

FDI and Irish Economic Development over Four Stages of European Integration

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Introduction

Ireland is the most FDI-intensive economy in Europe. Foreign-owned firms account for almost 50 percent of Irish manufacturing employment. This compares to an average figure of 23 for the Western European EU member states and a figure of 33 for the three largest Central and Eastern European economies. Of the 17 EU countries plus the US and Norway for which OECD (2005, E7) provides data, Ireland also records the highest share of services-sector employment in foreign-owned firms. These figures are reflected in the value of the stock of foreign direct investment (FDI). Per head of population, the Irish inward FDI stock is a multiple of the EU average.¹

Table 1: FDI-Intensity of the Irish Economy

	Share of foreign affiliates in manufacturing employment	Share of foreign affiliates in services employment	FDI inward stock (USD) per head of population (2004)
Ireland	49	22	57372
EU15	23	10	9796
CEE	33	16	2403

Notes: affiliate employment shares (2002 or closest date) come from OECD (2005, tables E6 and E7) Science, Technology and Industry Scoreboard. CEE refers to the country average for Hungary, Poland and the Czech Republic. FDI Inward Stock data come from the UNCTAD (2005) World Investment Report.

The distinguishing feature of the country's development strategy over the last four decades of outward orientation has been the emphasis placed on attracting FDI. The country had been remarkably successful in this regard even before the "Celtic Tiger

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¹ Luxembourg records a higher FDI stock per head of population than Ireland but this is largely concentrated in financial services and is much less employment-intensive.

era” of the 1990s and beyond. Having stumbled upon the strategy, it turned out with hindsight to accord well with Ireland’s advantages: its Atlantic location and English-speaking environment, relatively low labour costs by Western European standards, cultural connections with the US and Western European standards of governance.²

The present paper analyses the co-evolution of institutional features of the Irish economic environment and the types of FDI available to European economies. We divide the period of Irish outward orientation into four distinct phases. The first phase of Irish trade integration with Continental Europe began in the late 1950s when the country moved away from protectionism, dropped its restrictions on foreign ownership of industry and adopted a zero rate of corporation tax on manufactured exports. These moves drew in substantial numbers of US firms who exported into mainland Europe (as opposed to the UK, which remains to this day the dominant export destination of most Irish domestic firms) even though substantial tariff barriers remained against Irish-produced goods. Increased openness saw the country adopt the main proposals of an influential OECD report on primary and secondary education in 1965, which sparked a dramatic educational expansion at all levels.

The second phase began when Ireland joined the EU in 1973. This brought a substantial increase in FDI inflows which – in response to the upgrading of the Irish tertiary educational system – began to locate in higher-technology sectors. Macroeconomic instability over the period of the oil shocks however prevented Irish convergence on average Western European living standards over this period.

The third integration phase was driven by the Single European Market, the global high-tech boom and domestic policy adjustments in Ireland. The outlawing of restrictive public procurement practices on the part of EU governments allowed

² Standards of governance are widely recognised to be a crucial determinant of a country’s investment climate. Western European standards are based on an interlocking system of parliamentary, judiciary and press scrutiny, clear lines of responsibility and accountability, EU oversight, an independent Competition Authority, a series of independent regulators and a meritocratic civil service; Barry (2005). Governance standards are particularly important in the areas of privatisation and natural resource-seeking FDI. Associated with a fall in the country’s *Transparency International* rankings over recent years, Ireland has had to institute a number of high-profile tribunals of inquiry into allegations of corruption. It is noteworthy however that these allegations have been confined to sectors other than those dominated by export-oriented foreign MNCs – property, retail banking, beef processing and domestic telecommunications.

Ireland's locational advantages come more strongly to the fore; the low-corporation tax environment proved especially beneficial to high-tech MNCs who are better able to exploit its benefits; Ireland's continued educational upgrading remained an important magnet for such firms, while fiscal consolidation, EU regional aid and the institutions of social partnership brought further competitiveness gains. Furthermore, the EU-enforced inter-sectoral harmonisation of corporation tax rates in Ireland brought the Irish rate on services down dramatically just as global services-sector offshoring began in earnest.

The fourth phase arose as a consequence of Ireland's convergence on average Western European living standards over the Celtic Tiger era and the accession of other low corporation-tax states to the EU. This required Ireland to focus more on developing its national system of innovation in order to target the increasingly technology-sourcing foreign direct investment flowing into and across Europe.

2. Phase 1: from Protectionism to EU Accession (1958-1973)

Ireland remained protectionist for about a decade after most of the rest of Western Europe had moved towards freer trade. The post-war boom of the 1950s saw Western Europe achieving growth rates of almost 6 percent per annum while protectionist Ireland stagnated with a growth rate of less than 2 percent, and an employment growth rate of less than 1 percent. The need to import the more sophisticated capital and consumer goods that the country could not produce for itself led to balance of payments crises and macroeconomic instability, exactly as happened in protectionist Spain at around this time. The depressed economy of the 1950s saw more than 400,000 Irish people emigrate, out of a total population of less than 3 million.

By the end of the 1950s it was clear that economic policy would need to be completely overhauled. The First Programme for Economic Expansion, which removed protectionism, encouraged foreign direct investment and promoted exports, was introduced in 1958. The Anglo-Irish Free Trade Agreement, which aimed to liberalise trade with the country's major trading partner of the time, the United Kingdom, came into force in 1966, and both countries acceded to the then European

Economic Community (EEC) in 1973.³ The move towards openness was accompanied by the introduction of a zero tax rate on profits derived from manufactured exports and a liberalisation of the law on foreign ownership of companies. As the bulk of the country's exports at that time were agricultural in nature, there was little diminution of the tax base when the concessionary tax rate was adopted.

British and German companies were the first to respond to these new opportunities, with US companies coming to predominate only as EU entry approached.⁴

Table 2: Number of new foreign companies establishing operations in Ireland

	1955-59	1960-64	1965-69	1970-73
Total	30	86	116	168
..... UK	16	26	48	43
..... German	5	21	16	30
..... US	5	20	27	55
..... Other	4	19	25	40

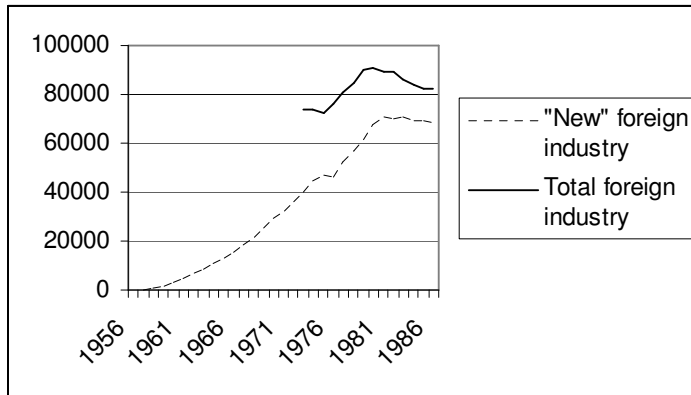
Source: Authors calculations from IDA (1973)

O'Hearn (1987) has estimated employment levels in the new foreign firms that entered Ireland to avail of the zero tax rate on manufactured exports. By the time of EU entry these firms accounted for slightly more than half of all foreign-firm employment in manufacturing, with the remainder accounted for by the mainly UK firms that had entered Ireland to cater to the home market, whether under protectionism or in the outward-oriented era. Figure 1 shows consistent growth in "new" foreign-firm employment.

³ The degree of protection is illustrated by the fact that the average effective tariff level before the Anglo-Irish Free Trade Agreement was almost four times that prevailing in the country's trading partners. This had declined to around twice the average level in the run up to EEC entry in 1973.

⁴ 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 the date of accession to the EU, the stock had risen to USD 269 million (in nominal terms), of which 90 percent was in manufacturing, with the bulk of the sector's output being exported (Lipse, 2003).

Figure 1: Employment in “new” foreign industry (attracted under outward orientation) and total foreign industry



As Table 3 reveals, most of the growth prior to EU entry was in traditional or low-tech sectors such as Textiles and Clothing, Metals Industries (such as aluminium extrusions, shipbuilding, cranes, metal nuts), Pulp and Paper, and Rubber and Plastics.

Table 3: Sectoral distribution of employment in “new” foreign industry

	1960	1965	1969	1973	1986
Food and Drink	2.8	3.4	9.0	10.8	8.6
Textiles and Clothing	10.2	16.4	19.2	21.1	15.9
Wood and Furniture	0.0	1.6	1.6	1.5	1.2
Pulp, Paper and Printing	11.3	5.9	3.6	2.9	2.1
Clay, glass and cement	0.0	1.9	2.3	2.4	2.6
Pharmaceuticals	0.0	3.3	2.9	2.3	5.7
Chemicals (excl pharma)	7.1	7.9	6.0	5.4	3.9
Electronics	6.4	8.5	12.1	10.9	25.9
Metal prods (excl. electronics)	49.6	40.0	29.6	27.4	15.1
Medical and optical	0.0	1.5	4.8	6.9	10.0
Other manuf (excl. med and opt)	12.6	9.4	8.7	8.4	8.9

Source: O’Hearn (1987)

The FDI inflows of this period led to Ireland developing a revealed comparative advantage (at the SITC-1 level) in Chemicals (whose share of exports grew from less than one half of 1 percent at the end of the 1950s to 6 percent at the time of EU entry) and in “manufactured goods classified by material” and “miscellaneous manufactured articles”.

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.

It is of interest to note that though the numbers of new foreign firms establishing operations in Ireland accelerated as EU accession drew closer, the impact of EU membership on inbound FDI would have been unclear a priori, since accession entailed the loss of Ireland's preferential position in the UK market.⁵

The increased intellectual openness of the period saw Ireland (and later Austria) volunteer to allow the OECD conduct a survey of the entire national education system.⁶ An important feature of the subsequent report, issued in 1965, was that – almost for the first time – technocratic expertise was now to be heard alongside the party political and denominational interests which had previously dominated ministerial councils (Logan, 1999). The report was scathing in its assessment of the Irish system, noting that over half of Irish children left school at or before the age of thirteen. This finding generated newspaper headlines and presaged the introduction of 'free' second-level education and free access to special transport networks for all second-level school pupils in 1967. These measures sparked a dramatic educational expansion over the course of the 1970s and subsequently.

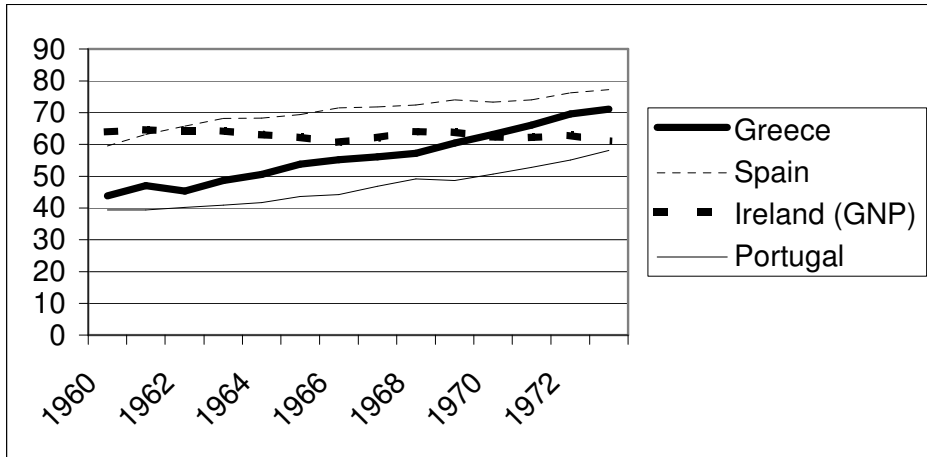
Notwithstanding Ireland's early successes in attracting FDI, there was no convergence on average Western European living standards over this period, nor indeed until the late 1980s. This is arguably ascribable to Ireland's "regional economy" character, where, because of the historic ease of emigration to the UK, Ireland can be thought to have little control over its net-of-tax labour costs (though there were substantial insider-outsider problems in the labour market also). This would have prevented Ireland from industrialising through the development of low-wage consumer goods exports as each of the other traditionally less developed Western European economies – Portugal, Spain and Greece – did in the 1960s (Figure 2).⁷

⁵ For manufactured exports McAleese (1975) estimated that the benefits of improved access to the EU market could be wiped out by the deterioration of Ireland's competitive position in the UK market. He pointed out however that as few of the firms attracted to Ireland by the low tax rate appeared to cater primarily to the UK market, the overall effect on FDI was likely to be positive, as proved subsequently to be the case.

⁶ A policy conference on "Economic Growth and Investment in Education" held in Washington in 1961 has proposed to conduct such a survey of two countries outside the Mediterranean region. White (2000) notes that "most representatives balked at the idea of exposing their country's shortcomings to the world's gaze".

⁷ It is interesting to note however that Balassa (1976) criticised the Irish regime as having employed "certain measures which, on balance, favor capital-intensive industries".

Figure 2: Convergence Experiences of the Cohesion Countries, 1960-1973: GDP per head adjusted for purchasing power (GNP for Ireland); EU15=100



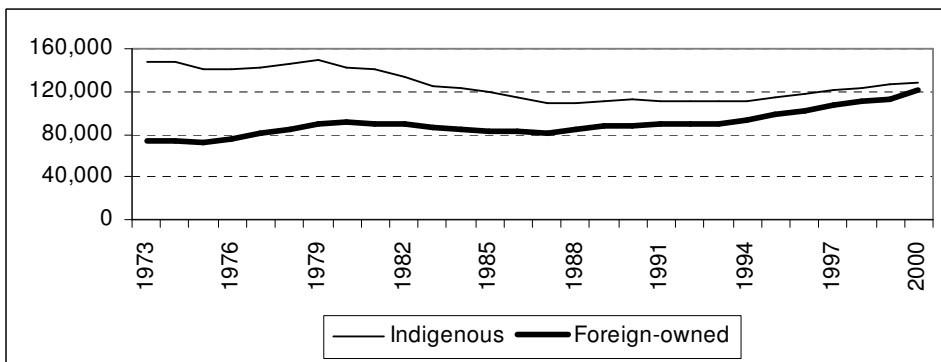
Source: Eurostat

Note: GNP rather than GDP is used for Ireland so as to exclude the substantial profits of the MNEs located there. Irish GDP is about 25 percent higher than GNP

3. Phase 2: From EU Accession to the Single Market Era (1973-87)

Although Ireland was already relatively FDI-intensive at the time of EU entry, the number of jobs in foreign-owned manufacturing industry grew by 23 percent between 1973 and 1980, before declining subsequently as a consequence of macroeconomic mismanagement.

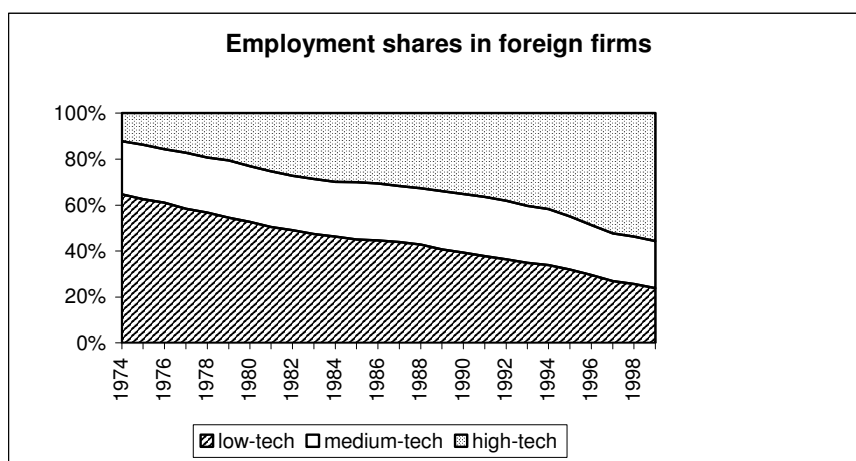
Figure 3: Employment in indigenous and foreign-owned manufacturing, 1973-2000



Source: Annual reports of the Irish state agency Forfás.

The foreign-owned sector became progressively more technology-intensive over the entire period however, as seen in Figure 4.

Figure 4: Technology mix of foreign firms.



Note: This figure employs the standard OECD sectoral classifications.

Although Ireland's low corporation-tax environment is particularly attractive to high-technology firms, the increasing technological intensity shown here (along with a continuous rise in R&D expenditures per employee) would not have been possible without the educational advance touched upon in the last section.

The structure of the Irish education system that emerged in the wake of the OECD report is unusual in that while Ireland just matches the OECD mean in terms of those with university qualifications, it has far higher proportions than the average OECD country with specific *post-secondary* and *sub-degree tertiary* educational qualifications (Table 4).

Table 4: Education attainment in Ireland and OECD country mean

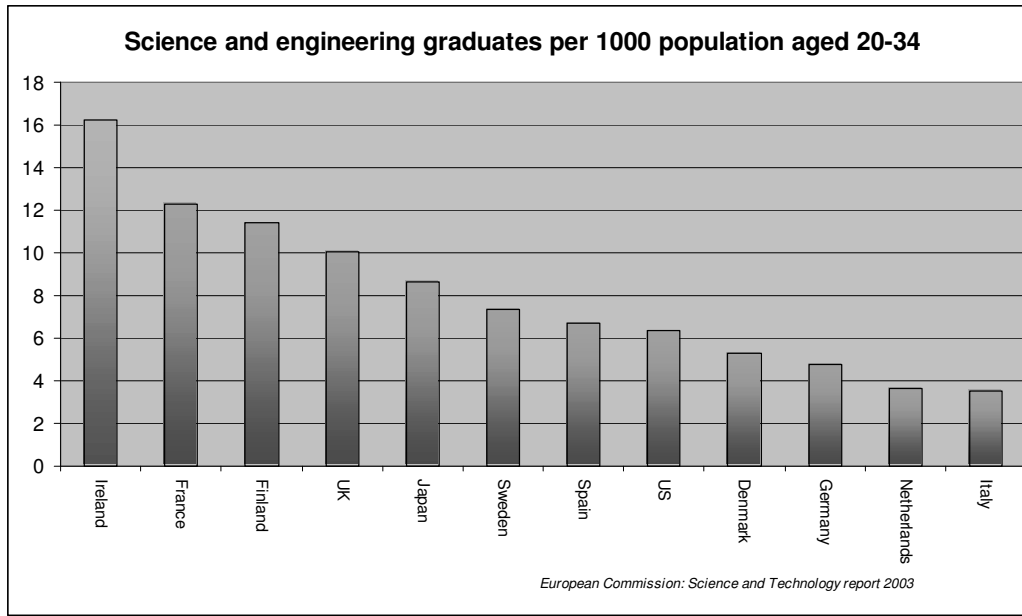
	Percentage of cohort aged 25-34 that has attained at least upper secondary	Percentage of cohort aged 25-34 that has attained tertiary level B	Percentage of cohort aged 25-34 that has attained tertiary level A and above	Post-secondary non-tertiary graduation rates
Ireland	67	13	16	25.8
OECD country mean	72	9	16	8.5

Source: OECD (2001)

Note: Tertiary B refers to practically-oriented and occupation-specific tertiary programmes of at least 2 years full-time-equivalent duration, while tertiary A refers to university level programmes. The post-secondary graduation rate refers to the ratio of post-secondary (non-tertiary) graduates to total population at the typical age of graduation. In Ireland the whole cohort included here are categorised as ISCED4C, i.e. in possession of a qualification which prepares participants for direct entry into specific occupations. This will include part of the Institute of Technology cohort as well as some PLC (Post Leaving Certificate) courses.

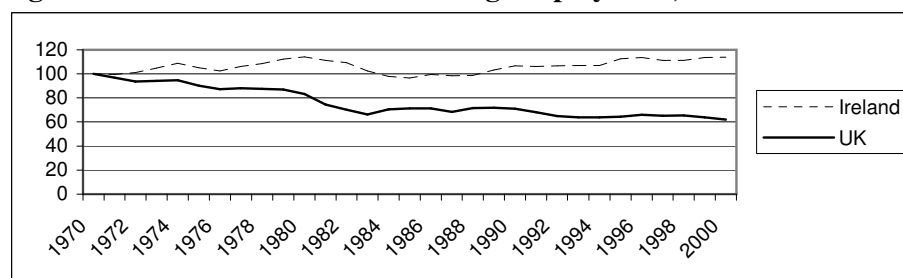
Furthermore, the post-secondary-level system – driven by the country’s FDI-focussed strategy – has produced one of the highest proportions of young people with science and engineering qualifications in the world; Figure 5.

Figure 5:



The post-secondary education system that emerged in Ireland was based on a realisation that, unlike in the UK – whose early industrialisation had ensured the evolution of a well-developed system to provide an intermediate layer of technicians – the education system in Ireland would need to provide this intermediate layer from scratch if human resources were to be available to sustain the industrial expansion, depicted in Figure 6, that followed on from Ireland’s relatively late trade-liberalisation-driven industrialisation.

Figure 6: Irish and UK Manufacturing Employment, 1970=100.



Source: OECD

The main components of the technical-education system developed in Ireland over the course of the 1970s were the Regional Technical Colleges (later rebranded as Institutes of Technology), for which there was no UK model. These offered sub-degree programmes of shorter duration than those at universities and concentrated in the fields of engineering and business studies, and their curricula had a practical orientation designed to be responsive to the needs of local industry and business.

From having had a tiny short-cycle third-level sector before 1970, by 1981 Ireland had internationally, after the Netherlands, the highest proportion of third-level students taking sub-degree courses.⁸ Since the late 1970s, furthermore, the universities themselves – at the behest of the national development agency, the IDA – had begun to accept increased responsibility for ensuring that manpower needs were met. The Manpower Consultative Committee was established in 1978 to provide a forum for dialogue between the IDA and the education system. The state agency, concerned by the looming disparity between electronics graduate outflows and its own demand projections, convinced the government to fund a massive expansion in educational capacity in these areas.⁹ The output of engineering graduates, as a result, increased by 40 percent between 1978 and 1983, while the output from computer science increased tenfold over the same short period. The IDA in turn was able to use the rapidity of this response – exemplified by the immediate introduction of a range of one-year conversion courses to furnish science graduates with electronics qualifications – as a further selling point to foreign investors; MacSharry and White (2000).

Ireland's foreign-owned manufacturing sector over this period, as mentioned earlier, was becoming increasingly high-tech in terms of sectoral allocation. As detailed below, the major expansions were in computing equipment and electronic

⁸ For more on the Irish education system and its integration into the FDI-focused strategy, see Barry (2006).

⁹ The Irish system offers a finite number of places in most third-level courses. These numbers are decided within the universities but are subject to government influence given that the latter provides the bulk of university funding. Ó Riain (2004) points out that this system 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.

components, pharmaceuticals and medical and optical devices, and these expansions continued into the following “Celtic Tiger” era.¹⁰

Table 5: Sectoral allocation of manufacturing-sector foreign-firm employment

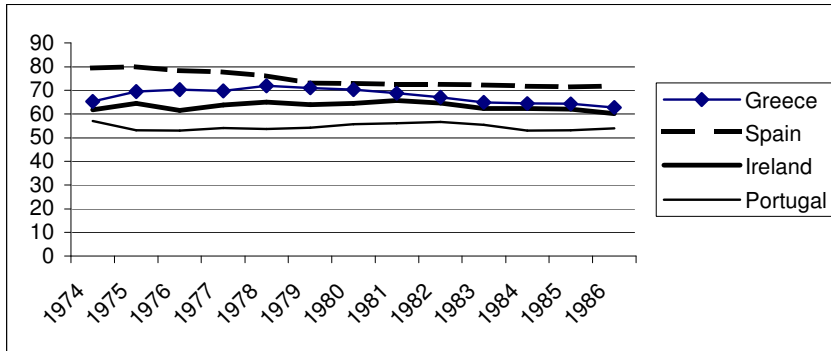
	1973	1987	2000
Food, Beverages and Tobacco	24	18	11
Textiles, Clothing and Footwear	19	14	3
Chemicals (excl. pharma)	6	7	5
Pharmaceuticals	2	6	11
Machinery and Equipment	4	6	5
Office and Data Processing Equipment	1	7	19
Electrical and electronic components	4	10	14
Medical and Optical Instruments	4	8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

Note: Remainder comprises Wood, Pulp, Paper and Printing; Rubber and Plastics; Non-Metallic Materials; Basic and Fabricated Metals; Coke and Refined Fuels and Miscellaneous Manufactures

Once again over this period however, notwithstanding the continued success in upgrading the country’s sectoral FDI allocation, no convergence was recorded on average Western European living standards. Unlike in the previous era (1960-73) however, this lack of convergence was replicated across all the poorer Western European economies, as detailed in Figure 7 below. Barry (2003) identifies deficient macroeconomic policymaking across all these four countries in the wake of the oil shocks as a common factor behind their weak performance, suggesting that poorer countries may be structurally less capable of adhering to appropriate monetary and fiscal policies in the event of a downturn in the world economy. Convergence is also known to be more difficult to achieve when the encompassing world economy is performing poorly.

¹⁰ Note that this table is based on a different dataset than the earlier Table 3. The present table refers to *all* foreign industry which includes protectionist-era foreign firms and those set up to cater to the domestic market. Comparison of the two tables shows that the latter groups were substantial in the Food, Drink and Tobacco sector.

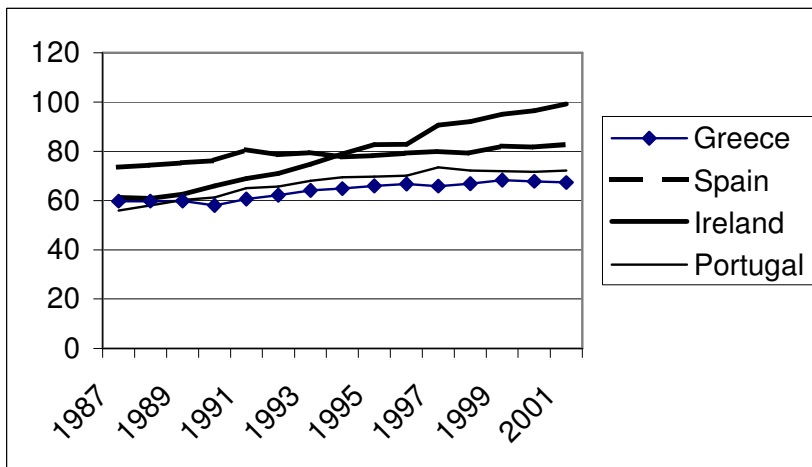
Figure 7: Convergence Experiences of the Cohesion Countries, 1974-1986:
 GDP per head adjusted for purchasing power (GNP for Ireland); EU15=100



4. Phase 3: The Single Market, Services Offshoring and the Celtic Tiger

In this phase, running from 1987 to the present, all four cohesion economies converged substantially on average Western European living standards, with Ireland’s performance being particularly dramatic. The various factors behind the Irish performance are discussed in detail elsewhere, e.g. in Barry (2004). Here we focus solely on the contribution of FDI.

Figure 8: Convergence Experiences of the Cohesion Countries, 1987-2002:
 GDP per head adjusted for purchasing power (GNP for Ireland); EU15=100



Manufacturing FDI into and within Europe expanded in the late 1980s. Figure 9 shows this with respect to US investments in Europe, with the US Department of Commerce *Survey of Current Business* (March 1991) attributing much of this to the lead up to the introduction of the Single European Market in 1992. The figure also shows that Ireland captured a growing share of US investments in Europe. MacSharry

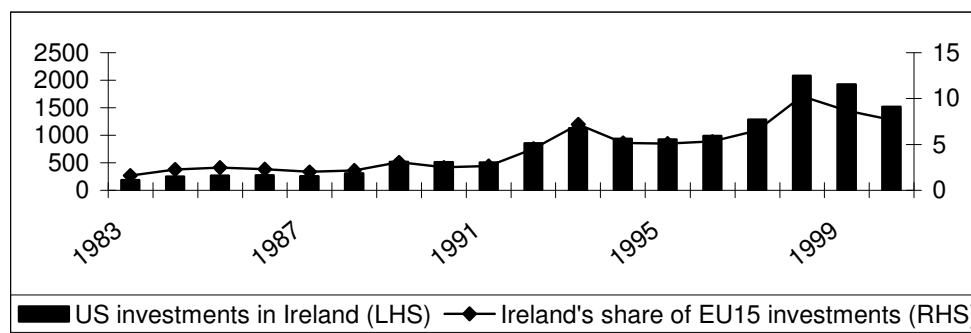
and White (2000) explain this latter effect by describing how several larger EU countries, in the pre-Single Market era, “had suggested to potential investors that publicly funded purchases of their products might be blacklisted if the new investment was located in Ireland” (rather than in the countries from which the threatening noises issued). With the outlawing of restrictive public procurement practices under the Single Market initiative, the attractiveness of Ireland as a destination for FDI increased. This effect would undoubtedly have been dampened without the concurrent restoration of macroeconomic stability.

The increasing share of high-tech sectors in European manufacturing over the 1990s also helped, as did the high profitability of the era, since both increase the attractiveness of a low corporation-tax environment.¹¹ Altshuler, Grubert and Newlon (2001) argue, furthermore, that US foreign investment has become more sensitive to differences in host country taxes in recent years, and Ireland has had – until the recent enlargement – the lowest rate of corporation tax in the EU. The Single Market programme may also have allowed Ireland achieve a critical mass of US firms in certain sectors, allowing agglomeration and demonstration effects to come into play (Barry, Görg and Strobl, 2003).

Thus the number of jobs in foreign-owned manufacturing in Ireland expanded by almost 50 percent between 1987 and 2000.

¹¹ Manipulation of transfer prices in order to shift profits to low-tax locations is easiest in R&D and advertising-intensive sectors because these factors make it difficult to locate the exact source of value added. Using Davies and Lyons’ (1996) categorisation, advertising and R&D-intensive sectors accounted for over 65 percent of foreign employment in Irish manufacturing in 2000, up from 45 percent of a much smaller base in 1973.

Figure 9: Investments by US Manufacturing Companies in Ireland (millions of 1996 dollars), and as a share of US Manufacturing Investments in the EU15.



Source: US Bureau of Economic Analysis (Capital Expenditures in Manufacturing by Foreign Affiliates).

Combined with this increase in manufacturing FDI, Ireland also began to attract increasing services-sector FDI inflows (Grimes and White, 2005). Starting from a base close to zero in the late 1980s, by the new millennium, foreign-firm employment in each of Ireland’s strong FDI-intensive manufacturing sectors is now matched by foreign-firm employment in several offshore services sectors located in Ireland. Thus computer software now matches hardware, international financial services matches pharmaceuticals and other business-process offshored (BPO) activities match employment levels in instrument engineering. Furthermore, as Barry and Van Egeraat (2005) show, as computer hardware firms have shifted their manufacturing facilities to Asia and Central and Eastern Europe, they have upgraded their operations in Ireland into services activities.

An indicator of Ireland recent successes in offshore services is shown in Table 6. Though Ireland has only around 1 percent of the EU15 population, it attracted 50 percent of new shared services projects in the EU15 and 8 percent of regional headquarters projects in the period to which the data refer.

Table 6: Number of FDI Projects by Destination Countries, 2002-2003

	Call centres	Shared services	IT services	Regional HQ
EU15	169	38	198	185
Ireland	29 (17%)	19 (50%)	14 (7%)	15 (8%)

Source: UNCTAD (2004, p 162).

It is well known that the share of services in international FDI flows has been increasing over recent decades (UNCTAD 2004). Ireland's ability to attract an increased share of services was facilitated by substantial reductions in the rate of corporation tax on services over the course of the 1980s and 1990s, as seen in Table 7. These changes were generally made of the behest of the European Commission. Export Profits Tax Relief, for example, began to be phased out in 1978, to be replaced by a special 10 percent rate for manufacturing industry. From 1987 this special rate was extended to qualifying activities carried out at the newly opened International Financial Services Centre in Dublin. Most other market services meanwhile continued to be subject to the standard 32 percent rate that prevailed at that time. The European Commission had been pushing for some time for tax harmonisation across sectors, implicitly hoping that Ireland's rate would be pushed much closer to the EU average. The Irish government instead decided in 1998 on a harmonised rate of 12.5 percent –to be instituted from 2003 – which yielded substantial benefits to most services sectors in order to cushion the impact on manufacturing. Developments over time in Ireland's corporation tax regime are charted in Table 7.

Table 7: Ireland's corporation tax regime

<ul style="list-style-type: none"> • 1956: Finance Act introduces Export Profits Tax Relief (EPTR), primarily for manufacturing industry, with 50 percent tax remission on profits (increased to 100 percent two years later). The measure provided full relief for fifteen years and tapering relief for a further five years. • 1969: EPTR extended to 1989-90. • 1978: Government abolishes EPTR and replaces it with a special 10 percent rate of corporation profits tax for all manufacturing industry from 1981-2000. Those qualifying for export-tax relief before 1981 continue to benefit until 1990. • 1987: Financial Services Act establishes International Financial Services Centre in Dublin. Profits of qualifying activities carried out from the Centre are taxed at 10 percent until 2005. • 1990: Government extends the 10 percent corporation profits tax rate to 2010. • 1998: Agreement with European Commission on universal 12.5 percent corporation tax for all trading companies from 2003. All existing commitments to the 10 percent tax rates for manufacturing industry to the year 2010 to be

honoured. The current 28 percent standard rate applying to most Services to be reduced by 4 percent annually in 2000, 2001 and 2002, and by 3.5 percent in 2003, giving a 12.5 percent rate at that date.

Source: Mac Sharry and White (2000)

The Finance Act 2004, furthermore, established a new headquarters regime aimed at attracting international corporations to establish their regional HQ in Dublin. This has further served to attract other activities such as shared services and treasury management (Finance Dublin Yearbook, 2004).

5. Phase 4: Science, Technology and Innovation Policy and the Offshoring of R&D Functions

Offshoring of R&D facilities is a growing phenomenon. Kuemmerle (1999a) tracked 32 MNCs in the pharmaceutical and electronics industries and found that their overseas R&D staff increased from 6 percent in 1965 to more than 25 percent today, while the number of overseas R&D labs increased from 14 to 84. His study distinguishes between “home-base-exploiting” R&D sites (which are associated with traditional FDI, where firms set up overseas to exploit on a larger stage the advantages, such as brand names, that they had already accumulated) and “home-base-augmenting” or technology-sourcing sites. The former are found to be more likely to be located close to existing factories and important markets, while the latter are more likely to be located close to universities.¹² The proportion of R&D labs that Kuemmerle categorises as home-base-augmenting rose from 7 percent to 40 percent over the period he studied.

The 2005 UNCTAD World Investment Report provides broader and more detailed evidence on the recent growth in global offshoring of R&D functions.¹³ This provides the context for recent developments in science, technology and innovation (STI) policy in Ireland.

¹² He also finds that R&D labs rarely share both functions or experienced a major shift in character, because the two types of labs have different missions and different management requirements. See also Kuemmerle (1999b).

¹³ The sectors at the forefront of the globalisation of R&D include pharmaceuticals and electronics, food and beverages, and automotive industries.

Given the growth in offshoring of R&D, along with Ireland's convergence on average Western European living standards by the early years of the new millennium – and perhaps also in response to the threat of increased corporation-tax competition from Central and Eastern Europe – science, technology and innovation policy has recently moved to the heart of the Irish policy agenda.

This was heralded by the release in 1996 of the first-ever Irish Government White Paper on Science, Technology and Innovation. It is underlined by the five-fold increase in investment in these areas under the current National Development Plan (2000-06), by the launch in 1998 of the Programme for Research in Third-Level Institutions (which established 24 major research centres as well as major programmes in human genomics and computational physics), by the establishment of Science Foundation Ireland (SFI) in 2000, and by the introduction of a 20 percent tax credit for incremental R&D in the Finance Act of 2004.

The origins of Science Foundation Ireland lay in a Technology Foresight Exercise organised by the state body Forfás, which asked client company executives where they saw their companies headed over the next 10–15 years, and what the Irish government could do to respond to those changes. The response was that as Ireland was no longer a low-cost manufacturing location it would have to develop more highly trained engineers, research scientists etc. to become a center for innovation, research, design and development.

The exercise proposed the establishment of a Technology Foresight Fund to promote and finance new basic and applied scientific and technological research in Ireland, and SFI was set up to administer this fund. Besides providing awards to support scientists and engineers working in designated fields (along the lines of the US NSF), SFI has established a host of joint partnerships between third level research institutions and industry.¹⁴

Within ICT alone, the last few years have registered a number of significant developments under this new strategy. Bell Labs has announced its intention to set up

¹⁴ http://www.sfi.ie/content/content.asp?section_id=419&language_id=1

a major R&D centre at Lucent Technologies' Dublin facility, linked with the establishment of a collaborative academic centre at one of the city's universities. Similarly, Hewlett-Packard announced the establishment of a world-class Technology Development Centre at its manufacturing facility outside Dublin, while its European Software Centre entered into collaboration with NUI-Galway in establishing the Digital Enterprise Research Institute. Intel has established an innovation centre at its main site outside Dublin and increased its investment in its research centre near Limerick. It has also partnered three Irish universities in an academic Centre for Research on Adaptive Nanostructures and Nanodevices. IBM over the same period announced significant investments in its R&D software facility in Dublin – a decision influenced, according to one of the company's directors, by the availability of the necessary skills, the strong support of the IDA and the increasing role of SFI. A number of similar investments have also appeared recently in the biotech and pharmachem areas.¹⁵

Conclusions

Ireland's success in attracting FDI can be ascribed to the following factors:

- EU membership, macroeconomic stability, Western European governance standards and an English-speaking environment
- a low corporation tax rate
- the skills and experience of the country's Industrial Development Agency (IDA)
- the quality of the telecommunications infrastructure, and
- an educational system that is integrated to a large extent with the country's FDI-oriented development strategy.

As one of the first countries in the world to adopt an FDI-focused development strategy (in the late 1950s), the country has had an extensive period of time to fine tune its policies and institutions in line with the requirements of international FDI. This has allowed it to continue to succeed as FDI flows into Europe have shifted progressively from traditional to higher-tech manufacturing sectors through services offshoring and more recently into the offshoring of R&D functions.

¹⁵ <http://www.idaireland.com/home/index.aspx?id=65>

Though a late starter – by Western European standards – in increasing educational throughput, Ireland by 1981 had, after the Netherlands, the highest proportion of third-level students taking sub-degree courses. This was a relatively inexpensive option for the country to follow, a strategy arguably justified in the case of a relatively poor European country. By international standards tertiary enrolments were heavily biased towards science and engineering, which accorded with the requirements of the MNCs that the country was trying to attract. As convergence on Western European living standards was progressively achieved and as offshoring of R&D has grown, the emphasis has increasingly switched towards university and post-graduate education.

As shown in the appendix, the country's IDA has also functioned effectively as a learning organisation through its transnational strategic networks. The strong focus on the importance of FDI in Ireland and the position of the IDA in the policymaking hierarchy ensure that the system is configured to respond rapidly to emerging market opportunities as well as changing factor-market conditions in Ireland.

One example, discussed earlier, concerns the pace of response to the looming disparity, once recognised, between electronics graduate outflows and the IDA's demand projections for such graduates. Another example is provided by the response to an EU Directive in the 1980s which allowed financial services companies, once established and registered with the regulatory authorities of one EU member state, to operate in any other member state. The directive freed firms to locate in countries where they found the regulations to be most favourable. Ireland was the second country after Luxembourg to implement the directive, in 1989. In addition the authorities decided to forego VAT and inheritance taxes on certain investment fund activities and two further items of legislation were enacted in 1990 to facilitate the development of investment funds. The industry's activities in Ireland expanded dramatically in response and by 2005 the country had become one of the world's leading locations for the domicile and administration of investment funds (Barry, Thebault and Wojcik, 2006).

References

- Altshuler, R., H. Grubert and T. S. Newlon. (2001) "Has US Investment Abroad become more Sensitive to Tax Rates?" In James R. Hines, Jr. (ed.), *International Taxation and Multinational Activity*. Chicago, IL: University of Chicago Press.
- Balassa, B. (1976) "Industrial and Trade Policy in Portugal", in *Conferência Internacional sobre Economia Portuguesa*, Lisbon: Fundação Calouste Gulbenkian.
- Barry, F. (2003) "Economic Integration and Convergence Processes in the EU Cohesion Countries", *Journal of Common Market Studies*, 41, 5, 897-921.
- Barry, F. (2004) "Export Platform FDI: the Irish Experience", *EIB Papers*, 9, 2, 8-37
2004. Luxembourg: European Investment Bank. Rev. 18 Nov 05
- Barry, F. (2005) "Structures and Institutions of Good Governance: Lessons for Indonesia", paper delivered to World Bank/ Bank Negara Malaysia conference on *Investment Climate and Competitiveness in East Asia: From Diagnostics to Action*, Kuala Lumpur, November.
- Barry, F. (2006) "Third-Level Education, Foreign Direct Investment and Economic Boom in Ireland", forthcoming in *International Journal of Technology Management*, special issue on Science and Technology Manpower Policy.
- Barry, F., Görg, H. and Strobl, E. (2003). "Foreign direct investment, agglomerations and demonstration effects: an empirical investigation". *Weltwirtschaftliches Archiv*, (139:4), pp. 583-600.
- Barry, F., L. Thebault and D. Wojcik (2006) "The Geography of Offshore Financial Services in Europe and the Emergence of Ireland's IFSC", unpubl. ms., University College Dublin.
- Barry, F., and C. Van Egeraat (2005) "The Eastward Shift of Computer Hardware Production: How Ireland Adjusted", WP 27, National Institute for Regional and Spatial Analysis, National University of Ireland-Maynooth.
- Evans, P. (1995) *Embedded Autonomy: States and Industrial Transformation*. Princeton, NJ: Princeton University Press.
- Evans, P., and J. Rauch (1999) "Bureaucracy and Growth: A cross-national analysis of the effects of "Weberian" state structures on economic growth", *American Sociological Review*, 64, 5, 748- 7654.
- Grimes, S., and M. White (2005) "The transition to internationally traded services and Ireland's emergence as a 'successful' European region", *Environment and Planning A*, 37, 2169 – 2188.
- IDA (1973) *Ireland: Industrial Handbook*; Dublin: Industrial Development Authority.

- Kuemmerle, W. (1999a) "Foreign direct investment in industrial research in the pharmaceuticals and electronics industries – results of a survey of multinational firms", *Research Policy*, 28, 179-93.
- Kuemmerle, W. (1999b) "The drivers of foreign direct investment into research and development: an empirical investigation", *Journal of International Business Studies*, 30(1), 1-24
- Loewendahl, H. (2001) 'A framework for FDI promotion', *Transnational Corporations*, 10, 1, 1-42.
- Logan, J. (1999) All the Children: the Vocational School and Education Reform 1930-1990, in J. Logan (ed.) *Teachers' Union: the TUI and its Forerunners 1899-1994*, Dublin: A.&A. Farmar.
- MacSharry, R. and White, P. (2000). *The making of the Celtic tiger: the inside story of Ireland's booming economy*, Mercier Press, Dublin, Ireland.
- McAleese, D. (1975) Ireland in the Enlarged EEC: Economic Consequences and Prospects, in J. Vaizey (ed.) *Economic Sovereignty and Regional Policy: A Symposium on Regional Problems in Britain and Ireland*, Dublin: Gill and Macmillan.
- Morisset, J., and K. Andrews-Johnson (2004) The Effectiveness of Promotion Agencies at Attracting Foreign Direct Investment, Occasional Paper 16, Foreign Investment Advisory Service.
- Nelson, R.C. (2004) "Moving up the Value Chain: A Good Approach for Ireland?", Management Case Study, Thunderbird: Garvin School of International Management, Arizona.
- OECD (1965) *Investment in Education*, Paris: OECD.
- O'Hearn, D. (1987) Estimates of New Foreign Manufacturing Employment in Ireland, 1956-72, *Economic and Social Review*, 18, 3, 173-188.
- Ó Riain, S. (2004) *The Politics of High-Tech Growth: Developmental Network States in the Global Economy*, Cambridge: Cambridge University Press.
- UNCTAD (2005) *World Investment Report: Transnational Corporations and the Internationalization of R&D*, UN: New York and Geneva.
- Wells, L.T., and A.G.Wint (2000) *Marketing a Country: Promotion as a Tool for Attracting Foreign Investment* (revised edition), Occasional Paper 13, Foreign Investment Advisory Service, Washington, DC
- White, T. (2001) *Investing in People: Higher Education in Ireland from 1960 to 2000*, Dublin: Institute of Public Administration.

Appendix

The Organisation, Evolution and Modus Operandi of Ireland's Industrial Promotion Agencies

Ireland's Industrial Development Agency (IDA) was set up within the Department of Industry & Commerce in 1949 to stimulate, support and develop export-led business. After the shift away from protectionism the IDA began to take on a more proactive promotional function but the agency found that it faced difficulties in developing relations with the private sector while operating directly out of a government department. Furthermore, every person hired by the agency, including clerical staff, had to be approved by the Department of Finance, while every foreign investment promotion mission required the approval of the Department of Industry and Commerce.

In the 1960s the external consulting firm Arthur D. Little, Inc. was asked to examine the existing IDA organizational structure and to make recommendations on alternative structures that would facilitate the achievement of the organisation's institutional objectives. The report, submitted in 1968, suggested that agency autonomy would allow greater flexibility and more rapid decision making, a position strongly supported from within the IDA.

IDA Ireland was subsequently incorporated as an autonomous state-sponsored body in 1969 with its own Board of Directors and with responsibility for all aspects of industrial development. The agency was granted the authority to identify and promote FDI from specific industries and to provide incentives and grants to prospective investors. It was also responsible for the provision of support to local firms.

The new structures are now regarded as representative of best-practice standards in the investment promotion field.¹⁶ Investment promotion agencies (IPAs) internationally have been found to be effective when autonomous and highly ranked in the government hierarchy. Autonomy is important because it insulates the agency from pressures to locate industry on political grounds. Effective IPAs also require a private-sector rather than bureaucratic orientation: "a willingness to take risks, to make quick decisions, to engage in a style of negotiation alien to many (though not all) civil service temperaments."

Because such agencies tend to retain key staff longer than civil service departments (in part because of flexible and performance-related salary structures), they also act as repositories of 'organisational learning' – the ability of a body to extract, accumulate and use effectively the insights that become available to it. Part of the reason for the success of IPAs in Singapore and Ireland has been their efficient structure.¹⁷ IPAs are most effective when they report to the highest level of government (for example, the president or the prime minister): this strengthens the government's commitment, reinforces the agency's credibility in the eyes of business and allows the agency sufficient bureaucratic, administrative and political "clout" to ensure that it can effectively deliver on its promises. The Irish and Singaporean IPAs were effectively put in charge of development strategy, and could coordinate factor market changes to attract the technology-intensive FDI they have targeted in recent decades.

The autonomy of the IDA from the civil services allowed it recruit a different type of employee, many with extensive industry and international experience and with an interest in living and working overseas. The fact that agency employees did not have the employment guarantees that automatically came with long-term civil service employment, and the likelihood that staff would have to spend a period of service in one of the agency's foreign

¹⁶ See e.g. Loewendahl (2001) and Morisset and Andrews-Johnson (2004).

¹⁷ Singapore's EDB was also established as a statutory body with its own board, most of the members of which are appointed from Singapore's private sector. The agency has more flexibility in setting salaries than does the regular civil service (Wells and Wint, 2000).

offices, may have attracted a more entrepreneurial type of personality. The prestige attached to work with these agencies also contributes to the strong *esprit de corps* reportedly shared by staff.

The Irish development bodies have been the subject of further external reviews, including the Telesis Report of 1982 and the Culliton Report of 1992. The former emphasised the needs of indigenous firms, calling for the promotion of linkages with foreign firms and the need to further develop local-firm capabilities. The Culliton Report advocated a restructuring of the IDA into separate agencies with different responsibilities, a move implemented in 1994 when three separate agencies were created out of the IDA. IDA-Ireland was allocated the task of FDI promotion, Forfás took charge of overall strategy, and a separate agency, renamed Enterprise Ireland in 1998, was charged with promotion of indigenous development.¹⁸ All three agencies operate under the Department of Enterprise, Trade, and Employment (which has emerged from the old Department of Industry and Commerce).

Other aspects of agency structures, such as meritocratic recruitment and predictable career ladders, also accord with international best-practice standards. As Evans and Rauch (1999) explain, meritocratic recruitment not only increases the likelihood of at least minimal competence but also helps generate corporate coherence and *esprit de corps*. Bureaucrats who see themselves as having joined their confreres in office by virtue of sharing similar abilities are more likely to internalize shared norms and goals than are those who know they owe their office to the favour of a particular patron. Identification with colleagues and the organization itself also increases the effectiveness of monitoring and the internalized intangible costs of corruption. The offer of rewarding long-term careers also increases corporate coherence and contributes to increased competence in the longer run. Careers that provide the expectation of a series of promotions related to performance and conformity to organisational norms create disincentives to corrupt behavior. The costs of breaking organizational norms are directly proportional to the expected longevity of membership in the organization and the expected rewards to longevity. Overall, meritocratic recruitment and predictable career ladders helps structure the incentives of individual bureaucrats in a way that enhances the ability of the organisations they manage to effectively pursue long-term goals.

Working with a sample of 35 developing countries for the 1970-1990 period, Evans and Rauch (1999) confirm that these "Weberian" characteristics (which are capable of relatively objective empirical assessment) significantly enhance prospects for economic growth, even when initial levels of GDP per capita and human capital are controlled for. The "Weberianness" score also has a consistently significant positive effect on end-of-period private investment levels, which is one of the principal mechanisms through which states promote higher rates of growth. Evans (1995) argues furthermore that the corporate coherence provided by Weberian characteristics needs to be combined with a dense systematic set of ties to the entrepreneurial class, which he refers to as "embedded autonomy".

Ó Riain (2004) evaluates the Irish civil service and the country's industrial development bodies on the Evans and Rauch 14-point "Weberianness" scale. His assessment gives Ireland a score of 12.5, which compares favorably to the highest scoring of the 35 "developing countries" in the original analysis – Singapore at 13.5, Korea at 13 and Taiwan at 12.

Ó Riain points out, with respect to the Irish case, that:

¹⁸ Enterprise Ireland was created in two steps. In 1994, the domestic industry side of IDA was combined with the technology agency Eolas to form Forbairt. In 1998, new legislation was passed which created Enterprise Ireland through a merger of Forbairt and the Irish Trade Board to provide one-stop-shop assistance for domestic industry.

- many new economic policies originate within state agencies
- more than 90 percent of higher officials enter the civil service via a formal examination system
- a typical higher-level official spends between twenty years and their whole career in those agencies
- someone who enters the agencies early in his or her career through a higher civil-service examination can expect to move up several levels with the civil service and then, in at least a few cases, move to the top of the agency on the basis of political appointments
- it is unusual (although increasingly more frequent in the industrial development agencies) for higher officials to spend substantial proportions of their careers in the private sector
- higher officials' salaries have been approximately 80 to 90 percent of those of private-sector managers with roughly comparable training and responsibilities
- bribes are a negligible proportion of civil servants' incomes
- between 1970 and 1990, salaries in industrial development agencies kept pace with those in the private sector, and
- among graduates of the country's most elite universities, a public-sector career has been considered the best option for those who are risk-averse.¹⁹

As Nelson (2004) proposes, the IDA and its sister organisations have shown the flexibility to constantly adapt to changing Irish circumstances and global business trends, which he ascribes to their highly internationalised staff and their “transnational strategic networks”.²⁰ The IDA's transnational strategic network consisted of two main components: its overseas offices and its relations with investors already in Ireland.

The IDA opened its first overseas offices in the 1960s in London, Paris, Cologne, New York, San Francisco and Chicago. Since then, these operations have expanded, particularly in the United States. IDA-Ireland currently has 13 foreign offices, with U.S. offices in New York, Atlanta, Boston, Chicago, and San Jose, California; Asia-Pacific offices in Australia, Hong Kong, Japan, Korea, and Taiwan, and European offices in Germany, the Netherlands and the United Kingdom.

The office staff might consist of just one Director and a few support personnel, as in the case of the Silicon Valley office, or a Senior Director and several Deputy Directors, as in the case of the New York office. All offices are tasked with learning as possible about prospective investors in their region and meeting with prospective investors from targeted industries.

In the process of learning about and interacting with prospective investors in the overseas locations, overseas Directors gather information about trends in targeted sectors and about new emerging sectors that warrant the attention of the agency. This information is then transmitted back to IDA headquarters through regular reports and through the annual IDA meeting attended by overseas directors. These allow the Strategy and Planning staff to learn about evolving trends among prospective investors and to establish new targets for the future.

This feedback not only influences the industries or subsectors targeted by the IDA. It also guides efforts to inform and persuade the government about required legislative changes or

¹⁹ The language used here reflects the questions addressed by Evans and Rauch to their panel of experts in each country in their sample.

²⁰ The term refers to a network of individuals, business associations etc., both domestic and international, that assist a government in understanding the needs and concerns of prospective foreign firms and the potential benefits they can offer to the country or region.

necessary investments in infrastructure or in specific training programs to serve the needs of targeted sectors.

MacSharry and White (2000, p.314) offer several reasons for why the powerful position of the IDA within the Irish state bureaucracy may not be easily replicable elsewhere.²¹ These include (i) institutional resistance on the part of Foreign Ministries to allowing other agencies establish such a strong foreign presence, (ii) difficulties in securing the right caliber of proactive people to run such agencies, and (iii) the fact that governments rarely provide investment agencies with a clear development mandate and the funds to carry out this mandate. “Very few countries”, they conclude, “have been able to create the combination of circumstances and people to forge an effective national investment promotion agency”.

The Modus Operandi of the IDA

In the wake of the second oil shock in the late 1970s, many MNCs shifted from Ireland to lower-cost locations elsewhere, and the government decided that the employment creation effect of MNCs should be secondary to their ability to generate linkages. This influenced the activities that the IDA sought to target. The modus operandi of the IDA was to identify, interactively, the high-growth activities that provided a good fit between the country’s resources and economic objectives. Having attracted computer and components MNCs in the 1970s, for example, the agency launched a campaign in the early 1980s to develop Ireland as a major European location for electronics and computer software.

These processes take time. IDA pursued Intel for over a decade before the corporation decided to open a plant in Ireland in 1989. IBM had traditionally shied away from export-platform activity. However, the success of its Software Development Centre in Ireland allowed the IDA to persuade it to experiment with export-platform activities in Europe.

In some cases, the identification of targets demonstrated the prescience of policymakers, as with the development of the International Financial Services Centre in Dublin (which has grown from the late 1980s to become one of Europe’s largest offshore financial centers). The authorities at the time had speculated that the global deregulation of financial services and the emergence of an electronic marketplace would create an opportunity for Ireland – with its advantages in terms of location, language, education and technology – to become a major player in the field.

²¹ The second author, Padraic White, was Managing Director of the Industrial Development Authority from 1981 to 1990.