

Entrepreneurial Activity and Living Standards in Ireland

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Abstract

This paper uses the neoclassical growth model to identify technological progress as the driver of sustained gains in income per person in Ireland. We argue that living standards in Ireland over coming decades will depend largely on productivity, which in turn will be determined by technological progress. We present evidence of a large gap between the productivity and innovation performance of foreign-owned multinational companies (MNCs) and domestic firms in Ireland. This paper argues that recent global developments mean that the responsibility for driving technological progress in Ireland may soon switch from the foreign-owned MNC sector to the indigenous sector, and that Ireland will require stronger entrepreneurial and innovation ecosystems to drive productivity growth and maintain high living standards. We consider policy options to deliver a world-class entrepreneurial ecosystem in Ireland, focusing on human capital and leadership talent.

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Executive Summary

- Future living standards in Ireland will depend on the economy's productivity, which in turn will be determined by technological progress. This paper aims to delve under the bonnet of technological progress in Ireland to understand the sources of Irish productivity growth and economic prosperity.
- On aggregate, Ireland's economy has one of the highest productivity rates in the world. This paper shows, however, that the Irish economy relies on a small number of foreign-owned multinational companies (MNCs) to drive this exceptional performance. The productivity of domestic firms is, in contrast, unexceptional.
- Recent global developments mean that the responsibility for driving technological progress in Ireland may soon switch from the foreign-owned MNC sector to the indigenous sector. The evidence suggests that, as things stand, the capacity of domestic firms to drive productivity growth and maintain high living standards in Ireland is in serious doubt.
- To improve the productivity performance of domestically-owned firms on a lasting basis, Ireland requires a world-class entrepreneurial ecosystem. Policies to forge start-ups in advanced industries and to build and scale indigenous firms are key to the country's future prosperity. Other countries are responding to the changing international landscape with policy moves to boost entrepreneurial activity. Ireland also needs to respond with ambition.
- The key elements for a thriving, self-reinforcing entrepreneurial ecosystem are human capital and talent. Technological progress begins with talented people. Ireland should aim to do much more to attract and retain, both from home and abroad, people with strategic vision and the capacity and experience to offer leadership and world-class mentorship to domestic entrepreneurs. Ireland, which in the past has used tax policy to attract physical capital from abroad (FDI), should now consider how to use tax policy to attract human capital (talent) from abroad to augment our existing talent base.

1. Introduction

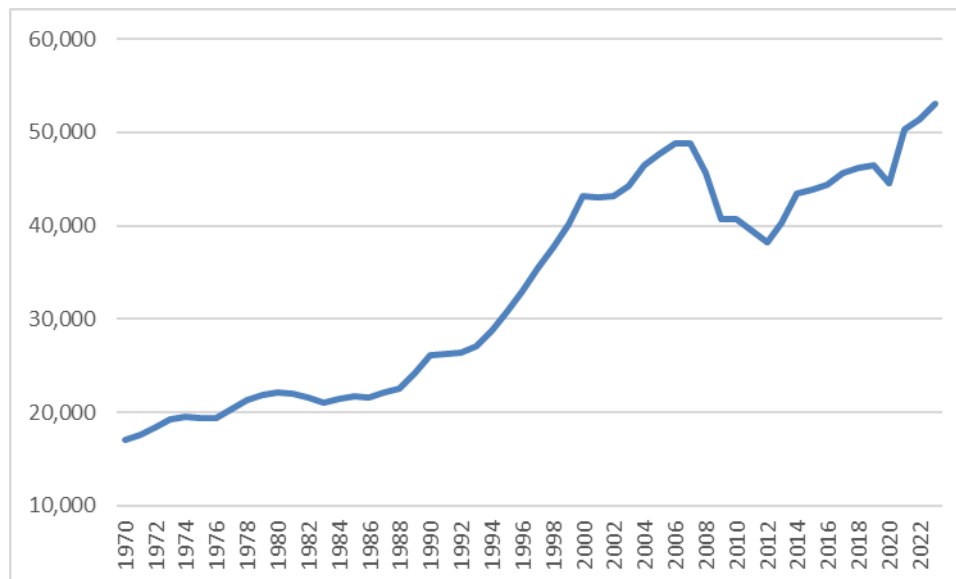
This section sets out a conceptual framework to help us understand the drivers of long-term economic growth in Ireland. Using standard growth theory, we identify technological progress as the ultimate source of sustained gains in income per person and argue that living standards in Ireland over coming decades will depend almost exclusively on the country's level of productivity, which in turn will be determined by technological progress.

1.1 Introduction

Living standards in Ireland have risen dramatically over the past half century. Over that time, Ireland went from one of the poorest countries in western European to one of the richest. Growth over that period was far from smooth, with the economy experiencing spectacular booms and deep recessions along the way. Today, the country has a successful enterprise economy with full employment and income levels amongst the highest in the world.

Figure 1.1 shows the evolution of real (that is, inflation adjusted) income per person – and hence the standard of living – in Ireland over the past 50 years.

Figure 1.1: Real income per person in Ireland (€) 1970-2023



Source: CSO and author's calculations. Income is measured by real GNI* reported by CSO for 1995-2023 and estimated by the author using backward extrapolation based on GDP growth rates for 1970-1994. Data are chain linked annually and referenced to year 2022.

In most countries, national income would be measured using GDP. In Ireland's case, however, it is widely recognised that GDP is not a reliable measure of the income available to people

living in the country. This unreliability is because of data distortions resulting from some activities of multinational companies (FitzGerald, 2023).¹ These distortions have been especially pronounced since 2015, following the relocation to Ireland of substantial amounts of intellectual property (IP) assets such as patents, trademarks, brands, and software licences owned by MNCs.

A better measure of national income in Ireland, which is used in the analysis below, is so-called “modified” Gross National Income (GNI*) developed by the Central Statistics Office (CSO) in response to recommendations published by the CSO’s Economic Statistics Review Group in 2016.²

As shown in Figure 1.1, real income in Ireland in 1970 stood at about €17,500 per person. By 2023, it had trebled to just over €53,000.

One of the most striking features of the data is the steep rise in the standard of living during the 1990s, with income per person increasing 5.6 per cent annually on average over the period 1989-2000, compared with 1.6 per cent during 1970-1988. Since the early 2000s, the economy has fluctuated noticeably between booms and recessions, with income per person about €10,000 (or 25 per cent) higher in 2023 than in 2000, representing an annual average growth rate of 1 per cent over that period.

As the focus on this paper is on medium- and longer-term economic growth, and therefore trends rather than business-cycle fluctuations, Figure 1.2 includes an estimate of the trend path of income per person in Ireland. The decomposition of economic data into a trend and cyclical component and the characterisation of business cycles as deviations in actual output/income from trend featured in the seminal work of Kydland and Prescott (1982) and Prescott and Mehra (1980).³

The downturn of the 1980s is evident in the chart, with (actual) income per person falling below trend in 1983 and remaining there for more than a decade. Ahearne, Kydland and Wynne (2006), using the business-cycle accounting approach of Chari, Kehoe and McGrattan (2007), provide evidence that the slump in the 1980s owed much of its severity to the sharp increase in income taxes in the early part of that decade.⁴ By 1988, income per person was

¹ FitzGerald, J., (2023), “Understanding the Irish Economy”, ESRI Special Article, Quarterly Economic Commentary, Summer.

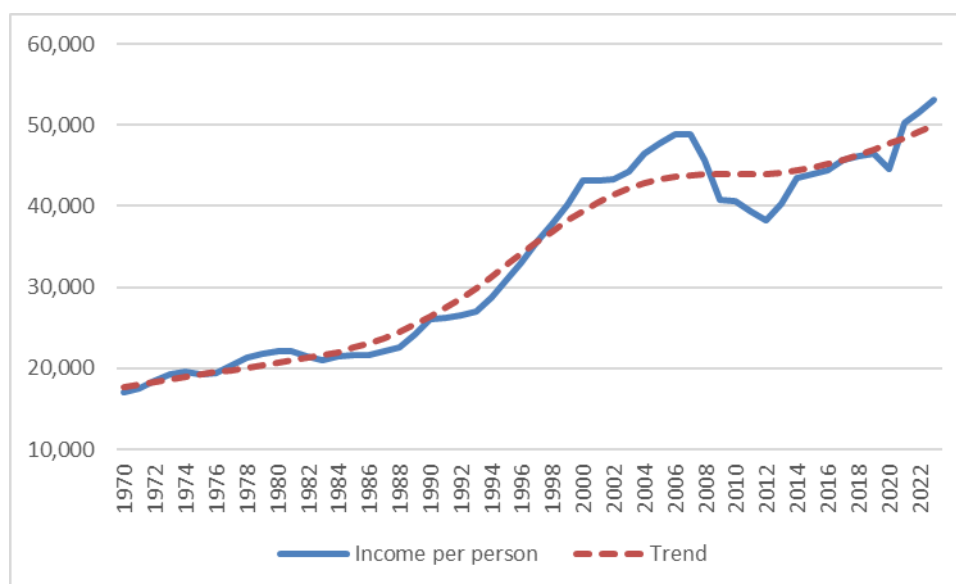
² GNI* is calculated by subtracting from GDP the after-tax profits and depreciation of foreign-owned capital in Ireland. For more details, see: Lane, P., (2017), “The Treatment of Global Firms in National Accounts”, Central Bank of Ireland Economic Letter, Vol.2017, No.1.

³ Kydland, F E, and E C Prescott (1982), “Time to Build and Aggregate Fluctuations”, *Econometrica* 50(6): 1345-70. Prescott, E C, and R Mehra (1980), “Recursive Competitive Equilibrium: The Case of Homogeneous Households”, *Econometrica* 48(6): 1365-79.

⁴ Ahearne, A., Kydland, F., & Wynne, M. A. (2006). Ireland's great depression. *Economic and Social Review*, 37(2), 215-243.

nearly 8 per cent below the trend path, bottoming out in the early 1990s at almost 10 per cent below trend. The rapid growth of the economy during the 1990s brought income per person back close to its trend level towards the end of the decade.

Figure 1.2: Real income per person and trend (€) 1970-2023



Source: CSO and author's calculations. Trend is calculated using the Hodrick–Prescott (HP) filter with a smoothing parameter set to 400, following Correia, et al (1992) and Cooley and Ohanian (1991).⁵

The unsustainable credit-fuelled boom of the mid-2000s saw income per person surge to nearly 12 per cent above trend by 2006, as the economy severely overheated. This “Celtic Tiger” era was followed by a spectacular bust, with income plummeting to a level 13 per cent below trend by 2012, before recovering later that decade. Income per person has moved above trend in recent years in the aftermath of the COVID-induced recession.⁶

Decomposing the evolution of income per person into a long-term trend path and short-term business cycle components is especially useful because different factors may affect the trend

V. V. Chari & Patrick J. Kehoe & Ellen R. McGrattan (2007), "Business Cycle Accounting," *Econometrica*, Econometric Society, vol. 75(3), pages 781-836, 05.

⁵ Correia, Isabel H., Joao L. Neves, and Sergio T. Rebelo (1992), "Business Cycles from 1850-1950: New Facts about Old Data," *European Economic Review* 36:2/3, 45

Cooley, Thomas J., and Lee E. Ohanian, "The Cyclical Behavior of Prices," *Journal of Monetary Economics* 28:1 (1991)

⁶ Care is needed in interpreting the most recent data owing to the well-known “end-point bias” that affects the Hodrick-Prescott (HP) filter used to estimate the trend in Figure 1.2. For more details, see, for example, Siemers, L.H.R. (2024), “On the Hamilton-HP Filter Controversy: Evidence from German Business Cycles. *Journal of Business Cycle Research* 20, 367–409.

and the cycle. The trend path of national income (and many other macroeconomic aggregates) is largely determined by the pace of technological progress (or productivity growth) and the accumulation of physical and human capital. In turn, technological progress is often associated with innovation, diffusion of technology, entrepreneurship, experimentation and new business formation (OECD, 2025).⁷ In contrast, cyclical movements tend to reflect temporary shocks to spending, energy prices or financial and credit markets, as well as the effects of changes to fiscal and monetary policies.

Emphasising developments in the trend of income per person over the past half-a-century (the dashed red line in Figure 1.2) allows us to see through the fog of short-term fluctuations and focus more sharply on the sources of long-term economic growth and living standards in Ireland.

That is not to say the business-cycles fluctuations are not important. One does not necessarily have to agree with Nobel laureate Robert Lucas' calculation that the potential welfare gains from eliminating these fluctuations are relatively small to appreciate the profound effect of long-term economic growth on human well-being.⁸ After all, small persistent differences in growth rates eventually accumulate to large differences in living standards. As Lucas himself put it in referring to differences in living standards across countries: "Once you start thinking about them, it's hard to think about anything else."⁹

The average annual rate of growth in trend income per person in Ireland over the past half century is shown in Table 1.1. The extraordinary performance of the Irish economy during the 1990s is again evident, with the trend path in income per person rising 4.2 per cent annually on average during that decade. Trend growth has since moderated, with trend income per person growing at a rate a bit less than 1 per cent per annum over the past decade-and-a-half.

Table 1.1: Growth in trend income per person (per cent, annual average)

	1970- 1979	1980- 1989	1990- 1999	2000- 2009	2010- 2023	<i>memo:</i> 1970- 1999	<i>memo:</i> 2000- 2023
Trend growth	1.6	2.2	4.2	1.4	0.9	2.7	1.1

Source: Author's calculations.

⁷ Extensive research output from the OECD's research programme on productivity is available at: <https://www.oecd.org/en/topics/productivity-and-business-dynamism.html>

⁸ Lucas, R.E. (1987), *Models of Business Cycles*, 1985 Yrjö Jahnsson Lectures, Basil Blackwell, Oxford.

⁹ <https://www.econtalk.org/lucas-on-growth-poverty-and-business-cycles/>

1.2 Conceptual Framework

An analytical framework is required to help us interpret these data and understand the recent drivers of long-term economic growth in Ireland.

The workhorse model in the literature on long-term economic growth is the basic neoclassical growth model, developed in the 1950s by Nobel laureate Robert Solow.¹⁰ The cornerstone of the neoclassical (or Solow) model – and, indeed, nearly all other growth models – is the aggregate production function for the economy.

This production function relates growth in output (and hence income) per worker to:

- technological progress (or productivity growth), and
- increases in the stock of capital (for example, machinery, plant and equipment) per worker, referred to as “capital deepening”.

Technological progress raises productivity, meaning that the economy can produce more output and generate more income with a given amount of capital per worker. The level of productivity across the economy can be affected by a myriad of factors, but only technological advance (that is, increases in the stock and usage of technical knowledge) can deliver sustained gains in productivity.

Neoclassical growth theory provides a useful framework for thinking about what has happened to the trend growth path of income per person in Ireland over the past few decades and prospects for the future.

For our purposes, the key insights from the Solow model are:

1. Technological progress is the sole determinant of growth in living standards (income per person) in the long run.
2. Along the balanced (or steady-state) growth path, income per person grows at the rate of technological progress.
3. An economy can experience growth rates in excess of the rate of technological progress for a while, driven by an investment boom as the economy transitions (or converges) to the steady state. However, capital deepening alone cannot sustain ongoing growth in income per person.

Viewed through the lens of the neoclassical growth model, the fast pace of growth experienced by the Irish economy in the 1990s can be seen as a period of convergence toward the steady state, with rapid advances in income per person driven by both technological progress and high rates of investment. This interpretation of developments is broadly

¹⁰ Robert M. Solow (1956), “A Contribution to the Theory of Economic Growth Source”, The Quarterly Journal of Economics, Vol. 70, No. 1.

consistent with the perspective in Honohan and Walsh (2002) that the 1990s boom represented a period of economic catch-up.¹¹ It should be noted that the convergence implied by the Solow model is conditional, in the sense that each economy will have its own steady-state level of income per person which depends on the characteristics of the economy.

Many commentators highlight the important role of Foreign Direct Investment (FDI) during this period, especially FDI from the United States as Ireland served as an attractive production location for US MNCs seeking to export to the European market (see, for example, Walsh, 2000).¹² As well as physical capital, MNCs brought knowledge and new technologies and thereby helped to push Ireland closer to the global technological frontier. FDI facilitated greater and more rapid diffusion of new technologies and ideas from the technological leader, (namely, the United States). Ireland's capacity to absorb new technologies from abroad was boosted by the country's high educational attainment. In time, these MNCs also greatly enhanced Ireland's capability to develop new technologies through in-house innovation and R&D activities at their Irish subsidiaries. Some MNCs also served as anchors around which local entrepreneurial ecosystems evolved (for example, med-tech in the west of Ireland as discussed in Giblin et al, 2025).¹³

FDI brought to Ireland high-growth, export-oriented firms at the frontier of technical knowledge. Ireland's low rate of corporation tax made the country an especially attractive location for firms with heightened potential to generate profits. These firms employed frontier technical knowledge to rapidly grow output and exports from Ireland, accounting over time for an increasing share of the economy's output. The rise in the footprint of these high-productivity firms on the Irish economy has boosted aggregate productivity. This interpretation of the main role played by foreign-owned MNCs in driving growth is consistent with the evidence in Ahearne, Kydland and Wynne (2006) that FDI contributed to the rapid increase in income per person in Ireland in the 1990s mainly by boosting Ireland's productivity.¹⁴

Figure 1.3 provides further evidence of Ireland's impressive convergence by comparing living standards in Ireland to those in the United States – the country at the technological frontier

¹¹ Honohan, P. and Walsh, B.M., (2002). "Catching Up with the Leaders: The Irish Hare", *Brookings Papers on Economic Activity*, 1:2002.

¹² Walsh, B. M., (2000), "The role of tax policy in Ireland's economic renaissance", *Canadian Tax Journal*, 48, pp. 658–73

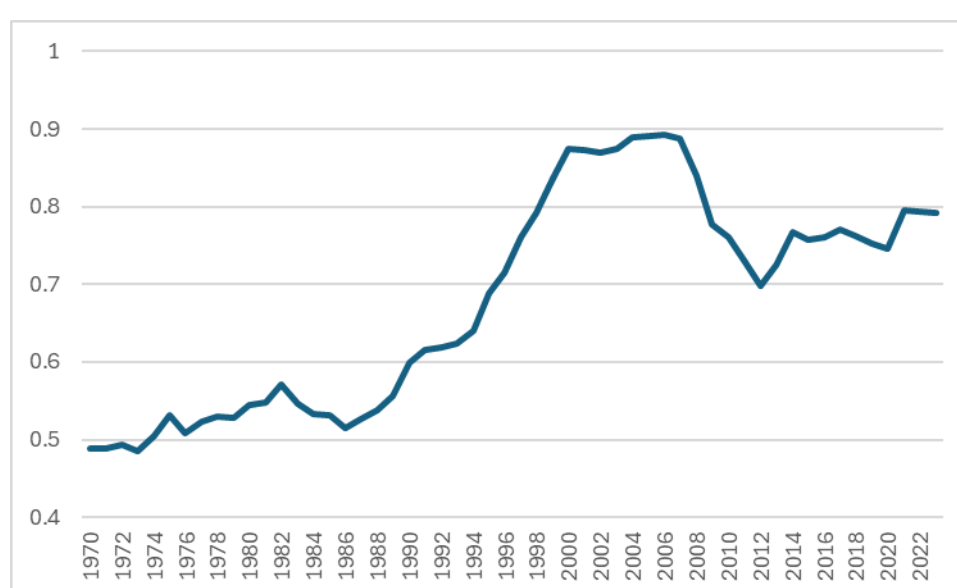
¹³ Giblin, M., Rodriguez, C., Buciuni, G. & Ryan, P, (2025) "Creating an entrepreneurial ecosystem in a 'knowledge desert': the role of international connectivity and public institutional support", *Small Business Economics*. <https://doi.org/10.1007/s11187-025-01028-z>

¹⁴ Similarly, albeit to a lesser extent, Hubert and Pain (2000) find that FDI played an important part in boosting productivity in the UK manufacturing sector in the 1980s and 1990s. Florence Hubert and Nigel Pain, (2000) "Inward Investment and Technical Progress in the UK Manufacturing Sector," *OECD Economics Department Working Papers* 268, OECD Publishing.

for more than a century. Income per person in Ireland increased from around 50 per cent of the level in the United States in the early 1970s (and in the mid-1980s) to nearly 90 per cent by the late 1990s.

However, a sizeable gap in living standards re-emerged in the aftermath of the financial crisis in the late 2000s and progress at narrowing this gap has since been slow, with income per person in Ireland currently around 80 per cent of the U.S. level. This gap largely reflects differences in productivity between Ireland the United States.

Figure 1.3: Income per person, Ireland relative to United States



Source: World Bank and CSO.

Having converged to a high level of income per person by the early 2000s, neoclassical growth theory would predict a moderation in growth since then as the pace of advance in income per person eases back to the rate of technological progress. This prediction is in line with the data in Table 1.1, with trend growth having moderated to 1.1 per cent per annum on average over the past 25 years.

The Solow model's emphasis on technological progress as the driver of sustained gains in living standards should not be interpreted as meaning that investment, including FDI, and the stock of capital are no longer important for growth. On the contrary, investment is required to, at the very least, maintain the ratio of capital per worker in the economy, referred to as "capital widening".

Ireland's population has swelled by nearly 1.6 million people (42 per cent) over the past quarter century to almost 5.4 million today. Under growth scenarios projected by the CSO, the population could grow by between 0.5-1.8 million (10-35 per cent) over the next 35 years, depending on the scale of net migration. A high rate of investment will be required to provide capital to an expanding labour force.¹⁵

Moreover, the economy's stock of capital depreciates as capital wears out and becomes obsolete due to technological progress (Oulton, 1995).¹⁶ As a result, investment is required to replace older capital with new, more technologically advanced capital.

Beyond investment in new capital goods that simply keeps pace with the growth of the population, the Solow model envisages that capital accumulation will be required to grow the capital stock per person along the steady state growth path. Moreover, growth theory implies that the rate of capital deepening will be the same as the rate of technological progress. It is important to note, however, that the ultimate source of growth in living standards along the steady state growth path is technological progress, notwithstanding the increases in capital per person. Without technological progress, capital accumulation would run into diminishing returns and the process of capital deepening would come to a halt. In that sense, technological know-how determines the standard of living, not only directly by determining productivity, but also indirectly by affecting the amount of capital per worker.

The availability of new technologies incentivises investment spending. In part, this is because new technology is often embodied in capital goods (Jin, 2017).¹⁷ To adopt frontier technologies, businesses often need to invest in new capital goods.

Table 1.2 provides a picture of capital deepening in the Irish economy over recent decades using the CSO's Productivity in Ireland data. The CSO publish data for both the domestic sector (covering subsectors of the economy dominated by domestic firms) and the foreign sector (covering subsectors dominated by foreign-owned MNCs), as well as for the total economy. The data exclude intangible capital assets such as IP, as the inclusion of such assets tends to distort Ireland's macroeconomic aggregates, as discussed earlier.

¹⁵ In thinking about future income, we assume, for simplicity, that the labour participation rate remains constant, so that the workforce grows at the same rate as the population. Similarly, we assume that the length of the average workweek remains constant, so hours worked grows at the same rate as the workforce.

¹⁶ Oulton, Nicholas. (1995), "Depreciation, Obsolescence and the Role of Capital in Growth Accounting." *Bulletin of Economic Research*. 47.

¹⁷ Jin, Y. (2017), "Capital-embodied technological progress and obsolescence: How do they affect investment behaviour?", OECD Economics Department Working Papers, No. 1445, OECD Publishing, Paris, <https://doi.org/10.1787/a0cbd544-en>.

Table 1.2: Capital Deepening in Ireland

	2000-2004	2005-2009	2010-2014	2015-2019	2020-2023
Total Economy	2.1	2.2	1.4	0.0	0.3
Domestic	1.3	2.1	0.3	n.a.	n.a.
Foreign MNCs	5.2	2.8	3.8	n.a.	n.a.

Source: CSO. Capital deepening is calculated as the growth in capital services (that is, the flow of services derived from physical assets to produce output) per hour worked. Intangible capital assets are excluded. The figures in the table refer to the contribution of capital deepening to labour productivity growth.

Two noteworthy features of the data in Table 1.2 deserve a comment.

First, there has been a marked slowdown in the pace of (tangible) capital deepening in the economy over the past decade or so, with only a negligible contribution from this source to growth in income per person since the mid-2010s. These data reinforce the notion that, unlike during the 1990s, Ireland can no longer rely on physical capital accumulation as a source of future increases in the standard of living.

Second, capital deepening in the past has been much stronger in sectors dominated by foreign-owned MNCs than in domestic sectors of the economy. The recent weakness in investment by Irish small and medium-sized enterprises (SMEs) has been documented in other studies (for example, Martinez-Cillero, et al., 2020).¹⁸ Neoclassical growth theory predicts that capital per person increases at the same pace as technological progress along the steady-state growth path. The pattern of capital deepening observed in Ireland suggests a much faster rate of productivity growth in foreign-owned MNCs than among indigenous SMEs. We will explore this difference in productivity performance in detail in Section 2.

The recent weakness in capital deepening may be playing a role in the re-emergence of a gap in income per person between Ireland and the United States shown earlier in Figure 1.3, although quantitatively it is unlikely to be able to explain a significant share of the relative deterioration.¹⁹ The reversal more likely indicates that Ireland has lagged the United States over the past decade or so in developing and adopting new technologies, and in producing

¹⁸ Martinez-Cillero, Maria, Martina Lawless, Conor O'Toole, and Rachel Slaymaker (2020), "Financial Frictions and the SME Investment Gap: New Survey Evidence for Ireland." *Venture Capital* 22 (3): 239–259.

¹⁹ The relevant input for production is the capital stock, not investment, and the capital stock responds relatively slowly to changes in investment.

high-growth firms using new technology. As a result, Ireland may have retreated somewhat from the global technological frontier.

1.3 Prospects for Growth

The analysis above, based on standard growth theory and textbook economic principles, means that we can expect living standards in Ireland to rise at around the same pace as technological advance over coming decades. For sure, economic shocks will buffet Ireland's small open economy in the years ahead, causing temporary deviations from the balanced growth path. Living standards a few decades from now, however, will depend almost exclusively on the country's level of productivity, which will in turn be determined by technological progress.²⁰

What rate of technological progress and increases in income per person can we expect over coming decades?

Table 1.3 shows estimates and projections for (total factor) productivity (TFP) growth in Ireland.

Table 1.3: Total factor productivity in Ireland (annual average growth rates, per cent)

Study	Time period	TFP growth (%)
European Commission (2018)	2028-2050	1.0
European Commission (2020)	2019-2070	1.1
Timoney (2023)	2000-2021	0.4
Department of Finance (2023)	2023-2050	0.8-0.4*
Egan and McQuinn (2024)	1995-2019	0.6
Central Bank of Ireland (2024)	2027-2050	0.6

*Department of Finance assume a gradual slowdown in TFP growth from 0.8 per cent to 0.4 per cent by 2050.

Source: Various (see footnote below).²¹

²⁰ In the neoclassical growth model, growth in technological progress is very closely related to, but not identical to, growth in total factor productivity (TFP). To be precise, the rate of (labour-augmenting) technological progress equals the rate of growth of TFP divided by labour's share of total income in the economy.

²¹ European Commission (2018). The 2018 Ageing Report Economic and budgetary for the 27 EU Member States (2016-2070). Institutional Paper, 79, May 2018. Brussels

Timoney, K. (2023), "Demystifying Ireland's national income: a bottom-up analysis of GNI* and productivity." Irish Fiscal Advisory Council Working Paper Series No. 21.

Department of Finance (2023) "Horizon Scanning – calibrating medium to long-term economic projections", Available at: <https://assets.gov.ie/static/documents/horizon-scanning-calibrating-medium-to-long-term-economic-projections.pdf>

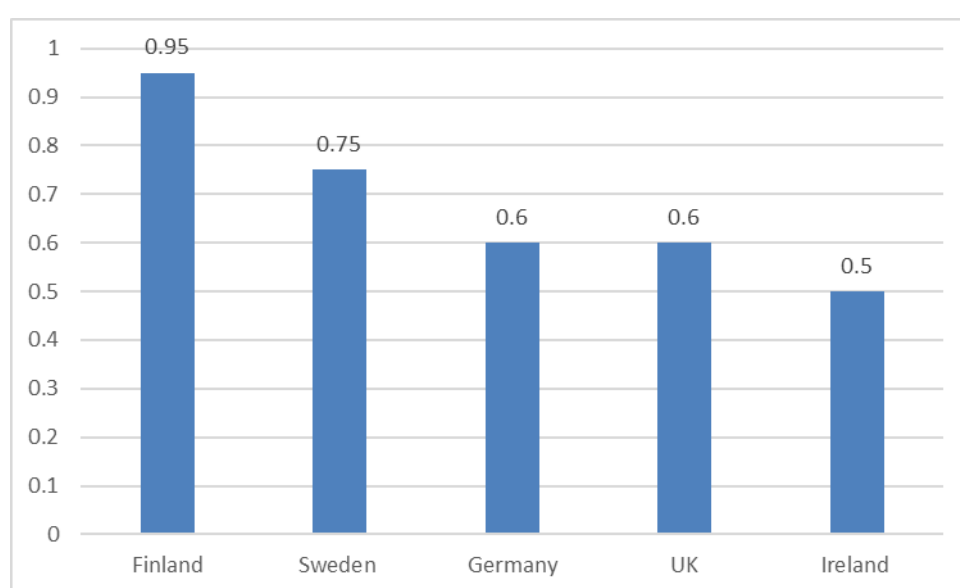
Egan, Paul and McQuinn, K. (2024), "Demographics, higher investment and the future potential growth rate of the Irish economy", ESRI Working Paper No. 795.

The median estimate of Ireland’s TFP growth of around 0.6-0.8 per cent per annum from these studies translates into a growth rate in income per person of about 1 per cent, consistent with the trend growth in living standards over the past roughly two-and-a-half decades shown previously in Table 1.1.

Compared with other countries, Ireland has performed strongly in terms of TFP growth, recording the fifth fastest rate of growth in Europe over the past three decades (Timoney, 2023). That said, the gap between Ireland and top performer Finland is notable (Figure 1.4).

As mentioned earlier, the implications of even small persistent differences in annual growth rates for future living standards are profound because of compounding. As Albert Einstein once said: "Compound interest is the eighth wonder of the world."

Figure 1.4: TFP in top five European countries (average annual per cent growth, 1995–2021)



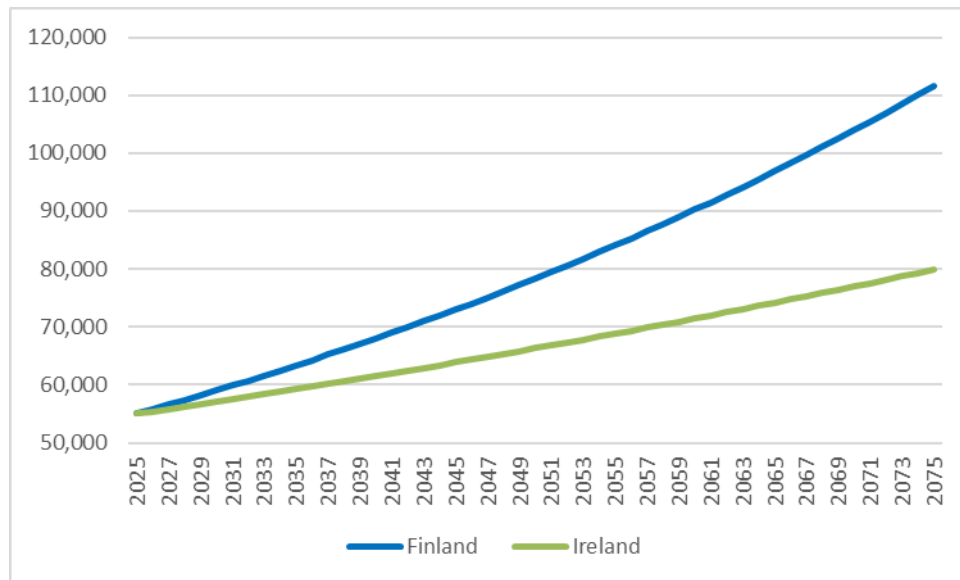
Source: Timoney (2023).

To illustrate the point, consider the diverging paths of income per person in Figure 1.5 below. The path marked “Ireland” shows how income per person would evolve over the next half century under a scenario where TFP growth was 0.5 per cent annually, the figure corresponding to the rate for Ireland in Figure 1.4. On the other hand, the path marked “Finland” shows how income per person would evolve under a scenario where TFP growth was 0.95 per cent annually, the figure corresponding to the rate for Finland. It is worth

Central Bank of Ireland (2024), “Long-Term Growth Prospects for the Irish Economy,” Quarterly Bulletin 04/December.

emphasising that this exercise is meant to be illustrative, and not a forecast for future living standards in Finland and Ireland.

Figure 1.5: Hypothetical scenarios, real income per person (€)



Source: Author's calculations.

Growth in technological progress of 0.5 per cent rate would increase income per person from about €55,000 in Ireland today to €66,200 in 2050 and €79,900 by 2085. In contrast, growth of technological progress of 0.95 per cent would result in a rise in income per person to €78,300 in 2050 and €111,600 by 2085. What might appear like a small difference of 0.45 per cent in annual TFP growth would mean a difference in annual income per person of €12,100 by 2050 and €31,700 by 2075.²²

Given that future living standards will be determined by productivity growth, we need to understand the sources of technological progress in Ireland. This is the focus of the next section.

²² From the perspective of conditional convergence in neoclassical growth theory, the implied distance of “Ireland” to the technological frontier by 2075 in this example would seem implausibly large. The point still stands, however, that even small difference in annual growth rates matter enormously over time.

2. Technological Progress in Ireland

“Innovation is the driving force of progress, materialising in new products, services, or processes that reshape industries and societies.”

European Future Innovation System (EFIS) Centre

This section presents evidence of a large gap between the productivity performance of foreign-owned MNCs and domestic firms in Ireland. We explore Ireland’s international ranking in innovation and find that there is potential for improvement in the innovation system that would promote technological advance and boost productivity in the domestic sector.

2.1 Introduction

It is generally accepted that the pace of technological progress depends both on innovation amongst new and existing firms at the technological frontier and the diffusion of technology from frontier firms (at home and abroad) to the rest of the economy.

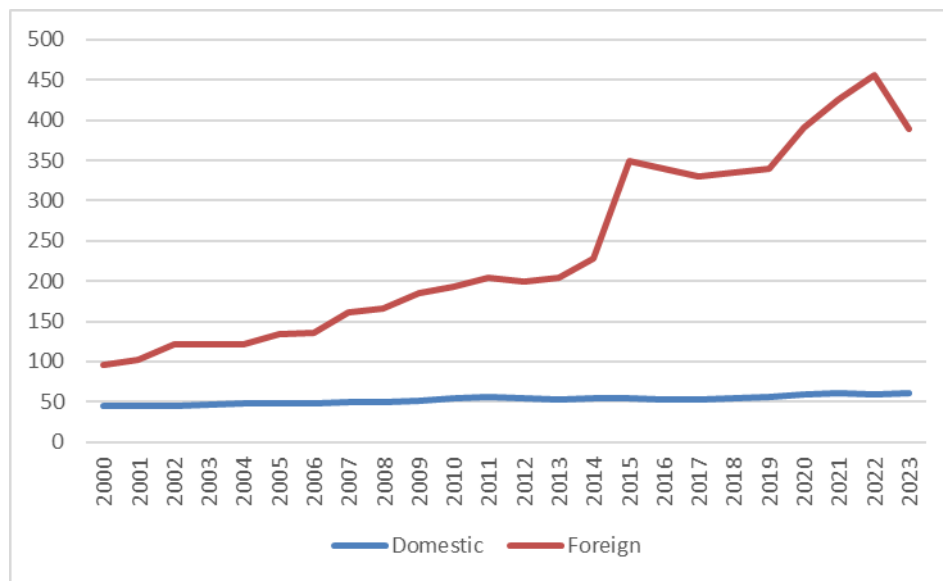
Productivity growth has been strong in Ireland over recent decades because high productivity firms have expanded their footprint in the economy by using new technical knowledge to compete successfully in the global marketplace.

2.1 Reliance on MNCS

Ireland’s strong productivity performance, however, has not been even across the economy. The CSO publishes data which splits measures of economic performance between domestically-owned and foreign-owned firms in Ireland. Foreign-owned MNCs account for a large share of Ireland’s output, with gross value added (GVA) across the economy split roughly two-thirds from foreign-owned firms and one-third from indigenous firms.

Strikingly, the level of productivity at foreign firms is around 6 times the level of productivity of domestic firms. The foreign sector is dominated by large, high productivity firms. The domestic sector is dominated by SMEs, only some of which have high productivity rates.

Figure 2.1: Productivity in Ireland: Foreign and domestic sectors (GVA, € per hour)



Source: CSO.

For sure, part of the measured gap in productivity between domestically-owned and foreign-owned firms reflects distortions in the data, especially after 2015 following the onshoring of IP by MNCs. As shown in Figure 2.1, however, the gap was widening even before 2015, so the divergence in productivity rates cannot be explained entirely by data distortions.

On aggregate, Ireland has one of the highest productivity rates in the world. The productivity of domestic firms, however, is unexceptional.

This productivity gap and the underperformance of the domestic sector has been recognised by Government in the White Paper on Enterprise 2022-2030:

“Ireland’s productivity performance is comparatively strong but driven by a narrow base of enterprises, disguising the majority of firms where productivity growth is stagnant or falling.”

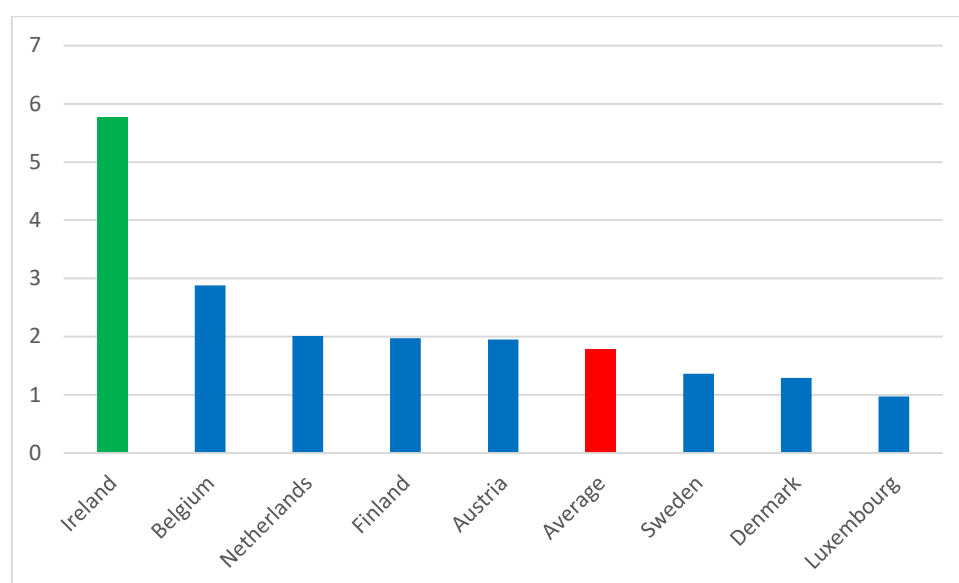
White Paper on Enterprise 2022-2030 ²³

Ireland is an outlier amongst countries in Europe in terms of the size of the productivity gap (Lawless, 2025).²⁴ The average ratio of productivity of foreign-owned to domestically-owned firms among a group of comparator countries is 1.8, compared with around 6 for Ireland (Figure 2.2).

²³ <https://enterprise.gov.ie/en/publications/white-paper-on-enterprise-2022-2030.html>

²⁴ Lawless, Martina (2025), “Hare or Tortoise? Productivity and Growth of Irish Domestic Firms”, Economic and Social Review, Vol. 56 No. 1, Spring.

Figure 2.2: Ratio of labour productivity of foreign-owned to domestically-owned firms



Source: Lawless (2025)

2.3 Innovation Rankings

Productivity growth is driven by innovation and advances in technology. Several cross-country measures throw light on how Ireland performs relative to other advanced economies in terms of conditions and activities that promote technological progress.

European Innovation Scoreboard

Ireland ranks 7th in the EU and is classified as a “Strong Innovator” with a summary innovation index (SII) score at 113 per cent of the EU average in 2024, according to the latest reading from the European Innovation Scoreboard (EIS).²⁵ The SII is the average of 32 indicators that measure a wide range of factors that affect innovation, from R&D expenditure to the number of doctorate students. Denmark, Sweden, Finland and the Netherlands are classified as “Innovation Leaders” with innovation performance well above (at least 125 per cent of) the EU average.

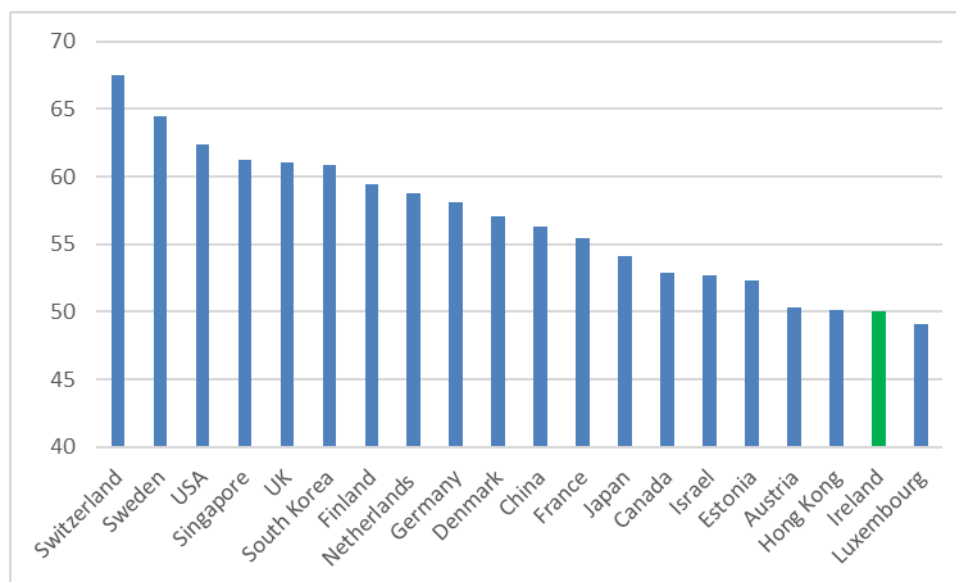
Global Innovation Index

The Global Innovation Index (GII) published annually by the UN’s World Intellectual Property Organization provides performance measures and ranks economies on their innovation

²⁵ https://research-and-innovation.ec.europa.eu/statistics/performance-indicators/european-innovation-scoreboard_en

ecosystems based on roughly 80 indicators. Ireland ranked 19th among the 133 economies featured in the GII 2024, and 11th in Europe.

Figure 2.3: Global Innovation Index rankings



Source: GII 2024, World Intellectual Property Organization ²⁶

Amongst the seven members of the Small Advanced Economies Initiative (Denmark, Finland, Ireland, Israel, New Zealand, Singapore, and Switzerland), Ireland ranks 6th, ahead only of New Zealand.²⁷

The GII publication identifies some of Ireland's strengths and weaknesses in innovation (Table 2.1). Ireland's ranks 1st in the world in areas clearly dominated by foreign-owned MNCs in the country, such as information and communications technology (ICT) exports and IP payments. Ireland performs less well in areas relevant to domestic startups and scaling firms in advanced industries, such as venture capital funding, industry diversification and patents filed.

²⁶ <https://www.wipo.int/en/web/global-innovation-index>

²⁷ The Small Advanced Economies Initiative is a collaboration between seven advanced economies with populations of 5-10 million. <https://www.smalladvancedeconomies.org/>

Table 2.1: Ireland's strengths and weaknesses in innovation

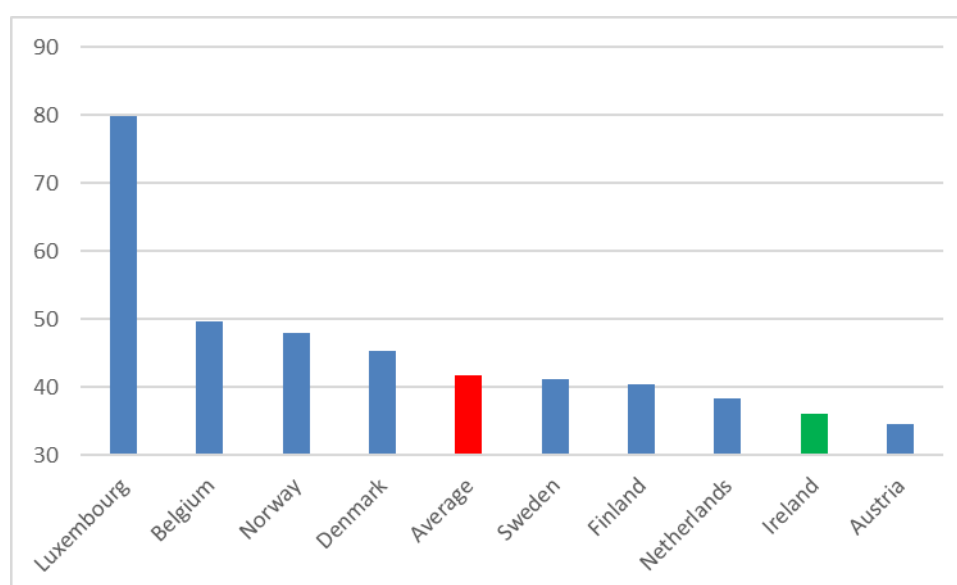
Strengths	Weaknesses
ICT services exports (1)	Domestic industry diversification (79)
Intellectual property payments (1)	Venture capital received (41)
Intangible asset intensity (2)	Patents by origin (33)
Intellectual property receipts (9)	Mobile app creation (29)

Source: GII 2024. The number in brackets after each indicator is Ireland's global rank in that area.

Advanced Industries

Several of the indicators used to construct the GII refer to the ICT sector, underscoring that sector's importance in driving technological progress. The ICT sector in Ireland accounts for almost one-fifth of the country's GVA and around 10 per cent of wages. The sector produces 30 per cent of Ireland's total exports and generates about one-quarter of total corporation tax receipts.²⁸ Foreign-owned MNCs account for the bulk of the overall contribution of the ICT sector to the economy, including more than 97 per cent of the sector's total GVA. Similarly, other technically advanced sectors of Ireland's economy such as MedTech and Biopharma are dominated by MNCs.

Figure 2.4: Labour productivity in domestically owned ICT sector (€ per hour)



Source: Smart and Taft (2024). Real value added per hour worked based on Eurostat's Globalisation in Business Statistics database.

²⁸ Conefrey, Thomas & Keenan, Enda & O'Grady, Michael & Staunton, David, 2023. "The Role of the ICT Services Sector in the Irish Economy," Quarterly Bulletin Articles, Central Bank of Ireland, pages 86-105, March.

Smart and Taft (2024) focus on the performance of indigenous ICT firms, comparing productivity amongst these firms to comparable firms in other small European countries.²⁹ Concerningly, they find lower levels of productivity in Ireland’s domestic ICT sector compared with the average across European peers (Figure 2.4).

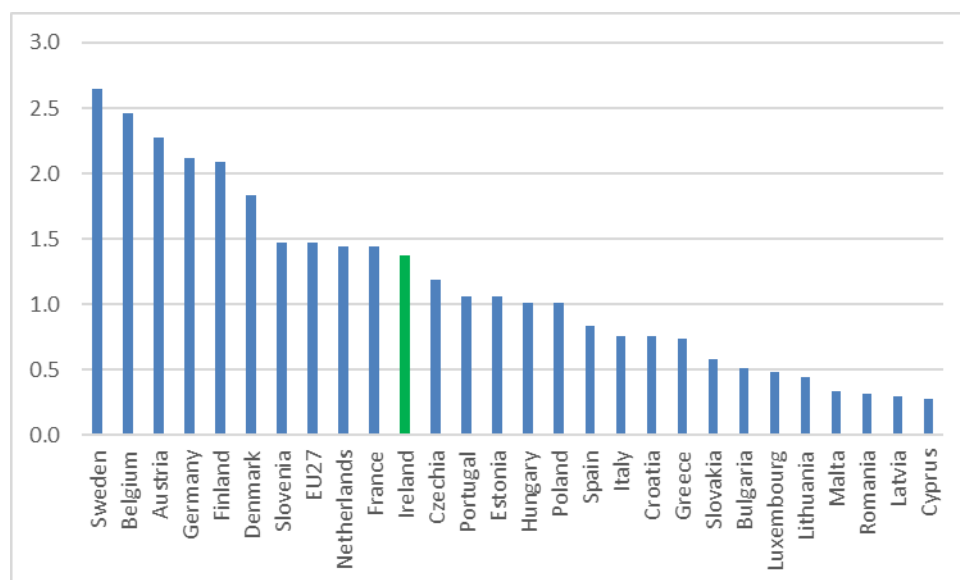
R&D Expenditure and Patents

Research and development (R&D) is a key building block of technological progress. Innovation that transforms new ideas and knowledge into products or services is generally advanced through R&D.

€7 billion was spent on R&D activities by firms in Ireland in 2023.³⁰ Foreign-owned enterprises account for 84 per cent of this expenditure.

Ireland ranked 10th in the EU in terms of R&D intensity in 2023, defined as R&D expenditure as a percentage of GDP (Figure 2.5). The use of GDP by Eurostat as a measure of output understates Ireland’s R&D intensity; Ireland is close to the top of the rankings when GNI* is used instead. That said, R&D spending is highly concentrated in the foreign-owned sector in Ireland, as mentioned earlier.

Figure 2.5: R&D intensity



Source: Eurostat.

²⁹ Smart, C. and Taft, M., (2024), Productivity in Ireland’s Domestically-Owned Market Economy: A Comparative Survey, NERI Report Series, No.35 NERI (nerinstitute.net).

³⁰ Eurostat, Business Expenditure on Research and Development (BERD) survey.

Breslin (2025) uses data from the World Intellectual Property Organization to show that most patent applications in Ireland over the period 2009-2024 came from MNCs, with a smaller number coming from indigenous firms.³¹

The evidence above clearly points to significant differences in productivity performance between the foreign and domestic sectors in Ireland. The Irish economy relies heavily on a small number of foreign-owned MNCs to drive technological progress. These high-productivity firms raise the value of aggregate productivity from what would otherwise be a level close to the average EU-15 level.

This reliance on MNCs is seen by many commentators as a structural vulnerability of the Irish economy which public policy should seek to address. For example, the Central Bank of Ireland, in drawing attention to the concentration in the ICT sector, advises that:

“Policies that contribute to improving the resilience of the economy, such as increasing investment and productivity in indigenous firms... would lessen the negative effects of any future sectoral downturn.”

Central Bank of Ireland Quarterly Bulletin, March, 2023

More generally, there may come a time when the MNC sector will pass the baton for driving technological progress to the domestic sector. In the next section, we will turn our attention to the capacity of domestic firms to meet that challenge.

³¹ https://www.linkedin.com/posts/johnbreslin_the-majority-of-patent-applications-in-ireland-activity-7315348387095089152-fnCL/

3. Entrepreneurial Ecosystems

“The core problem in Europe is that new companies with new technologies are not rising in our economy.”

Mario Draghi, September 2024

This section compares Ireland’s entrepreneurial ecosystem to other countries. We find that Ireland could, and should, do better at encouraging and supporting high-growth indigenous businesses.

3.1 Introduction

It is well recognised that business dynamism (that is, the process of entry and exit of firms in the market) is a crucial driver of technological progress and economic prosperity. Schumpeter (1942) coined the phrase “creative destruction” to describe this process whereby new firms enter the market with new technologies or innovations, expand market share and eventually displace old ones, thereby boosting productivity and growth.³² Caballero (2008) summarised the large amount of empirical evidence supporting the Schumpeterian view that the process of creative destruction is a major driver of technological progress.³³ For example, using data on U.S. manufacturing industries, Foster et al. (2001) find that output reallocation across production sites makes a large contribution to industry-level TFP growth.³⁴

From this perspective, factors that hinder business dynamism are “barriers to riches”. Ahearne and Shinada (2005), for example, provide evidence that so-called “zombie firms” in Japan prevented more productive companies from gaining market share during the 1990s and early 2000s, strangling a potentially important source of productivity gains for the overall economy.³⁵ Importantly, Aghion et al (2009) show how overall productivity growth can be especially hindered by a low rate of start-ups in innovative sectors.³⁶

As is clear from the quote by Mario Draghi above, the Draghi report on the future of European competitiveness identifies the lack of business dynamism as the main culprit behind slow

³² Schumpeter, J. (1942) “Capitalism, Socialism, and Democracy.” New York: Harper & Bros.

³³ Caballero, Richard J. (2008) “Creative Destruction”, The New Palgrave Dictionary of Economics, Second Edition, edited by Steven N. Durlauf and Lawrence E. Blume.

³⁴ Foster, L. & John C. Haltiwanger & C. J. Krizan, (2001) “Aggregate Productivity Growth: Lessons from Microeconomic Evidence,” in New Developments in Productivity Analysis, pages 303-372, National Bureau of Economic Research.

³⁵ Ahearne, A., Shinada, N. (2005) “Zombie firms and economic stagnation in Japan.” International Economics and Economic Policy, Vol. 2, 363–381. <https://doi.org/10.1007/s10368-005-0041-1>

³⁶ Aghion, P., Blundell, R., Griffith, R., Howitt, P., & Prantl, S. (2009), “The effects of entry on incumbent innovation and productivity.” The Review of Economics and Statistics, 91(1), 20-32.

growth in Europe over recent decades.³⁷ Draghi's report stresses that the "EU is weak in the emerging technologies that will drive future growth" and that "the productivity gap between the EU and the US is largely explained by the tech sector."

A dynamic business environment is one that nurtures the growth of small firms so that they become mid-sized and eventually large firms over a relatively short period of time (Storey and Greene, 2010).³⁸ Mason and Brown (2014) describe how policymakers have increasingly turned to the "entrepreneurship ecosystem approach" to create more high-growth firms. They define an entrepreneurial ecosystem as:

"a set of interconnected entrepreneurial actors (both potential and existing), entrepreneurial organisations (e.g. firms, venture capitalists, business angels, banks), institutions (universities, public sector agencies, financial bodies) and entrepreneurial processes (e.g. the business birth rate, numbers of high growth firms, levels of 'blockbuster entrepreneurship', number of serial entrepreneurs, degree of sellout mentality within firms and levels of entrepreneurial ambition) which formally and informally coalesce to connect, mediate and govern the performance within the local entrepreneurial environment."

A successful entrepreneurship ecosystem is not one that simply promotes the creation of new firms. Enterprise policies may result in many start-ups, but what matters for productivity growth is the number of high-growth start-ups and scaling firms. OECD data on firm births, for example, show high birth rates in some countries that have produced many new solo or small businesses, in part because of generous government grants, but hardly any high growth firms. These countries tend to exhibit low levels of productivity. Bretas et al (2025) discuss how scaling ecosystems differ from ecosystems for start-ups.³⁹

The key point is that a thriving ecosystem is characterised by distinctive elements beyond a set of traditional business-support policies. Undoubtedly, the most important factor is human capital and talent.⁴⁰ Technological progress, after all, begins with talented people.

In part, the stock of human capital relates to skills in the workforce and at research institutions, and is closely tied with education levels, universities, and immigration. Silicon

³⁷ https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en

³⁸ Storey, D. J., & Greene, F. J. (2010). *Small Business and Entrepreneurship*. Pearson.

³⁹ Bretas, V.P.G., Tippmann, E., and Levie, J. (2025). Networks for scaling businesses: Accessing international support webs for critical support resources. *Journal of World Business* 60(4).

⁴⁰ Van Reenen, John (2022), "Innovation and Human Capital Policy", in *Innovation and Public Policy*, Goolsbee and Jones.

Valley, for example, the world's most successful technology ecosystem, is renowned for its concentration of highly skilled talent.

Another crucial dimension of talent within an ecosystem is so-called “entrepreneurial recycling”.⁴¹ This process refers to the “involvement of a critical mass of experienced entrepreneurs who have contributed time, energy and wisdom to support the ecosystem notably by business angels, mentoring of start-ups and establishing and leading organisations that support entrepreneurs.”⁴² These experienced entrepreneurs are leaders who excel at strategic thinking and can create the right culture within the ecosystem.

The discussion above raises some fundamental questions for Ireland. Do we have sufficient business dynamism to drive fast technological progress in the indigenous business sector? How does Ireland perform in terms of new high-growth, innovative firms entering (start-ups) and rapidly expanding (scale-ups) in the market? How good is Ireland's entrepreneurial ecosystem at encouraging and supporting high-growth businesses?

This section provides a snapshot of Ireland's start-up and scale-up landscape to try to shine some light on these issues.

3.2 StartupBlink Ecosystem Index

StartupBlink publishes an annual index ranking the start-up ecosystems of 100 countries and more than 1,400 cities across the world.

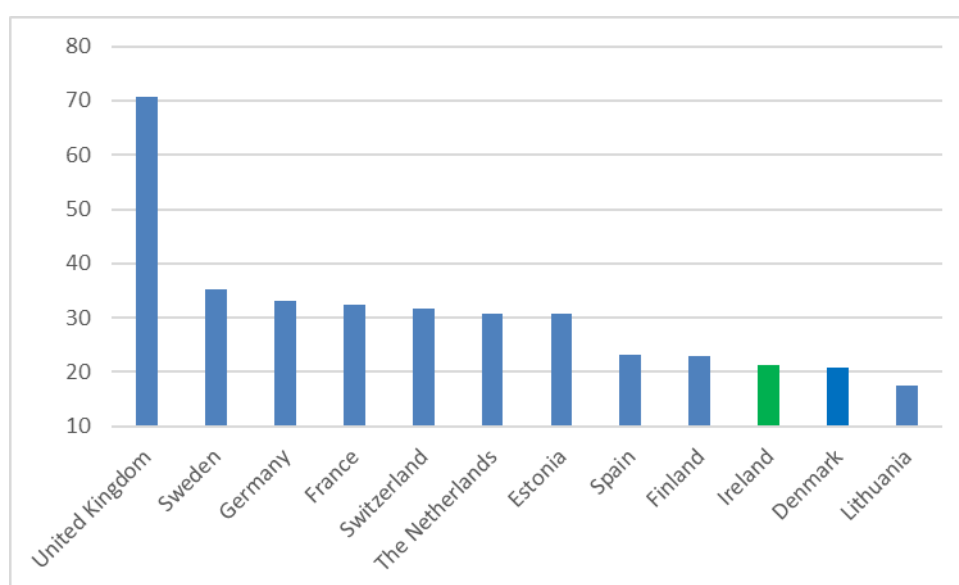
Ireland ranks 16th in the world in 2025 with a score of 21, compared with scores for the top 5 countries of 254 for the United States; 71 for the United Kingdom; 62 for Israel; 55 for Singapore; and 45 for Canada. Within Europe, Ireland ranks 10th (Figure 3.1).

Amongst cities globally, Dublin's startup ecosystem ranks 55th with a score of 17, ahead of, say, Manchester (ranked 78th, score 11) but behind cities like Paris (ranked 8th, score 82), Tel Aviv (ranked 9th, score 79) and Helsinki (ranked 43rd, score 21).

⁴¹ Mason, C M and Harrison, RT (2006), “After the exit: Acquisitions, entrepreneurial recycling”, *Regional Studies*, 40, 55 - 73

⁴² Brown, R. C., and Mason, C. (2014), “Entrepreneurial Ecosystems and Growth-Oriented Entrepreneurship”, Organisation for Economic Cooperation & Development.

Figure 3.1: Startup ecosystems in Europe, 2025



Source: StartupBlink, <https://www.startupblink.com/>

In the overview of Ireland's startup ecosystem, the StartupBlink report for 2024 notes that:

"Ireland's ecosystems enjoy several substantial advantages. The country is perfectly located between North America and Europe, and has a highly skilled, native English speaking population. The country also has one of the highest levels of STEM graduates per capita in the EU, with a significant number of 23-34 year-olds holding university degrees".

Global Startup Ecosystem Index 2024, page 105

The report goes on to caution, however, that "Ireland's potential has yet to be fully realized."

Other indexes provide similar readings.

3.3 Startup Genome Ecosystem Ranking

Irish cities do not feature in top 40 global start-up ecosystems according to the latest Startup Genome Global Startup Ecosystem report, in which U.S. ecosystems occupy 4 of the top 6 places (Silicon Valley, New York, Los Angeles and Boston, in that order) along with London and Tel Aviv.⁴³

⁴³ Startup Genome Global Startup Ecosystem Report 2024, <https://startupgenome.com/report/gser2024>

Dublin, however, does rank 4th in the list of emerging ecosystems (defined in the report as start-up communities at earlier stages of growth and displaying high potential to be top global performers in the future), behind Madrid and Barcelona but ahead of Manchester-Liverpool.

3.4 Global Entrepreneurship Monitor

The Global Entrepreneurship Monitor (GEM) reports on the relative strength of the entrepreneurship ecosystem by evaluating the conditions faced by a person trying to start a new business and then develop the new venture into a sustainable established business.⁴⁴

In 2021, the latest year for which data for Ireland are available, Ireland's score of 4.7 ranked the country joint 12th among European comparator countries, below the European average of 4.9. In particular, Ireland scored poorly on measures relating to access to entrepreneurial finance. The Netherlands (6.3) and Finland (6.2) ranked highest in Europe.

3.5 Financial Times/Sifted/Statista Ranking

In the Financial Times/Sifted/Statista rankings of European start-up hubs, three Irish hubs rank in the top 100; Dogpatch Labs in Dublin ranked 20th, Republic of Work in Cork ranked 49th, and Furthr in Dublin ranked 88th (Table 3.1).

Table 3.1: Financial Times/Sifted/Statista ranking of Europe's Leading Start-Up Hubs 2025

Hub	Country	Score
UnternehmerTUM	Germany	90.2
Station F	France	88.6
Start2 Group	Germany	87.9
HEC Paris	France	85.2
Founders Factory	UK	85.0
Venture Kick	Switzerland	84.7
Lanzadera	Spain	84.5
SSE Business Lab	Sweden	84.1
Startup Autobahn	Germany	83.9
ESA Business Incubation Center	France	83.4
<i>memo:</i>		
Dogpatch Labs	Ireland	81.8
Republic of Work	Ireland	78.4
Furthr	Ireland	76.7

Source: Financial Times/Sifted/Statista⁴⁵

⁴⁴ <https://gemconsortium.org/data>

⁴⁵ <https://rankings.ft.com/incubator-accelerator-programmes-europe/ranking/europes-leading-start-up-hubs>

3.6 Unicorns

According to the market intelligence platform Tracxn, Ireland is home to 9 unicorns, a term used to describe a privately-owned company with a valuation greater than \$1 billion.⁴⁶ Tracxn ranks Ireland in 20th place globally in terms of total unicorns created. Of course, on a per capita basis, this figure puts Ireland much higher up the rankings, though still below the US, Singapore, Israel and Estonia.

Dillion (2025) highlights the success of Ireland's unicorns, but asks some pertinent questions:

"The success of these firms is a testament both to the entrepreneurial savvy of Irish founders and the supportive ecosystem for such ventures. But with concern rising about the over-dependence of the economy on foreign direct investment in a global economy that has become increasingly uncertain due to Trump administration policies, are we creating enough of them? Moreover, are we capable of holding on to them as Irish owned and Irish-based ventures or do they inevitably have to sell out to overseas investors – often US-based institutions – to gain unicorn levels of scale? The concern here is that jobs and tax revenues from ventures that were typically supported in their early stages by the State, may benefit other economies."

Frank Dillon, Irish Times, 2 April 2025.⁴⁷

The capacity of a scale-up ecosystem to grow innovative young firms into unicorns depends on a range of factors, including, *inter alia*, the availability of scaling finance, entrepreneurial vision and managerial skill, and the quality of mentorship and strategic advice. The leading U.S. ecosystems are consistently at the top using individual metrics such as venture capital investment, the number of unicorn start-up companies, and the number of patents filed.⁴⁸

While seed funding for start-ups in Ireland reached record levels recently, access to funds to scale Irish firms appears to be more of a challenge.⁴⁹ As a result, Ireland is heavily dependent on foreign investors to scale domestic start-ups that are doing well:

"Seed funding availability is generally good in Ireland but once companies achieve a certain scale and need to expand out of Ireland, they often have to rely on funds from outside of this country."

Sarah Jane Larkin, Irish Venture Capital Association.

⁴⁶ <https://tracxn.com/d/unicorns>. We note that data from CB Insights suggest 8 unicorns in Ireland. <https://www.cbinsights.com/>

⁴⁷ "There's nothing mythical about Ireland's growing unicorn herd", <https://www.irishtimes.com/special-reports/2025/04/02/theres-nothing-mythical-about-irelands-growing-unicorn-herd/>

⁴⁸ Kerr, W. R., and F. Robert-Nicoud, (2020), "Tech Clusters." *Journal of Economic Perspectives* 34 (3): 50–76.

⁴⁹ <https://www.siliconrepublic.com/start-ups/ivca-williamfry-venture-pulse-q1-2025-survey>

Table 3.2 summarises the various rankings of Ireland’s entrepreneurial ecosystem *vis-a-vis* other European countries. No single index or indicator can provide a complete picture of a country’s capacity to produce high-growth firms and rapidly scale innovative young firms. The totality of the evidence, however, strongly suggests that Ireland’s capacity to forge high-growth firms lies just outside the top ten in Europe.

Table 3.2: Ireland entrepreneurial ecosystem, rankings within Europe

Index	Rank
OECD	15
StartupBlink	10
Financial Times	20
Global Entrepreneurship Monitor	12

Source: As per previous tables.

Not having a world-class domestic ecosystem has not proven a barrier to riches for Ireland over recent decades because MNCs have filled the gap. The next section will discuss how things are rapidly changing, however, so we may have to stand on our own two feet sooner than expected.

4. Risks to Ireland's Economic Model

*"And you better start swimmin'
Or you'll sink like a stone
For the times they are a-changin'."*

Bob Dylan

"We are in the midst of a rupture, not a transition. We know the old order is not coming back."

Mark Carney, Canadian Prime Minister

Ireland's economic model has delivered high levels of income per person. This section discusses recent international developments that present challenges to this model, including increased global trade protectionism, the reshaping of the transatlantic relationship and the post-war global order, shifts in EU industrial policy, and the intensifying competition amongst countries in the "war for talent." These forces mean that in coming decades Ireland will almost certainly rely much more heavily on domestically-owned firms to drive technological improvements, productivity, exports and rising living standards.

4.1 Introduction

As shown in Section 3, technological progress in Ireland has been largely driven by sectors of the economy dominated by foreign-owned firms. Ireland's position near the top of the league of advanced countries in terms of productivity owes much to the performance of foreign-owned MNCs operating in the country. The contribution of the domestic sector to aggregate technological advance is more modest. The evidence in the previous section casts doubts over the capacity of the domestic sector to drive technological progress at the pace required.

Ireland's dependency on MNCs for technological progress exposes the economy to significant concentration risk, similar to the well-known concentration risks in Irish tax receipts and exports. Foreign-owned MNCs account for the bulk of Ireland's total corporation tax (CT) receipts, with 10 firms accounting for more than half of CT revenues in recent years and just three firms accounting for more than one third (Cronin, 2023; McCarthy and Hayden 2024; Fiscal Council, 2024).⁵⁰ Moreover, the employees of these firms contribute a large proportion

⁵⁰ Cronin, B., (2023). Understanding Ireland's Top Corporation Taxpayers. Irish Fiscal Advisory Council, Working Paper No.20. June 2023. McCarthy, L. and Hayden, Y. (2024), Corporation Tax – 2023 Payments and 2022

of income tax receipts, exacerbating the risk to the public finances (McCarthy, 2023).⁵¹ In addition, foreign-owned MNCs produce three-quarters of Ireland's exports of goods (CSO, 2025).⁵²

Ireland's economic model has delivered high levels of income per person. Recent international developments, however, present risks to this model and suggest that in coming decades Ireland will likely rely much more heavily on indigenous firms to drive technological improvements, productivity, exports and rising living standards. The country will also probably lean more on the domestic sector to generate tax revenues to fund expanding public services such as health and education and much needed infrastructure spending.

Recent fundamental geopolitical shifts, increased trade protectionism around the world, and fragmenting globalisation are changing the global landscape for flows of FDI. These changes should be seen not as temporary shocks to the world economy, but rather structural upheavals that threaten to reshape patterns of global capital flows.

In particular, the desire of major economies and economic blocs to build strategic autonomy in certain sectors has led to more active industrial policies around the world. These industries include technology and life sciences -- two sectors in Ireland that are dominated by foreign-owned MNCs and make an outsized contribution to the Irish economy. A central element of these new industrial policies is the increased use of large government subsidies – and trade barriers such as tariffs in the case of the United States – to influence MNCs' investment decisions.

4.2 Changes to the International Economic System

Over the past year, the world trading system has radically changed. The import tariffs announced by the Trump administration over the past 12 months and the U.S. retreat from an open and rules-based international trading system threaten to divert investment in strategic sectors from Ireland to the United States and other countries. So far, Ireland has avoided the most painful consequences of Trump's tariffs, but recent geopolitical developments have rocked the transatlantic relationship and may result in a sustained step-down in cross-border flows of investment.

In addition, Ireland's role as regulator of many U.S. major technology firms that have their European headquarters here poses risks for the country should the transatlantic relationship deteriorate further.

Returns. Revenue Statistics. Fiscal Council (2024), Fiscal Assessment Report: December.

⁵¹ McCarthy, John (2023) Opening remarks at the Department of Finance Annual Conference, "Future-proofing the Public Finances – the Next Steps," July.

⁵² CSO, (2025), Ireland's Trade in Goods, <https://www.cso.ie/en/statistics/externaltrade/irelandstradeingoods/>

4.3 EU Industrial Policy

A sea change is currently underway in the European Union on the use of government subsidies and EU State Aid rules, in part in response to changes in the world order. Recent policy initiatives at the EU level, such as the Green Deal Industrial Plan, Net-Zero Industry Act and the European Chips Act, envisage increased use of subsidies and a loosening of State Aid rules to achieve their goals.

These new flexibilities in the use of subsidies may allow larger EU Member States with deeper pockets to outbid smaller ones such as Ireland for internationally mobile investment in strategic sectors.⁵³

New EU initiatives present challenges, but they also create opportunities for Ireland. The EU Startup and Scaleup Strategy launched in May 2025 aims to make the EU a more attractive place for tech businesses to scale.⁵⁴ The plan includes a simplified legal framework for firms to operate under a single set of rules across the 27 EU Member States as well as measures (for example, a new Savings and Investments Union) to boost funding for start-ups and scaling firms.

The Draghi report points out that only four of the world's top 50 technology companies are European and sets out a strategy to close the innovation gap with the United States and China. The report's proposals to improve the EU financing environment for disruptive innovation raises the prospect of greater access to funding for Irish start-up and scalers. If heeded, Draghi's call to strengthening the Single Market in Europe through further integration would make it easier for Irish firms to sell innovative goods and services into the large EU market.

4.4 Global War for Talent

Another major trend in international economic policy is the intensifying competition amongst countries in the "war for talent" (Michaels et al, 2001).⁵⁵ Policymakers are increasingly recognising the strategic importance of leadership talent for competitive advantage and are responding to the changing international landscape with policy moves to attract, develop and retain highly talented leaders.

Not surprisingly, some of the most far-reaching policy moves to increase and maintain global competitiveness through enhancing the talent base have been in small advanced economies. In particular, tax policy has been used by some of these countries to attract human capital and gain competitive advantage as the contest for talent amongst countries has intensified.

⁵³ ECIPE Policy Brief on The Impacts of EU Strategy Autonomy Policies – A Primer for Member States, available at: https://ecipe.org/wp-content/uploads/2022/11/ECI_22_PolicyBrief_AutPol_09_2022_LY02.pdf

⁵⁴ https://commission.europa.eu/news/choose-europe-your-startup-and-scaleup-2025-05-28_en

⁵⁵ Ed Michaels, Helen Handfield-Jones, Beth Axelrod (2001), "The War for Talent", Harvard Business Press.

Portugal, for example, in 2025 introduced a new regime known as the Tax Incentive for Scientific Research and Innovation (IFICI) regime aimed at attracting and retaining highly-qualified professionals in the fields of scientific research, investment, and business development. The IFICI targets companies within the technology, science, and research sectors, as well as companies with programmes for research and innovation and that benefit from specific tax incentives. Israel has had a similar inpatriate tax regime to Portugal's IFICI regime in place for quite some time. However, using tax policy as a means to attract human capital is not unique to smaller economies; Spain's Beckham Law is a well-known example in this regard, and was originally introduced to attract high-value foreign employees. The use of tax policy by these countries to attract human capital reflects the crucial role that talent plays in a successful entrepreneurial ecosystem (Leendertse et al, 2002).⁵⁶

Finland recently revised its Talent Boost programme focused on attracting international talent.⁵⁷ These reforms complement Finland's plans to increase state investment in R&D by 80 per cent, which will put the country among the world's top spenders. Finland is also building the largest start-up campus in Europe to support start-ups in health technologies, AI, cybersecurity, gaming and defence technology.⁵⁸

Sweden has consistently featured in the top 10 countries in the world for technological innovation, with high scores for technology infrastructure, business sophistication, knowledge base and technology outputs. Sweden's early introduction of internet infrastructure and strong social support system are often cited as factors that underpin the country's successful innovation ecosystem. As such, it may be that Sweden's ecosystem has developed under a set of conditions which other (non-Nordic) countries might find difficult to replicate. That said, countries can tailor their policy interventions (for example, Portugal's IFICI) to best suit their own circumstances.

In Germany, the programme for government of the new CDU/CSU and SPD coalition government promises significant reform of the country's start-up and innovation ecosystem.⁵⁹ Proposed reforms include measures to increase R&D spending in Artificial Intelligence (AI), ramp up the number of deep-tech and biotech spin-offs, attract foreign technology experts and other top talent, and increased public procurement to position the public sector as an "anchor customer" for start-up firms.

⁵⁶ Leendertse, Jip, Mirella Schrijvers & Erik Stam, (2022) "Measure Twice, Cut Once: Entrepreneurial Ecosystem Metrics," Research Policy, Volume 51, Issue 9.

⁵⁷ Eurofound (2022), Talent Boost, measure FI-2017-17/2692 (measures in Finland), EU PolicyWatch, Dublin, https://static.eurofound.europa.eu/covid19db/cases/FI-2017-17_2692.html

⁵⁸ "Finland's bid to win Europe's start-up crown" <https://www.bbc.com/news/articles/cx28y8jj4lxo>

⁵⁹ Isidro Laso, "Unleashing the Startup Revolution: How the New German Coalition Agreement is Pioneering Innovation", April 2025.

Ireland can, and undoubtedly will, respond to these international developments and will remain an attractive location for FDI, given the country's economic strengths. But to assume that productivity-rich FDI will locate in Ireland in coming decades in the volumes experienced in the past could be a grave strategic mistake.

Productivity growth is going to have to come from somewhere else, which calls for urgent action by Irish policymakers to boost Ireland's start-up and scale-up landscape. Leading firms in advanced industries are 'moving fast and breaking things' and Ireland's global competitors are not sitting on the hands. In response, Ireland needs to be ambitious -- and to quickly turn that ambition into action. Section 5 considers some things that Ireland could do in response.

5. Policy Implications

This section considers policy options to deliver a world-class entrepreneurial ecosystem in Ireland focused on the creation and diffusion of innovations. Given the crucial role of talent in creating and fostering self-reinforcing clusters of innovation highlighted in the previous section, we pay particular attention to policy levers that might be available to Irish policymakers to attract human capital to augment our existing talent base. We argue that the proposed new national innovation campus, though possibly an important ingredient for a first-rate innovation cluster, will not succeed without the involvement of world-class global talent, strategic leadership in the area of emerging technologies and the involvement of experienced entrepreneurs as mentors.

5.1 Introduction

Ireland needs to increase innovation and productivity growth in the domestic sector to sustain solid improvements in living standards over coming decades. To do so, Ireland will have to improve its performance at forging domestic high-growth firms with the potential to develop innovative products and services based on advanced technology.

These firms may be in sectors such as healthcare (using, say, telemedicine and AI), fintech, advanced manufacturing (robotics and automation), agriculture (biotechnology), entertainment (virtual reality) and green energy. They will be leaders in the industries of the future. These firms will disrupt existing global business models and will expand rapidly to become international market leaders. Fast growth of the most productive firms is the key to improved productivity growth.

Central to these efforts must be a marked strengthening in the country's entrepreneurial ecosystem. What is clear from the rapidly expanding literature on successful entrepreneurial ecosystems is that certain ingredients are conducive to the emergence of high-growth firms. Leendertse et al (2022, *op. cit.*), for example, find that talent, physical infrastructure, formal institutions and finance are fundamental conditions of entrepreneurial ecosystems. We consider each of these fundamental conditions below.

This paper is by no means the first to explore these issues from an Irish perspective. Indeed, some of the recommendations in three recent key reports speak directly to these factors, namely the OECD's recent assessment of Ireland's startup support system,⁶⁰ the AI Advisory

⁶⁰ "Supporting start-up globalisation in Ireland through incubation and acceleration."
<https://enterprise.gov.ie/en/publications/supporting-start-up-globalisation-in-ireland-through-incubation-and-acceleration.html>

Council's recommendations on Ireland's AI Future,⁶¹ and the recent report by the Department of Enterprise, Tourism and Employment's (DETE) Finance for Scale-ups Working Group.⁶²

5.2 Human Capital and Talent

The most important ingredient for a successful entrepreneurial ecosystem is human capital and talent (see, for example, Acs and Armington, 2004; Glaeser et al., 2010; Lee et al., 2004; Qian et al., 2013).⁶³ In particular, the recycling of entrepreneurial talent, strategic leadership and the involvement of experienced entrepreneurs as mentors are critical ingredients in delivering a world-class ecosystem.

"Founders of start-ups and scale-ups can benefit significantly from exchanges with former entrepreneurs who can guide them on how to improve their business ideas, and sometimes connect them to other relevant stakeholders, including investors. These experts can often take on the role of mentors, and their leadership is highly regarded by entrepreneurs. They can also be a source of inspiration for aspiring entrepreneurs and the presence of these leaders can sometimes make the difference between successful and unsuccessful ventures."

OECD Entrepreneurial Ecosystem Diagnostics report, June 2025⁶⁴

Mentorship networks, both formal and informal, have unquestionably served as a linchpin of Silicon Valley's success.⁶⁵

"The importance of mentors in shaping the quality of incubation and acceleration that is provided to startups cannot be overstated. Indeed, many stakeholders indicated that the mentoring received during accelerator programmes is, in the long run, the most beneficial element of the support provided to startups."

OCED 2024 report

⁶¹ "Helping to Shape Ireland's AI Future." <https://www.gov.ie/en/department-of-enterprise-trade-and-employment/publications/ai-advisory-council-advice-papers/>

⁶² "The Use of Finance as a Catalyst to Develop a Scaling Ecosystem" DETE's Finance for Scale-ups Working Group, <https://enterprise.gov.ie/en/publications/finance-as-catalyst-to-develop-scaling-ecosystem.html>

⁶³ Zoltan J. Acs, Catherine Armington, (2004) "The impact of geographic differences in human capital on service firm formation rates," Journal of Urban Economics, Volume 56, Issue 2.

E.L. Glaeser, W.R. Kerr, G.A.M. Ponzetto, (2010) "Clusters of entrepreneurship" J. Urban Econ., 67 pp. 150-168.

S.Y. Lee, R. Florida, Z.J. Acs (2004) "Creativity and entrepreneurship: a regional analysis of new firm formation Reg. Stud., 38, pp. 879-891.

H. Qian, Z.J. Acs, R.R. Stough, (2013), "Regional systems of entrepreneurship: the nexus of human capital, knowledge and new firm formation", J. Econ. Geogr., 13, pp. 559-587.

⁶⁴ OECD (2025), "Entrepreneurial Ecosystem Diagnostics, OECD Studies on SMEs and Entrepreneurship", OECD Publishing, Paris, <https://doi.org/10.1787/7096961f-en>.

⁶⁵ <https://livefromsiliconvalley.com/the-role-of-mentorship-in-silicon-valleys-startup-success/>

“Experienced mentors offer practical advice, constructive feedback, and support based on their own successes and failures. They provide an invaluable perspective that founders can leverage to avoid common pitfalls, improve decision-making, and accelerate growth.”

StartupYard⁶⁶

Mentors can offer invaluable advice because they have ‘been there, done that’. They provide unparalleled industry insights and knowledge.

“A startup mentor may be a goldmine of knowledge that helps entrepreneurs grow their companies and steer clear of the possible pitfalls that many first-time entrepreneurs encounter when going it alone. Mentors typically have a wide network of contacts, including professionals, investors, vendors, and stakeholders, because they have a long history in the sector.”

Punith Raj and Yoganathan (2025)⁶⁷

In the newly published OECD Entrepreneurial Ecosystem Diagnostics report, Ireland ranks 19 out of 38 OECD countries in terms of the numbers of these leaders available to entrepreneurs, with the US, UK, Canada, Germany and Israel making up the top five.⁶⁸

The policy implication is that Ireland should aim to do much more to attract and retain, both from home and abroad, people with strategic vision and the capacity and experience to offer leadership and world-class mentorship to domestic entrepreneurs. Small countries like Israel and Estonia that punch well above their weight in technology innovation have successfully leveraged their global diaspora to enhance their ecosystems. As outlined in the previous Section, Israel has successfully used tax policy to achieve these aims. Ireland, which in the past has used tax policy to attract physical capital from abroad (FDI), should now consider how to use tax policy to attract human capital (talent) from abroad to augment our existing talent base.

5.3 Physical Infrastructure

Good infrastructure, including digital infrastructure, is a key element of a successful entrepreneurial ecosystem (Audretsch et al., 2015).⁶⁹ Ireland currently faces a significant

⁶⁶ <https://startupyard.com/>

⁶⁷ N, Punith & Srinivasan, Yoganathan, (2025), “Building Resilient Startups: The Role Of Mentorship In Entrepreneurial Ecosystem.” *Cuestiones de Fisioterapia*. 54.

⁶⁸ https://www.oecd.org/en/publications/entrepreneurial-ecosystem-diagnostics_7096961f-en.html

⁶⁹ D.B. Audretsch, D. Heger, T. Veith (2015), “Infrastructure and entrepreneurship”, *Small Bus. Econ.*, 44, pp. 219-230,

infrastructure deficit (especially in housing, water, energy and transport) which the forthcoming revised National Development Plan will aim to reduce over time.

A particular example of a piece of infrastructure relevant for entrepreneurial ecosystems which has garnered attention recently is an innovation campus. Both the OECD and the AI Advisory Council point to the Station F start-up campus in Paris as a model for a new national innovation campus in Ireland.

“A large national entrepreneurship campus that co-locates a high number of start-ups, services, support programmes and other ecosystem actors would also raise the cohesiveness and visibility of the incubation and acceleration system and the entrepreneurial ecosystem more broadly. Such a campus would also improve the effectiveness of the support provided by incubators and accelerators to global start-ups by creating opportunities for networking and collaboration, as well as by facilitating the sharing of resources and facilities between incubators and accelerators.”

OECD 2024 report, page 49

“Establishing a high-visibility innovation campus, similar to Station F, with a specific AI focus would further accelerate these efforts, giving startups direct engagement with policymakers, access to hardware and research labs, and the resources necessary for transformative and globally competitive innovation.”

AI Advisory Council report, page 2

The new Programme for Government 2025, Securing Ireland’s Future, commits the government to:

“consider the development of a national start-up hub for entrepreneurs” and “develop an all-island innovation and entrepreneurial ecosystem.”

Securing Ireland’s Future⁷⁰

A large cluster of start-ups and scale-ups co-locating in a new purpose-built campus would bring together in one place the vital human capital and talent discussed earlier -- entrepreneurs, talented workers, mentors, scientists, investors, as well as support programmes. In other countries, building spatially concentrated clusters appears to have helped to induce agglomeration economies that are important for a successful ecosystem

⁷⁰ <https://www.gov.ie/en/department-of-the-taoiseach/publications/programme-for-government-2025-securing-irelands-future/>

(Fleisher, 2021).⁷¹ The question of where this new campus would be located and the implications of that decision for balanced regional development is an important one, but beyond the scope of this paper.

What is clear from the evidence presented above, however, is that a new national innovation campus may be a necessary condition for a stronger entrepreneurial ecosystem, but it is certainly not a sufficient one. Without the involvement of world-class global talent, strategic leadership in the area of emerging technologies and the involvement of experienced entrepreneurs as mentors, the campus will almost certainly fail to meet its objectives.

5.4 Formal Institutions

Formal institutions refer to “economic institutions determine the incentives of and the constraints on economic actors, and shape economic outcomes”.⁷² They refer, *inter alia*, to factors such as the strength of the rule of law and enforcement of property rights. Ireland already scores very well in these areas, so the room for improvement is limited. In the newly published OECD Entrepreneurial Ecosystem Diagnostics report, for example, Ireland ranks first among 38 OECD countries in terms of offering the most conducive institutional contexts for entrepreneurship, scoring highly along indicators such as the rule of law, control of corruption, favourable corporate tax rates and product market regulation.⁷³

5.5 Finance

One of the three key recommendations of the Finance for Scaling Working Group convened by DETE is that the government should design instruments that incentivise investment into scaling companies.

“The Irish economy has been the beneficiary of innovative tax policy for FDI. Scale-ups will be the next engine of industrial growth and innovation in taxation and will be a contributor to encouraging broader participation in the funding ecosystem.”

Finance for Scaling Working Group 2024 report

A key point often overlooked when discussing investment in start-ups and scale-ups is that Ireland runs a current account surplus on the balance of payments, so, in principle, there is no shortage of savings in the country to fund entrepreneurial activity. In 2023, Ireland’s

⁷¹ Fleisher, Chris (2021), “The Effect of High-Tech Clusters on the Productivity of Top Inventors”, American Economic Review, October.

⁷² D. Acemoglu, S. Johnson, J.A. Robinson, (2005), “Institutions as a fundamental cause of long-run growth”, Handbook of Economic Growth, pp. 385-472.

⁷³ OECD (2025), “Entrepreneurial Ecosystem Diagnostics, OECD Studies on SMEs and Entrepreneurship”, OECD Publishing, Paris, <https://doi.org/10.1787/7096961f-en>.

(modified) current account recorded a surplus of €9.5bn, meaning Ireland is a large net exporter of financial capital.⁷⁴

Successful ecosystems attract large capital inflows because they offer the potential of attractive returns on investment. Building an ecosystem in Ireland that is conducive to the emergence of high-growth firms will likely prove the most effective way to attract private funding into Irish start-ups and scale-ups.

⁷⁴ The modified current account excludes the depreciation of foreign-owned domestic capital and the retained earnings of firms that are predominantly owned by foreign portfolio investors.

6. Conclusion

The Irish economy has developed strongly in recent decades by attracting and retaining significant investment by MNCs. The boost to aggregate productivity delivered by these firms has been a critical factor in rapidly rising standards of living in Ireland.

Recent geopolitical developments are radically shifting the global landscape for flows of foreign direct investment. We can expect that in coming decades Ireland will depend much more on technological progress among indigenous firms to drive gains in income per person. The evidence gathered in this paper makes a compelling case for a step change in Ireland's approach to supporting start-up and scaling businesses in advanced industries. Policies to help innovative start-ups succeed and to build and scale our indigenous firms are key to the country's future prosperity. To paraphrase Robert Lucas, once you start thinking about them, it's hard to think about anything else.

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