international life insurance sector in 2001 overtook Luxembourg in terms of gross premia written, while recent statistics indicated that it may now also have overtaken the Isle of Man. In spite of this strong recent growth in life insurance, non-life insurers remain more prevalent in the IFSC.

A recent breakdown of employment and activities in the international financial services sector in Ireland is provided in Table 4 below.

Table 4: Irish International Financial Services Activities

| Sector | Activities | Employment (2007) |
|------------------------------------|--|--|
| Banking and Capital Markets | Corporate Finance Structured Finance Investment Banking Securitisation Treasury Management. Asset Financing/Leasing | 10,000 |
| Investment Management | Discretionary Fund Mngt. Non-discret. Fund Mngt. Fund Servicing Trustee and Custodian Servicing Transfer Agency Services Asset Management | 9,000 (Administration: 6500; Management: 2500) |
| Insurance | Life Captive Non-Life Reinsurance | 3,000 |

Source: Expert Group on Future Skills Needs (2007)

4. Inward FDI and the Foreign Affiliate Sector over the Global Financial Crisis

Having reached an all-time high of almost \$2 trillion in 2007, worldwide FDI flows collapsed over the following two years. 2009 flows were down almost 40 percent on those seen two years earlier. Developed countries were hit particularly hard, with 2009 inflows down over 50 percent on 2007 levels.

The extent of Ireland's FDI-intensity might be thought to have left the country particularly vulnerable to the collapse in international FDI flows that occurred over the course of the global financial crisis. Ireland ended up bucking this trend however. Though inflows turned negative in 2008, 2009 inflows surpassed those achieved in 2007 and were not far off the Irish peak achieved in 2002.⁹

It is important to note though that FDI data of this type bear very little relationship to the real foreign MNC activities that are the main focus of attention.¹⁰ The foreign-affiliate employment data used in this paper, for example, refer only to export-platform FDI, while FDI stock and flow data from the balance of payments pertain to all sectors, including non-tradables. A second reason is that the inward FDI data aggregate both IFSC and non-IFSC FDI, while, as UNCTAD (2004, p. 104) notes, "a good deal of services FDI – notably that in holdings and financial affiliates – involves activities with little value added, employment, sales or investment expenditure on fixed capital". A third reason is that the FDI data include only a sub-set of the forms of investment finance employed by MNCs, specifically inward equity flows, intra-company loans and reinvested earnings. Barry and O'Mahony (2005) and Griffith (1999) show that FDI inflows in particular sectors are typically lower and much more volatile than measures of real foreign-MNC investments in plant and equipment.

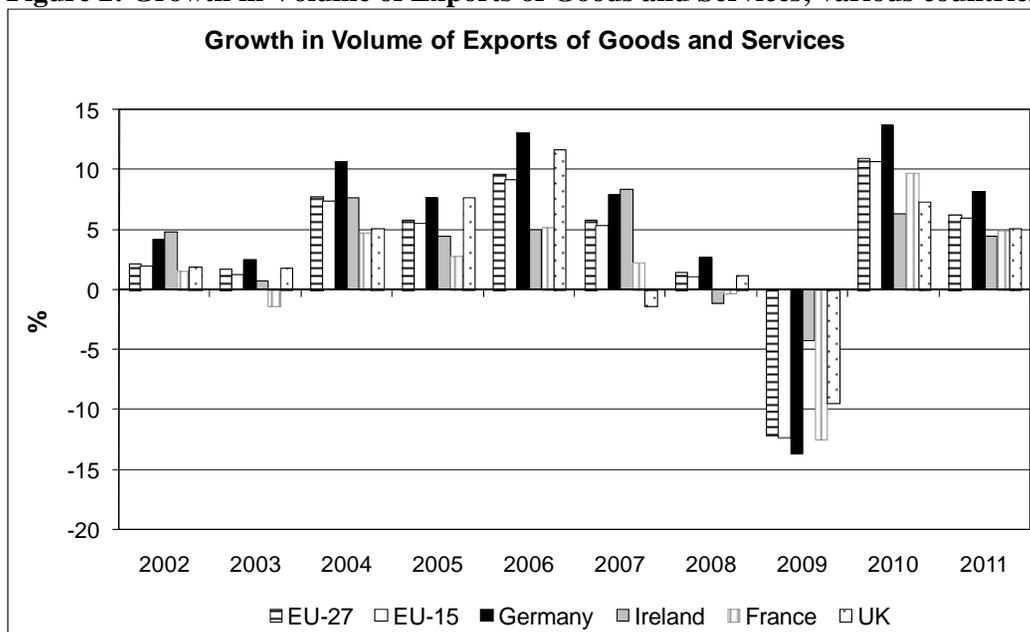
⁹ Data from UNCTAD online statistics.

¹⁰ See Lipsey (2003a) and, for the Irish case, Barry and O'Mahony (2005).

The fact that gross FDI inflows to Ireland were negative over several recent years – indicating that inter-affiliate loan advances and repayments from resident foreign-owned enterprises exceeded inward equity flows and reinvested earnings – is indicative of the complexity of MNC financing decisions. For some years, IFSC transactions were responsible for the negative aggregate; for other years, it was driven by non-IFSC inflows (Barry and Bergin, 2010). For all of these reasons, our focus remains on real MNC activities such as exports and employment.

Total Irish exports remained relatively flat in 2008. 2009 saw a dramatic fall while 2010 and 2011 witnessed a return to growth. As seen in Figure 2, these broad developments largely mirrored those in the other European economies – the EU27, the Western European EU15, France, Germany and the UK – against which we benchmark Irish performance.

Figure 2: Growth in Volume of Exports of Goods and Services; various countries



Source: Eurostat: Exports and imports by EU countries and third countries - volumes.

By 2011, the increase in Irish exports on 2007 levels, though lagging behind Germany, exceeded that for Western Europe overall, and for the other Western European economies shown (Table 5).

Table 5: Export Volumes

| | 2011 outcome: % increase on 2007 outcome | | | Share of services in total exports |
|----------------|--|-------|----------|------------------------------------|
| | Total | Goods | Services | 2007 |
| EU27 | 5 | 5 | 5 | 24 |
| EU15 | 4 | 4 | 5 | 24 |
| Germany | 9 | 8 | 18 | 16 |
| Ireland | 5 | 4 | 7 | 33 |
| France | 1 | 1 | -1 | 19 |
| UK | 3 | 5 | 2 | 39 |

Source: Eurostat: Exports and imports by EU countries and third countries - volumes.

To what extent are these outcomes due to differing sectoral export compositions within manufacturing and services? As mentioned earlier, based on 2000-04 export data Ireland had a strong revealed comparative advantage (RCA), among manufacturing sectors, in pharmaceuticals and other chemicals, medical and surgical equipment, office and computing machinery, a number of food and drink sub-sectors, and recorded media.

Ireland is likely to have lost its RCA in office and computing equipment more recently, particularly with the closure of Dell's manufacturing facilities, though the sector had been migrating out of Ireland over the last decade. Siedschlag's (2008) recent estimates of RCA in services, based on 1998-2006 data, show Ireland developing a strong and increasing RCA in computer and information services (into which 'recorded media' has merged) and in insurance and financial services.

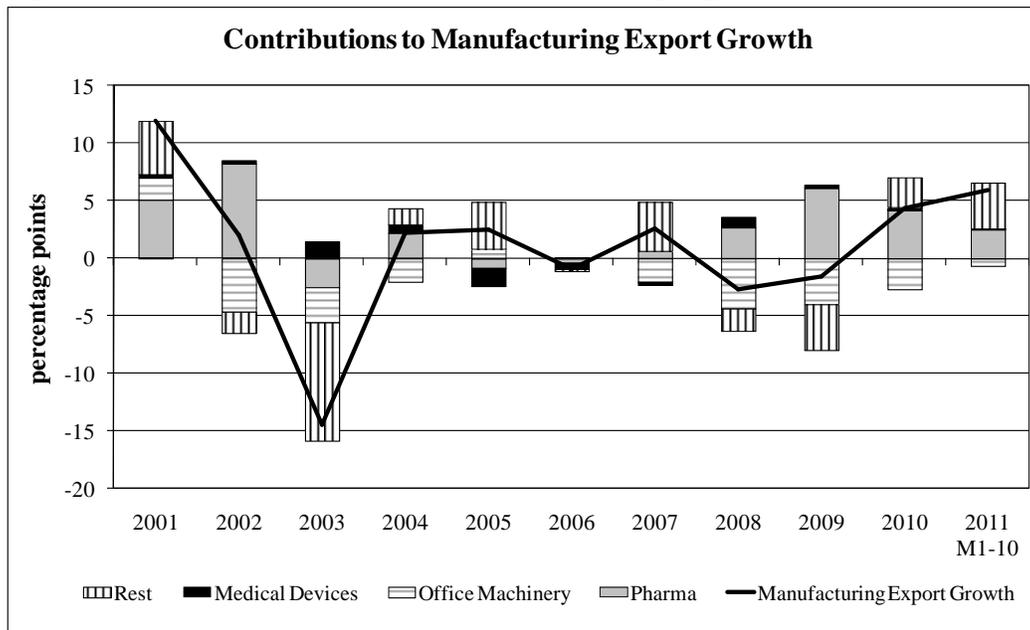
Pharmaceuticals and chemicals have increased as a share of EU15 manufactured exports over the downturn, as have medical devices, suggesting – unsurprisingly – that these sectors are less vulnerable to recession. Ireland's RCA in these sectors has helped to stabilise the economy. Correspondingly, the fact that Ireland does not have an RCA in transport equipment will have helped to insulate the economy since this sector – globally and at the EU level – performed poorly over the downturn. In terms of services, computer and information services increased as a share of EU15 services exports over the period, suggesting that Ireland's revealed comparative advantage in this sector has also helped to stabilise the economy.¹¹

Figures 3 and 4 chart the contributions of these and other sectors to Irish manufacturing and services export growth over the period 2001-2010.

Pharmaceuticals and medical devices exports helped to prop up the economy, while the performance of office machinery had an opposite effect.

¹¹ See Barry and Bergin (2010) for data on the aggregate performance of specific sectors at the EU level.

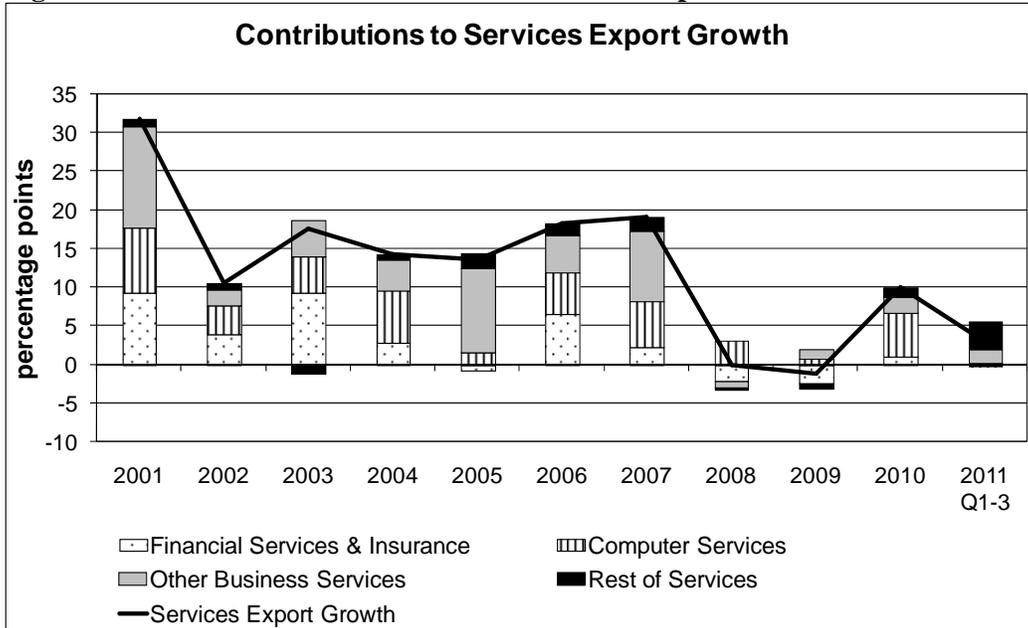
Figure 3: Sectoral Contributions to Irish Manufacturing Export Growth (€millions)



Source: CSO External Trade Statistics. Note: The graph shows the growth in manufacturing exports in the first 10 months of 2011 compared to the first 10 months of 2010.

Within services, computer and information services exports also had a beneficial effect (Figure 4).

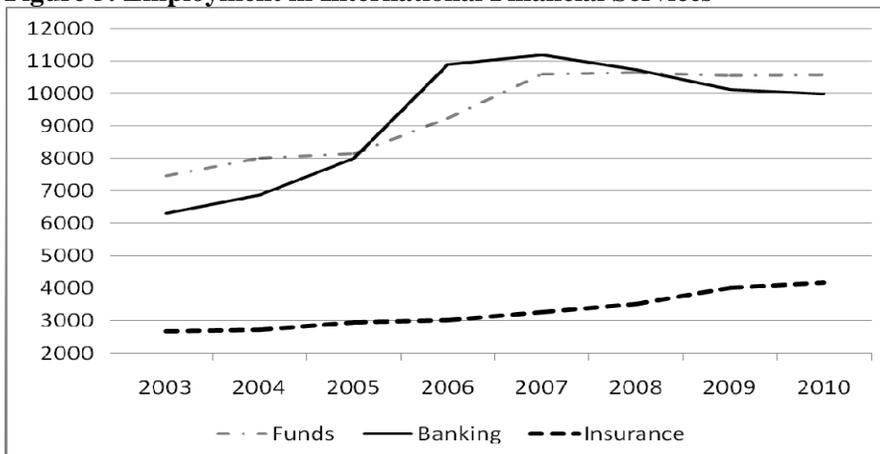
Figure 4: Sectoral Contributions to Irish Services Export Growth



Source: CSO Balance of Payments.

While financial services and insurance made a negative contribution to export growth over 2008 and 2009, job numbers remained largely stable over the downturn (Figure 5). Within the banking and capital markets segment, the employment fall in securitisation activities was partly offset by an expansion in aircraft leasing, in which activity the IFSC is a major international player.¹² The IFSC also benefitted from the Foreign Account Tax Compliance Act introduced in the US in 2009, which targeted Caribbean tax haven jurisdictions. A number of US companies responded by moving their corporate headquarters from locations such as Bermuda and the Cayman Islands to Dublin.

Figure 5: Employment in International Financial Services



Source: Finance Dublin Yearbook.

¹² Aircraft leasing is counter-cyclical, in that many airlines opt to lease rather than buy during a downturn, while leasing companies benefit further from the better aircraft prices on offer.

We next turn to aggregate employment developments across the economy over the bubble period and the downturn. Table 6 shows the massive cyclical fluctuations in construction-sector employment, while employment in the tradables sectors is seen to have fluctuated less than for the overall private sector.¹³

Table 6: Employment in Tradables and in the Public and Private Sectors (thousands)

| | 2000 | 2007 | 2008 | 2009 | 2010 | % change 2000-07 | % change 2007-10 |
|---------------------------|-------|-------|-------|-------|-------|------------------|------------------|
| Private Sector | 1,354 | 1,665 | 1,628 | 1,446 | 1,358 | 23 | -18 |
| ... of which | | | | | | | |
| – Foreign-owned Tradables | 182 | 174 | 170 | 154 | 155 | -4 | -11 |
| – Indigenous Tradables | 168 | 183 | 177 | 159 | 155 | 9 | -15 |
| – Construction | 166 | 267 | 236 | 156 | 120 | 61 | -55 |
| Public Sector | 343 | 457 | 472 | 483 | 490 | 33 | 7 |
| Total | 1,697 | 2,123 | 2,100 | 1,929 | 1,848 | 25 | -13 |

Sources: Forfás (2997, 2010, AES) for total employment in tradables sectors; ESRI databank and CSO (QNHS) for aggregate economy; CSO (2006, Construction and Housing in Ireland) for employment in construction in 2000.

Note: The public sector, from the QNHS, is taken to comprise public administration and defence; compulsory social security; and education, human health and social work activities.

Employment prospects for the future depend, on the demand side, on a resumption of growth in Irish export markets, and on a more diverse range of factors operating on the supply side. Barry and Bergin (2010) offer an optimistic assessment of Ireland's attractiveness to FDI inflows over the medium term. Employment prospects will be enhanced by the reversal in the crowding out of the traded sector entailed by the collapse of construction, much slower (if not negative) growth in the public sector over the medium term, and the recent substantial improvement in Irish cost competitiveness associated with the downturn. This is likely to prove a greater stimulus to the indigenous than to the foreign sector, since the former is both more cost sensitive and more employment intensive.

Indirect employment effects of the foreign affiliate sectors arise through wage expenditures (which in turn depend on job quality), total taxes paid, linkages, productivity spillovers and other beneficial effects on the innovativeness of the enterprise environment. Foreign affiliates dominate indigenous firms on most of these fronts (Barry, 2004). They pay higher wages and spend much more per job on training and on research and development.

¹³ The large decline in indigenous tradables employment is related to the collapse in construction in both Ireland and the UK (which is the most significant market for indigenous exports), as much of indigenous output in traditional sectors serves as an input to construction activities.

Though indigenous firms purchase more materials in Ireland, foreign affiliates spend significantly more on Irish services, which are particularly employment intensive. It is notable that the bulk of Irish services purchases are made by the growing services segment of the foreign-affiliate sector (Table 7).¹⁴

Table 7: Materials and Services Purchases in Ireland (€k)

| | Raw materials purchased in Ireland, 2009 | Services purchased in Ireland, 2009 |
|-------------------|--|-------------------------------------|
| Indigenous | 8,465,137 | 4,493,298 |
| of which | | |
| .. manufactures | 7,953,974 | 3,665,906 |
| .. services | 511,163 | 827,392 |
| Foreign | 2,494,805 | 9,106,688 |
| of which | | |
| .. manufactures | 1,882,450 | 2,733,417 |
| .. services | 612,355 | 6,373,272 |

Source: Forfás (2009) ABSEI

Spillovers are another channel through which the foreign sector can benefit the economy. Though the international econometric evidence on productivity spillovers from foreign affiliates is mixed, the effects are generally found to be positive for Ireland (Görg and Greenaway, 2004). The case study evidence supports this. Giblin and Ryan (2011) find evidence of beneficial intra-industry spillovers from the presence of the leading foreign medical devices firms in the west of Ireland, while Barry (2011) argues that the variety of FDI firms and sectors in Ireland in the 1970s and 1980s created an environment conducive to the emergence of a successful indigenous IT software export cluster, which was in turn the only significant source of export growth during the export downturn of 2009.

Concluding Comments: Ireland's Success as an Export Platform

A cross-country study by Slaughter (2003) on the determinants of US FDI in Europe helps us to pinpoint some of the key factors behind Ireland's success in attracting export-platform FDI.¹⁵ He finds geographic proximity to the US to be a significant determinant of the overall level of FDI attracted, while EU membership is found to be particularly significant for FDI in manufacturing and financial services. Smaller markets unsurprisingly attract export-platform activity rather than production for local markets, and US affiliate production tends to be concentrated in low-tax countries.

The importance of Ireland's low corporation tax regime in kick-starting FDI inflows has already been alluded to. The country's corporation tax regime has remained amongst the most stable in Europe since the adoption of the low tax strategy in the late 1950s, and according to Pádraic White, a former Managing Director of the IDA, it remains "the unique and essential foundation stone of Ireland's foreign investment

¹⁴ Services purchased in Ireland by foreign manufacturing and services affiliates both peaked in 2003, while total global services purchases continued to grow. Irish services purchases may have been damaged by the reduction in Irish competitiveness over the period of the property bubble.

¹⁵ This section draws substantially on Barry (2004).

boom” (MacSharry and White, 2000, p. 250).¹⁶

Most manufacturing industry had been taxed at a special rate of 10 percent from 1978, while the rate on services was substantially higher. From 1987, the special rate was extended to qualifying activities carried out at the recently established International Financial Services Centre in Dublin. In the face of European Commission pressure to harmonise rates across sectors, the government chose a low harmonised rate of 12.5 percent to apply across all sectors from 2003.

Another factor widely regarded as important in attracting FDI to Ireland has been the effectiveness of the state agency IDA-Ireland. MacSharry and White (2000) – the former an erstwhile Finance Minister and EU Commissioner and the latter a former Managing Director of the IDA – describe how the organisation in the wake of the oil shocks of the 1970s began to focus on sectors that would be more insulated from competition from lower wage locations, and on job creation through backward linkages rather than labour-intensive processes.

They summarise the modus operandi of the IDA as follows. First, the sectors and sub-sectors experiencing international growth – and that are thought to provide a good fit for Ireland’s resources and development aims – are identified. Having attracted several computer and components firms in the 1970s, for example, and being favourably impressed by their performance *in situ*, electronics and computer software were among the industries listed as meeting these criteria in 1983, when an all-out campaign to develop Ireland as a major European location for the industry began.

In other cases, the identification of target niches appears prescient. The establishment of the IFSC in the late 1980s has been discussed earlier. Though the commercial development officer of the Isle of Man, which had a long-established reputation as an offshore financial centre, cautioned that “Dublin would be better building on its own resources, which do not particularly include financial services”, a little over a decade later the IFSC had grown to become a significant European offshore financial centre itself.

After the identification of target niches, the IDA establishes contact with the strongest companies in these sub-sectors. The agency had been interacting with Intel and IBM for over a decade before these firms ultimately chose to locate in Ireland.

The IDA and its sister agencies also have an influence in the development and upgrading of the human capital and physical infrastructure required to facilitate the country in climbing the ladder of comparative advantage. This brings them into policy areas not traditionally recognised as lying within the industrial promotion remit. In Ireland, they played a major role in forcing through the modernisation of the country’s telecommunications infrastructure in the late 1970s to early 1980s and in convincing the government to use part of its EU regional aid allocations to institute conversion courses to furnish science graduates with electronics qualifications. The tertiary education system in Ireland has over recent decades become more tightly

¹⁶ Financial incentives in the form of grants to firms had been substantial in earlier years but have been scaled back significantly in line with EU restrictions on state aids to industry.

integrated into the country's economic development strategy through an agency known as the Expert Group on Future Skills Needs (Barry, 2007).¹⁷

Agglomeration and demonstration effects have also been found to have played a role in enhancing Ireland's attractiveness as an export-platform location. Barry and Bradley (1997) noted that surveys of executives of newly arriving foreign companies in the computer, instrument engineering, pharmaceutical and chemical sectors indicated that the presence of key market players in Ireland strongly influenced the location choice of the newcomers, for which Barry, Görg and Strobl (2003) subsequently provided empirical support.

It is clear that non-policy reasons have been important as well. That Ireland and the United Kingdom are particularly attractive locations for US corporations presumably reflects strong cultural connections, including a shared language and shared common law traditions.¹⁸ Proximity between FDI home and host locations remains a statistically significant determinant of FDI inflows, as seen in the gravity modelling of Slaughter (2003) for example. It is clear also that for many economic activities the overall 'ease of doing business', which tends to change only slowly, insulates advanced EU countries from global competition in the market for inward FDI.

¹⁷ The Irish system offers a finite number of places in most third-level courses. These numbers are decided within the third-level institutions but are subject to government influence as the latter provides the bulk of educational funding. As Ó Riain (2004) points out, this gives the Irish state a much greater capacity to mould the labour market for specific economic sectors than is the case in many other countries.

¹⁸ Kraemer and Dedrick (2002) point out that when Dell Computers first moved into Europe, the company was attracted by locations that were similar to the United States in terms of language and business culture.

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Institute for International Integration Studies

The Sutherland Centre, Trinity College Dublin, Dublin 2, Ireland

