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by

Zoltan Acs
George Mason University

Colm O`Gorman
University College Dublin

Laszlo Szerb
University of Pecs

Siri Terjesen
Queensland Universtiy of Technology

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For editorial correspondence,
please contact: egppapers@econ.mpg.de

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Max Planck Institute of Economics
Group Entrepreneurship, Growth and
Public Policy
Kahlaische Str. 10
07745 Jena, Germany
Fax: ++49-3641-686710

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Zoltan J. Acs *
School of Public Policy
George Mason University, Fairfax, Virginia, 22030, USA
E-mail: zacs@gmu.edu

Colm O’Gorman
UCD School of Business, University College Dublin, Dublin, 4, Ireland
Email: Colm.ogorman@ucd.ie

Laszlo Szerb
Faculty of Business and Economics
University of Pecs, Pecs, 7601, Hungary
E-mail: szerb@tkk.pte.hu

Siri Terjesen
Brisbane Graduate School of Business,
Queensland University of Technology, 2 George Street,
GPO Box 2434, B423, Brisbane, 4001, Australia
E-mail: Siriterjesen@yahoo.com

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Abstract:

It is widely recognized that foreign direct investment (FDI) plays an important role in economic development. Internationalization theory is used to explore how inward FDI impacts entrepreneurial activity. Using data from the Global Entrepreneurship Monitor we find significant differences in entrepreneurial activity between Ireland and Hungary in both the type of people starting businesses and the opportunities pursued. These results suggest that economic development policies for middle-income countries, like Hungary, should focus on increasing human capital, promote enterprise development, and upgrading the quality of FDI.

Keywords: Entrepreneurial Activity, GEM, Economic Development, Foreign Direct Investment, Knowledge Spillovers, Ireland, Hungary.

JEL Classification: M13, F23, O10, O30

* Corresponding author. The authors’ names are listed alphabetically.

I. Introduction

In 1970, Hungary and Ireland were both relatively poor and had about the same standard of living, as measured by their per capita GDPs of about \$2,000 U. S.¹ The two countries were similar in other respects. Hungary had about 10 million people Ireland had about 3 million. About 20 percent of Hungarians lived in Budapest and about 29 percent lived in Dublin. In both countries, all boys of primary school age were in school, and almost all girls. Only 9.5 percent of Hungarians in their early twenties were in College as compared to 11.4 percent in Ireland. In Ireland 17 percent of GDP was generated in agriculture, and 35 percent in industry. In Hungary the comparable numbers were 20 and 45 respectively. Most exports in Ireland consisted of agricultural goods 42 percent and in Hungary 22.8 in Hungary. Both countries were loosing educated population.

From 1970 to 2000, GDP per capita in Hungary grew at just under 6 percent per year, about the average for per capita income in the world as a whole. In Ireland, over the same period, per capita income grew at 8.7 percent, a rate consistent with doubling of living standards every 7 years. Irish incomes are now similar to the United Kingdom, Germany and France, about 80 percent of the income of the United States and about three times income in Hungary (See Figure 1).

We do not think it is in any way an exaggeration to refer to this continuing transformation of Irish Society as a miracle, or to apply this term to the very similar transformations that are occurring in Taiwan, and Singapore. Never before have the lives of so many people undergone so rapid an improvement over so long a period, nor is there any sign that this progress is near its end (Lucas, 1993). How did this miracle happen in Ireland? It did so to a large part by attracting technology through FDI to increase its knowledge base.

FDI plays an important role in the economic development policies of several countries including Ireland, Israel and Taiwan. Since the late 1960s, Ireland has focused mainly on FDI based industrial development policies. Israel has focused on inducing industrial R&D activities through government grants, with project ideas originating solely from private industry. Taiwan relied on public research agencies to lead R&D efforts and diffuse the results throughout industry (Breznitz, 2007). FDI inflows can bring in the latest technology, create employment and lead to tradable goods. FDI not only enables the transfer of intangibles to another country but also makes knowledge spillovers possible and therefore may play a role in indigenous entrepreneurship.

These knowledge spillovers can lead to the establishment of new home-grown enterprises in the host country leading to further economic development (Young, Hood and Peters, 1994).³ Software was the main sector where indigenous companies and not only Irish subsidiaries of MNCs achieved worldwide success. The number of indigenous software companies in Ireland rose from 129 in 1991 to 630 in 1998, while the total number of firms rose from 365 to 760 (Breznitz, 2007, p. 12).

In this paper we build on internalization theory and use data from the Global Entrepreneurship Monitor (GEM), to explore if and how the policy of attracting inward (FDI) from multinational enterprises impacts indigenous entrepreneurial activity. We use GEM data to profile and compare entrepreneurial activity in Ireland and Hungary (Reynolds, et al 2005). We expect that countries will benefit from FDI spillovers when there is a strong cultural context that supports entrepreneurial activity. Such a context will lead to more individuals perceiving entrepreneurial activity as a desirable economic choice. More specifically, a strong supporting cultural context will lead to a higher percentage of the population having a strong personal

entrepreneurial context. A strong personal entrepreneurial context is one where the individual perceives opportunities, believes that they have the skills, knowledge and experience to start a business, and has a personal entrepreneurial role model. The effect of a strong supporting culture and positive personal context will be higher levels of opportunity-based entrepreneurial activity. Therefore, we expect population-level differences between Ireland and Hungary in terms of (i) levels of opportunity-based entrepreneurial activity, (ii) the entrepreneurial culture of the population; and (iii) the personal entrepreneurial context of the population (Sternberg and Wennekers, 2005).

Based on internationalization theory we expect that entrepreneurs in Ireland and Hungary will differ in terms of 'type' of person exploiting entrepreneurial opportunities and the nature of the opportunities they pursue. First, we expect that for entrepreneurs to exploit opportunities that arise from knowledge spillovers, entrepreneurs will need the appropriate personal absorptive capacity or the appropriate 'knowledge' and resources. While these cannot be measured directly, we expect that higher levels of education might indicate that entrepreneurs are using higher levels of 'knowledge' in their entrepreneurial activity. We also expect that entrepreneurial activity in Ireland will be more pervasive in sectors where entrepreneurs are exploiting opportunities relating to MNE economic activity. Therefore, we expect differences between Irish and Hungarian entrepreneurs in terms of the (i) education levels and (ii) new venture sectors.

Section two presents the theory of FDI and its role in Industrial Development Policy. Section three details the Irish case study. The fourth section features the Hungarian case study while the fifth section tests the hypothesis that entrepreneurs, as

well as the population attitude towards entrepreneurs, are different in Hungary and Ireland. The final section examines policy options for the Hungary economy.

II. Theoretical Development

FDI is a major Industrial Development Policy tool. It is the location, outside of the home country, of a firm's activities such as manufacturing, assembly, sales, distribution, R&D or design. FDI is a growing phenomenon: between 1979 and 1999, the ratio of world FDI stock to world GDP rose 5% to 16% and the ratio of world FDI inflows to GDP formation rose from 2% to 14% (UNCTAD, 2000). Although the majority of the world's \$648 billion FDI inflows are to developing countries, FDI is the dominant source of flows of financing in developing countries and is especially directed to new Greenfield investments and certain industry sectors (UNCTAD, 2005). The role and scope of FDI has changed with the advent of the global knowledge economy. Table 1 provides an overview of FDI inflows to a number of countries, including Ireland and Hungary, suggesting the strong role that FDI has played in developing these economies.

Although Ireland has pursued an industrial policy strategy of attracting inward FDI for over four decades, for most of the early 1990s, FDI inflows were higher in Hungary than in Ireland (Figure 2). Much of the early FDI inflows into Hungary were attributed to privatization of a finite number of state owned enterprises and profits were not reinvested in the country. After 1997, FDI inflows to Ireland increased significantly while in Hungary, FDI declined. The two countries' dramatic reversal of net FDI inflows can be attributed to a number of factors. In Ireland a significant share of FDI is in machinery and equipment, 10% vs 2% in Hungary and electrical equipment 15% vs 8% for Hungary (Table 2). Sectors where there are higher levels

of FDI in Ireland compared to Hungary include chemicals, machinery and equipment, electrical and optical equipment, software, computers and financial services. Sectors where inward FDI is more important in Hungary than Ireland include motor vehicles, and other manufacturing.

II.I. Internationalization Theory

Internalization theory describes how local firms' knowledge of laws and relationships with local players provide 'home court advantages'. Foreign firms must leverage special advantages, often information-based intangibles, in order to compete in these markets (Morck and Yeung, 1991; 1992). Foreign firms must choose from a number of international trade options such as exporting, licensing, strategic alliances, or joint ventures. MNEs find it difficult to leverage capabilities through arm's length transactions such as exporting due to the need for on-the-ground service or the presence of high trade barriers. Options such as licensing, strategic alliances, or joint venturing may not be optimal due to MNEs' concerns about piracy of intellectual property, reverse engineering of goods and also differing production qualities of branded goods. When faced with such problems, firms choosing to internationalize by retaining direct control of their intangibles become MNEs.

In today's global knowledge economy, firms are more interested in countries in which they can take advantage of strategic assets, especially intangibles such as information and human capital. Thus, more recent FDI flows have shifted from the stand-alone variety described above to more strategic-asset seeking activities that involve the MNE combining resources in order to achieve its goals. In the case of the copper mine, this new FDI takes the form of a developmental relationship with the host country, perhaps establishing a production facility or, at the extreme, even R&D capabilities. This type of FDI is long-term and face-to-face and requires knowledge

transfer across the MNE. The MNE's ability to access countries' resources depends on the relational capital (e.g. goodwill and trust between firm and its actors such as customers, partners, governments, suppliers). Once a MNE finds a country that offers a long-term strategic asset, there are advantages to maintaining a presence in the country. FDI also enables institution-building legal and business frameworks and physical infrastructure, increases local human capital, and reduces the stigma of doing business in a developing country.

II.II. Knowledge Spillovers and Entrepreneurship

During the course of FDI activities, there is a transfer of technology and intangibles to the host country that involves people and machinery, and some of this knowledge spills over. These spillovers are not intentional as the MNE is a profit-maximizing entity and is not willing to transfer knowledge unless it obtains a return. Knowledge spillovers result from a gap in technology between foreign and local firms. The amount of intangible spillovers increases with the presence of MNEs and the size of the foreign-local firm technology gap. MNE activities, which are more knowledge intensive, (e.g. R&D) will receive more knowledge. Also if the foreign unit of the MNE competes with local firms then the MNE may inject more support in the form of knowledge transfer. Technology transfer is said to increase with the sophistication of technology in the local environment. The extent of these spillovers varies with the stage of economic development.

First, not all types of FDI have the same potential for knowledge spillovers. The potential for knowledge spillovers is related to the type of FDI and the level of human capital in the host country. FDI in high technology industries is more likely to generate knowledge-intensive spillovers (Buckley, Newbould and Thurwell, 1988).

High levels of human capital (formal education, on-the-job training including industry, management and business development experience) make it easier for entrepreneurs to start high value-added firms. Individuals working in MNEs obtain higher levels of training and development than in local firms (UNCTAD, 1994) and wish to obtain the best returns for these skills. Individuals may feel unable to realize appropriate returns in the existing firm or may believe that the bureaucratic MNE does not value this knowledge, and seize the opportunity to create a new entity.

Second, for such entrepreneurial activity to occur, the host country will require a cultural context that supports indigenous entrepreneurial activity. Such a context will lead to more individuals perceiving entrepreneurial activity as a desirable economic choice. For entrepreneurs to exploit opportunities that arise from knowledge spillovers, entrepreneurs need the appropriate personal 'knowledge' and resources. While these cannot be measured directly, we expect that higher levels of human capital might indicate that entrepreneurs are using higher levels of 'knowledge' in their entrepreneurial activity. Furthermore, as different types of FDI enable different levels of knowledge spillovers, we expect that entrepreneurial activity will be more pervasive in sectors where entrepreneurs are exploiting opportunities relating to MNE economic activity (Acs and Varga, 2005).

We present case studies of two countries, Ireland and Hungary that have pursued policies of attracting inward FDI. Ireland and Hungary were selected as they have both successfully pursued industrial development policies that sought to attract inward FDI. (For example, Ireland and Hungary have the highest shares of R&D by foreign affiliates in the world, at 72% and 62% respectively (UNCTAD, 2005)). The purpose of the Irish case is to explore how inward FDI might impact indigenous entrepreneurial activity, and to consider if such effects might be expected in Hungary.

In each case we describe the industrial development policies used to attract inward FDI, the changing nature of FDI, the shift to enterprise development policies used to encourage entrepreneurial activity, and the extent and nature of entrepreneurial activity. Finally, we explore how knowledge spillovers from FDI might have impacted on entrepreneurship, including any specific policies that might have sought to maximize such spillovers.

III. Ireland Case Study

Ireland's recent economic success, earning it the label 'Celtic Tiger'⁴, was partially the result of four decades of pursuing an export-led industrial policy that relied significantly on attracting inward FDI. In particular, Ireland has sought to attract export-oriented firms. The motivation for the FDI policy was a strong desire to create employment and to stem emigration from Ireland. The FDI-oriented efforts have been successful. By 2004, there were slightly over one thousand international corporations in Ireland employing 129,000 staff. Annual output for 2002 from foreign owned companies amounted to €69B, of which €65B was exported.

Ireland, like all of the East Asian miracle economies have become large scale exporters of manufactured goods of increased sophistication. Ireland is the world leader in "high-tech" business activity with 46.5 percent of value added in manufacturing from high tech companies (OECD, 1998). The European Union average is 10 percent and the United State average is 16.4 percent. Ireland has become highly urbanized and increasingly well educated. Ireland has a pro business government, with relatively low taxes equal to the European average. Ireland has also been the recipient of significant structural funds from the European Union. But so have other countries that have not grown as rapidly.

It is also important to point out that Ireland performs well below the European average in higher education expenditures on R&D, number of patents per 100,000 population, business research and development per capita and business investment. So Ireland did not achieve its growth miracle in higher value added manufacturing goods by building a high tech economy on its own.

III.I. Inward FDI in Ireland

Ireland's success at attracting FDI broadly reflects government commitment to the policy objective, government policy initiatives and instruments, and the extensive efforts of the Ireland's Industrial Development Authority (IDA). These policies have evolved over time, as have the reasons for why firms have chosen Ireland as a location (Begley, Delaney, and O'Gorman 2005). The key reasons why firms have chosen to locate in Ireland are the following: low corporate tax regime, access to capital and employment grants, IDA lobbying, a pro-business regulatory environment and government, 'demonstration effects' and the availability, at a low cost, of a young, English-speaking, educated and trained workforce.

Ireland's first started attracting export-oriented FDI inflows with the introduction, in the mid-1950s, of a fifteen year 'tax holiday' on profits from export sales⁶. At the time the Irish government funded the state development agency's programs that built 'advanced factories' (purpose built factory accommodation for overseas firms) and provided generous capital grants to foreign firms. Such initiatives, aided by Ireland's entry to the European Economic Community in 1973, led to significant success in attracting inward FDI during the period from 1973 to 1980 (Ruane and Görg, 1996). However the oil shocks of the 1970s and the ensuing global recession forced many foreign firms to close their operations in Ireland. In particular,

labor-intensive firms involved in sectors such as man-made fibers, textiles, clothing and footwear, found that Ireland was no longer an attractive location.

In response, the IDA developed new policies that targeted ‘flagship’ emerging high technology sectors such as electronics, computer software, biotechnology, and healthcare. Often, the IDA targeted relatively young firms in these new key sectors. For example, Apple Computers located in Ireland prior to becoming a public company in the US. The Irish government subsequently extended incentives to cover firms engaged in internationally traded services (e.g. financial services, call centers). Reflecting the nature of such activities, and the policy objective of generating employment, firms receives employment grants as well as capital grants (that is, payments per job created). In addition, a broad range of policy tools such as training grants, subsidized rents, technology transfer grants and low interest loans were used by the IDA to tailor packages that would be attractive to specific firm needs (Murphy and Ruane, 2004). The Irish government also sought to increase the flow of trained graduates to industry by creating new National Institutes of Higher Education (tertiary colleges with a focus on vocational skills).

From the 1990s, the number of firms investing in Ireland significantly increased. In particular, there has been tremendous growth in the scale of FDI inflows from the US. Of the one thousand foreign firms located in Ireland, 46% are headquartered in the US. These American firms account for 75% of all exports from foreign owned Irish subsidiaries and 69% of employment in foreign-owned Irish subsidiaries⁷. This rapid growth may be partly explained by ‘demonstration effects’. In explaining the decision to invest in Ireland, executives of newly arriving firms in sectors such as computers, instrument engineering, pharmaceuticals and chemicals

cite that their location decision is strongly influenced by the fact that other key market players were located in Ireland (Naveretti and Venables, 2004).

There has been a significant change in the sector representation of firms locating in Ireland since the 1970s, when foreign firms primarily operated in low technology sectors. For example, by the late 1990s, over half of Ireland's foreign industry was in high technology sectors, with about a quarter each in medium and low technology sectors (Naveretti and Venables, 2004). Following government policy initiatives, a growing proportion of FDI was directed to ICT sectors (Carlsson, 2005) and key FDI dominated sectors in Ireland now include office and data processing, medical and optical equipment, radio, TV and communications, chemicals, electrical machinery and apparatus, paper and printing, food, and pharmaceuticals. For example, investors in Ireland include thirteen of the fifteen largest global pharmaceuticals, seven of the ten largest information and communication technology and fifteen of the twenty-five largest medical technology firms⁸.

The Irish government's FDI policy continues to evolve. Increasingly the IDA seek higher value added manufacturing activities, marketing and sales, R&D and Head Office functions. Measures such as additional tax allowance for R&D expenditures are aimed at attracting R&D projects to Ireland and encouraging existing foreign firms to engage in R&D activities.

Reviewing the effectiveness of policies aimed at attracting FDI, Murphy and Ruane (2004:135) argue that three factors partly explain Ireland's success: (a) the emergence of self sustaining clusters in areas such as software, electronics, pharmaceuticals, and financial services that resulted from the targeted approach of the IDA and their efforts to build vertical linkages; (b) the extension of incentives to include internationally traded services; and (c) the emergence of a pro-FDI reputation,

that reflects the consistency and pro-active nature of Irish government policies towards FDI.

III.II Emerging Entrepreneurial Policy in Ireland

In addition to attracting inward FDI, Irish industrial policy has sought to support export-oriented indigenous firms, including new enterprises. The opening of the Irish economy in the 1960s resulted in a period of protracted decline in indigenous manufacturing activity, particularly in sectors exposed to foreign competition (O'Malley, 1989). Overall, indigenous manufacturing firms have persistently lagged foreign-owned firms in terms of productivity, export intensity, R&D expenditure, staff training expenditure, salaries paid to staff, technology intensity and the diversification of exports from the UK into continental Europe and other markets (O'Malley, 2004). While the differences between foreign and indigenous firms have persisted, there is evidence that the performance of indigenous manufacturing firms has improved. Today's indigenous manufacturing firms are more export-oriented and profitable than those operating before 1987 (O'Malley, 2004).

Industrial policy has focused assistance on established and new manufacturing firms, which had export potential, or to substitute for an imported product. As such, entrepreneurship policy in Ireland focused on a very narrow range of 'high potential start-up' entrepreneurs. This group consists of manufacturing businesses with export potential and 'internationally traded services' businesses. The range of measures used to assist established and new manufacturing firms includes preferential corporate tax⁹ and capital and employment grants.

In 1978, the IDA initiated the 'Enterprise Development Programme' (EDP) that targeted managers, professionals (engineers and accountants) and academics to

start businesses with high growth potential. Often the new EDP ventures supplied to foreign owned firms or import substitution businesses. EDP entrepreneurs received extensive state assistance in terms of loan guarantees and 'soft supports'. Over the twenty years the EDP operated, about 350 businesses received state assistance, across sectors such as machinery/tool making/computers, electrical and electronics, food, instruments and medical devices and internationally traded services.

The IDA also operated a 'Linkages Programme', under which it actively sought to encourage established and new firms to exploit sub-supply opportunities in foreign firms. This programme enjoyed moderate success in some sectors, such as electronics, although the nature of foreign firm activity means that a significant proportion of their exports consist of components sourced from outside Ireland.

Current supports for entrepreneurial activity are focused on a small number of new start-ups engaged in manufacturing or internationally traded services (for example software firms) and are delivered by Enterprise Ireland, the sister organization of IDA.¹⁰ Enterprise Ireland provided assistance to 54 HPSUs in 2002 and 65 HPSUs in 2004. Policy interventions by Enterprise Ireland have evolved to include initiatives aimed at stimulating venture capital investments (by part investing in venture capital funds), the funding on incubators for universities and institutes. In addition, regional County Enterprise Boards were introduced to support and promote entrepreneurial activity in a broader range of sectors, although they also act as the 'seed' development stage for future Enterprise Ireland clients.

III.III Entrepreneurial Activity in Ireland

The period of rapid growth in the 1990s was characterized by an increase in the number of new businesses. Not surprisingly, this entrepreneurial activity was concentrated in sectors related to the increase in domestic demand. The rapid increase in the numbers at work in Ireland translated into an increase in consumer spending, in real terms, of about 75% between 1993 and 2003. Using registrations for Value Added Tax (VAT), a requirement if a business or sole trader will sell more than €25,000 (service businesses) or €50,000 (manufacturing businesses), the areas of activity where entrepreneurial activity was most prevalent in 2000 were in the construction sector, one third of net new VAT registrations, and other professionals, a group comprising advertising, architects, barristers, solicitors, legal agents, press, were one fifth of net new VAT registration.¹¹

The nature and scope of entrepreneurial activity in Ireland suggests that entrepreneurship is now positive career choice for many well educated Irish workers. Did the policy of attracting FDI directly or indirectly influence such entrepreneurial activity? While knowledge spillovers from MNEs can be difficult to demonstrate, Grög and Strobl (2002) demonstrated that the presence of MNEs has had a positive effect on the entry of indigenous manufacturing firms in Ireland. They concluded that this effect reflects both the presence of MNEs in the same industry and the presence of MNEs in downstream industries. In estimating the impact of MNE purchasing of services and supplies from Irish firms, Barry (2004) suggested a ‘ballpark estimate’ that every 100 jobs in foreign-owned manufacturing firms create 100 service sector jobs and 10 indigenous manufacturing jobs through backward linkages¹². Other research indicates that there is a positive indirect employment effect of MNEs on locally based suppliers, including both indigenous and foreign owned suppliers, in the Irish

electronics sector (Grög and Ruane, 2001). One way that knowledge spillovers might occur is through entrepreneurs leaving MNEs to start their own firms. Of the 270 new high potential start-ups that received assistance from Enterprise Ireland, for the period 1999 to 2003, eighty-eight (33%) were started by entrepreneurs whose immediate prior place of employment was a foreign multinational firm in Ireland; while twenty seven (10%) were started by entrepreneurs leaving universities and institutes.

In some sectors, populated by foreign-owned firms, there has been an increase in indigenous entrepreneurial activity. The most striking example can be found in the software sector. Since the mid-1980s, the software industry has been one of the fastest growing sectors of the Irish economy. There have been significant inflows of FDI, with firms such as Apple, Lotus and Microsoft are among the over one hundred foreign firms located in Ireland. Foreign-owned MNEs are highly export-oriented, sending about ninety-eight percent of output overseas, mostly to European markets. These firms employ over thirteen thousand in Ireland, mostly in Dublin. In the early 1990s when Ireland was the largest exporter of software products in the world, firms such as Microsoft, involved in package software production, outsourced activities such as the printing of manuals, translation activities, and disc duplication to indigenous and foreign firms. In addition, firms such as Ericsson and IBM performed software development activities in Ireland.

In addition to these inflows of FDI, there has been significant indigenous entrepreneurial activity. Ireland's indigenous software sector has over five hundred and fifty firms, output of €1.35 B, and employs about eleven thousand, and exports eighty percent of all output. At least half of these firms have been created since 1991 (when there were 291 indigenous software firms in Ireland). These firms are concentrated in Dublin¹³ (seventy percent of indigenous firms) and spend 18% of

sales on R&D, compared to just 1.5% of sales for other business sectors in Ireland (O'Malley and O'Gorman 2001).

The presence of MNEs has stimulated indigenous investment and new companies in the same industries, but in different product categories (Carlsson, 2005). Foreign firms have had a significant positive influence on the emergence of strong competitive advantage in indigenous firms (O'Malley and O'Gorman, 2001). These benefits include the development of a skilled workforce and access to market opportunities and, in particular, export markets. First, a skilled workforce is an important factor input to the software industry. Indigenous firms benefited from investments in the tertiary education system that sought to produce graduates with skills suitable to attracting FDI. In addition, 'on the job' learning in MNEs in a broad range of sectors was important in developing the skills of the indigenous firms' workforce. Additionally, Irish software entrepreneurs have commonly gained some experience working in foreign MNEs in Ireland, in a variety of sectors. A survey by O'Malley and O'Gorman (2001) suggest that while a minority of the founding entrepreneurs worked in foreign-owned MNEs immediately before starting their own firms, over two-thirds of the new entrepreneurs gained experience working in a foreign-owned MNE in Ireland at some stage in their careers. About half of new Irish entrepreneurs had also worked abroad in software or a related sector at some time before starting their company.

Second, a domestic market of sophisticated customers, many of whom were internationally competitive foreign owned firms, was important for emerging indigenous firms. Many indigenous software firms sell to subsidiaries of foreign firms located in Ireland, including firms in ICT and other sectors. Overseas MNEs, in a range of sectors, are relatively more important in Ireland than they are in most other

countries. Two areas of concentration of sales from Irish software firms are banking/financial services and process flow industries such as pharmaceuticals, chemicals, and dairy products. The financial services sector, while not unusually large in Ireland compared to other countries, does include the Dublin-based International Financial Services Centre, which is home to over 450 firms, the majority of which are foreign owned. Process flow industries, many of which include subsidiaries of MNEs, count for a larger share of production in Ireland than they do in many other EU countries. Furthermore, a significant number of indigenous firms reported that selling to foreign-owned firms in Ireland had helped directly to provide access to export markets (O'Malley and O'Gorman, 2001).

In addition, it appears that specific policies adopted by the development agencies were important in facilitating entrepreneurial activity in the software sector. In the survey by O'Malley and O'Gorman (2001), 80% of the respondents reported receiving some form of state financial assistance, and of those, just over half said that this had been important or very important to their company's development. The main impact of such aid is to enable firms to hire employees earlier and to build sales faster, to enable them to take risks which they might have had to avoid such as following speculative market leads, and to boost profitability which enables other finance to be sourced more readily (Clarke, 1995). A majority (three-fifths) of firms also reported that they received non-financial assistance such as marketing information and assistance with developing management skills and business planning from state development agencies, though for most firms (80%) such non-financial assistance was not of great importance or not relevant at all. We now turn to a discussion of the role of FDI and indigenous entrepreneurship in the Hungarian economy.

IV. Hungary Case Study

When the Iron Curtain fell in 1947, Hungary's new regime nationalized private property and banned private firms with less than ten employees. From 1980, a clause in the Civil Code enabled individuals to establish firms as 'civil law associations' and there were some entrepreneurial efforts such as a software firm run by a group of intellectuals (Hisrich and Szirmai, 1993). However, it was not until Hungary's transition to a free market economy in the late 1980s, that new market institutions and legal structures were developed. During this transition, many state-owned enterprises were privatized, and foreign investors played a major role.

IV.I Inward FDI in Hungary

The Hungarian government's policy of attracting FDI was based on the expectation that foreign firms would bring much-needed financial capital as well as innovation and market economy-related management practices. The Hungarian Investment and Trade Development agency (HITD) was established in 1993 to help foreigners identify investment opportunities and to provide legal and financial advice. In parallel, the Hungarian government led a number of initiatives to enable foreign investment inflows. For example, amendments to the 1988/24 Investment Act, provided foreign investors with equal national treatment, protection against asset expropriation, unlimited ownership, free transfer of profits and the ability to acquire real estate. Further policies to induce FDI included corporate tax exemptions, free profit reapportion, accelerated amortization, duty-free imports of machinery, fully convertible national currency and direct financial support for job-creation, training and low-cost real estate. Hungarian FDI policies have generally been more generous than those promoted by the other Central European economies (Sass, 2003). Indeed, Hungary successfully attracted over US\$22.7 billion in inflows from the period of

1993 to 2002 (UNCTAD, 2005). Foreign firms entering Hungary are often geographically proximate, for example, Germany (led by foreign affiliate Audi Hungaria Motor) and Austria account for nearly 50% of FDI (ITD, 2004).

Initial FDI was directed to privatization of state-owned Hungarian enterprises, especially in the manufacturing sector (ITD, 2004). The Hungarian government was particularly keen to attract blue chip companies and sometimes offered these firms monopoly or otherwise strong market positions (Sass, 2003). The earliest foreign investors included individuals with some experience with Hungary, as émigrés from Hungary or those previously involved with Hungarian firms. Initial FDI inflows were directed to low-cost and low-valued-added production and the opportunities enabled by national and EU government grants and subsidies. In addition to privatization, early FDI was market seeking, focusing on the food and beverage sectors and characterized by “first mover” advantages, e.g. Coca-Cola. FDI was directed mainly to Budapest and to the Central and West Transdanubian region (ITD, 2004). Many of these early foreign investors took minority ownership, but increased these to majority stakes over the years (Inzelt, 2000). Meanwhile, this first phase of FDI was characterized by little cooperation between foreign and Hungarian-owned enterprises (Inzelt, 2000).

In 1990, there were just 231 wholly foreign owned and 4,462 partly foreign owned firms operating in the Hungarian economy; by 2004, these numbers rose to 17,000 and 10,000 respectively (ITD, 2004). With the influx of new firms, the scope of FDI has also changed. The Hungarian government introduced a number of performance requirements in order to secure benefits from the FDI. These included stricter performance, employment and sales target guidelines as well as requirements to invest in particular regions, sectors and activities (Sass, 2003). The government

also introduced a number of sub-contracting programmes designed to increase Hungarian suppliers' share of MNE production, however these were met with limited success (Sass, 2003).

A number of other developments also improved Hungary's FDI fortunes. Duty-free zones were structured to attract export-oriented Greenfield investment, particularly in R&D. Greenfield investments comprise about 25-30% of FDI inflows and generally lead to the creation of more new jobs, high export-orientation and more advanced production technologies than Brownfield investments (Sass, 2003), Hungary's May 2004 entry to the EU has helped to change its fortunes. FDI inflows to the 10 EU accession countries rose 69% in 2004, with Hungary receiving the third largest flow of FDI, behind Poland and the Czech Republic (UNCTAD, 2005). At the same time, former asset-seeking foreign investors, who selected Hungary because of the lower wage advantages, began to leave the country. Exiting firms included IBM, Philips, Kenwood, and Salamander. The decrease in investment in rubber and plastics and motor vehicles has been offset by an increase in food and tobacco, and radio and television (ITD, 2004).

Between 1995 and 2003, MNEs increased their R&D spending in Hungary by 40.7%, with foreign affiliates' share of R&D spend now at 62.5%, mostly linked to manufacturing, and in the automotive and electronics industries (UNCTAD, 2005). This number includes General Electric (GE)'s 1990 takeover of the Hungarian firm Tungram. New owner GE initially made layoffs but then transformed the local R&D laboratories into specialized corporate R&D centers (UNCTAD, 2005; Kalotay and Hunya, 2000).

FDI earnings were, to some extent, reinvested in the country. Hungary ranked 16th in the world economies' FDI reinvested earnings, with \$2.1B in reinvested earnings in 2003, well behind Ireland in first place with \$19.4B in reinvested earnings (UNCTAD, 2005). It is generally thought that FDI in Hungary was critical in helping to integrate the country into the world economy and to improve labor productivity, competitiveness, innovation, export potential and industry structure (Sass, 2003).

IV.II. Emerging Entrepreneurial Activity in Hungary

In contrast to the linkages between FDI and indigenous firms, there is little evidence in Hungary that FDI has stimulated indigenous entrepreneurial activity. Connections between Hungarian and foreign businesses are limited, and few external or spillover effects have been reported. This phenomenon is known as the “dual structure” of the Hungarian economy. The considerable variation in the two groups' profitability, competitiveness and export-orientation has persisted over time (Novak, 2002). First, we review the limited interaction between foreign MNEs and Hungarian SMEs and then turn to a discussion of the extant indigenous entrepreneurship.

The establishment of subcontracting connections between large foreign businesses and smaller Hungarian businesses has had limited success. One example is Suzuki which has the capacity to produce over 80,000 cars a year in Hungary (IDH, 2000). Hungarian firms are estimated to comprise about 40% of Suzuki's supplies (Sass, 2003). Still other foreign firms such as Audi, Sony and Opel cars source less than 10% of their supplies from Hungarian firms (Sass, 2003). In Hungary, it is believed that the type of FDI impacts the scale and scope of backward linkages. When compared to Greenfield's, FDI inflows to privatization are more likely to retain original indigenous suppliers (Sass, 1997). For example, the privatized GE-Tungsam

unit sources between 60-70 from local firms (Sass, 2003). Furthermore, certain sectors such as automotive and electronics, are less likely to source from indigenous suppliers (Sass, 2003). Despite sporadic government efforts, Hungarian SMEs have not been able to meet the quality, financial, timing, and managerial requirements of the MNEs. Although the FDI-driven introduction of new technologies has the potential to spillover to indigenous Hungarian firms, the impact on indigenous firms' performance has been limited (Novak, 2003). Rather, indigenous firms' performance has benefited from increased competition with MNEs and backward linkages to these firms (Novak, 2003). A recent loss of some multinationals mainly to East Asia can be contributed to the weak local supplier connections that can be one of the key element of attracting other MNCs in a particular region (Békés, 2005)

Hungary has witnessed several phases of entrepreneurial activity. The earliest phase (1990-1996) was characterized by a dramatic three-fold increase in the number of new businesses, to over one million new firms. Individuals who had lost their jobs and supported through a variety of government programs often started these new ventures. However, the majority of these small firms failed, due in part to the Hungarian entrepreneurs' limited experience and inability to meet the requirements of the market economy and competition. From 1996, the rates of new firm creation declined as Hungarian government policy focused on attracting FDI. The worldwide recession in 2000 further undermined the weak small business sector, and new venture creation decline continued, resulting in formation rates that barely replaced the disappearing businesses'. Hungarian governments have failed to recognize the importance of entrepreneurial businesses (Inzelt and Szerb, 2004). Hungary lacks an "entrepreneurship policy" per se, although the National Development Plan directs government support to innovation, investment and job creation.

The so-called Four Phase Capital Access Program aims mainly to improve the undercapitalization of existing SMEs and to ease the access to finance. The overall impact of these programs have proved to be limited except the over 35 000 users of the Széchenyi Credit Card that serves to relieve the short term financing problems of small businesses. At the same time business establishment costs and administration increased sharply, and the access of new ventures to markets worsened. The newly formulating strategy regarding SMEs directs to change from direct financial support to developing markets and services for SMEs, however, its execution can be questioned.

One interesting area for Hungary's future is the young biotechnology sector, comprising more than fifty businesses. This sector is unconnected to the MNEs operating in the Hungarian economy.

V. Nascent Entrepreneurship Comparison

From the case studies, it should be apparent that the major hypotheses concerning national variation in entrepreneurship should be that Ireland and Hungary have followed different economic development trajectories. We might therefore expect that Ireland and Hungary would also differ in terms of the populations' culture and personal attitudes towards entrepreneurs. Furthermore, we might anticipate that the level of opportunity entrepreneurship and the profile of entrepreneurs and their new venture sectors would also differ between the two countries. We put forward the following five hypotheses:

Hypothesis 1: Compared to Hungary, there are higher levels of opportunity entrepreneurs in Ireland.

Hypothesis 2: Compared to Hungary, Ireland is more likely to have a stronger entrepreneurial culture.

Hypothesis 3: Compared to Hungarian, the Irish population are more likely to have a personal entrepreneurial context.

Hypothesis 4: Compared to entrepreneurs in Hungary, Irish entrepreneurs are more likely to higher formal education qualifications.

Hypothesis 5: Compared to entrepreneurs in Hungary, Irish entrepreneurs are more likely to start in knowledge intensive sectors.

V.I. Data & Variable Definitions

To test these hypotheses, we use data from the Global Entrepreneurship Monitor (GEM) for Ireland and Hungary. The GEM data uses population samples to estimate the prevalence rates of nascent and new businesses. A standardized telephone survey was conducted of a representative sample of adults (18-64 years old) in 2002, 2003 and 2004 in Ireland and 2002 and 2004 in Hungary, yielding a total sample of 10,841 individuals (5,963 Irish and 4,878 Hungarians). The survey requested a broad array of information related to individuals' demographics, perceptions of the country environment for entrepreneurship, attitudes and awareness of entrepreneurship and the self-reporting of involvement in entrepreneurial activities.

Demographics

Individual demographics collected include *country* (a dichotomous variable where 1=Ireland and 2=Hungary), *gender* (a dichotomous variable where 1=male and 0=female), *age* (a scaled variable from 18 to 64, computed from the respondent year of birth) and *education* (a scaled variable based on the respondent's highest level of education completed and categorized into five groups: 'no education,' 'some secondary education,' 'secondary degree,' 'post-secondary education' and 'graduate degree.')

Country Environment

Individuals' perception of country environment for entrepreneurship was also obtained. *Desirable Entrepreneur Career* is a dichotomous variable where 1=yes and 0=no to the statement, 'In your country, most people consider starting a new business a desirable career choice.' *Entrepreneur High Status* is a dichotomous variable where 1=yes and 0=no to the statement, 'In your country those successful at starting a new business have a high level of status and respect. *Entrepreneur Media Attention* is a dichotomous variable where 1=yes and 0=no to the statement, 'In your country, you will often see stories in the public media about successful new business.'

Personal Attitudes

Individual attitudes toward entrepreneurship were also queried. These included dichotomous variables coded 1=yes and 0=no to the following statements: 'In the next six months, there will be good opportunities for starting a business in the area where you live;' 'You know someone personally who started a business in the past two years;' 'You have the knowledge, skill and experience required to start a new business;' and 'Fear of failure would prevent you from starting a business.'

Total Entrepreneurial Activity

To identify individuals engaged in entrepreneurial activities, respondents were asked to respond to the statement: “You are, alone or with others, currently trying to start a new business, including any self-employment or selling any goods or services to others.” Individuals who answered ‘yes’ were classified as entrepreneurs. This measure, known as *Total Entrepreneurial Activity (TEA)* includes the prevalence of both nascent firms and new or young firms which have survived start-up. This resulted in a sample of 664 entrepreneurs: 409 Irish entrepreneurs and 255 Hungarian entrepreneurs.

Opportunity Entrepreneurship

An important division is between opportunity and necessity-based entrepreneurial activity. Opportunity entrepreneurship is characterized by voluntary participation in entrepreneurial activities, while necessity entrepreneurship is distinguished by the individual’s perception that entrepreneurship is the best option for employment, however not necessarily the preferred option. *Opportunity entrepreneurship* is calculated as a dichotomous variable where the responses ‘take advantage of business opportunity’ and ‘have a job but seek better opportunities’ are coded 1=yes and ‘no better choices for work’ is coded 0=no. Opportunity entrepreneurship resulted in a smaller sample of 590 total opportunity entrepreneurs: 341 Irish entrepreneurs and 159 Hungarian entrepreneurs.

Entrepreneurial Activity Types

Finally, information was gathered about the entrepreneurs’ venture activities.

Respondents described the industry sector and type of new businesses; the variable *Sector* consists of the responses aggregated into ten categories. *New Technology* is a dichotomous variable based on the response to the question, 'Were the technologies or procedures required for this product or service generally available more than a year ago?' where 1=new technology and 0=no new technology. *Export Orientation* is based on the number of sales expected outside of the home country where 1=over 50% of sales from abroad and 0=0-49% of sales from abroad. *Current Jobs* is based on the number of people who are working only for this business, and is a scaled variable. *Future Jobs* refers to the expected number of people who will be working for the business in five years' time, and consists of four categories: no jobs, 1-5, 6-19 and more than 20 jobs expected. *Market Expansion* is an aggregated variable based on responses to other questions and consists of four categories; no, little, some and maximum market expansion.

V.II. Levels of Entrepreneurial Activity in Ireland and Hungary

There are fewer entrepreneurs in Hungary than in Ireland (Table 3). The total entrepreneurial activity rate in Hungary for the period studied was 5.45%, compared to 8.07% in Ireland. This difference is statistically significant. Entrepreneurial activity in Ireland is generally motivated by opportunity (rather than necessity) 6.64% compared to 2.75% in Hungary. Thus, we find support for Hypothesis 1.

V.III Entrepreneurial Culture and Personal Context: Adult Population

Next we turn to the population levels of entrepreneurial culture and personal context. We find significant differences in entrepreneurial culture and the personal context of the adult population between Ireland and Hungary (Table 4). In Ireland, the adult

population is significantly more likely to indicate that in their country, most people consider starting a new business a desirable career choice, that most people consider starting a new business to have a high level of status and respect, and that there is frequent media coverage of successful businesses. We also find significant differences in personal attitudes toward entrepreneurship. Compared to the Hungarians, the Irish are more likely to indicate that they know an entrepreneur, see good start-up opportunities in their environment and feel that they have the knowledge and skills to start a business. The Irish are more likely to indicate that fear of failure would prevent them from starting a business than the Hungarians. Hypotheses 2 and 3 are also supported.

V.IV. Profile of Entrepreneurs

Demographic Variables

We probed for any difference in terms of age, gender and education demographics (Table 5). We find no significant difference in terms of gender and age; however, we found a difference in highest level of education obtained. Irish entrepreneurs are more likely to have obtained a higher level of educational qualifications than their Hungarian counterparts. This is statistically significant for both the entire population of entrepreneurs and that of just opportunity entrepreneurs.¹ Thus, our findings support Hypothesis 4.

The New Ventures

As shown in Table 6, entrepreneurs in Ireland and Hungary establish businesses in different sectors. Irish entrepreneurs are more likely to start new companies in

¹ It may be that the Irish population is generally more likely to pursue higher levels of education than the Hungarian population (OECD, 2005).

business services, consumer services, transport/communications/utilities, and to a small extent wholesale/motor vehicle sales/repair. Hungarian start-ups are more likely to be found in agriculture/forestry/hunting/fish, mining/construction, manufacturing and retail/hotel/restaurant sectors. These findings support Hypothesis 5. There was a significant difference, at the .02 level, in terms of market expansion, with Irish entrepreneurs more likely to be market expansive than Hungarian entrepreneurs. Irish entrepreneurs were more likely to report higher expectations of job creation (with nearly 40% reporting six or more jobs created) compared to Hungary (29% reported six or more jobs created). There was no different in new technology created. The two countries' entrepreneurial activities also differed in terms of export orientation with the Irish significantly more likely to start businesses where more than 50% of the product/service is export.

VI. Policy Conclusions

We started this paper with a question, "Could the Irish Miracle be repeated in Hungary?" To answer this question we needed first to understand the Irish Miracle and second, to put the Hungarian economy into global perspective. Let us review the key milestones in Ireland's economic development policy. At the economy wide level Ireland like Taiwan and Israel pursued:

- A liberated market economy.
- Improved the physical infrastructure
- Improved its education system, leading to higher rates of skill formation between the 1960s and the 1980s.

- Created public telecommunication companies that vastly improved their line subscription rates. Deregulation and privatization of the telecommunication market followed, leading to higher rates of wireless and Internet penetration.
- At the micro and industry level The Irish Development Agency pursued policies of inward FDI for four decades and these policies have evolved seeking to exploit higher value added FDI.
- The Irish Development Agency also pursued an Enterprise Development Policy to create new firms. The Irish case study suggests that entrepreneurial activity became increasingly important about a decade ago with the development of policies to grow a high-technology sector.
- The policies directed at attracting inward FDI and policies focused on indigenous entrepreneurial activity have sought to maximize the benefits of inward FDI knowledge spillovers on indigenous industry. Managers in MNEs have left these careers to start their own firms, for example in the software industry.

Putting the Hungarian economy into a European and global perspective we cannot miss the fact that Hungary is not in the same position that Ireland was twenty years ago. Hungary joined the European Union at a time when there is much more competition for funds from other former Eastern European countries whereas Ireland joined when it was able to benefit massively from agricultural and regional subsidies. Ireland, now one of the richest countries in Europe, still received 407 euros per resident in contributions from the European Union. This amounts to about 1.5 billion euros per year. In comparison, Hungary, a middle-income country received 19 euros per resident in 2004, the lowest net recipient in Europe (Speigel, No. 7 2005 p.75).

Second, we know that FDI has played an important role in economic development in Hungary. Attila Varga and Hans J. Schalk (2004) examined macroeconomic growth in the post communist era. Specifically they were interested in the contribution of FDI in terms of new knowledge, the domestic stock of knowledge and regional R&D played in macroeconomic growth. Now surprisingly they found that the most important variable explaining total factor productivity was FDI. This is not surprising given the important role the FDI has played in economic development in Ireland, Israel and Taiwan. Hungary does not have enough FDI and with the emergence of India (software) and China (hardware) it is not sure that moving up the value chain in ITC is a viable strategy. A case in point is the purchase of Swedish jet fighters by Hungary from Saab. However, very little, if any, of the manufacturing, design sourcing of the fighter comes to Hungary. This is a lost opportunity.

Third, as suggested by Acs, et al. (2005) Hungary, like other Central European Economies, and unlike Ireland, Israel and Taiwan, has a small and declining entrepreneurial sector. Both the type of person that becomes an entrepreneur and the nature of entrepreneurship in general are fundamentally different between the two countries. The Irish population is more likely to report that entrepreneurial careers are desirable, convey high levels of status and respect, and are reported in the media. Irish entrepreneurs have high levels of education, are likely to be in high skilled, knowledge-intensive sectors such as business services and are more likely to be export-oriented than Hungarian entrepreneurs. Finally, and perhaps most important, Hungary has not invested enough in education to raise the skill level of the population.

So, what lessons can Hungary learn from Ireland? The case evidence and the comparison of entrepreneurial activity between Ireland and Hungary suggest that

there are three aspects of economic development policy that Hungary needs to consider: government policies directed towards FDI, and those policies directed at entrepreneurship and education. First, at the economy wide level Hungary needs to greatly improve the skill levels of the population and restructure its higher education policies like Ireland, Israel and Taiwan have done. While the proportion of graduates leaving from high school and continuing their studies at universities has increased there are structural problems. University education fits very little to the demand of the labor market, showing an overproduction in the fields of humanities, law, economic and business, and an underproduction in the fields of sciences and engineering.

Second, at the industry level Hungary needs a development a strategy to acquire the knowledge base upon which to base its economic development. Ireland offers one model, but there are many others. In terms of FDI, industrial development policy attract higher value added FDI that has potential to spillover into the local economy. Such spillovers can be encouraged by using FDI to support and initiate clusters (Rocha and Sternberg, 2005).

Finally, Hungary needs an Enterprise Development Policy to create a more innovative economy that will lead to its own high-tech industry. Our case studies suggest that such policies should be implemented soon. Policies aimed at encouraging entrepreneurs to exploit knowledge spillovers from MNEs might include the following: encouragement and support for individuals to become more active in entrepreneurial careers, and in particular those with the resources and knowledge that can exploit knowledge spillovers from MNEs. In parallel, policies within the higher education system need to encourage the commercialization of technology. Hungary does not appear to be taking full advantage of FDI.

Hungary can learn from Ireland how to integrate an Industrial Development Policy that attracts high value FDI and Enterprise Development Policy that maximizes knowledge spillovers. Here the Irish Miracle may provide an example for Hungary to follow as it tries to integrate into the global knowledge economy (Arenius and de Clercq, 2005).

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Notes.

¹ Why Hungary was poor during the 1950s and 1960s was clear. Hungary was devastated during World War II, had a revolution in 1956 and had a Stalinist social and economic structure. It was not until the 1960 that the New Economic Order starts to take hold, but the country still had a communist government without private property and a market economy. The fall of the Berlin wall in 1989-the end of communism- set the country back for years at it started market reforms. Ireland is more complicated. According to Tom Garvin (2004) the culprits for delaying modern Ireland's industrial take-off until the 1960s are: the anti-economic mind-set of the state's key political and social elites, rooted as they were in the social conditions of the inter-war years; and the Irish Catholic Church for fostering such a mind-set, in particular through its hold on the educational system, which was oriented towards the professions rather than science and practical learning and which for decades denied schooling to most young people beyond the age of 14. The unemployment and emigration crisis of the mid-1950s gave the latter the opportunity to seize hold of the ship of state and open the country to foreign capital and the EU.

³ Ireland also leads European Union countries in the rate of new company formation (The European Observatory for SMEs, 1996).

⁴ Ireland experienced unprecedented growth of output, exports, incomes and employment during the decade of the 1990s. The effect of recent growth was that by the year 2000 Ireland had a GNP per capita that was at the same level as the average for the fifteen members of the European Union. Compared to Ireland’s economic performance prior to the 1990s and to the economic performance of other under-developed European economies such as Spain, Portugal and Greece, this was a remarkable achievement. This dramatic economic performance has generally been referred to as the ‘Celtic Tiger’.

⁶ This was replaced with a 10% tax on all corporate profits from manufacturing in 1980.

⁷ Unpublished internal IDA data.

⁸ Unpublished internal IDA data.

⁹ Indigenous firms could avail of the 10% manufacturing corporate tax rate in 1980. However this incentive was of less value to indigenous firms as those that did manufacture tended to have low rates of profitability.

¹⁰ IDA activities were divided into two separate organizations following a review of industrial policy in 1982.

¹¹ Data from the Department of Revenue, Government of Ireland.

¹² In 2003, foreign firms purchased of €4.4B of materials and €5.0B of services in Ireland (Barry, 2004).

¹³ Across all sectors there has been some regional concentration among the new jobs created by FDI. For example, the number of permanent jobs in IDA Ireland supported companies (i.e. overseas MNEs that have availed of Irish tax and grant incentives for locating in Ireland) in the East region, which in

References:

Acs, Z.J., Morck, R., and Yeung, B. 2001. Entrepreneurship, Globalization and Public Policy, *Journal of International Management*, 7, 235-251.

Acs, Z. J., P. Arnius, M. Hay and M. Minniti, 2005, *Global Entrepreneurship Monitor- Executive Report. 2004*.Wellsley - London: Babson College and London Business School.

Acs, Z. J. and Terjesen, S. 2005. Born Local: Two Views of Internationalization, paper presented at *JIBS CIBER Conference: Emerging Research Frontiers in International Business Studies*; Rotterdam, September 28-30, 2005.

Acs, Z.J., and Varga, A. 2005. Entrepreneurship, Agglomeration and Technological Change, *Small Business Economics*, 24(3): 323-334.

Arenius, P., and D. de Clercq, "A Network Based Approach on Opportunity Recognition," *Small Business Economics*, 24(3), 249-265.

Békés, G 2005. Location of Manufacturing FDI in Hungary: How important are inter-company relationships? Accessed at 10.10.2005.
www.mnb.hu/Resource.aspx?ResourceID=mnbfle&resourcename=bekes0503

Barry, F. 2004. Export-platform foreign direct investment: the Irish experience, *European Investment Bank Papers*, 9(2): 8-37.

Bates, T. 1990. Entrepreneur Human Capital Inputs and Small Business Longevity, *Review of Economics and Statistics*, 551-59.

Begley, T. M., E. Delaney and C. O’Gorman, 2005, "Ireland at the Crossroads: Still a Magnet for Corporate Investment" *Organizational Dynamics*, 34(3) 202-217.

Buckley, P., Newbould, G., and Thurwell, J. 1988. *Foreign Direct Investment by Smaller UK Firms*, London: Macmillan.

Clarke, A. 1995. *Software Support Programme: Final Report*. Dublin: EU Structural Funds Operational Programme for Industrial Development Evaluation Unit.

Garvin, T., 2004, *Preventing the Future: Why Was Ireland so Poor for so Long?* London: Gill and McMillan.

Grög, H., and Ruane, F. 2001. Multinational Companies and Linkages: Panel-Data Evidence from the Irish Electronics Industry, *International Journal of the Economics of Business*, 8(1), 1-18.

Grög, H., and Strobl, E. 2002. Multinational companies and indigenous development: An empirical analysis, *European Economic Review*, 46: 1305-1322.

Heston, A., R. Summers and B. Alen, Penn World Table Version 6.1, Center for International Comparison at the University of Pennsylvania (CICUP), October 2002.
Hisrich, R., and Szirmai, P. 1993. Developing a market oriented economy: a Hungarian perspective. *Entrepreneurship and Regional Development*, 5(1): 1-71.

Hungarian Central Statistics Office (HCSO). 2002. Foreign Direct Investment 1999-2000, Budapest, Hungarian Central Statistical Office.

Inzelt, A. 2000. Foreign Direct Investment in R&D: Skin-deep and Soul-deep Cooperation, *Science and Public Policy*, 27(4): 241-251.

Inzelt, A. and Szerb, L. 2004. The Innovation Activity in a Stagnating County of Hungary, University of Pecs, Pecs, Hungary.

ITD Hungary (ITDH). 2004. Electronics Industry in Hungary. Pamphlet.

ITD Hungary (ITDH). 2005. Doing Business in Hungary, <http://www.itdh.hu/index.ivy?public.lang=en-US> accessed: January 31.

Kalotay, K. 2003. Működőtőke – válságban? (FDI – In Trouble?) *Hungarian Economic Review*, L(1): 35-55.

Kalotay, K., and Hunya, G. 2000. Privatisation and FDI in Central and Eastern Europe, *Transnational Corporations*, 9(1): 39-66.

Lucas, R., 1993, Making a Miracle, *Econometrica*, 61(2), 251-272.

Morck, R., and Yeung, B. 1991. Why Investors Value Multinationality. *Journal of Business*, 64: 165-187.

Morck, R., and Yeung, B. 1992. Internalization: An event study test, *Journal of International Economics*, 33: 41–56.

Murphy, A. and Ruane, F. 2004. Foreign Direct Investment in Ireland: An Updated Assessment, in Central Bank and Financial Services Authority Annual Report 2003, Dublin, Ireland.

National Economic and Social Council (NESC). 2003. An Investment in Quality: Services, Inclusion and Enterprise, Government Publications Office, Dublin.

Naveretti, G. B., and Venables, A. 2004. 'FDI and the Host Economy: A Case Study of Ireland', in Haaland, J., and Venables, A *Multinational Firms in the World Economy*, Princeton University Press, pp 187-216.

Novak, C. 2002. Hatekonyasgnovekedes es kulfoldi tulajdon a Magyar feldolgozoiparban (Efficiency growth and foreign ownership in Hungarian manufacturing.). *Kulgaszdasag*, (LXVI:5): 41-52.

Novak, C. 2003. A Kulfoldi mokodotoke es a technolgiai tovagyorozes Magzarorszagon. FDI & technology spillovers in Hungary. MTA VKI M_helytanulmanyok. No. 50. October.

Organization for Economic Co-operation and Development (OECD). 2005. FDI Database. <http://www.oecd.org/dataoecd/14/3/8264806.xls>. Last accessed November 10, 2005.

O'Malley, E. 1989. *Industry and Economic Development: the Challenges for the Latecomer*, Dublin: Gill and Macmillan.

O'Malley, E. 2004. Competitive Performance in Irish Industry, *Quarterly Economic Commentary*, Winter.

O'Malley, E., and O'Gorman, C. 2001. Competitive Advantage in the Irish Indigenous Software Industry and the Role of Inward FDI. *European Planning Studies*, 9(3): 303-321.

Reynolds, P., N. Bosma, E. Aution, S. Hunt, N. de Bono, I. Servais, P. Lopez Garacia and N. Chin, 2005, "Global Entrepreneurship Monitor: Data Collection Design and Implementation 1998-1003," *Small Business Economics*, 24(3), 205-231.

Rocha, H., and R. Sternberg, "Entrepreneurship: The Role of Clusters, Theoretical Perspectives and Empirical Evidence from Germany," *Small Business Economics*, 25(3), 267-292.

Ruane, F., and Görg, H. 1996. Aspects of Foreign Direct Investment in Irish Manufacturing since 1973: Policy and Performance, *Journal of the Statistical and Social Inquiry Society of Ireland*, XXVII(IV): 1-51.

Sass, M. 1997. Beszallitok Magyarországon. Egy kerdoives felmeres eredmenyei. Suppliers in Hungary. The results of a questionnaire survey. IWE HAS Budapest. Manuscript.

Sass, M. 2003. FDI in Hungary: The First Mover's Advantage and Disadvantage. *EIB Papers*, 9(2): 62-90.

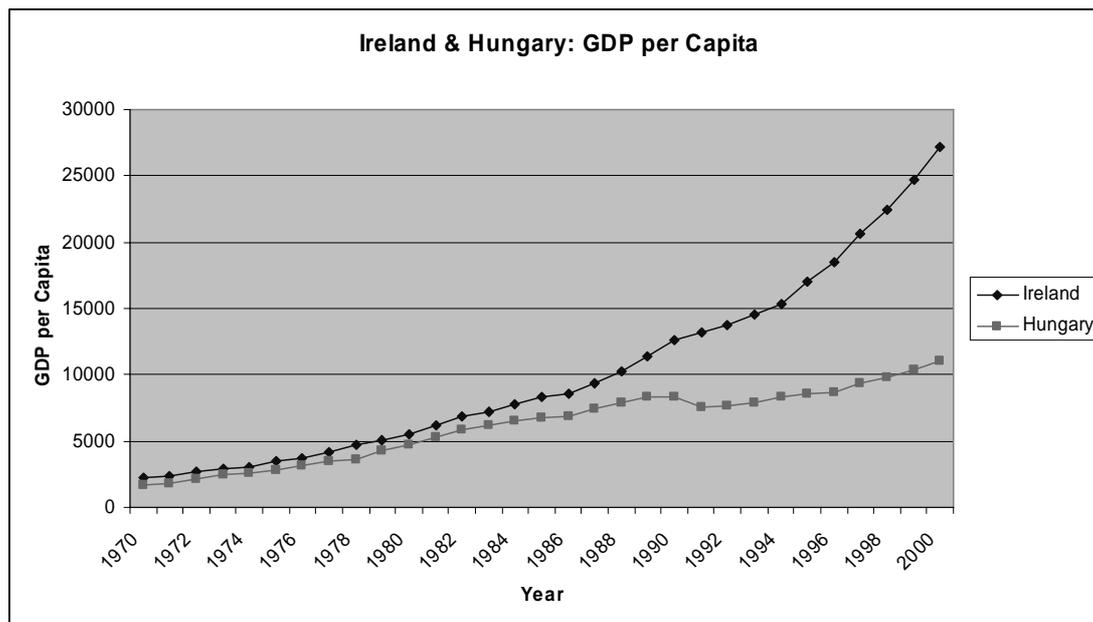
Sternberg, R., and S. Wennekers, 2005, "Determinants and Effects of new Business Creation Using Global Entrepreneurship Monitor Data," *Small Business Economics*, 24(3), 193-203.

UNCTAD. 2005. World Investment Report. Transnational Corporations and the Internationalization of R&D.

Varga, A. and Schalk, H. J. 2004. Knowledge Spillovers, Agglomeration and Macroeconomic Growth. *Regional Studies*, 38(8): 977-989.

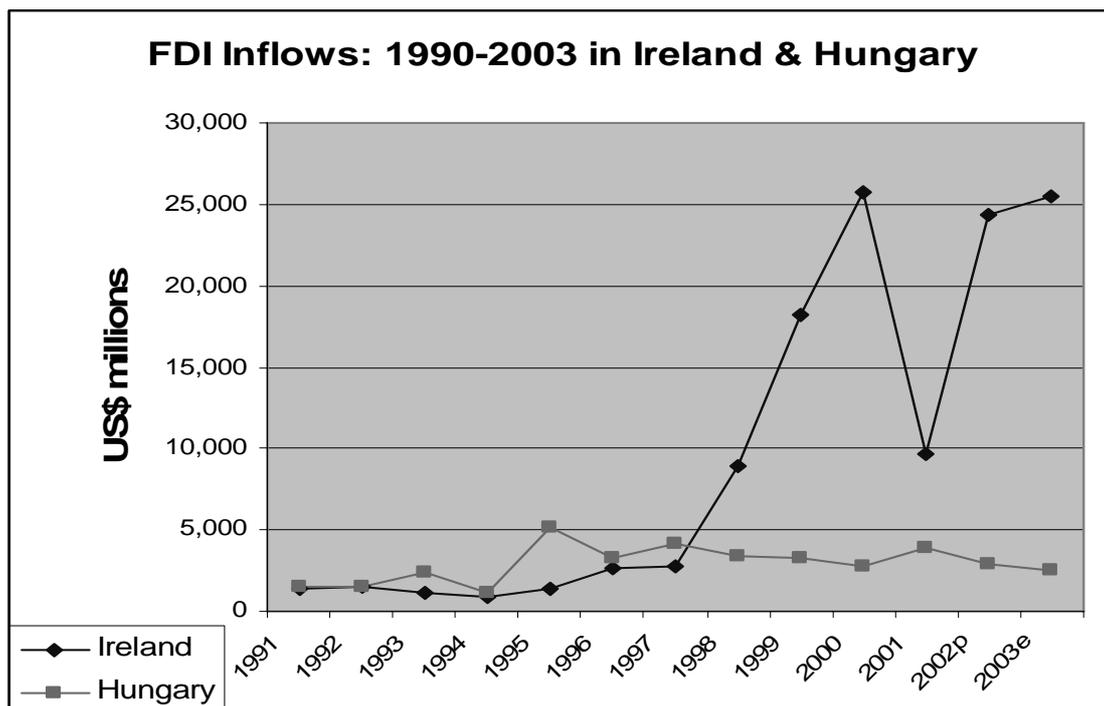
Young, S., Hood, N., and Peters, E. 1994. Multinational Enterprises and Regional Economic Development. *Regional Studies*, 28(7): 657-679.

Figure 1: Per Capita GDP in Ireland and Hungary 1970 - 2000



Source: Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002.

Figure 2: FDI Inflows (US \$Millions) in Ireland and Hungary: 1990-2003



Source: OECD, 2005

Table 1: FDI Inflows in 30 OECD Countries (in US\$ billions)

Economy	Cumulative FDI Inflows 1993-2002
United States	1284.5
Belgium/Luxembourg	682.4
United Kingdom	484.5
Germany	393.8
France	322.4
Netherlands	272.5
Canada	206.1
Sweden	167.9
Spain	152.7
Mexico	128.6
<i>Ireland</i>	97.2
Denmark	88.9
Australia	74.9
Italy	73.3
Switzerland	73.3
Poland	49.4
Finland	45.2
Japan	44.3
Korea	37.9
Austria	36.3
Czech Republic	35.9
Norway	35.1
Portugal	28.7
<i>Hungary</i>	22.7
New Zealand	21.9
Turkey	10.7
Slovak Republic	9.6
Greece	9.3
Iceland	1.0

Source: OECD, 2005

Includes Dublin, increased from 35 percent in 1993 to 48 percent in 2000 (NESC, 2003).

Table 2: Estimated Structure of FDI in Hungary and Ireland (1998-2002)

Industry/Branch	Ireland % of Total	Hungary % of Total
Manufacturing		
- Of food, beverages and tobacco	4%	10%
- Of textiles, leather products and clothing	.001%	.001%
- Of wood, pulp, paper, publishing and printing	.001%	2%
- Of coke, refined petroleum products, nuclear products and nuclear fuel, chemicals and chemical products and man-made fibers including rubber and plastics	20%	12%
- Of other non-metallic mineral products	1%	2%
- Of basic metals and fabricated metal products	0.5%	2%
- Of machinery and equipment*	10%	2%
- Of radio, television, electrical and optical equipment*	15%	8%
- Of motor vehicles/ transport equipment	0.5%	11%
- Other manufacturing	2%	5%
Agriculture, hunting, forestry and fishing	.001%	.001%
Mining, quarrying and petroleum	.001%	.001%
Wholesale and retail trade, repair of motor vehicles and household goods	8%	6%
Hotels and restaurants	.01%	1%
Transport, storage, post and communications	10%	10%
Real estate, renting and business activities, including financial intermediation and insurance	22%	15%
Electricity, gas, and water	4%	9%
Construction	1%	.001%
Education, health and social services	.001%	.001%
Other sectors	0%	5%

Source: Based on HCSO (2002); UNCTAD (2005); OECD (2005); ITD (2004);

* includes high technology

Table 3: Total Entrepreneurial Activity

Entrepreneur Profile Variables	Ireland	Hungary	Significance
Total Entrepreneurial Activity	8.07%	5.45%	***
Opportunity Entrepreneurship	6.64%	2.75%	***

*** p<.001

Table 4: Entrepreneurial Culture and Personal Context: Adult Population

Country Environment Variables	Ireland	Hungary	Significance
<i>Entrepreneurial Culture</i>			
Desirable Entrepreneur Career: 'In your country, most people consider starting a new business a desirable career choice': % Yes response	66%	55%	***
Entrepreneur High Status: 'In your country, those successful at starting a new business have a high level of status and respect': % Yes response	81%	58%	***
Entrepreneur Media Attention: 'In your country, you will often see stories in the public media about successful new businesses': % Yes response	80%	35%	***
<i>Personal Context</i>			
Personal Knowledge of Entrepreneur: 'You know someone personally who started a business in the past 2 years': % Yes response	46.2%	35.6%	***
Good Start-Up Opportunities: 'In the next six months, there will be good opportunities for starting a business in the area where you live': % Yes response	41.5%	14.1%	***
Knowledge and Skills: 'You have the knowledge, skill and experience required to start a new business': % Yes response	51.2%	41.1%	***
Fear of Failure: 'Fear of failure would prevent you from starting a business': % Yes response	29.1%	24.8%	***

*** p<.001

Table 5: Entrepreneurs: Age, Education and Gender

Demographic Variables	Ireland	Hungary	Significance
Age (mean)	37.74	38.28	*
Highest Level of Education Completed			
- None	0%	0%	***
- Some Secondary	12.8%	31.1%	
- Secondary	31.5%	52.8%	
- Post-Secondary	38.9%	11.0%	
- Graduate	16.7%	5.1%	
Male : Female Ratio	2.30	1.67	**

*** p<.001; **<.05; * p<.10

Table 6: New Ventures in Ireland and Hungary

	Ireland	Hungary	Significant
Sector			
- Agriculture/Forestry/Hunting/Fish	8.0%	6.5%	
- Mining/Construction	9.5%	12.9%	
- Manufacturing	7.3%	14.3%	
- Transport/Communications/Utilities	7.3%	3.7%	
- Wholesale/MV Sales/Repair	6.1%	4.1%	***
- Retail/Hotel/Restaurant	17.9%	28.1%	
- Finance/Insurance/Real Estate	1.9%	3.2%	
- Business Services	19.5%	16.6%	
- Health/Education/Social Services	7.6%	6.0%	
- Consumer Services	14.9%	4.6%	
Future Jobs			
- No Jobs Expected	16.7%	20.8%	
- 1-5 Jobs Expected	43.5%	48.6%	***
- 6-19 Jobs Expected	25.5%	10.8%	
- 20 or More Jobs Expected	14.2%	19.8%	
Exports >50% Sales	14.6%	5.5%	***

*** p<.001