

Lessons from the 'Irish Miracle'

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Lessons from the Irish Experience

In 1987 Irish GDP per person was 69 percent of the EU average (adjusted to EU 15); by 2003, it had reached 136 percent. Unemployment fell from 17 percent in 1987 to 4 percent in 2003, and government debt shrank from 112 percent of GDP to 33 percent. Annual GDP growth in the decade of the 1990s averaged a tiger-ish 6.9 percent. Perhaps even more impressive, after a downward blip coinciding with the American and, especially, the information technology (IT) slowdowns in 2001-02, the economy is bouncing back: growth both this year and next is expected to be around 4-5 percent.[1]

Ireland has become a resilient and powerful economy in a matter of decades, groomed a work force that is the envy of nations and has become a powerhouse of the knowledge economy, ranking number one in its proportion of creative-class workers. The small island's success seems even more remarkable when contrasted with its dismal economic past.

For most of the postwar period, Ireland had been one of Europe's most notable economic under-performers. While much of Europe enjoyed an economic boost in the 1960s, Ireland sustained high unemployment and inflation, coupled with slow economic growth and considerable emigration which persisted through the early 1980s. Then, beginning in the late 1980s, Ireland started to catch up. For the first time in over a century, Ireland experienced a healthy level of immigration and through the 1990s boasted economic growth to rival East Asia. Indeed, the emergence of the Celtic Tiger seems nothing short of a miracle. Ireland appears to have entered a golden age and envious policy leaders the world over are clambering to discover: What made Ireland boom?

'The Luck of the Irish' or Strategy and Leadership?

Was Ireland simply the recipient of good fortune? Or is the Irish Miracle the payoff to smart policy strategies and careful crafting of an attractive business environment? In truth, it is likely a combination of both, but our best guess at the relative proportion of luck to foresight depends upon how one views Ireland. Although Ireland is, of course, a country, it is a very sparsely populated country with total population slightly smaller than that of the Boston metro area. Additionally, as a member of the EU, Ireland increasingly is constrained by central EU policy and integration objectives. For example, Ireland does not control its own monetary policy, an important policy lever the U.S. and other large countries wield to smooth out business cycles and control economic growth. Thus, to beg the question, should Ireland be viewed simply as a European whose economy is finally catching up with other European countries, or should it be viewed as a booming region analogous to Singapore or Hong Kong or even a U.S. region or state? The difference is of practical importance.

If the Irish Miracle is simply the result of delayed convergence, then theory suggests that the role for Irish policymakers hoping to sustain Ireland's standard of living is to pursue orthodox fiscal policy and ensure that the egregious barriers to growth that plagued Ireland in the 1970s and '80s do not re-emerge. However, if the Celtic

Tiger emerged as the result of a regional boom, there is no guarantee that current economic prosperity is sustainable and there is a policy imperative for strategic initiatives aimed at continually renewing Ireland's competitive advantage.[2,3]

Delayed Convergence – Isolated Labor Markets

"In Ireland the inevitable never happens and the unexpected constantly occurs."

*Sir John Pentland Mahaffy (1839-1919)
Former Provost Trinity College, Dublin*

To explain growth of nations, economists center in on productivity growth. This makes sense because while the labor force in a given U.S. state or city, for example, may fluctuate considerably, the U.S. labor force at large is more or less fixed (not as volatile as that of regions within the U.S.). Thus, if the national economy is going to grow, that growth must come from increases in what workers are able to produce (i.e. productivity gains).

In the convergence scenario, the path to growth for poorer countries is inevitable. Government's role is to lay the necessary infrastructure to support industry and then stay out of the way. The market works to place capital in poorer countries because labor inputs are cheaper and the infusion of capital leads to productivity growth until overall standards of living have converged to that of developed economies. However, if this theory holds, the interesting question is not what caused the Irish miracle but rather, what took Ireland so long? Why didn't the "market work" sooner?

Ireland long has had institutions that would support a market economy, including the rule of law, respect for private property, high-quality public administration and a well-developed financial system. During the 1960s, Ireland moved away from protectionism that had been at the core of Eamon De Valera's economic policy since the 1930s, unilaterally reduced tariffs and encouraged foreign investment. Ireland joined the European Economic Community in 1973. Educational attainment was also rising as a result of universal adoption of free secondary education in 1967. All of the preconditions for convergence were in place as early as the 1970s.

However, Ireland suffered under unusually poor fiscal policy from 1973-1986. Unfavorable global economic conditions in the early 1980s pushed Ireland further into fiscal calamity. Driven by a desperate need to avoid a full-scale debt crisis, the incoming government in 1987 enacted the biggest spending cuts Ireland had seen in 30 years. The primary budget deficit was eliminated in 1987 and the debt-to-GDP ratio started falling. With its fiscal house in order, the stage was set for rapid long-term economic growth in Ireland.

Thus, from a traditional growth theory perspective the emergence of the Celtic Tiger is not so much a miracle as an inevitable convergence in standards of living.[4] But this view is incomplete. While macroeconomic forces and lifting of institutional barriers to trade openness and investment certainly factor in Ireland's coming of age, this view of Ireland ignores some of the dynamics behind growth in smaller regions, like labor mobility, and dramatic changes in industry makeup over short periods of time. These characteristics complicate the growth story, making convergence in living standards not quite so certain and making the optimal role for government under these

conditions different. Indeed, when people can easily move from region to region, what's to stop them all from leaving when the region is not attracting enough quality jobs? Convergence is not so inevitable. In this light, Ireland may best be viewed as a region within a broad Anglo-Saxon "country-nation" that spans the UK, much of the EU and even portions of the United States. And this does matter.

The Region View: Flexible Labor Markets

Regions are embedded within country/nations in that their economies are more dynamic with more volatile performance. People and business flow more freely and rapidly in and out of regions than in and out of country/nations. Thus, an influx of people and jobs into a region can create a boom, completely absent any gains in productivity. So rather than looking for productivity gains to explain growth in regions, economists are more concerned with job creation – and a good indication of a region's ability to create jobs is "the number of young people voting with their feet" to go elsewhere in search of jobs. [5] Returning to the story of Ireland's success, it is apparent this success is due to quality job creation and not simply productivity gains. This is not to imply that productivity gains are inconsequential in determining the prosperity of individual Irish citizens, just that labor force flows do determine overall regional prosperity.

In 1840 Ireland was one of Europe's most densely populated countries, but by 1960 population had decreased by nearly 65 percent and still continued to fall. Large-scale emigration was becoming so common to Irish life, it was a grim joke; as George Bernard Shaw wrote: "I showed my appreciation of my native land in the usual Irish way by getting out of it as soon as I possibly could." Importantly, young people were leaving Ireland in large numbers and although the Irish education system has always been strong, Ireland was not reaping the benefits because its best brains kept crossing the ocean.[5] But for the first time in over a century that trend has reversed. Indeed, some Irish IT graduates who emigrated in search of work in the 1980s have now returned to launch their own companies. [6] What changed?

The simple story is Ireland started creating jobs, and significant numbers of high quality jobs at that. The rise in Ireland's per capita GDP that has led to its comparison with economic powerhouses such as Singapore and Taiwan was not so much due to productivity growth, but rather was the result of a rise in the employment-to-population ratio.¹ The nation's unemployment rate fell from a high of 17 percent in 1987 to around 4 percent today. The increased availability of jobs coupled with demographic and social trends has also brought new groups of the population into the labor force. Some of the increase in labor force participation may have been due to supply factors (i.e., a new

¹ Capital formation does not appear to be a root cause of Ireland's success, which indicates that the gains are not the result of increased productivity but rather the deployment of labor resources that had long been underutilized. Because of a drop in public sector capital spending, gross domestic capital formation fell from a high of 30 percent of GDP in 1979 to an average of only 17 percent of GDP over the period 1986-1995. Once adjustments are made to account for a handful of manufacturing industries for which measured outputs may have been manipulated by transfer pricing, there are no dramatic productivity gains apparent in Irish manufacturing.

generation of women more oriented to participation in the paid work force). But the bulk of the rise in the share of the population employed is thought to have been demand-driven. The Irish economy simply generated more jobs, and many of those jobs were created in foreign-owned enterprises that had chosen to invest in Ireland.

Foreign-owned companies played a huge role in Ireland's economic revival. Surveys by the government business development agency Forfas suggest that nearly 70 percent of employment gains in the 1990s took place in foreign-owned companies. Almost half of the job gains took place in internationally traded financial services. An important part of this activity is the "back office" work for major international banks. Employment in export-based manufacturing has grown in Ireland, in contrast to declines registered in many OECD countries. Most of this employment growth has been in modern, high-tech industries such as electronics, pharmaceuticals and medical devices where foreign-owned firms account for 90 percent of output.

Over the last three decades, Ireland has become an increasingly attractive home for foreign direct investment (FDI); as early as the 1970s, Ireland was beginning to attract an increasing share of U.S. manufacturing. Multinational corporations (MNCs) have been attracted to Ireland for many reasons: an educated, English-speaking work force, common law traditions, a low corporate tax rate, and guaranteed access to EU markets. Indeed, MNCs have discovered, as the Irish folk song goes, "You may search everywhere but none can compare to my Wild Irish Rose."

Clearly in a dynamic economy like Ireland's, economic growth depends critically on the ability to create and retain high-quality jobs. This thinking sharply contrasts with the large, more stable (in terms of labor force and industrial makeup) country/nation level perspective because it implies a more proactive role for government. In dynamic economies, the choice for businesses and citizens to express dissatisfaction by exiting is in general much less costly, and therefore they do so more often. Additionally, the choice between investing in one dynamic region within a larger economic context verses another is arguably more open to influence, whereas the "choice" between economic contexts is often dictated by the nature of the business or product itself. Thus, in smaller dynamic economies, government must create a competitive business climate to encourage people and businesses to "vote with their feet" to stay, but competitiveness in a small, dynamic economy goes beyond simply maintaining low corporate tax rates and ensuring a generally trained work force.

Ireland's Tools for Success

Smaller economies must compete aggressively with the other small economies within the same economic context for jobs and people in order to grow. During the 1990's Ireland emerged as a top competitor in this economic game, beating out other small economies like Greece within the larger EU economic context, which also had a pool of low-cost labor. The question is how?

Harvard economist Michael Porter has worked with national and regional policymakers around the world to craft competitive strategies for prosperity; recently he participated in the National Council on Competitiveness's Clusters of Innovation Initiative. Through his research, Porter has concluded that "the most important sources

of prosperity are created, not inherited.” Therefore, low-cost factors of production may not be enough to catalyze the type of boom Ireland experienced.

Porter argues that in order to attract quality jobs, a region must be competitive on four fronts: Context for Firm Strategy and Rivalry, Demand Conditions, Factor (Input) Conditions and Related and Supporting Industries. Each of these four factors is defined in Table 1. Together these factors constitute Porter’s Diamond of Competitive Advantage; each of the four points reinforcing the others to create a synergistic, competitive whole. Building on this framework, Porter argues that regional governments must leverage their ability to influence their regions’ competitiveness with respect to each point in the Diamond. The specific objectives for regional governments outlined by Porter and colleagues are also summarized in Table 1.

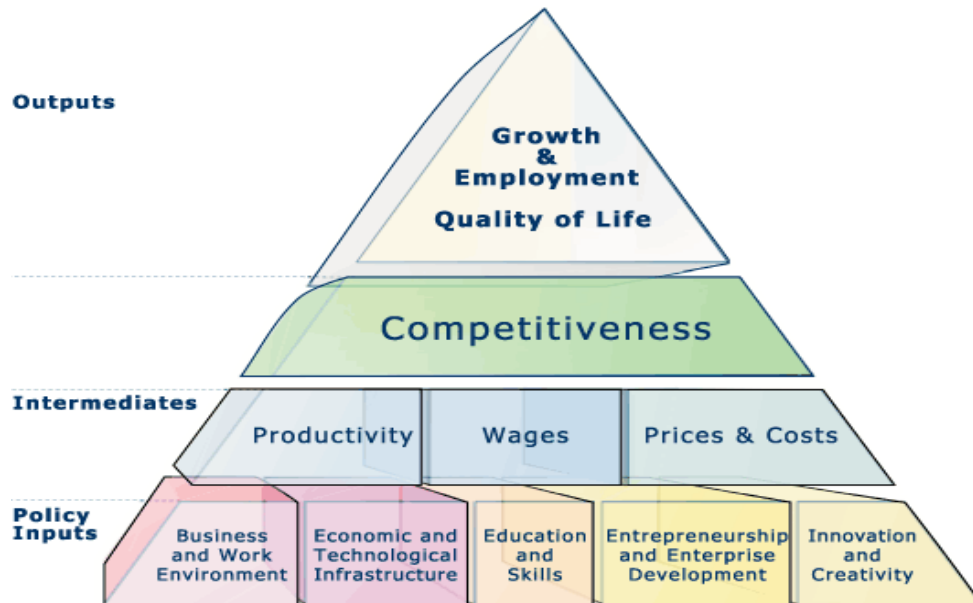
Table 1

<i>Determinants</i>	Context for Firm Strategy and Rivalry	Factor (Input) Conditions	Related and Supporting Industries	Demand Conditions
<i>Definitions:</i>	Local context encourages rivalry and innovation	High quality specialized inputs such as: human resources, physical infrastructure and scientific and technological infrastructure	Availability of capable, locally based suppliers and firms in related fields	Sophisticated and demanding consumers Specialized demand that anticipates needs elsewhere
<i>Policy intervention:</i>	Tax policy	Educational system – notably regional universities and industry specific research institutions	Breadth of regional economy Regional institutions for collaboration Existence of quality suppliers	Consumer protection laws

[7]

Ireland’s National Council on Competitiveness has crafted its approach to economic development on the same principles Porter has emphasized. Figure 1, created by the Irish National Council on Competitiveness, illustrates the link between a competitive business environment supported by key “policy inputs” and growth. The Council identifies economic and technological infrastructure, education and skills, entrepreneurship and enterprise development and innovation and creativity as key policy inputs because they believe “that it is within these particular areas that policymakers can have the greatest impact on competitiveness.”

Figure 1



Whether thinking in terms of Porter's Diamond of Competitive Advantage, or the Council's input/output pyramid framework, the message is clear: government has a strategic role to play in securing the economic future of a region. Irish policymakers understood this. A brief overview of the role of the Irish government leading up to the Irish Miracle and its direction for the future demonstrates the government's commitment to creating a competitive business environment and its role in actualizing that goal.

Ireland built an attractive business climate by setting low (at one time non-existent) corporate tax rates on foreign capital, reviving a hugely deficient telecommunication infrastructure, and pursuing social partnership strategies between labor and industry to maintain competitive wages and industrial peace. However, Ireland's policy objectives reached far beyond an "if you build it, they will come" approach to attracting quality foreign capital. Government funded agencies aggressively sought out capital investment from global industry leaders such as Apple, Intel, Lucent, Metronic and Citigroup, to name a few. The Irish strategy for attracting FDI has largely been the charge of the Industrial Development Authority (IDA) and its affiliated agencies. The IDA has played an aggressive role in courting foreign capital: "It sets out to understand what its customers – international investors – want. It then sees how Ireland can match these needs." [8] The Apple Computers story characterizes the nature of Ireland's approach to FDI quite well.

The Apple Story

In 1997, Apple Computers was one of the main employers in Cork, employing over 1,800 people, 90 percent of whose jobs were in manufacturing. [1] However, as the trend has been in other industrialized nations, these jobs were rapidly disappearing as other countries began to compete globally and erode Ireland's low-cost advantage.

Rather than pull out of Ireland in favor of low-cost manufacturing alternatives, IDA convinced Apple to realign its value-adding chain and make Cork its primary European software development and support center. [1] Through targeted incentives, guaranteed skilled labor and favorable tax and industrial policy, Ireland has been able to succeed in retaining key companies like Apple, and this has communicated a signal to the rest of the business community that Ireland is not only business-friendly but also ripe for high-quality technological investment. Table 2 summarizes a few of the IDA's other success stories.

When Ireland's success is viewed as a regional boom where dynamic changes in the work force composition occur all the time, Ireland's proactive approach to FDI makes sound economic sense. Policymakers have recognized that economic growth is dependent upon the health of industry and creation of jobs. Whereas in a large country/nation such as the U.S. industrial health refers to a wide-ranging body of industries and millions of employers, in a small dynamic country or region like Ireland, the concern is targeted at a few key growth industries and attracting specific employers. A smaller economy is more vulnerable to the type of economic havoc wrought on the town of Greenville, Mich., when its primary employer, Electrolux, chose to close plants and "vote with its feet." The U.S. economy as a whole was unchanged, but for Greenville, Mich., and surrounding areas, this was an economic nightmare. Therefore, government in smaller dynamic economies like Ireland, or states and cities within the U.S., should be very concerned about attracting and retaining specific employers and creating a competitive industrial base to shield their citizens from an economic blow such as this. True, macroeconomic forces that are fundamentally changing the way business is done and converting developed economies like the U.S. from manufacturing to services cannot be overcome by local policies. Electrolux was arguably choosing to operate in a different economic context altogether, and so there may have been little that would have kept them in Michigan. But when the choice is between Michigan and Georgia, or Arizona and Nevada, or Phoenix and San Diego, regional policymakers have a vital role to play.

Table 2

		
<p>Microsoft's operations and development centers for the EMEA region, which serve as its fiduciary, tax and legal hub, are housed in Ireland. Microsoft employs 1,600 people and serves customers in 70 EMEA countries</p>	<p>Lucent Ireland is responsible for management of the supply of product to the EMEA and international arena. Additionally, it is responsible for selected management and support functions. Recently, Ireland has become Lucent's global headquarters for research into telecommunications and supply chain technologies.</p>	<p>Metronic employs close to 2,000 people in Galway involved in the research, development and manufacture of product technologies for the company's Vascular Division. The Irish operation has made a significant impact on Metronic's overall performance and thus has been rewarded with increased responsibility and an expanded charter.</p>
<p><i>"Over a period of nearly 20 years operating in Ireland in our very dynamic industry, the real sense of support and partnership we have experienced here has been a constant: allowing us to evolve and become one of Microsoft's most important business centres worldwide"</i></p> <p>Terry Landers Head of Corporate Affairs Microsoft Ireland</p>	<p><i>"Ireland has provided Lucent Technologies Inc an ideal location to take maximum advantage of a talented work force and pro-business infrastructure, together with a gateway to the EU and the new EU accession states. Ireland is the hub for our international business and our recent announcement positions Ireland as Lucent's global centre of research for Supply Chain. These critical mandates underscore Lucent's confidence in, and commitment to the Ireland location"</i></p> <p>Mike Devane Vice President and Managing Director Lucent Technologies, Ireland</p>	<p><i>"The Medtronic facility in Galway has gone from strength to strength. We attribute this to the core competencies of our people and our relentless drive for excellence in execution. The linkages we have developed with both local and national universities and institutes of education have been a key component in our ongoing success as a technology development site and manufacturing center of excellence within Medtronic"</i></p> <p>Gerard P. Kilcommins Vice-President of Operations and General Manager</p>

[9]

Two aspects of firm capital location decisions help to explain why it is so vital for policymakers to be actively committed to attracting quality capital investment rather than wait for the market to bring it to their door. One, information is scarce and expensive; two, investing internationally is risky. Economist Paul Krugman explains how these factors together shape investor's decision making and create a situation very receptive to strategic governmental incentives:

"Imagine two firms A and B, each with independent information about the relative merits of Ireland and Spain, but each also knowing that the other may know things it does not. Suppose that firm A chooses Ireland. This demonstrates that its information suggests that Ireland is a better location. If firm B's own information offers no clear advantage to Spain, it will be wise to emulate A, figuring that it knew something. In fact, even if B's information seems more favorable to Spain, it will still rationally choose Ireland unless that information is sufficiently strong to

overrule the evidence that someone else arrived at a different conclusion. If there is a firm C, it will look at the decisions of both A and B to choose Ireland and be very reluctant to trust its own judgment even if its own analysis favors Spain; and so on. In other words, even aside from the demonstration effects of early success, early decisions about the location of investment can produce a cascade of followers.” [3]

From Krugman’s hypothetical, it is clear that once a tipping point of quality investment has been reached, FDI can become a self-propelling force. This is in part due to the reduction of risk and uncertainty described above, but also in part because Ireland is indeed becoming even more attractive. Firms in the same or related industries benefit from external economies such as knowledge spillovers and specialized skill pools when they locate in the same area. Silicon Valley is a well-known example of an industrial cluster. Thus, to the extent that forward-looking governmental institutions, such as the IDA in Ireland, not only create a competitive business environment but also entice leading firms in strong high-wage industries to locate within their jurisdiction, they can help their region become home to a thriving industrial cluster; when leading firms dedicate capital, other firms observe that decision as a signal of the location’s quality for capital investment and also may look at the incumbent firm as a strategic partner or competitor. Either way, as firms in a given industry cluster together, others will be forced to follow to maintain competitive position and take advantage of external economies. Under these conditions, it would be unwise for government to simply sit back and rely on orthodox policies and wait for convergence; they risk losing the best capital investment to locations that have gone out of their way to attract it. A regional boom needs a catalyst, such as the accumulation of a critical mass of high-quality capital investment, and this critical mass can be obtained through targeted government initiatives. Ireland has done exactly that.

In short, while macroeconomic factors such as globalization, outsourcing of services and breakthroughs in communication technology enabling global sourcing strategies, certainly helped Ireland to grow, it is also apparent that the Irish government took concerted steps to make Ireland competitive in each of the four points of the Diamond as summarized in Table 3. Most notably, Ireland has placed special emphasis on created a highly skilled work force to support the specific demands of its industrial base and has avidly sought after quality capital investment. Truly, the moral of the Irish story is, as Professor James Burnham has said “Fortune favors the well prepared.” [5]

Table 3

<i>Determinants</i>	Context for Firm Strategy and Rivalry	Factor (Input) Conditions	Related and Supporting Industries	Demand Conditions
<i>Policy Approach</i>	Maintained low corporate tax rates	Championed education to secure adequate supply of skilled affordable labor	Avidly pursued quality foreign capital investment	Exploited advantage of proximity to European consumer markets

However, as Ireland's policies increasingly become subject to EU oversight, it will have to alter its courtship approach to FDI; tax incentives and subsidies will likely be prohibited. Indeed Ireland has already been induced to raise its corporate tax rate to even out the playing field throughout the EU. Thus, Ireland will have to find new ways to attract the quality investment it thrives upon. Policymakers realize this. Instead of financial incentives, they are pursuing innovative strategic partnerships between the public and private sector and have channeled their energy and resources into creating expertise in research science and technology. Networks of knowledge between public and private sector, thriving centers of research and development, and the ability to develop in their work force whatever skills the market demands in short order are their new carrots to offer prospective investors. Naturally, to build these competencies, Ireland is turning to its universities.

What Ireland is Doing Now

“Over the last decade we’ve come a long way. The truly historic achievements of ending mass unemployment and mass emigration deserve to be savoured and celebrated. However, we must not become complacent – we must not fall into the trap of believing that we have taken out a patent on economic success.”

*Micháel Martin T.D.
Minister for Enterprise, Trade and Employment
[10]*

To ensure that the regional boom Ireland is enjoying does not go bust, policymakers have laid out an ambitious agenda. In July 2004, The Enterprise Strategy Group, a government task force established to create a strategy for growth and employment in Ireland, released a strategic plan to develop/maintain the following five competitive advantages: world-class skills, education and training, attractive taxation regime, effective agile government, expertise in markets (international marketing and sales), and expertise in technology-product and service development. [11] The first three factors have been the backbone of Ireland's competitive advantage in the past, and policymakers intend to pursue innovative approaches to ensuring they remain competitive in these areas. The last two areas reflect growth opportunities Irish policymakers have chosen to target; they are competitive advantages Ireland hopes to gain. The drive to build expertise in technology-product and service development in particular is supported by a web of institutions and initiatives and arguably has become Ireland's primary front in its battle for competitiveness.

Ireland has developed a policy portfolio to establish itself as a leading knowledge economy and has chosen specifically to leverage its competitive advantage in science and technology. Speaking at the launch of the Enterprise Strategy Group's report, Tanaiste Mary Harney said:

Our future depends on how well we manage the transition to a world where knowledge and ideas are more important than bricks and mortar. Every economic region is trying to capitalize on new technologies and new markets. If we are to succeed we have to do the same but must be more creative and flexible than our competitors. [12]

To do so, the following are among the Enterprise Strategy Group's recommendations:

- Increase public funding for applied research conducted in-firm, at universities and through joint collaboration.
- Allocate public funds (€20 million per year over five years) to support creation of business networks.
- Formulate a national research and innovation strategy statement with the support of all stakeholders (business, research community, government agencies etc.) in the national innovation system.
- Create a long-term strategic infrastructure investment plan to address current and future needs of industry including broadband, national roads, waste management, air services and energy.

[12]

In addition to the Enterprise Strategy Group's (ESG) recommendations, the Interdepartmental Committee on Science, Technology and Innovation released a report containing complimentary strategic objectives to support the development and reinforcement of ESG's areas of competitiveness. The report proposes the following objectives to be met by 2010:

- Business investment in R&D should increase from 0.9 percent of GNP to 1.7 percent of GNP²
- R&D performance in the higher education should increase from 0.4 percent of GNP to 0.8 percent of GNP by 2010.
- The combined increases in performance in business, higher education and public sector R&D should result in gross expenditure on R&D increasing to 2.5 percent of GNP by 2010.
- The number of researchers as a ratio to total employment should nearly double by 2010 (from 5.1 to 9.3 per 1,000 employees).

[13]

To meet these ambitious five-year targets, the report suggests that Ireland should act to promote a national pro-innovation culture, encourage R&D in both the private and public sector and create a highly attractive environment for researchers. Indeed, in order to become a leader in R&D, Ireland must create an innovation-friendly environment, ensure that the building blocks to innovation (quality educational system, key infrastructure components such as telecommunications) are in place, and strategically support quality research initiatives. Government must become a champion of research and development. Minister for Enterprise, Trade and Employment, Micheál Martin, T.D. sums up the task facing policymakers as follows:

...An increased focus on research must become a core pillar of our national enterprise policy... there is nothing abstract or indulgent about investing in advanced research – it is essential to guaranteeing that we maintain and grow quality employment. Increasing the number of people with highly developed skills in mathematics and science has the potential to have the same catalytic effect on our economy – in both manufacturing and services. However, skilled people will not be sufficient itself. Research and development is both risky and costly. Funding research is a challenge for enterprise, especially

² Includes specific targets for both indigenous companies and foreign affiliates.

smaller firms. And even larger firms can face difficulties when making significant investments in advanced research that may take several years to generate a payoff in the marketplace. This 'market failure' underscores the case for state support to firms undertaking R&D.

[10]

The Structure Behind Ireland's Strategy: Science Foundation Ireland (SFI)

"Ireland has recognized one aspect of the future that is almost a guarantee: research creates knowledge, knowledge spurs innovation, and innovation inspires growth." [8]

*Dr. William Harris
Director General
Science Foundation Ireland*

In 2000, Ireland established the Science Foundation Ireland (SFI) within the Department of Enterprise, Trade and Employment, with objective of developing quality human capital (particularly in the areas of science and engineering); supporting innovation; and promoting partnerships between agencies and institutions (universities in particular) and business. SFI administers the Ireland's Technology Foresight Fund and provides grants to support scientific research in areas such as biotechnology and information and communications technology. This fund consists of approximately \$735 million, with funding secured from the National Development Plan through 2006 in order to ensure Ireland's future as an internationally recognized leader in research and development.

SFI champions Ireland's goal is to move up the value chain to establish itself as a research and innovation-driven economy, through the creation of quality human capital, support of research excellence and fostering of academic-industrial collaboration. [14]

Micheál Martin, Minister for Enterprise Trade and Employment, describes the integral role of SFI in the government's strategy for R&D advancement as follows:

Through its investments, Science Foundation Ireland is supporting knowledge creation and human capital development, which are the corner stones of a knowledge economy. The funding is being used to recruit and retain researchers and research groups capable of developing high-impact, internationally significant discoveries in the fields underpinning Biotechnology and Information and Communications Technology (ICTs). Since its establishment in 2000, Science Foundation Ireland has awarded over €396 million to support more than 1,038 individuals, research teams, centres, and visiting researchers in creating the knowledge and driving the discoveries to underpin future competitiveness in key industries. The intention is to have these people innovate here in Ireland and in this way ensure that Ireland is recognized as an economy at the cutting edge of research and innovation. All of this will work towards ensuring that Ireland is successful in its effort to support the creation of a knowledge-based society and is able and willing to profit from the opportunities that arise from such innovation.

[15]

Some of the award allocations referred to by Martin include the SFI Investigator Award aimed at investing research dollars in the best people/ideas, SFI Fellow Awards and Research Professorships targeted at importing leading scientists, and the Walton Visitor Award which works to establish international partnerships. Additionally, SFI supports public-private research collaboration through funding of Centres for Science, Engineering and Technology (CSETs).

Institutions such as SFI are helping Ireland to continue to advance into a thriving knowledge-based economy and reduce its economic reliance on manufacturing and agriculture. This shift guarantees higher-wage jobs for Irish workers and continued growth in the economy. Signs of the success of the SFI institutional arrangement already are apparent.

Since its inception, SFI has had notable success in recruiting internationally renowned research talent. Recently, SFI-funded researchers have made strides in increased understanding diseases such as cancer and stroke, and this research has made waves in the international science community. Additionally, SFI has attracted investment from Bell Labs to establish a world-class engineering, manufacturing and value-chain research center in Ireland, and Siemens has established a new research facility at the Royal College of Surgeons in Dublin. Strategic partnerships between SFI and the business community have played a vital role in these and many other recent economic successes, and public support and funding commitment for excellence in science and technology research continues to attract matching private-sector investments. [16, 17]

Efforts like SFI stand in sharp contrast with the picture of Ireland just 20 years ago. These policies, crafted in a climate Honohan and Walsh describe as a “Corporatist Social Partnership,” transmit clear signals to trade unions, domestic firms and MNCs investing in Ireland. [4] Firms can enjoy abundant skilled labor and competitive labor markets. Moreover, institutional reforms have evolved as the result of cooperative efforts between government, business and labor. Investments in technology and science communicate the Irish commitment to long-run competitiveness and translate into a more attractive strategic opportunity for firms. Ireland’s global policy position has forced existing companies to adopt a global mindset and strive for competitiveness on a global scale, and the current research and development initiative has reinforced the integral role of innovation in economic growth.

Opportunities for an 'Arizona Miracle'

What can Arizona learn from Ireland? Is Arizona poised to shift growth trajectory in a similar fashion? How do the two economies compare today and over the last 20 years? Arizona can hardly be viewed as deficient in skilled labor or in the kind of financial strife that Ireland experienced in the early 1980s, yet there are some interesting parallels and lessons to be gleaned from a targeted comparison.

Demographically, the Republic of Ireland is only slightly larger than Maricopa County; with population just under 4 million people, which is about 70 percent of the population of the state of Arizona (Table 4). Net immigration in 2002 was just over 40,000 in Ireland compared with 66,500 in Arizona. Positive net immigration is a recent

phenomenon in Ireland. The average annual rate of growth in population lags that of Arizona over the last 17 years due to severe emigration in the late 1980s. Ireland's recent economic expansion has helped stem the tide of emigration. The rate of increase in the Irish economy has been very rapid since 1985, with average annual rates of nominal growth of GNP and GDP at 9.6 percent and 10.2 percent respectively, which exceeds the rate of nominal GSP growth in Arizona of 7.4 percent, a robust rate of nominal growth by U.S. standards over the last decade and a half (Table 5).

Table 4

Population in 2002			
(thousands)			
	1986	2002	Avg Ann % Growth
Ireland	3,443	3,917	0.76%
Arizona	3,317	5,456	2.97%
Maricopa County	1,800	3,295	3.62%

Net Migration in 2002	
(thousands)	
Ireland	41.3
Arizona	66.5

Sources: Central Statistics of Ireland and US Census Bureau

Table 5

Value of GNP			
at Current Market Prices			
(millions of current Euros or equivalent in 1985)			
	1985	2003	Avg Ann % Chg
Ireland	21,091€	109,800 €	9.60%

Value of GDP			
at Current Market Prices			
(millions of current Euros or equivalent in 1985)			
	1985	2003	Avg Ann % Chg
Ireland	23,587€	135,200 €	10.19%

Gross State Product			
(millions of current dollars)			
	1985	2003	Avg Ann % Chg
Arizona	\$50,080	\$182,208	7.44%

Sources: Ireland, Budgetary and Economic Statistics 2004, and US Bureau of Economic Analysis, Arizona

Perhaps a better measure of economic growth can be obtained by normalizing the output numbers for change in prices and relative size of the population or work force (Table 6). Real GNP per person soared at a rate of nearly 5 percent annually since 1985 in Ireland, and grew a robust 2.9 percent on a per-worker basis. In comparison, real GSP per person grew in Arizona by 1.3 percent and per worker by 1.2 percent over the same period.

At the same time, the overall rate of employment growth in the two economies was remarkably similar (Table 7). The rate of job growth in Ireland just slightly exceeded that of Arizona on average since 1985, with the rate of service employment growing at 3.8 percent in both economies. Ireland was somewhat more successful in preserving jobs in Industry (manufacturing and construction) over the same period. Unemployment rates plummeted in Ireland over this period, falling from 16.3 percent in 1988 to 4.4 percent in 2003 (Table 8). Unemployment rates declined in Arizona as well, from 6.3 percent to 5.6 percent. Memberships in trade unions declined in Ireland over the same period (Table 9). But the decline was not nearly as large as the decline in unemployment rates.

Table 6

GNP per Head				Gross State Product per population			
Constant (1995) Prices				Constant 1995 prices			
Euros or equivalent in 1985				Dollars			
	1985	2002	Avg Annual Rate of Change		1985	2003	Avg Annual Rate of Change
Ireland	8,324 €	18,986 €	4.97%	Arizona	\$22,383	\$28,372	1.33%

GNP per Person at Work				GSP per Employed Person			
Constant (1995) Prices				Constant 1995 prices			
Euros or equivalent in 1985				Dollars			
	1985	2002	Avg Annual Rate of Change		1985	2003	Avg Annual Rate of Change
Ireland	27,308 €	44,233 €	2.88%	Arizona	\$55,800	\$69,385	1.22%

Sources: Ireland Budgetary and Economic Statistics, 2004; Bureau of Economic Analysis and Arizona Department of Economic Security

Table 7
Estimated Total Labor Force and Number of Persons at Work
in the Main Branches of Economic Activity
(thousands)

Ireland			
Branch of Activity	1985	2003	Avg Ann Rate of Chg
Industry	306	493	2.68%
Services	602	1,173	3.78%
Total (non-ag) at Work	908	1,666	3.43%
1985 presented on PES Basis mid-April each year			
2003 presented on ILO Basis, March-May			
Arizona			
Branch of Activity	1985	2004	Avg Ann Rate of Chg
Industry	305	371	1.04%
Services	972	1,966	3.78%
Wage and Salary Empl.(non-ag)	1,277	2,337	3.23%

Sources: Ireland Budgetary and Economic Statistics, 2004, and Arizona Department of Economic Security, October 2004

Table 8
Unemployment Rates

	1988	2003
Ireland	16.3	4.4
Arizona	6.3	5.6

Ireland 2003 data is based on March-May quarterly data.

Sources: Ireland Budgetary and Economic Statistics 2004, Arizona Bureau of Labor Statistics

Table 9
Trade Union Participation Rates

	1980	2000	%Chg	% Point Change
Ireland	57	38	-33%	19
U.S.	22	13	-41%	9

Source: www.usatoday.com/money/world/2004-11-10-eurolabor_x.htm

Research and Development expenditures at universities in Ireland are quite similar to those in Arizona when measured on a per capita basis, and converted to a common currency (Table 11). However, after controlling for the number of students in Arizona universities, total R&D expenditures at Irish universities substantially exceed similar outlays at Arizona universities.

Table 11
R&D Expenditures at Universities
Fiscal Year 2000

	Ireland (Euros)	Arizona (Dollars)
Per Capita	63.47 €	\$89.62
Per Undergraduate	1,776.12 €	\$1,460.82
Per College Student	1,565.79 €	\$1,271.49

Sources: FORFAS survey on R&D in Higher Education; Chronicle Almanac, Vol. 51, Issue 1, p.39; National Science Foundation.

Looking Behind the Data

Are there parallels between Ireland's path to success and opportunities that exist for Arizona? Ireland's proximity to European markets and the skilled labor deficiency were integral parts of the impetus for strategic policy interventions, institutional reforms, and key investments in competitive infrastructure. Returning to Porter's Diamond of Competitive Advantage framework, Arizona shares some of the opportunities for growth that Ireland had.

As Table 12 shows, Ireland's main advantages were in its traditionally low corporate tax rates, cheap, English-speaking work force, small core of early investors from which to launch industrial clusters and its proximity to sophisticated consumers.

Table 12

Determinants	Context for Firm Strategy and Rivalry	Factor (Input) Conditions	Related and Supporting Industries	Demand Conditions
<i>Ireland's Advantages</i>	Tradition of low corporate tax rates	Inexpensive, English-speaking work force Quality education system	Key early investors (Apple Computers)	Proximity to sophisticated consumers with considerable buying power in Continental Europe
<i>Arizona's Advantages</i>	Conservative, business friendly policy environment	Large and diverse labor force Quality higher education system	Strong presence of high value-add industry: Intel, Motorola etc.	Specialized demand for medical services due to large retiree population. Need for innovative solutions for managing water and energy resources.

Arizona, like Ireland, has adopted a fairly competitive tax structure and overall business policy approach and has attracted some key players in knowledge economy industries.

Ireland's experience is not a general prescription for government to "pick winners and losers," nor for government to absorb risk that is more appropriately borne by private sector entrepreneurs. Government's role in this context is to create an environment – a climate – that is conducive to nurturing growth and business development. Policy actions may pertain to fiscal incentives, regulatory environment, labor force development, research infrastructure or simply physical infrastructure. Some question the payoff to investments in specific R&D initiatives, arguing that science and technology innovation takes place everywhere with the benefits accruing everywhere. However, fertile 21st century regional business climates will have infrastructures that support development of patentable innovations and be endowed with the "absorptive capacity" to monitor and quickly adopt best practices and reap the benefits knowledge creation worldwide. This public infrastructure can support business innovation in whatever direction it takes, and not be dependent on the success or failure of any single industry or enterprise. And this infrastructure will be essential to the success of economic development efforts aimed at generating high-quality jobs.

NOTES

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