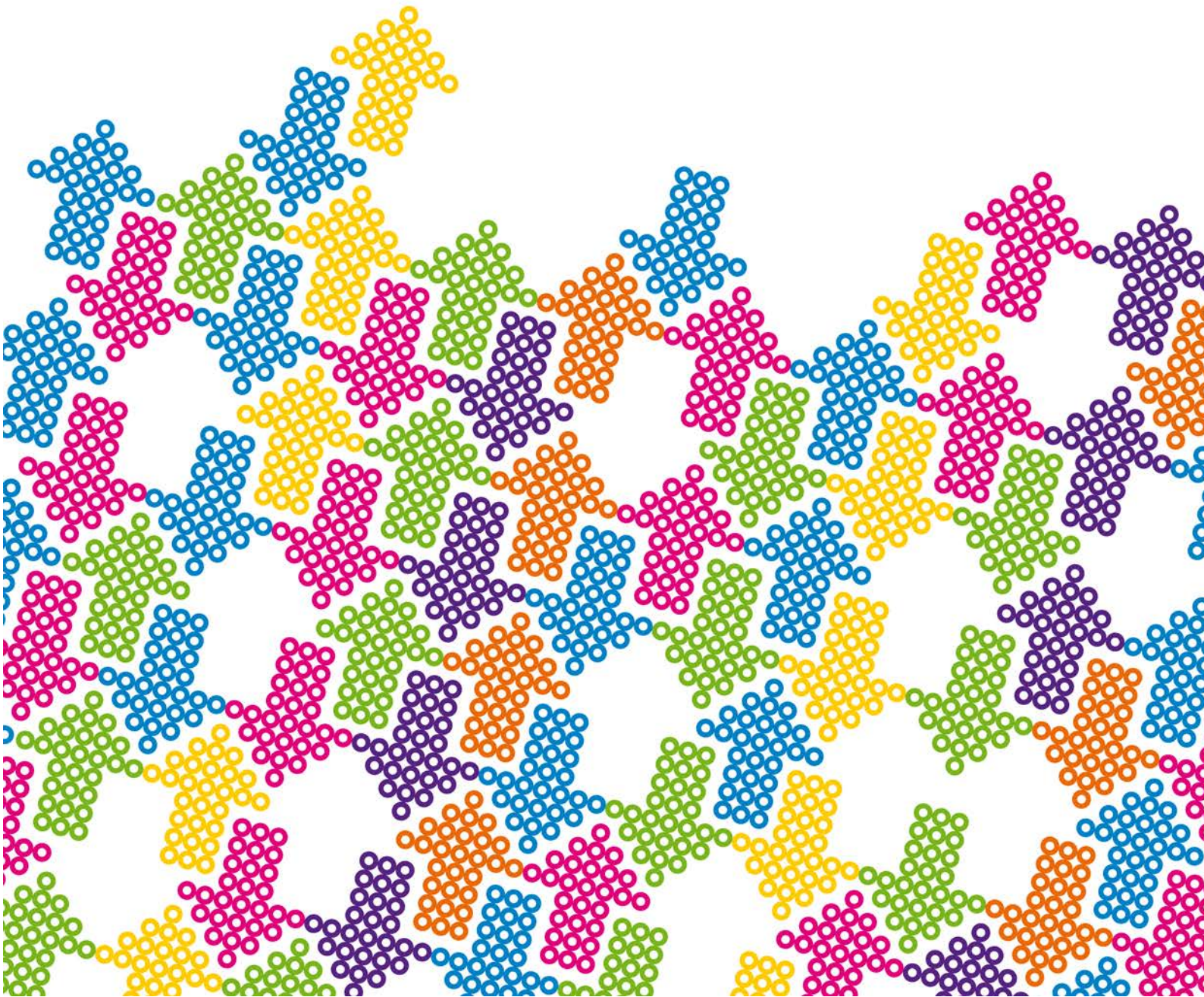




Benchmarking Competitiveness: Ireland and the United Kingdom, 2017



Introduction to the National Competitiveness Council

The National Competitiveness Council (NCC) reports to the Taoiseach and the Government, through the Minister for Jobs, Enterprise and Innovation on key competitiveness issues facing the Irish economy and offers recommendations on policy actions required to enhance Ireland’s competitive position. Each year the NCC publishes two annual reports:

- Ireland’s Competitiveness Scorecard provides a comprehensive statistical assessment of Ireland’s competitiveness performance; and
- Ireland’s Competitiveness Challenge uses this information along with the latest research to outline the main challenges to Ireland’s competitiveness and the policy responses required to meet them.

As part of its work, the NCC also:

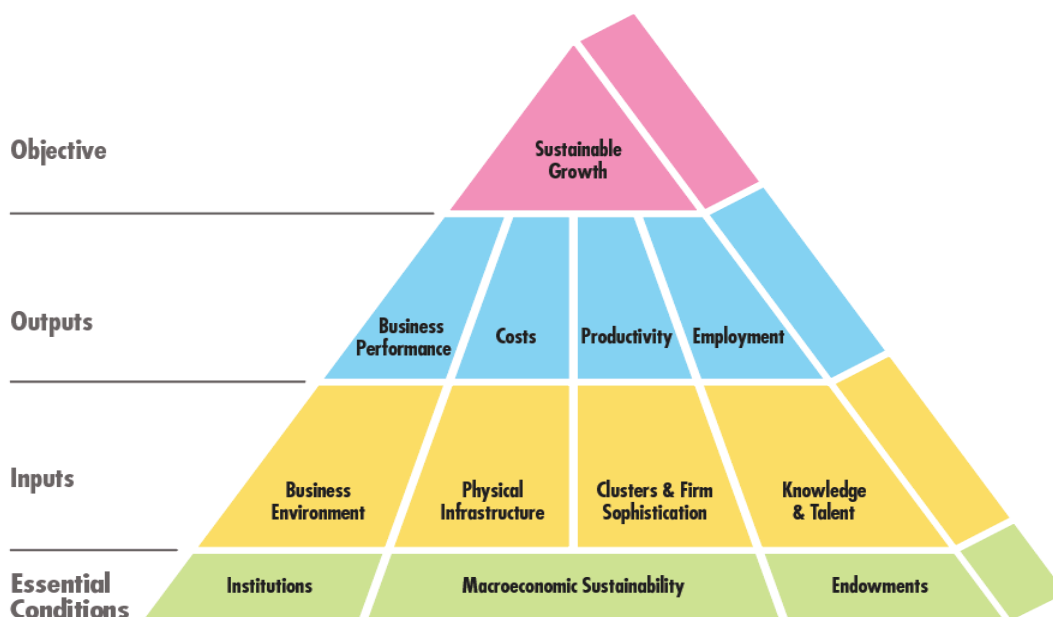
- Publishes the Costs of Doing Business where key business costs in Ireland are benchmarked against costs in competitor countries; and
- Provides an annual Submission to the Action Plan for Jobs and other papers on specific competitiveness issues.

The work of the National Competitiveness Council is underpinned by research and analysis undertaken by the Strategic Policy Division of the Department of Jobs, Enterprise and Innovation.

The NCC’s Competitiveness Framework

The Council defines national competitiveness as the ability of enterprises to compete successfully in international markets. National competitiveness is a broad concept that encompasses the diverse range of factors which result in firms in Ireland achieving success in international markets. For the Council, the goal of national competitiveness is to provide Ireland’s people with the opportunity to improve their living standards and quality of life. The Council uses a “competitiveness pyramid” to illustrate the various factors (essential conditions, policy inputs and outputs), which combine to determine overall competitiveness and sustainable growth. Under this framework, competitiveness is not an end in itself, but a means of achieving sustainable improvements in living standards and quality of life.

The NCC Competitiveness Framework



National Competitiveness Council Members

Professor Peter Clinch	Chair, National Competitiveness Council
Pat Beirne	Chief Executive Officer, Mergon Group
Kevin Callinan	Deputy General Secretary, IMPACT Trade Union
Micheál Collins	Assistant Professor of Social Policy, University College Dublin
Isolde Goggin	Chair, Competition and Consumer Protection Commission
Cathriona Hallahan	CEO/Managing Director (Ireland), Microsoft
Declan Hughes	Assistant Secretary, Department of Jobs, Enterprise and Innovation
Jane Magnier	Joint Managing Director, Abbey Tours
Danny McCoy	Chief Executive Officer, Ibec
Seán O'Driscoll	President, Glen Dimplex Group
Margot Slattery	Country President, Sodexo Ireland
Martin Shanahan	Chief Executive, IDA Ireland
Julie Sinnamon	Chief Executive, Enterprise Ireland
Ian Talbot	Chief Executive, Chambers Ireland
Patrick Walsh	Managing Director, Dogpatch Labs
Jim Woulfe	Chief Executive, Dairygold Co-Operative Society Limited

Council Advisers

Brid Cannon	Department of Agriculture, Food and the Marine
Patricia Cronin	Department of Communications, Climate Action and Environment
Kathleen Gavin	Department of Education and Skills
John McCarthy	Department of Finance
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David Moloney	Department of Public Expenditure and Reform
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Chairman's Preface



Ireland's economic prosperity is inextricably linked to how competitive we are in international trade. This determines employment, wages and living standards as well as our ability to finance public services such as health, education and social protection. As we progress through the year 2017, Ireland is on the verge of a structural shift in its global trading relationships which, arguably since independence, is paralleled only by our decision to open up to free trade in the late 1950s and our decision to join the EEC in 1973. While there have been economic challenges along the way, those profound decisions regarding trade set Ireland on a path to become one of the world's most prosperous countries. Those good decisions were our decisions. Now it is the decisions of others, most significantly the UK's decision to leave the EU, which will have a profound effect on our trading relationships.

So, with much out of Ireland's control, what is within our control and what should we do?

In the National Competitiveness Council's recent Challenge 2016 report, we set out, across a range of areas, where we perform well and where we lag behind our key competitors. We also set out how we should grasp the competitiveness levers of the economy to insulate Ireland as best as possible from the turbulence caused by the structural shifts in political and economic policymaking across the world. I stated in my Preface to the Challenge report that Ireland faces a serious and imminent threat to its economic security. The view of the Council is that this threat remains, and the UK's decision to leave the EU is the most significant of the factors underpinning this threat.

In producing this benchmarking report, the Council is placing a microscope over our competitive relationship with the UK. The likely shift in the UK's trading relations with EU partners has far reaching implications for Ireland across a range of policy areas – including implications for trade, investment, the labour market, and energy, as well as many sector specific competitiveness impacts – particularly on the agri-food, traditional manufacturing, tourism and sectors vulnerable to cross-border trade, and e-commerce. While the UK is, and will, remain a key trading partner for Ireland, it is also a country with which we compete in terms of mobile investment and export market share. In the run-up to, and post-, Brexit we can expect the UK to intensify its investment in infrastructure, enhance and develop its tax and non-tax offering for enterprise, develop its skills and innovation base and expand trade into new and existing markets. Moreover, we can expect other countries to continue to enhance their competitiveness position.

The Council is particularly concerned about the challenges confronting our enterprise sector, specifically; the cost-competitiveness implications caused by the volatility in exchange rates, and uncertainty regarding trade. These pose real threats to continued enterprise growth. This report shows that Brexit requires Ireland to place an increased emphasis on enhancing the factors driving our competitiveness performance. We must focus on securing Ireland's macroeconomic environment as well as improving microeconomic structural factors such as innovation capacity, the quality of infrastructure, costs of doing business and productivity. This would increase the competitiveness of our indigenous enterprise base and enhance our attractiveness as a location for FDI. If we do not urgently seize the opportunity to put in place more solid foundations for growth, we are undermining Ireland's future competitiveness and putting at risk our future prosperity. Therefore, the Council restates a number of key areas for Government action:

- In regard to public finances, efforts to bring fiscal stability and improved performance have been exceptional. It is important to ensure our fiscal position remains sustainable in the face of an uncertain international trading and investment environment. The Council is of the view that, while we must compete and win in terms of our international tax competitiveness offering, we should avoid any narrowing of the tax base which might leave us exposed in the future and we must ensure the tax system supports and rewards employment, enterprise, investment and innovation.
- Our medium-term competitiveness is being affected by the restrictions on state spending on capital investment. Clearly, Ireland's investment level is deficient relative to our competitors. This will have a negative impact on our competitiveness in the future and damage our potential with regard to the challenges

of Brexit. Recent developments in the national accounts highlight the highly globalised nature of economic activity in Ireland. Multinational enterprises are an integral to our economy and Ireland has recently benefitted from record levels of mobile investment which underlines the need to ensure costs and supply-side conditions remain competitive but also the need to invest in infrastructure to sustain growth.

- While our trade performance will always be conditional on the ebb and flow of global markets, a more diverse export base can reduce exposure to external demand shocks, exchange rate fluctuations and instability in export earnings, upgrade value-added, and enhance growth and jobs. Irish-based exporters, particularly in exposed sectors such as traditional manufacturing and agri-food, must continue to be supported to scale and diversify sustainably and strategically to reduce the market exposure which Brexit has highlighted. There is a need to evolve into new products, markets and sectors, whilst maintaining the competitive advantages we enjoy in existing ones.
- Research suggests one of the most significant factors explaining differences in prosperity between countries is the demographics and skills of the population. Skilled labour is increasingly critical to retaining and winning mobile investment and the growth of a cohort of internationally-trading indigenous companies. Failure to tackle the under-resourcing of higher education is placing Ireland at a considerable disadvantage internationally and will have a significant medium-term impact on competitiveness and productivity in the economy.
- Innovation and productivity are key to enterprise and export competitiveness in the medium-term. We must ensure that Irish enterprise stays at the forefront of technology and innovative activity, has a talent pool of skilled labour, obtains and develops management talent, and is able to access necessary, and competitively-priced, finance. We must also facilitate an increased level of start-ups (particularly those with the potential to scale and internationalise) and support existing high-potential growth companies with scaling opportunities. This must be supported by an administrative and regulatory framework that facilitates enterprise and exports.

While the magnitude of the challenges we face are enormous, we must approach these with confidence in the capability of our labour force and enterprise base. Through the efforts of Ireland's firms and workers, and with a supportive environment from Government, Ireland's economic performance in recent years has been strong. In rebuilding our public finances and fostering the conditions for employment and enterprise growth, sacrifices have been made which have improved our competitiveness position. The Council acknowledges that Government has been preparing for, and actively responding to, the UK's decision to leave the EU. This report, we hope, will aid that process for both them and the exporting firms on which we rely.

As Brexit looms, this brings significant uncertainty. And uncertainty is costly. We can be sure that the exporting environment to the UK will be far more challenging for Irish firms, and for particular sectors, but we cannot be sure of the exact impact and how quickly firms can adapt. We are also unsure of what the overall net outcome of Brexit will be in terms of inward investment. And, at a political level, we cannot be sure of what decisions will be made by the EU and the UK, and we will have limited influence on those decisions. What we can be sure of is that, if Ireland improves its competitiveness, we will place ourselves in the best possible position to reduce the negative impacts of Brexit in terms of exports and inward investment, and make the most of the opportunities that arise.



Professor Peter Clinch

Chair, National Competitiveness Council

Objectives of Benchmarking Competitiveness: Ireland with the UK

The purpose of this report is to provide a statistical snapshot assessment of Ireland's current competitiveness performance across areas which are crucial to improving our international competitiveness position. As an exceptionally open economy, heavily dependent on international trade and investment, Ireland's economic outlook is highly dependent on constantly enhancing our competitiveness performance. The UK is likely to implement a range of policies to enhance the attractiveness of their business environment over the coming months and years and Ireland cannot stand still. Brexit has underscored the importance of Irish competitiveness and it is important that we understand Ireland's strengths and weaknesses – not just in relative terms but also in terms of direct comparison with the UK. The Council's 2016 Competitiveness Challenge report outlined a range of issues which will require policy attention to support Irish firms trading with or dependent on UK markets, and to ensure that Ireland is best placed to take advantage of the opportunities and withstand the challenges posed by Brexit (e.g. the Common Travel Area, trade policy). The objective of this benchmarking exercise is to consider Ireland's competitiveness performance with specific reference to the UK, and establish areas where policy attention could be focussed to enhance Ireland's competitiveness performance. There is a clear need for relevant Government Departments to consider and develop sector by sector responses to Brexit based on in-depth analysis of the implications of Brexit.

Benchmarking competitiveness is useful - it informs the policymaking process and raises awareness of the importance of national competitiveness to Ireland's wellbeing. Nonetheless, there are limitations to benchmarking:

- The most recent and up-to-date data is used. While every effort is made to ensure the timeliness of the data, there is a natural lag in collating comparable official statistics across countries.
- Competitiveness indices can seek to measure a vast range of issues. Generally, these indices are based on weighting systems. The relevance and importance of the individual metrics included will vary across countries.
- Given the different historical contexts and economic, political and social goals, and differing physical geographies demographics and resource endowments, it is not realistic or even desirable for any country to seek to outperform other countries on all measures of competitiveness. Further, Ireland's membership of the EU and Euro area, institutions and the prevalence of clusters are important if difficult to quantify determinants of economic performance.
- There are no generic strategies to achieve national competitiveness as countries face trade-offs. It is important to note that competitiveness is not an end in itself, but rather is a means to achieve sustainable improvements in living standards and quality of life.
- Finally, it is important to note that trade and investment between countries is not a zero-sum game; economic advances by other countries can, in aggregate terms, lead to improvements in living standards for the Irish population.

Methodology

Competitiveness performance reflects the interaction of a wide range of factors that combined determines firms based ability to compete successfully in international markets. This Benchmarking report considers many of the key areas which determine our competitiveness performance and uses internationally comparable data, with the OECD and Eurostat as the sources for the majority of indicators. Indicators from specialist international competitiveness bodies (e.g. from the World Bank's Doing Business report, the World Economic Forum's Global Competitiveness Report and the Institute for Management Development's World Competitiveness Yearbook) are also used. Where further depth is of benefit, national sources such as the Central Bank and the CSO, and their counterparts in the UK are used. Subject to data availability, Ireland's performance is benchmarked against the UK, the United States, and Euro area¹ are also included as the source of much inward and outward direct investment, and important trading partners.

Executive Summary

- **Brexit represents a structural shift in UK trading relations with EU partners. Ireland faces unique competitiveness challenges given the nature of our deep and longstanding economic relationship with the UK.**
- **Brexit has implications across a range of policy areas including trade, investment, the labour market, and energy, as well as sector specific competitiveness impacts particularly on the agri-food, traditional manufacturing, tourism and sectors vulnerable to cross border and e-commerce trade.**
- **Enhancing competitiveness requires an increased focus on Ireland's macroeconomic environment and microeconomic structural factors such as innovation capacity, market diversification, infrastructure, costs of doing business and productivity.**

The decision by British voters to leave the European Union has far reaching consequences for Ireland's economy. The specific effects are as yet unclear and will be determined by the terms and conditions of the UK's exit and in particular the new trade deal which will emerge. In addition, the size of the economic impact of Brexit on the UK and EU economies and the extent to which this is transmitted to the Irish economy will take time to emerge. While the final impacts, consequences and nature of Brexit remain uncertain, it is clear that Ireland faces unique challenges given the nature of its existing relationship with the UK especially the all-Ireland issues that arise. Brexit represents a structural shift in the UK trading relations with the EU.

The Council acknowledges that Government has been preparing for and actively responding to the UK decision to leave the EU for well over a year. With Article 50 due to be triggered in March 2017, engagement is intensifying at political and official level. The Council fully supports the Government's overarching headline priorities:

- Minimising impact on trade and the economy
- Protecting the Northern Ireland Peace Process
- Maintaining the Common Travel Area
- Influencing the future of the European Union.

At national level, short, medium and long term policy responses will be needed to safeguard Ireland's national competitiveness. From a national competitiveness perspective, Brexit has implications across a range of policy areas – including implications for trade, inward investment, the labour market, and energy, as well as many sector specific competitiveness impacts – particularly on the agri-food, traditional manufacturing, tourism and sectors vulnerable to cross border and e-commerce trade. Brexit will also impact at the level of the individual firm, and will certainly pose challenges in terms of North-South relations on the island of Ireland. The vital economic, social and political implications of Brexit – and indeed the institutional arrangements between the UK and EU, and between Ireland and the UK – remain unclear at this juncture. The immediate impact of Brexit has been uncertainty, reduced growth prospects and increased currency volatility. Through **currency effects**, there have been immediate short term cost implications for Irish exporters, many of whom are dependent on the UK market. The depreciation of Sterling has diminished competitiveness relative to UK produced goods and services. Conversely, imports to Ireland from the UK are becoming more competitive. The permanency of the exchange rate shift is an important competitiveness consideration. Further volatility and depreciation of Sterling represents a major threat to Irish export competitiveness. Ireland's ability to achieve sustainable growth is dependent on our ability to trade internationally. EU membership has been, and remains, integral to Ireland's pursuit of export-led growth. At the sectoral level, a number of employment intensive sectors dominated by indigenous SMEs are highly reliant on trade with the UK. These include Agri-Food and Traditional Manufacturing. The UK is also a key market for FDI exports, particularly chemicals, ICT and Financial Services. It is vital for Irish tourism. The UK is Ireland's foremost aviation and maritime transport partner.

The specific effect of Brexit on **trade** is as yet unclear and will be determined by the terms and conditions of the UK's exit and in particular the new trade deal which will emerge. To maintain competitiveness Irish enterprise must evolve into **new products, markets and sectors**, whilst maintaining the competitive advantages we enjoy in existing ones. Ensuring the environment for enterprise supports start-ups, and develops a cadre of firms of sufficient scale and capability to succeed in international markets remains integral to competitiveness. Ireland and the UK are competing for and winning **inward investment** in similar sectors. In both countries, in recent years, Software & IT services, Business Services, Financial Services and Communications account for the majority of inward investment projects and job creation. While Brexit may present opportunities for Ireland in terms of attracting inward investment, competition is global and intensifying. The competitiveness and consistency of our tax offerings, our legal, regulatory and administrative environment, cost base, the availability of talent, technology and property solutions are crucial to attracting and retaining indigenous entrepreneurs and inward investment post Brexit.

Geographic proximity, language and cultural and historical ties mean the Irish and UK **labour markets** have deep linkages. Changes in the bilateral flow of labour between Ireland and the UK and changed intra EU migratory flows could have significant potential labour market impacts for Ireland. Tightening labour market conditions in the UK and Ireland have the potential to lead to skills shortages and wage inflation which would undermine competitiveness. There is considerable overlap with the UK in terms of skills shortages in sectors such as ICT, Science and Engineering, Financial Services, Health and Craft and Technical occupations. Ireland must ensure it remains competitive in attracting and retaining talent. In this regard, Ireland's **tax competitiveness** relative to the UK is crucial. From an enterprise perspective, it is important that the taxation system is balanced, broad and provides certainty in a manner that supports and rewards employment, investment, innovation and entrepreneurship. The Irish income tax system is progressive particularly at lower and middle incomes. However, Ireland's marginal tax rate is high relative to the UK. In addition, Ireland's 33 per cent Capital Gains Tax rate is particularly high relative to the UK's 28 per cent. Ireland's corporation tax rate remains internationally competitive at 12.5 per cent. It is vital that Ireland's tax offering remains stable, transparent and competitive for firms seeking an EU base for operations. Maintaining the competitiveness of our R&D tax credit and Knowledge Development Box are also critical to attract FDI and support Irish enterprises to invest, innovate and compete internationally.

The availability of qualified work ready **skills and talent** is a fundamental source of competitive advantage. The attainment profile of those exiting the formal Irish education and training system has been improving steadily. Ireland outperforms the UK in relation to reading and mathematical competency and proficiency scores but is behind on science and digital skills. Ireland has made significant progress in reducing the proportion of early school leavers. At tertiary level Ireland has a higher attainment rate than the UK. However, the level of resourcing per student for education remains significantly lower than the UK, particularly at tertiary levels. Ireland has scope to improve participation levels in apprenticeship programmes and lifelong learning. Demographic change means increased investment in the sector is necessary over the medium term.

As a small open economy, any deterioration in our **cost competitiveness** will have a major negative impact upon economic growth, employment and our standard of living. The UK's decision to leave the EU brings cost competitiveness into sharp focus. Ireland's current price profile could be described as 'high cost, rising slowly', the UK is "high cost, rising quickly". Price levels in Ireland were 22.5 per cent more than the EU average in 2015; the UK was 31.3 per cent above the EU average. Ireland needs to maintain and improve its relative cost competitiveness. Access to competitively priced sources of **finance for growth** is essential to facilitate enterprises to establish and expand their operations, improve productivity and ultimately survive and scale. Relative to the UK, Irish SMEs are still heavily reliant on bank loans with limited uptake of non-bank financing sources. Demand for credit in Ireland is relatively low, and while falling, SME interest rates are also relatively high. The significance of location-sensitive cost factors differs by sector, but Ireland needs to maintain and improve its relative performance in labour costs, property and utilities and ensure productivity growth. . The interaction between productivity growth and costs is vital. Relative to the UK,

Ireland's **productivity** performance is strong; however, the narrow base of sectors driving productivity performance leaves Ireland vulnerable to shocks. Increasing productivity is a major focus of UK economic policy and increasing productivity across all sectors of the Irish economy remains a significant challenge.

Ireland's **economic infrastructure** and related networks have a strong bearing on the competitiveness of indigenous enterprises and as a driver of inward investment. Although absolute levels of Irish investment are recovering, over the medium term, capital investment as a percentage of GDP is projected to increase but remains low relative to pre-crisis levels. Public investment as a proportion of gross fixed capital formation (2%) is below both the UK and Euro average (2.7%). Developing our infrastructure base, while complying with the EU's fiscal rules, is a fundamental challenge to enhancing competitiveness relative to the UK and others.

From a competitiveness perspective, the returns from innovation are a vital component in securing productivity growth, diversifying and broadening the enterprise and exports base, growing FDI, and creating competitive advantage in intellectual property and commercial products and services. Levels of **public investment in R&D** in Ireland remain below the UK. The gap in Government Expenditure is most pronounced with the UK spending almost two-and-a-half times the Irish rate of expenditure as a proportion of GDP. Enhancing Ireland's innovation performance is essential if we are to diversify and broaden the enterprise and export base, grow foreign direct investment, and create new competitive advantage in intellectual property and commercial products and services.

As a small peripheral EU economy, with limited resources, factors outside of our control such as international oil prices exert a significant influence on **energy** prices. The energy implications for Ireland of Brexit could be significant given our dependence on energy imports from the UK. While maintaining the trade in secure supplies of energy with the UK must remain a priority, Brexit means diversifying energy sources and supplies is critical to ensure security of supply. Ireland continues to have a very high dependence on imported fossil fuels, particularly oil on which 48 per cent of our energy consumption is based. Meeting Ireland's climate change commitments presents significant challenges and opportunities at sectoral level and it is vital that Ireland's new emissions targets arising out of the Paris agreement are appropriate to long term economic growth potential.

In terms of quantitative data, **international indices of competitiveness** such as the WEF and IMD reports combine current economic performance metrics (e.g. economic growth, fiscal position, productivity levels, employment, prices indicators) with measures of potential future success (e.g. investment in infrastructure, education and innovation). In comparison to the UK, Ireland has a similar perceived performance in international competitiveness rankings with respect to: the quality of institutions; the performance of the Health and Primary Education sectors; the quality of higher education and training; and the efficiency of product markets. Relative to Ireland, in addition to its larger market size, the UK has higher rankings with respect to: infrastructure; financial market development; labour market efficiency; technological development; innovation; and business sophistication. Ireland's performance on current **economic metrics**, while welcome, generally improves Ireland's overall competitiveness score. This may suggest that our current performance, which is relatively strong, is overstating our overall competitiveness position and masking weakness in the underlying drivers of future competitiveness performance.

Further competitiveness improvements are essential. We need to focus on Ireland's macroeconomic environment as well as microeconomic structural factors such as innovation capacity, infrastructure, costs and productivity across all economic sectors. This would increase the competitiveness of our enterprise base and enhance our attractiveness as a location for FDI. Post Brexit, Ireland will be the only English-speaking country in the EU, at the heart of the Single Market. Ireland has a well-educated population, is open to trade and has a business friendly environment. In rebuilding our public finances and fostering the conditions for employment and enterprise growth, hard sacrifices have been made which have improved our competitiveness position. Only a renewed commitment to constantly improving our competitiveness can enable firms based in Ireland to compete in international markets and to provide Ireland's people with the opportunity to improve their living standards and quality of life.

1. Ireland's Competitiveness Performance

- Ireland's competitiveness performance has evolved in recent years in three of the most high profile international competitiveness-relevant indices.
- The WEF Global Competitiveness Report shows Ireland is ranked 23rd and the UK 7th most competitive out of 138 countries. The WEF estimate Brexit is likely to affect UK competitiveness performance in the long run through increases in the cost of trade, declining economic growth and investment, loss of market size and reduced ability to attract and retain talent.
- The IMD measure of competitiveness ranked Ireland 7th and the UK 18th out of 61 countries.
- The World Bank's Ease of Doing Business report shows Ireland ranking 18th and the UK 7th out of 190 economies.

Ireland's long run competitiveness performance

Figure 1.1 shows how Ireland's competitiveness performance has evolved in recent years in three of the most high profile international competitiveness-relevant indices². Our position in the World Economic Forum (WEF) and Institute for Management Development (IMD) rankings deteriorated prior to and over the course of the recession but has gradually started to recover in recent years. The most recent WEF Global Competitiveness Report shows Ireland is ranked 23rd most competitive economy, an improvement of 1 place this year. Pre Brexit, the UK was ranked 7th most competitive out of 138 countries. Using the IMD measure of competitiveness Ireland is ranked 7th in 2016, an improvement of 9 places from last year, the UK is ranked 18th out of 61 countries. The World Bank's annual Ease of Doing Business report shows our ranking of 18th out of 190 economies – a fall of 3 places from the previous year. The UK is ranked 7th, a fall of 1 place from last year.

Indices and rankings are useful, if imperfect, measures of competitiveness performances. In some instances it is not a question of Ireland's absolute deterioration or improvement in these categories but rather a matter of other countries improving their position relative to Ireland's. In addition, the methodology, surveys and data used in these benchmarking reports differ significantly. Methodologies are frequently revised and this can have an impact on Ireland's ranking. For example, over the past two years, the World Bank's Doing Business Report has been incorporating changes in methodology and improvements in the indicators used, which can make direct comparison with previous years very difficult. While acknowledging that year on year fluctuations in data may be subject to 'data noise', (particularly as regards perception based indicators) performance across these rankings indicates the dynamic and global nature of competitiveness.

World Economic Forum Global Competitiveness Index Report³

The WEF's Global Competitiveness Index Report 2016-2017 provides a largely qualitative-driven index-based assessment of the factors driving competitiveness. The most recent report ranks Switzerland, Singapore and the US as the world's most competitive economies. Out of 138 countries, Ireland is ranked 23rd an improvement of 1 place from 2015-2016. Overall, 65 indicators show an improvement since last year's report, and 24 show deterioration, 22 show no change and 2 are not comparable over time. Figure 1.2 shows overall, Ireland performs relatively well in the following pillars:

- Goods market efficiency (ranked 5th);
- Labour market efficiency (12th);
- Technological readiness (12th);
- Institutions (12th);

Benchmarking Competitiveness: Ireland and the United Kingdom, 2017

- Health and primary education (13th), and Higher education and training (13th).

Within these headings, a range of strengths largely based on the findings of the Executive Survey are evident – Ireland is ranked in the top 10 in relation to perceived strength of intellectual property protection, burden of government regulation, investor protection, quality of education system, FDI rules and productivity levels. Ireland is outside the global top 20 in three pillars; Infrastructure (29th), the macroeconomic environment (43rd) and financial market development (6th). Ireland's low infrastructure ranking is primarily a result of poor perception-based scores related to the quality of physical transport infrastructure. Regarding the macroeconomic environment, the ranking (43rd) is related to historical data on government debt and relative inflation performance, the UK is ranked 85th. Ireland's financial market performance relates to perception based assessments of the soundness of the banks and the availability and affordability of credit. The WEF rank the UK as one of the most competitive economies in the world, moving up three places to 7th. In comparison to Ireland, the UK has a similar top 20 ranking with respect to: institutions (12th); the Health and Primary Education sectors (13th); higher education and training (20th); and the efficiency of goods markets (9th). In addition to its larger market size, relative to Ireland, the UK has better scores with respect to:

- Infrastructure (9th);
- Financial market development (16th);
- Labour market efficiency (5th);
- Technological readiness (3rd);
- Innovation (13th); and
- Business sophistication (7th).

The UK is perceived as the best EU performer with respect to labour market efficiency and is currently the most attractive EU destination for talent. It is important to note that the data were collected before the referendum vote and the repercussions from Brexit are not captured by this year's performance. The WEF estimate Brexit is likely to affect UK competitiveness performance in the long run through increases in the cost of trade, declining economic growth and investment, loss of market size and reduced ability to attract and retain talent.

[Institute for Management Development Global Competitiveness Yearbook⁴](#)

The IMD uses quantitative and qualitative survey data to assess the ability of nations to create and maintain an environment in which enterprises can compete globally. In the 2016 report Ireland is regarded as the 7th most competitive economy in the world (out of 60 economies) by the IMD. The UK is ranked 18th. Ireland's relative performance across the four key competitiveness factors assessed by IMD can be summarised as follows:

1. Economic Performance - 6th position, improvement up 6 places on 2015 (UK is 28th, down 10 places)
2. Government Efficiency – 13th position, improvement up 2 places on 2015 (UK is 16th, up 3 places)
3. Business Efficiency – 2nd position, improvement up 11 places on 2015 (UK is 18th, up 2 places)
4. Infrastructure – 23rd position, improvement up 1 place on 2015 (UK is 16th, no change)

Ireland's strong economic growth in 2015 (GDP and GDP per capita growth, and budgetary position) were the criteria which improved most in the IMD's assessment with the biggest declines observed in price inflation and exchange rate stability. Figure 1.3 sets out Ireland's relative performance across the competitiveness sub factors used by the IMD. Respondents to the IMD's Executive Opinion Survey consider a competitive tax regime, high education and skills levels, and a business friendly environment as key attractiveness features of the economy.

Ireland is ranked 2nd for attitudes and values, (openness of our national culture, flexibility and adaptability), 3rd for international Investment (investment incentives, stock and flow of FDI), and 3rd in indicators assessing the domestic economy (GDP and related components growth). Examining the discrete components of the IMD's competitiveness assessment, strengths include the productivity level of our workforce (4th) the UK is 23rd. Ireland is ranked 5th for

adaptability of companies compared to the UK 23rd. The quality and availability of skilled labour is critical for competitiveness. Ireland is rated the 5th best in the world in terms of the perceived availability of skilled labour, (1st for finance skills) and 5th best at attracting and retaining talent. These metrics have all improved since 2015. Ireland's employment rating is relatively poor arising from the recession with large competitiveness drags remaining vis a vis the unemployment rate, long-term unemployment and youth unemployment. Ireland is rated 41st for working hours and 53rd for hourly compensation in manufacturing; however, these are relatively unchanged on 2015. Ireland's international trade performance (10th) is strong driven by export growth, exports as a share of GDP and the current account. However, weaknesses are evident in the degree of export concentration by partner and product (52nd and 47th respectively; compared to 11th and 19th in the UK), and prices/cost of living where Ireland ranks poorly due to the relative cost of office and residential property rents. Perceived ease of access to credit for enterprise remains a weakness (41st compared to the UK 23rd). In terms of relative weakness, in Infrastructure Ireland is ranked 40th overall, the UK is 27th. We are 36th for investment in telecommunications, the UK is 11th. We score poorly on perceptions of the connectivity of people and firms (51st) and communications technology (51st), where the UK is ranked 34th and 9th respectively. Ireland is 40th in the IMD's ranking of electricity costs for industrial customers ahead of the UK (46th). Ireland is ranked 25th for expenditure on research and development as a percentage of GDP and 20th as regards Business Expenditure on R&D and Knowledge Transfer. In Education, Ireland is ranked 18th overall. Ireland is ranked 1st for perceived availability of finance skills and 5th best at perceptions regarding attracting and retaining talent being a priority for companies. The UK ranks 11th and 16th respectively in these criteria. Ireland scores well on perceptions regarding the education system meeting the needs of the economy (9th) compared to the UK (18th) yet ranks 43rd with regard to perceptions that language skills meet the needs of business, (UK is ranked 51st) and 48th on perceptions that apprenticeships are sufficiently implemented (UK 32nd).

World Bank Ease of Doing Business⁵

The World Bank's annual Ease of Doing Business report⁶ tracks changes in regulations affecting businesses. The report sheds light on how easy or difficult it is for a local entrepreneur to open and run a small to medium-size business when complying with relevant regulations. It measures and tracks changes in regulations affecting 11 areas in the life cycle of a business: starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, resolving insolvency and labour market regulation.

Economies at the upper end of the rankings' scale find it harder to get high impact from their reforms due to their already strong performance (i.e. as a country nears the frontier or limit of best practice, the harder marginal improvements are to achieve). In 2016, Ireland achieved an ease of doing business ranking of 15th out of 190 economies – a fall of 3 places from the previous year⁷. While Ireland's performance and overall score has improved, other countries have also improved their performance and improved at a faster rate. The UK is ranked 7th, a fall of 1 place from last year. While we are improving our performance other countries continue to reform and we must continue the implementation of high-level reforms to improve the business competitiveness environment. However, as Figure 1.4 shows, relative to the UK there is room for continuous improvement in a number of areas. Ireland ranks ahead of the UK in terms of starting a business (fewer procedures, 10th and 22nd respectively), paying tax (rate and time to complete, 5th and 10th respectively) and resolving insolvency (17th and 13th respectively). Ireland's performances on some of the metrics that comprise the index vary considerably. Relative to the UK, Ireland's performance is poor in the following areas:

- *Enforcing Contracts (Ireland 90th, UK 31st)*

This category is based on the ease or difficulty of enforcing commercial contracts. This is determined by following the evolution of a payment dispute and tracking the time, cost, and number of procedures involved from the moment a

plaintiff files the lawsuit until actual payment. The World Bank reports the time taken for filing and service, trial and judgement and enforcement (including time for appeal) is 650 days compared to 437 in the UK. The average for OECD high income countries is 553 days. Ireland also scores poorly relative to the UK on case management and case automation. Total cost of contract enforcement in Ireland is estimated at 26.9 per cent of a claim, compared with 43.5 per cent in the OECD.

- *Dealing with Construction Permits (Ireland 38th, UK 17th)*

This category is based on the procedures, time, and costs to build a warehouse, including obtaining necessary licenses and permits, completing required notifications and inspections, and obtaining utility connections. Ireland and the UK are similar in terms of the total number of procedures required (9 and 10 respectively). Ireland scores well on building control and regulatory quality but poorly on time and cost to build. The World Bank estimates it takes 149.5 days to build a warehouse in Dublin compared with 86 days in London. Cost is recorded as a percentage of warehouse value. (The value is €2 million in Dublin and £1.4 million in London) and is reported as 5.4 per cent in Ireland compared to 1.1 per cent in the UK.

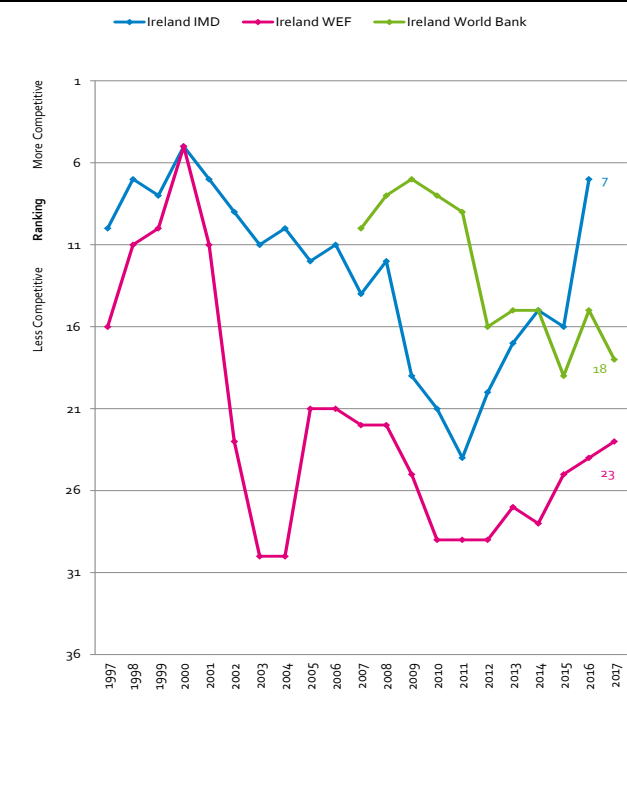
- *Getting Electricity (Ireland 33rd, UK 17th)*

This category is based on the number of steps, time, and cost for a business to obtain a permanent electricity connection for a newly constructed warehouse. Ireland and the UK score equally well on the World Bank's index which assesses reliability of supply and transparency of tariffs. The World Bank reports the UK has 4 procedures associated with new warehouse electricity connection compared to 5 in Ireland. It takes 85 days to complete connection in Ireland compared to 79 in the UK. In terms of the fees and costs associated with completing the procedures to connect a warehouse to electricity, cost is recorded as a percentage of the economy's income per capita. Costs are exclusive of value added tax. The World Bank reports cost as percentage of income per capita is 61.9 per cent in Ireland compared to 25.8 per cent in the UK.

- *Trading Across Borders (Ireland 47th, UK 28th)*

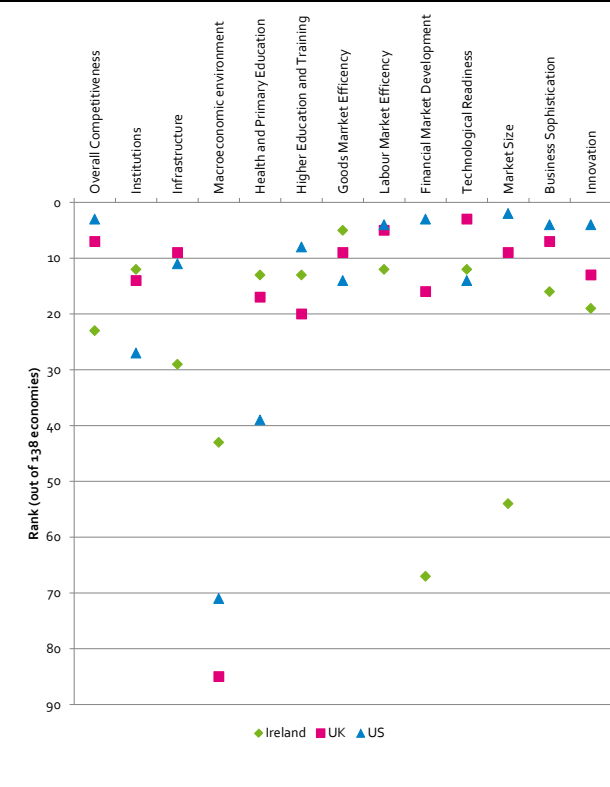
This category tracks the time and cost (excluding tariffs) associated with three sets of procedures—documentary compliance, border compliance and domestic transport—within the overall process of exporting or importing a shipment of goods by sea. The World Bank reports the border compliance times for both exporting and importing in Ireland is 24 hours, compared to 24 hours and 3 hours respectively in the UK. The costs associated with border compliance for exports from Ireland are higher than the UK (US\$305 in Ireland compared with US\$280 in the UK). It is notable that border and documentary compliance costs to import in the UK are estimated at nil and reported for Ireland as US\$253 and US\$75. Time and costs associated with domestic vehicular transport used in exporting and importing are better in Ireland than in the UK.

Figure 1.1: Ireland's Competitiveness Rankings



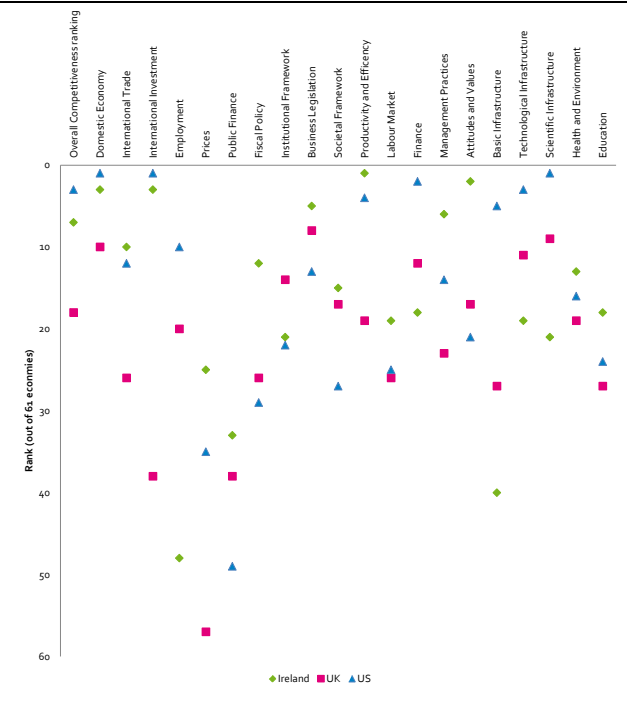
Source: IMD, WEF, World Bank

Figure 1.2: WEF Competitiveness Rankings 2016-2017



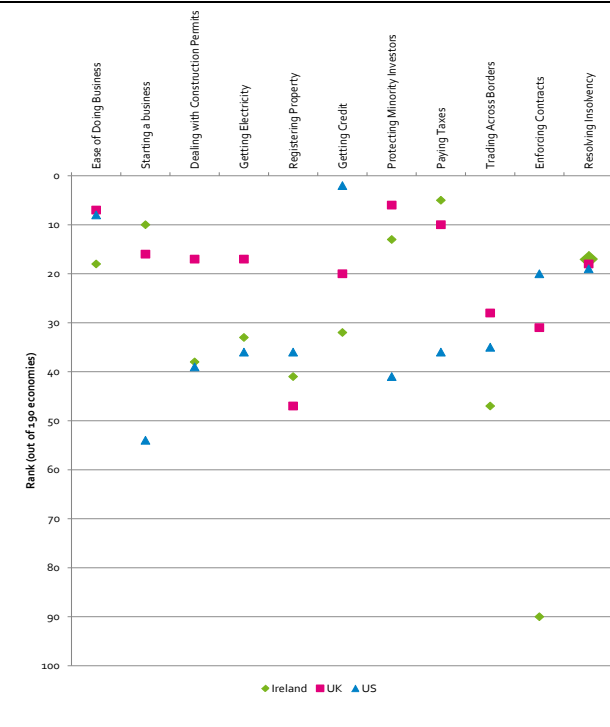
Source: WEF Global Competitiveness Index 2016/2017

Figure 1.3: IMD Competitiveness Rankings 2016



Source: IMD Global Competitiveness Yearbook 2016

Figure 1.4: World Bank Ease of Doing Business 2017



Source: World Bank Ease of Doing Business 2017

2. Macroeconomic Performance and Outlook

- Economic growth has been strong in Ireland since 2013 and is reflected in a buoyant labour market and increased tax returns. Net exports were a key driver of economic growth. In 2016 growth was driven by domestic demand. The short term outlook is positive but with considerable downside risks, particularly Brexit, and uncertain prospects in Ireland's major trading partners.
- Revisions to Ireland's 2015 national accounts led to an upgrade of the data on economic growth resulting in the inclusion of very significant amounts of activity carried out elsewhere, but recorded as part of Irish GDP and GNP. It remains to be seen whether the changes in national income and the related increases in Irish corporation tax revenue might be one-off adjustments or recurring.
- Sound and sustainable public finances are a prerequisite for competitiveness. Economic and employment growth and prudent fiscal policies resulted in significant improvements in the Irish public finances over the period 2012-2016. Ireland made significant strides in 2016, as evidenced by decreasing debt and deficit ratios and exiting the EU's Excessive Deficit Procedure. As a non-Euro member, the UK has been free to set its own fiscal and monetary policies, and unlike Ireland, is not liable to sanctions under the EU's fiscal rules.

Economic Growth

Preliminary CSO estimates⁸ indicate that year on year GDP increased by 5.2 per cent in 2016. On a seasonally adjusted basis GDP increased by 2.5 per cent in Q4 2016. Overall, net exports declined in 2016. Year on year, exports increased by 2.4 per cent in 2016, while imports increased by 10.3 per cent. Domestic demand (+16.8% year on year) is now the main driver of growth with personal consumption (which accounts for almost half of domestic demand) increasing by 3 per cent in 2016. Government expenditure increased by 5.3 per cent. Capital formation increased by 45.5 per cent in 2016. The CSO attribute this growth rate to the import of intellectual property products. The CSO report the impact of these additions to Ireland's capital stock is offset in the results by the corresponding imports of these products. The overall impact on GDP of these intellectual property products imported in 2016 is neutral⁹.

Economic growth in the UK was estimated by the ONS at 2 per cent, down from 2.2 per cent in 2015 and 3.1 per cent in 2014. During Quarter 4 2016, UK GDP was estimated¹⁰ to have increased by 0.6 per cent, with growth driven by the services sector. In the US GDP is estimated¹¹ to have increased by 1.9 per cent in the fourth quarter of 2016, and by 1.6 per cent, year on year. This compares with 2.6 per cent in 2015. In the Euro area GDP increased by 1.7 per cent year on year in 2016 and by 0.5 per cent quarter on quarter. Year on year growth in the EU28 in the fourth quarter of 2016 was 1.8 per cent.

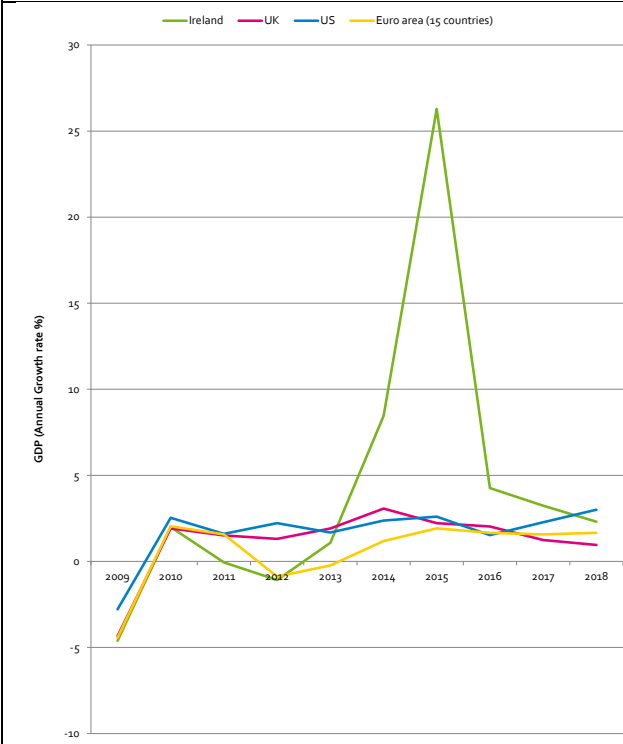
Figure 2.1 shows the growth rate in Ireland, UK, US and Euro area since 2011 and OECD forecasted growth for 2017 and 2018. Since 2013, Ireland has recorded strong growth relative to the UK and Euro area and both GDP and GDP per capita have moved above their pre-crisis levels. Excluding one-off factors, Irish GDP is estimated to have grown at between 4-4.5 per cent in 2016 which is an extremely strong performance in an EU context and relative to the UK and US. While GDP growth is a somewhat imperfect measure of economic performance, especially for highly-globalised economies such as Ireland, economic growth is reflected in continued positive momentum in the exchequer returns and the labour market. High frequency indicators such as retail sales, index of industrial production and purchasing managers' indices also show growth has continued into 2017. Growth in the UK and US has been strong relative to the Euro area. The economic performance of both countries is particularly important, given the prominence of both countries as export destinations for Irish produced goods and services. Over the course of the recession, net exports were the key driver of economic growth. Export growth, is likely to track demand in Ireland's main trading partners, the EU, US and UK. Therefore, any negative effect that the Brexit decision has on UK growth is also likely to be strongly felt in terms of Irish economic growth. While Ireland's dependence on the UK as an export destination has declined in recent decades, it remains our single largest market in the EU, and both economies are highly interlinked.

Simulations by the ESRI suggest that the effect of a 1 per cent reduction in UK GDP is to reduce Ireland's GDP and GNP by 0.3 per cent in the medium term¹².

The Central Bank considers that domestic demand is likely to remain the key component of Irish economic growth in the short term¹³. In 2015 and 2016 the relative contribution of both domestic demand driven by increased personal consumption, and investment increased. In 2016, personal consumption expenditure increased by 3 per cent buoyed by an upturn in the labour market. Consumer spending on goods has been strong with retail sales for all businesses (excluding the motor trades) increasing by 2 per cent in volume terms in 2016. The national accounts show Government expenditure has increased at a faster rate in 2016 increasing by 5.3 per cent. As set out in Budget 2017, Government consumption is projected to increase by 2.0 per cent per annum on average in 2017/2018. It is notable that investment growth in recent quarters has been volatile driven by fluctuating levels of investment in intangible assets - largely attributable to intellectual property transactions and R&D activity by multinational enterprises and aircraft investments. Overall, notwithstanding the above caveats on the data, the Central Bank estimate total investment to have increased by 5.1 per cent for the year 2016¹⁴ and looking ahead to 2017 and 2018 is expected to increase by around 7 per cent in both years¹⁵. All sectors of the economy experienced growth in 2016. In volume terms, Distribution, Transport, Software and Communications grew by 7.8 per cent and Other Services by 6 per cent. Within the Industry sector, Building and Construction and Manufacturing increased by 11.4 per cent and 1.8 per cent respectively in the year.

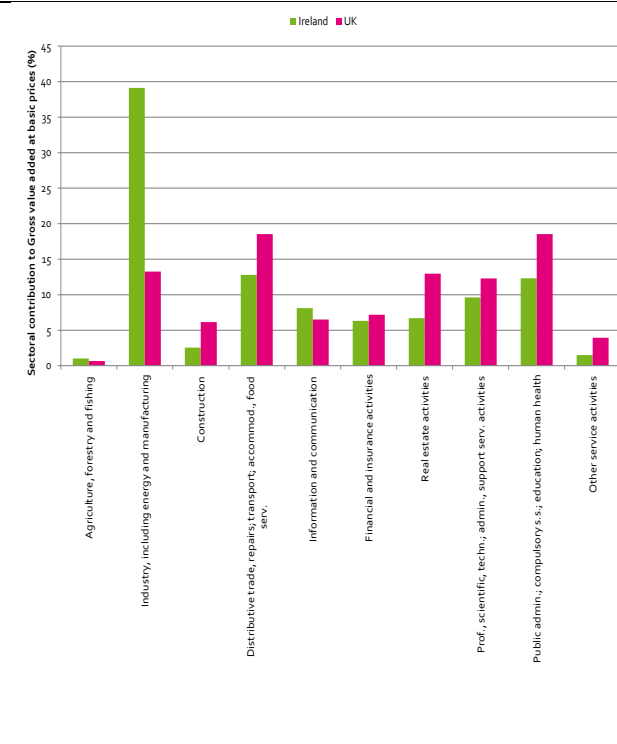
Figure 2.2 shows the sectoral composition of economic activity in Ireland and the UK. It illustrates how the Manufacturing and ICT sectors are far more important to the Irish economy than is the case in the UK in Gross Value Added (GVA) terms. The UK has five sectors contributing over 10 per cent of total GVA, with the largest sectors being Retail and Wholesale and Public Administration. In Ireland, the composition of economic activity is dominated by a narrow range of sectors and a concentrated cohort of firms. CSO data¹⁶ shows the top 50 enterprises by value, generate 40 per cent of business economy value added, while only accounting for 6 per cent of employment. In addition, the presence of foreign multinationals in Ireland, particularly in the Pharma and ICT sectors has a significant impact on gross domestic product and value added. Foreign owned enterprises account for 52 per cent of GVA in the Irish non-financial business economy. The narrow base of sectors driving economic activity leaves Ireland vulnerable to external shocks. Returning to Figure 2.1 Irish GDP increased by 26.3 per cent in 2015. This figure has been attributed to the activities of a small number of large multinational firms and due to a number of factors (contract manufacturing, relocation of intellectual property assets) which have limited impact on actual activity in the Irish economy. Developments in the National Accounts highlight the potential volatility of some rapidly growing sources of recent Exchequer revenues, such as corporation tax receipts, which grew by almost 7 per cent in year-on-year terms in 2016. It would be dangerous to rely on volatile and potentially transitory revenue sources, to fund permanent levels of public spending, or reductions in tax rates which can prove difficult to reverse. As a highly globalised economy, Irish National Accounts data now include a very significant amount of activity carried out elsewhere, but formally recorded as part of Irish GDP and GNP. Metrics from these measures, such as the various fiscal ratios-to-GDP, measures of potential output, the output gap, the structural deficit and the expenditure benchmark, have become less meaningful. It remains to be seen whether the quarterly changes in national income and related increases in Irish corporation tax revenue might be one-off adjustments or recurring. While GDP continues to be the required EU indicator, the Council welcomes the publication of the report by the Economic Statistics Review Group¹⁷ which has proposed the development of a new indicator gross national income (GNI*) to capture the specific nature of the Irish economy. Such a measure would appropriately adjust the retained earnings of re-domiciled firms and depreciation on foreign-owned domestic capital assets. Given the complex and highly-globalised nature of the Irish economy the development of a supplementary measure of the level of economic activity accruing to domestic residents is essential to inform policy development. Constructing such a measure is made all the more important given the potential for continued volatility in conventionally measured national income statistics in the future.

Figure 2.1: GDP Annual Growth and Forecast



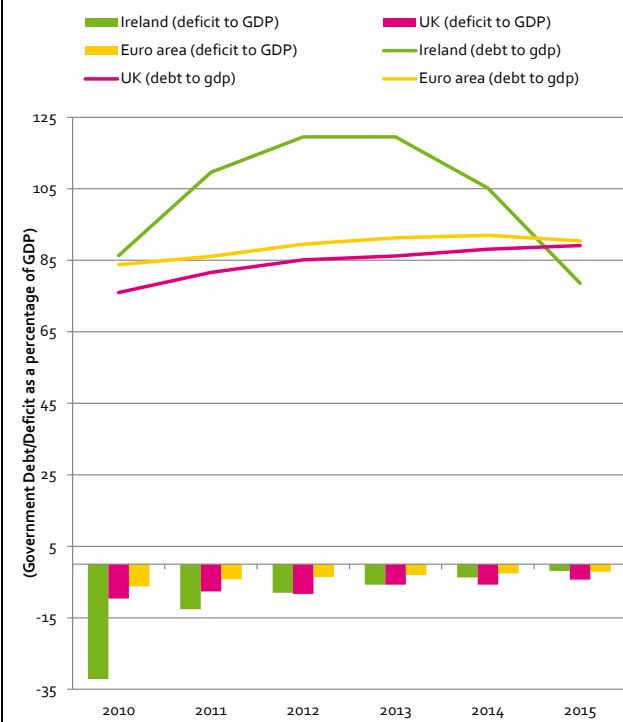
Source: OECD

Figure 2.2: Sectoral Composition of Economic Activity 2015



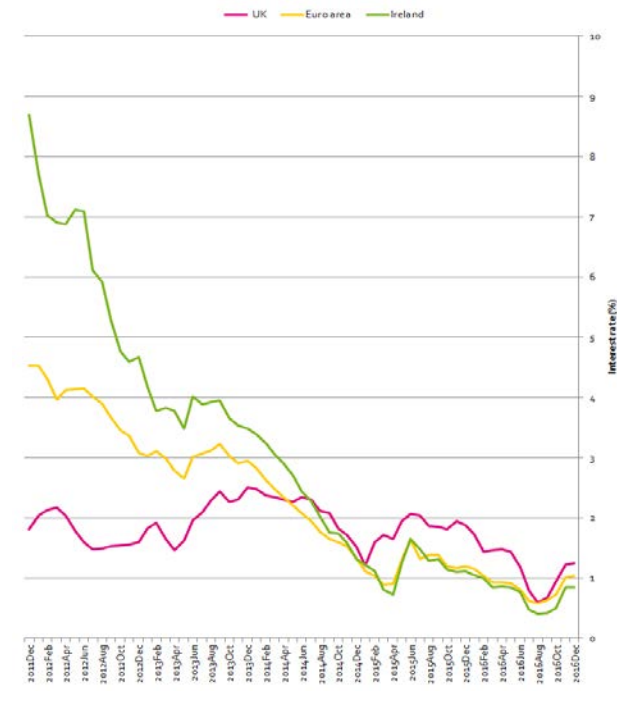
Source: OECD

Figure 2.3: Government Debt and Deficit to GDP ratios



Source: Eurostat

Figure 2.4: Ten-year government bonds (Interest Rates)



Source: ECB

Public Finances

Sound public finances underpin sustainable competitiveness. Economic and employment growth and prudent fiscal policies resulted in significant improvements in the Irish public finances over the period 2012-2016. Exchequer returns for December 2016 show that €47,864 million was collected in tax revenue in 2016, 1.4 per cent ahead of profile and an increase of 5 per cent on 2015. Income tax revenues for 2016 were 4.4 per cent higher in year-on-year terms.

Performance was strong across the major tax categories with year on year growth in corporation tax receipts (7%), VAT (4%), Stamp (9.5%) and Customs (7.9%) receipts. Total net voted expenditure for 2016, at €43,986 million, was €1,123 million (2.6%) higher in year on- year terms and €138 million (0.3%) below profile. Total Exchequer debt interest costs remain very high at €6,739 million, albeit they have continued to decrease and fell by 3.6 per cent year-on year.

Department of Finance data show the general government debt-to-GDP ratio has declined sharply since 2013. The debt-to-GDP ratio was 78.6 per cent in 2015, significantly down on its peak of 120 per cent in 2012. Substantial consolidation on the expenditure side throughout the recession, as well as more buoyant tax revenues, have resulted in the general government deficit falling sharply since 2010. At 1.9 per cent of GDP and 1 per cent respectively, both the headline and underlying General Government deficits are below the Treaty reference value (3 per cent of GDP). The debt and deficit ratios are expected to continue on a downward path meaning Ireland is moving towards a position where balanced budgets are achieved.

In its 2016 Stability Programme (which is predicated on a no-policy change assumption), the Government set out plans to gradually improve the headline balance and plans to achieve a surplus of 0.4 per cent of GDP in 2018. Ireland's projected deficit for 2016 is 0.9 per cent of GDP and the forecast for 2017 is 0.4 per cent of GDP. A new debt to GDP target beyond the requirements of the Stability and Growth Pact was announced in Budget 2017 which equates to a domestic target of a debt to GDP ratio of 45 per cent to be reached by the mid-2020's or thereafter depending on economic growth. Budget 2017 also commits to eliminating the current budget deficit, a balanced budget in 2018 and budgetary surpluses after that date.

In the UK the general government deficit fell to 4.3 per cent of GDP in 2015 from 5.7 per cent in 2014, driven both by cuts to the public wage bill and robust revenues, the latter linked to strong domestic demand. The structural deficit decreased to 4.3 per cent of GDP in 2015-16, from 4.9 per cent in 2014-15. The Government debt to GDP ratio has been increasing in recent years and stood at 89.1 per cent in 2015 up from 88.1 per cent a year previously. In the UK the current fiscal mandate requires a budget surplus to be in place by 2019-20 and this target will require debt to fall relative to national income every year. However, overall debt levels are forecast to continue to rise. The UK Government has also recently proposed new fiscal targets and this new fiscal mandate requires a structural deficit, (borrowing unrelated to temporary weakness in the economy), below 2 per cent of GDP in 2020-2021.

The pronounced improvement in Ireland's public finances relative to the UK and Euro area is shown in Figure 2.3. With the budget deficit below the threshold of 3 per cent of GDP, Ireland formally exited the Excessive Deficit Procedure in May 2016. As a result, Ireland is now under the preventive arm of the Stability and Growth Pact. The preventive arm gives primacy to the structural balance – the budgetary position excluding one-off factors and taking account of the economic cycle. As a non-Euro member, the UK has been free to set its own fiscal and monetary policies, and unlike Ireland, could not face sanctions under the EU's fiscal rules. The UK did not participate in the recent developments put in place to strengthen the Euro, including the fiscal compact, Banking Union or the Euro plus pact.

Despite global geopolitical uncertainty, the cost of borrowing for European Governments is low by historical standards, partly due to the impact of non-conventional monetary policy on Euro area sovereign bond yields, reflecting improved economic and fiscal positions. Figure 2.4 shows Irish bond yield movements are now trading in line with core European sovereign yields and are below the rates for the Euro area 19 and the UK. In 2011 the yield on a ten year Irish government bond reached 14 per cent, now it has remained steady through 2016, trading at below 1 per cent.

Economic Forecasts

Following estimated GDP growth of 5.2 per cent in 2016 as shown in Table 2.1, the rate of expansion in Irish GDP is projected by the European Commission to moderate to 3.4 per cent this year. As an exceptionally open economy, heavily dependent on international trade and investment, Ireland's economic outlook is highly dependent on growth and demand levels in our major trading partners. As set out in its most recent Winter Forecast, the European Commission expects Euro area GDP growth of 1.6 per cent in 2017 and 1.8 per cent in 2018. US growth is forecast to pick up from 1.6 per cent in 2016 to 2.3 per cent and 2.2 per cent in 2017 and 2018, respectively. Following the recession, economic growth in the UK has also been strong since 2013. The impact of Brexit on UK economic growth has yet to be seen in terms of significant changes to output and the labour market. However, the uncertainty of the terms, timing and impact of Brexit has already led to reduced growth prospects, dampened business confidence and increased uncertainty, as reflected in downward revisions to growth and labour market forecasts.

Geo-political uncertainty, financial market instability, increased trade protectionism and volatility in exchange rates are also some of the many substantial downside risks that exist. Subdued trade, investment and productivity growth is also checking the momentum of the recovery in advanced economies, and the growth forecasts - particularly for those in the Euro area - reflect positive if moderate growth. In addition, inflation across the Euro area has recently picked up as energy prices have begun to increase after a prolonged spell of low prices. The price per barrel of Brent crude oil was \$55.49 in January 2017 compared with \$32.22 in January 2016¹⁸. While price increases are moderate in Ireland over the forecast horizon, inflation is expected to accelerate in the UK over the short term with headline rates edging towards the Bank of England's 3 per cent target by the end of 2018. The ECB's monetary policy approach has helped facilitate a low interest rate environment across the Euro area. In recent months the ECB has cut interest rates and continued its asset-buying programme to provide a boost to Euro area growth and stimulate inflation. A tightening of monetary policy in the Euro area would have implications for the costs of debt, stability and growth.

Table 2.1 Macroeconomic forecast, Ireland and the UK, selected indicators, 2016-2018

Macro Indicators	2016	2017	2018
Ireland GDP Growth (% y-o-y)	4.3	3.4	3.3
UK GDP Growth (% y-o-y)	2.0	1.5	1.2
Ireland Inflation (% y-o-y)	-0.2	0.9	1.0
UK Inflation (% y-o-y)	0.7	2.5	2.6
Ireland Unemployment (%)	8.0	7.0	6.7
UK Unemployment (%)	4.9	5.2	5.6

Source EU Commission Autumn forecast, February 2017

The long term impact of Brexit on the Irish Economy

While estimates of the potential loss to the UK economy arising from leaving the EU vary, and depend on the assumptions about the precise format that Brexit will take – the close trading ties between Ireland and the UK mean the long term prospects for Irish growth are likely to be significantly affected by the UK’s decision.

Research by the Central Bank projects that under the most adverse scenario, (where increased tariff and non-tariff barriers significantly reduce bilateral trade flows) the level of Irish GDP could be approximately 3 per cent below a no-Brexit baseline projection ten years after the UK leaves the EU¹⁹.

Research by the ESRI²⁰ under the joint Department of Finance and ESRI Research Programme on the potential macroeconomic impact of Brexit has modelled three different long term scenario as identified by the UK’s National Institute of Economic and Social Research (NIESR). The three Post Brexit scenarios outlined are:

1. A Norwegian-type solution whereby the UK becomes a member of the European Economic Area (EEA);
2. A scenario based on the UK agreeing a bilateral trade agreement with the EU along the lines of the EU/Swiss trade agreements, where trade in services is not free; and
3. A scenario where the UK exercises its rights under the Most Favoured Nation (MFN) clause of the World Trade Organisation (WTO).

The impact of these scenarios on the UK and other variables are incorporated into the ESRI’s COSMO model of the Irish economy to quantify the potential impact of Brexit over the ten years 2019-2029. In each scenario, the COSMO model projects the level of Irish output, exports and employment in 2029 is permanently below what it otherwise would have been in the absence of Brexit. The model projects that under EEA, EFTA and WTO, the level of Irish GDP (Gross value added at basic prices) decreasing by between 2.3 per cent and 3.8 per cent, the impact on the exporting sector is more severe than on the non-traded sector. The model projects exports could be between 3 per cent and 4.9 per cent lower and the level of wages and consumption could potentially be reduced by between 2.2 per cent and 3.4 per cent and 2.2 and 3.4 per cent respectively compared to a no Brexit baseline. The impact on numbers employed and the unemployment rate is also significant with unemployment potentially 1.9 per cent higher than under a no Brexit baseline.

Table 2.2 Impact of Brexit on Ireland in 2029, percentage change from baseline projections

<i>Percentage Deviation from Baseline Projection:</i>	EEA	FTA	WTO
Gross value added at basic prices	-2.3	-2.7	-3.8
Gross value added at basic prices, Traded sector	-2.6	-3	-4.3
Gross value added at basic prices, Non-traded sector	-2.3	-2.7	-3.6
Exports of goods and services	-3	-3.5	-4.9
Personal consumption of goods and services	-2.2	-2.5	-3.4
Employed persons	-1.2	-1.4	-2
Average wage €	-2.2	-2.5	-3.6
Personal savings rate, %	-0.3	-0.3	-0.5
Unemployment rate, %	1.2	1.4	1.9
General Government Balance, % GDP	-0.6	-0.8	-1

Source ESRI

3. Competitiveness and Exchange Rate Performance

- In recent years, the weak Euro exchange rate, low ECB interest rates, and low international fuel prices have driven improvements in Irish Harmonised Competitiveness Index (HCI) competitiveness. The nominal HCI appreciated by 3.8 per cent on a year-on-year basis to November 2016. The real HCI increased by 2.3 per cent when deflated with consumer prices, indicating a degree of diminishing Irish competitiveness.
- In 2016, the Euro strengthened and appreciated by 16 per cent against Sterling posing significant challenges for parts of the exporting sector reliant on trade with the UK, particularly the food sector, traditional manufacturing and areas of the economy sensitive to cross-border and online trade.
- Over the medium term, Brexit and the outlook for the UK economy means a level of Euro/Sterling at or above £0.85 is likely to be sustained. Further volatility and depreciation of the Sterling represents a major threat to Irish export competitiveness.

Harmonised Competitiveness Index

Much of Ireland's competitiveness narrative can be illustrated using Harmonised Competitiveness Indices (HCIs). The purpose of HCIs is to provide meaningful and comparable measures of countries' price and cost competitiveness that are also consistent with the real effective exchange rates (REERs) of the Euro. The nominal HCI is an effective exchange rate for the Irish economy that reflects, on a trade weighted basis, movements in the exchange rate vis-à-vis 56 trading partners. The real HCI (nominal deflated by consumer prices) takes into account relative price changes along with exchange rate movements. In Figure 3.1, an upward sloping line indicates a loss of competitiveness, whilst a downward sloping line indicates improving competitiveness. In recent years, the weak Euro exchange rate, low ECB interest rates, and low international fuel prices have all combined to improve Irish HCI competitiveness. Much of the fluctuation in Ireland's HCI competitiveness over recent years has been driven by changes in the Euro exchange rate with both Sterling and the US Dollar. Between 2012 and 2014, the nominal HCI deteriorated by proportionately more than the real HCI, suggesting that Euro exchange rates were the primary factor in Ireland's loss of competitiveness. From March 2014, renewed Euro depreciation provided a boost to Irish cost competitiveness, prior to the loss of competitiveness experienced in late 2015-early 2016, partially arising from the impact of a weakening Sterling. The latest HCI data for November 2016 show that the nominal HCI appreciated by 3.8 per cent on a year-on-year basis. The real HCI increased by 2.3 per cent when deflated with consumer prices. While both the nominal and real HCI are trading at relatively low historic levels, recent developments point to a decline in competitiveness.

Exchange rate developments

Exchange rate values have a significant impact on national competitiveness. Ireland has a relatively high share of trade outside the Euro area – meaning that Ireland is more exposed to the impact of exchange rate fluctuations: Ireland has the second highest ratio in the EU in terms of exports to non-Euro area countries (goods and services) relative to GDP. The last twelve months have seen significant movements in currencies, particularly Sterling which depreciated by 16 per cent against the Euro (using year-end values). Volatility in exchange rates can affect the Irish economy through a number of channels. It may generate expenditure switching effects between foreign and domestic goods both at home and in trade partners, thus affecting net exports. To the degree that nominal exchange rate changes are absorbed by importers/exporters rather than passed on through relative prices, exchange rate movements may also affect firms' profit margins, with possible second-round effects on investment. Goods and, in particular, services exports to and imports from the UK account for a significant share of Irish trade. The UK is the top export destination for Enterprise Ireland (EI) supported companies. In value terms, 37 per cent of EI clients' exports are to the UK. The value of the Euro against Sterling is, therefore, critical for Irish exporters, particularly those in employment intensive sectors such as the agri-food sector which remain very dependent on strong trading activity with the UK.

To assess the overall strength or weakness of a currency, multilateral exchange rates are used. Real effective exchange rates (REERs) take account of the exchange rate of a currency vis-à-vis a range of other currencies weighted by their share in world trade and price level changes between countries. The REER is considered the most appropriate indicator to assess changes in the competitive position of a country. Figure 3.2 shows the effect of the appreciation of the Dollar and the recent depreciation of Sterling. Low rates of inflation and the depreciation of the Euro served to strengthen the competitiveness of Euro area exporters. These movements benefited countries such as Ireland that have high levels of trading activity with the US and the UK. Since mid-2015, the differential vis-à-vis the Euro area, Ireland and the UK has narrowed as the value of the Sterling exchange rate fell.

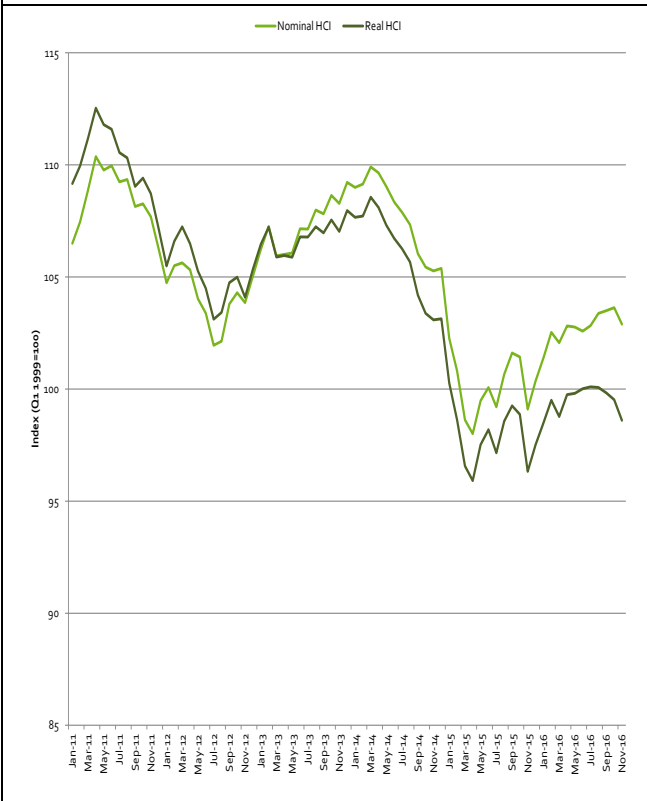
A favourable exchange rate vis-à-vis our main trading partners makes firms based in Ireland more cost competitive and allows them to trade more effectively in international markets. In particular, the value of the Euro against the US Dollar and Sterling is intrinsic to export cost competitiveness. As a result of the scale of Ireland's non-Euro denominated trade, (i.e. with the UK and US), Euro exchange rates have a greater impact on our relative international competitiveness than is the case in many Euro area countries. Exchange rate appreciation has also acted as a source of deflation in the second half of the year as the sharp appreciation of the Euro/ Sterling exchange rate passed through to Irish consumer prices.

Figure 3.3 shows that over the past five years, the value of the Euro relative to Sterling and the Dollar has fluctuated considerably. While the fall in Sterling has been rapid, the Euro was weak relative to Sterling for much of 2013-2015. The average value of Sterling in this time period was £0.86 and ranged from £0.69 to £0.90. Through the first nine months of 2016, the Euro had appreciated moderately against the US Dollar. However, in recent months this trend has reversed. For 2016 as a whole, the Euro depreciated by 3.3 per cent against the Dollar; closing at \$1.05. In recent months the Euro strengthened and appreciated by over 14 per cent against Sterling amid concerns related to Brexit.

Figure 3.4 shows that over the past year there has been a pronounced fall in the value of Sterling against the Euro. Following the EU referendum, the value of Sterling against the Euro fell sharply and in October and November 2016 it was above £0.90. In the six months since Brexit the value of Sterling has averaged £0.86 compared to £0.77 in the 6 months leading up to the vote. Sterling now appears to have fallen into a relatively settled position, ranging from €1 to £0.84-0.86 well down from the post referendum peak of €1 to £0.90. This is a return from levels seen in 2013 but significantly higher than the favourable rate of exchange for Irish exporters which existed over the period 2014-2016. The Euro's appreciation relative to Sterling above £0.90 would pose significant concerns for parts of the exporting sector reliant on trade with the UK, especially the food and traditional manufacturing sectors and areas of the economy sensitive to cross-border and online trade.

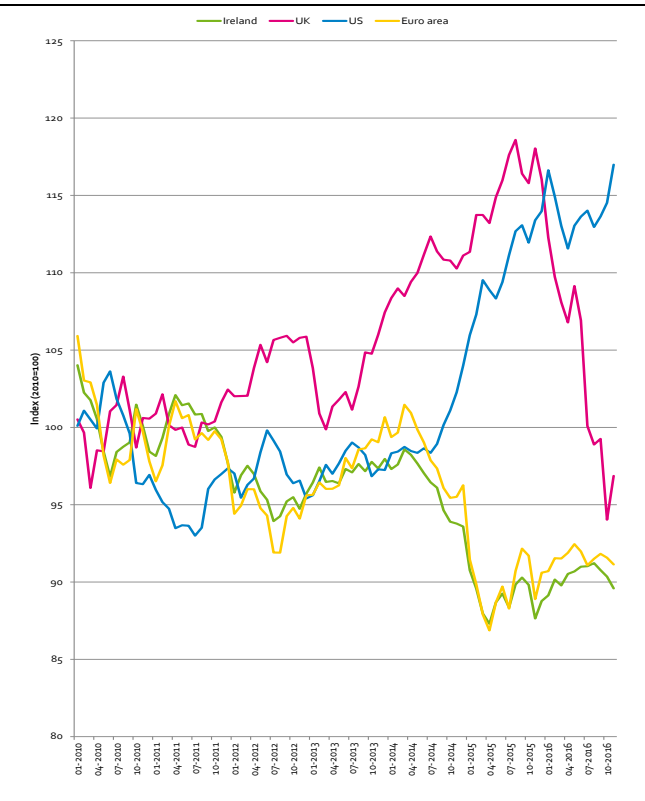
The factors affecting the value of the Euro are complex. International capital flows, investor sentiment, economic performance, market conditions as well as monetary and fiscal policy at EU, ECB and global levels have substantial effects on exchange rate value and volatility. Over the medium term, Brexit and the outlook for the UK economy means a level of Euro/Sterling at or above £0.85 is likely to be sustained. However, further volatility and depreciation of the Sterling remains a clear threat to export competitiveness. Irish policymakers cannot influence exchange rates, and the trade performance of our small open economy will always be conditional on the ebb and flow of global markets. However, a competitive, sustainable, cost base can help to create a virtuous circle between inflation, wage expectations and productivity, and can provide a buffer against such exchange rate fluctuations and other uncontrollable, external factors. While continuing to maximise export opportunities from established markets, policies which facilitate the development of more diverse export markets can help reduce exposure to bilateral exchange rate fluctuations. Irish based exporters selling to markets outside the Euro area and those reliant on one market, such as the UK, need to implement appropriate strategies to mitigate further adverse exchange rate developments.

Figure 3.1: Harmonised Competitiveness Indicator



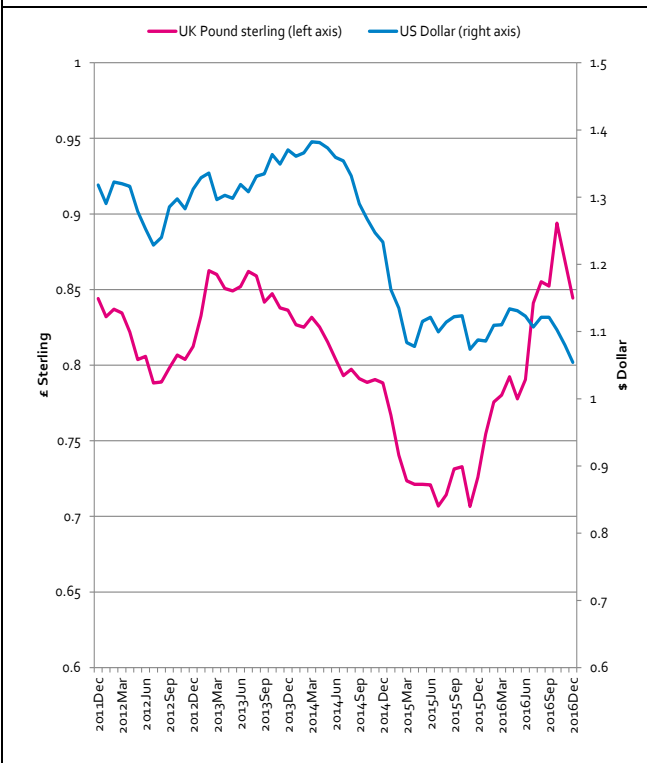
Source: Central Bank of Ireland

Figure 3.2: Real Effective Exchange Rates



Source: Bank of International Settlements

Figure 3.3: Euro/Sterling & Euro/Dollar Exchange Rates



Source: ECB

Figure 3.4: Euro/Sterling Exchange Rate



Source: ECB

4. Trade

- Ireland's ability to achieve sustainable growth is dependent on our ability to trade internationally. EU membership has been, and remains, integral to Ireland's pursuit of export-led growth.
- Ireland has substantial intra and extra-EU trade links. The UK accounts for 11 percent of Goods exports and 19 per cent of Services exports. At the sectoral level, a number of employment intensive sectors dominated by indigenous SMEs are highly reliant on trade with the UK. These include Agri-Food and Traditional Manufacturing. The UK is a key market for FDI exports, particularly chemicals, ICT, Financial Services and Irish tourism. The UK is Ireland's foremost aviation and maritime transport partner.
- Brexit related tariff and non-tariff barriers where Irish exports are concentrated would have very significant implications on export competitiveness and trade and transport logistics. The specific effect of Brexit on trade is as yet unclear and will be determined by the terms and conditions of the UK's exit and in particular the new trade deal which will emerge. To maintain competitiveness Irish enterprise must evolve into new products, markets and sectors, whilst maintaining the competitive advantages we enjoy in existing ones.

Trade Flows

Notwithstanding the immediate impact of currency volatility, the longer term effects of Brexit on Ireland's export economy is as yet unclear and will be determined to a large extent by the terms and conditions of the UK's exit and in particular the new trade deal which will emerge. The application of tariff and non-tariff barriers on the products or sectors where Irish exports are concentrated would have very significant implications on export growth and employment. As a small open economy, Ireland's ability to achieve sustainable growth is dependent on our ability to trade internationally. Ireland is a highly globalised economy - our share of global trade is greater than our size might suggest. World Trade Organisation²¹ data shows that Ireland accounted for 0.7 per cent of Global Exports in 2015 up from 0.6 per cent in 2014. The US and the UK accounted for 9.1 per cent and 2.8 per cent respectively. Services now account for approximately half of total Irish exports, and the increasing proportion of exports accounted for by services has been more rapid in Ireland than for global services trade as a whole. Ireland has expanded its share of the world's services market, accounting for 2.7 per cent of global exports in 2015 up from 2.2 per cent in 2005. The corresponding UK figure is 7.6 per cent.

EU membership has been and remains integral to Ireland's success in export led growth. As an EU member state Ireland is integrated into the world's largest trading block, and offers access to the world's largest single market with transparent rules and regulations and an established legal framework. Ireland has substantial intra-EU trade links. CSO data shows that in 2016, 51 per cent of total goods exports (€59,561 billion) were exported to the EU, of which 70 per cent were destined for Euro area markets. Over a third of goods exports go to two countries outside the Euro area (i.e. the US, 25.8 per cent and the UK 11.5 per cent).

While exports to markets outside of these key markets have grown in recent years, Irish exports, particularly goods exports to the UK tend to be concentrated in a small number of sectors and products. The UK market is particularly important for Agri-Food (e.g. dairy, and food related produce) and Traditional Manufacturing sectors (e.g. building materials, basic materials, textiles), which are particularly exposed to the negative impacts of a changed trading relationship. Figures 4.1 and 4.2 set out the most recent annual data on Ireland's trading activity in Goods and Services classified by country. In value terms, the five biggest markets for Irish goods exports are the US, Belgium, UK, Germany and Switzerland. The most important sources of imports for Ireland are the UK, US, France, Germany and China. Ireland runs a goods trade surplus with its major export partners with the exception for the UK and France. The UK accounts for the largest single share of Irish imports (22.3%). Exports to countries such as Canada, Mexico, Australia, China, Japan and Saudi Arabia have increased in value and share terms over the last five years. However,

Benchmarking Competitiveness: Ireland and the United Kingdom, 2017

Ireland's trade remains dependent on the EU, US and UK. As a share of exports and imports, the UK remains a key trading partner but its relative share in total exports and imports has declined in recent years. Import share decreased from 29 per cent in 2010 to 22 per cent in 2016. The UK's share of total goods exports was 13.9 per cent in 2010 and 11.3 per cent in 2016. Figure 4.2 shows in value terms, the five biggest markets for Irish services exports are the UK, US, Germany, Italy and France. The most important sources of imports for Ireland are the US, Netherlands, UK, Luxembourg, Switzerland and France. The UK accounts for 19 per cent of total services exports. The CSO report that in 2015 the largest increases in services exports were to Germany (€0.8bn) and France (€0.7bn) comprising mainly of Computer services. Increases in exports to Spain (€0.7bn) and Italy (€0.5bn) were largest in the Tourism and Travel and Insurance services categories respectively. Service exports to Asia also increased by €4.5 billion, mainly in Computer services, with exports to China up €2 billion year on year.

Figure 4.3 shows the composition and range of goods exported from Ireland and the UK as a percentage of total EU exports. Ireland accounts for approximately 17 per cent of insurance and pension services exports, 5 per cent of total EU exports in financial services and 6 per cent for charges for Intellectual property use. Reflecting our large base of ICT enterprises, Ireland accounts for almost 25 per cent of total EU services sector exports. The UK's dominant position in the financial and insurance sectors is evident, accounting for 38 per cent and 41 per cent of total EU exports in these sectors respectively. The EU remains an important trading partner for the UK, but the importance of other markets outside the EU has been increasing in relative terms. The UK imports more from the largest Member States than the UK exports to them. With the exception of Ireland, the UK's trade balance with other EU Member States is close to zero or negative. The contribution of services to trade in Ireland is one of the largest among OECD economies, reflecting Ireland's specialisation in services activities. The services share of inward investment is also high.

The composition of Goods and Services exports

Table 4.1 details the composition by commodity of Ireland's current Goods and Services trading activity in total and to the UK. Goods exports totalled €116,916 million in 2016, the highest annual total on record, according to preliminary CSO trade figures²². This is an increase of €4,508 million (4%) over 2015. Imports in 2016 decreased by €507 million (-1%) to €69,604 million compared with 2015. The preliminary trade surplus for 2016 was €47,312 million, however, Ireland imports more from the UK than it exports and the trade deficit was -€2,235 million.

Examining the stock of export trade shows 57 per cent of all goods exported in 2016 are in the category Chemicals and related products with 6 per cent of these exports going to the UK. 16 per cent were in the category Machinery and transport equipment and 11 per cent of these goods went to the UK. Miscellaneous manufactured articles accounted for 12.5 per cent of exports with 8 per cent of these goods exported to the UK. Food and live animals accounted for 8.6 per cent of all goods exported from Ireland in 2016 with 37 per cent of goods in this category went to either Great Britain or Northern Ireland.

While Ireland's export reliance on the UK has been diminishing it remains one of our largest trading partners accounting for approximately 11 per cent and 24 per cent of goods exports and imports respectively. In 2016 €13,314 million of goods were exported to UK with approximately 60 per cent in 2 categories - Food and live animals and Chemicals and related products. The third main category of goods exported to the UK was Machinery and Transport Equipment which accounted for 16 per cent of export to the UK. Principal imports from the UK were Gas, Petroleum, Petroleum products & related materials and Miscellaneous manufactured articles. In terms of annual growth trends in 2016, the CSO data shows the largest increase in exports was in Machinery and Transport (13%) which increased by €2,200 million driven by an increase in electrical related machinery. Chemicals and related products increased by 3.4 per cent. Goods exports to the UK decreased by €496 million (-4%) to €13,314 million in 2016 compared with 2015, while imports from the UK decreased by €1,354 million (-8%) to €15,549 million in the same period. On a year-on-year basis, the value of exports to the UK decreased in Machinery and Transport Equipment (-15%) and Food (-5.5%) categories.

Benchmarking Competitiveness: Ireland and the United Kingdom, 2017

Table 4.1 Goods Exports and Imports classified by commodity, €million, 2016

	Total Exports	Exports to UK	UK % of Total	Total Imports	Imports from UK	UK % of Total
Food and live animals	10,073	3,697	37%	6,658	2,761	41%
Beverages and tobacco	1,330	223	17%	906	318	35%
Crude materials, inedible, except fuels	1,531	376	25%	822	148	18%
Mineral fuels, lubricants and related materials	661	436	66%	3,743	2,040	55%
Animal and vegetable oils, fats and waxes	78	11	14%	245	46	19%
Chemicals and related products	66,440	4,010	6%	14,964	2,376	16%
Manufactured goods classified chiefly by material	2,137	927	43%	4,787	1,735	36%
Machinery and transport equipment	19,008	2,173	11%	27,323	2,971	11%
Miscellaneous manufactured articles	14,658	1,130	8%	8,221	2,222	27%
Commodities and transactions not classified	336	332	99%	376	933	248%
Total	116,916	13,314	11%	69,604	15,549	24%

Source CSO

Table 4.2 Services Exports and Imports classified by commodity, €million, 2015

	Exports	(to UK)	UK % of Total	Imports	(from UK)	UK % of Total
Transport	5,936	4,753	80%	2,489	603	24%
Tourism and travel	4,320	851	20%	5,121	1,137	22%
Communications	668	149	22%	1,021	... ²³	...
Insurance	10,300	2,562	25%	7,090	1,660	23%
Financial services	11,042	3,786	34%	6,991
Computer services	57,409	6,933	12%	916	121	13%
Royalties/licences	6,723	305	5%	67,765	611	1%
All business services	21,958	3,118	14%	57,902	6,001	10%
Other services not elsewhere stated	2,139	998	47%	266	64	24%
Services total	121,605	23,535	19%	150,963	12,054	8%

Source CSO

CSO data for 2015 shows Ireland exported €121,605 million in services with approximately 19 per cent going to the UK. The largest components of export trade were Computer services at €57,409 million (47% of total exports) and Business services at €21,958 million (18%). Financial Services and Insurance accounted for 9 per cent and 8.4 per cent of exports. Transport and Tourism account for 4.8 per cent and 3.5 per cent. In absolute terms, the largest components of exports of services to the UK were Computer services, Financial Services and Business services. Ireland exports more services to the UK than it imports. As a share of total exports to the UK, they are highest in Transport (80%), Financial Services (34%), Insurance (25%), Communications (22%) and Tourism and Travel (20%). Ireland's tourism and hospitality sector is employment intensive and heavily dependent on UK trade. Of the 9.3 million overseas trips to Ireland in 2015, 41 per cent were made by UK residents. Trips by UK residents to Ireland increased by 10.6 per cent in 2016.

Market Restrictiveness

Figure 4.4 shows 2015 results from the OECD's Service Trade Restrictions Index (STRI) which helps identify policy measures which restrict trade. The STRI indices take the value from 0 to 1, where 0 is completely open and 1 is completely closed. Ireland has a lower score on the STRI than the average in all 22 sectors examined by the OECD. Ireland outperforms the UK in every sector with the exception of Legal, Air Transport and Distribution.

Transport and Logistics

The ability to move goods cost and time-efficiently to markets is fundamental for international trade, particularly in the short-life agri-food and fisheries sectors which depend on rapid transit to markets. The treatment of goods passing through the UK on their way to and from Ireland also bears consideration (i.e. whether additional tariffs or custom duties are applied to such goods), as does the impact of Brexit on the freight sector. A survey conducted by the Irish Exporters Association²⁴ in June 2016 highlights the importance of trade traffic to and from the UK. 42 per cent of their members import raw materials from the UK, 71 per cent export finished products to the UK and 56 per cent transit products through the UK on their export journey to either continental Europe or further afield.

CSO data shows that the UK is the destination for 50 per cent of all maritime goods exports and 88.4 per cent of roll on/roll-off freight traffic. Of the total amount of goods received at Irish ports in 2015, a third arrived from the UK. The proportion of exports varies depending on the type of cargo involved. 85 per cent of roll-on/roll-off traffic arrived from the UK while 41 per cent of liquid bulk originated in the UK. The implications of extra administrative costs and tariffs, standards and regulations and customs on the transport of goods exports between Ireland and the UK could negatively impact on indigenous exporters' supply chains, and their capacity to competitively price products, not only in the UK but domestically and in other international markets.

The World Bank's Ease of Doing Business Report reports the border compliance times for both exporting and importing and the costs associated with border compliance for exports from Ireland are higher than the UK (See chapter 1). The World Bank's Logistics Performance Index²⁵(LPI) uses survey data²⁶ to measure and benchmark performance along the logistics supply chain within a country. The most recent LPI results for 2016 rank Germany as the best performing country in terms of the efficiency of its international trade, shipment and supply chain logistics quality. Germany's score on a scale from 1 to 5 is 4.23. The UK is ranked 8th (out of 160 countries) with a score of 4.07. Ireland is ranked 18th with a score of 3.79.

The LPI benchmarks performance in six components and Ireland lags the UK in all but one component:

1. The efficiency of customs and border management clearance (UK 5th, Ireland 25th)
2. The quality of trade and transport infrastructure (UK 5th, Ireland 22nd)
3. The ease of arranging competitively priced shipments (UK 11th, Ireland 10th)
4. The competence and quality of logistics services (UK 7th, Ireland 20th)
5. The ability to track and trace consignments (UK 7th, Ireland 16th)
6. The frequency with which shipments reach consignees within scheduled delivery times (UK 8th, Ireland 29th)

Sectoral exposure

Irish exports, particularly indigenous SME goods exports to the UK tend to be concentrated in a small number of sectors and a small number of products. Table 4.1 shows the UK accounts for 37 per cent and 41 per cent of Food and live animals exports and imports respectively. The UK accounts for 43 per cent of exports and 36 per cent of imports in the category manufactured goods classified chiefly by material, including products such as leather, cork and wood, textiles and rubber. This narrow base means that Irish exporters may be more vulnerable to sector-specific trade barriers or tariffs or to any other developments such as a loss of cost competitiveness which weaken our relative export

competitiveness. The principal exported goods to the UK are Meat & meat preparations, Medical & pharmaceutical products, Organic chemicals and Dairy & eggs.

At the sectoral level, research published by the Department of Finance²⁷ (2016) identified a number of mainly indigenous sectors comprised of SMEs that are highly reliant on trade with the UK. These include: Food and Beverages, Electrical Equipment, Materials Manufacturing and Traditional Manufacturing. Using Census of Industrial Production (CIP) data the research shows these sectors are highly dependent on the UK both as a destination for exports and for turnover. Over 40 per cent of turnover in food and beverage, traditional manufacturing and electrical equipment comes from indigenous companies and almost 70 per cent in the materials manufacturing sector. These sectors also import intermediate goods from the UK. Sectors that trade in bulky goods (i.e. high volume/low value products) tend to be most affected by the introduction of trade tariffs. It is not clear at this juncture what the trading relationship between the EU and the UK will look like. Access to the EU market for non-members can take a number of forms ranging from regional free trade deals, country specific negotiated agreements or the application of the World Trade Organisation (WTO) tariff schedule which applies to non-members without a specific trade agreement under WTO rules. Recent research by the ESRI²⁸ models a WTO scenario for post-Brexit UK-EU trade. Combining these tariff-induced price increases with elasticity response estimates, the EU's exports to the UK would fall by 30 per cent representing a 2 per cent reduction in its total world trade. The UK's exports to the EU would fall by 22 per cent with total trade declining by 9.8 per cent. The ESRI paper shows considerable heterogeneity in sectoral and country-level impacts largely owing to the different existing tariff rates which apply to each sector, the existing composition of trade flows and price elasticity. In terms of share of goods exports to the UK, Ireland (13.7%) is amongst EU member states most reliant on the UK market and would be the most exposed, potentially losing 4 per cent of total exports in a scenario where WTO tariffs were introduced. The ESRI estimate that Food (Meat, Dairy, Processed Foods and Cereals) and textiles trade would be the hardest hit, with trade in these sectors reducing by up to 90 per cent. As noted by the Department of Finance²⁹, services sectors would not be affected by trade tariffs to the same extent as some of the most exposed manufacturing sectors. Certain services sectors such as the indigenous tourism and hospitality sector will be equally exposed to the competitiveness challenges posed by Brexit particularly depreciation of Sterling vis-à-vis the Euro. Given that up to 40 per cent of our agri-food products were exported to the UK, Brexit reinforces the need for Ireland to continue to diversify and seek growth opportunities into other markets in order to minimise our dependence on any one sector or market.

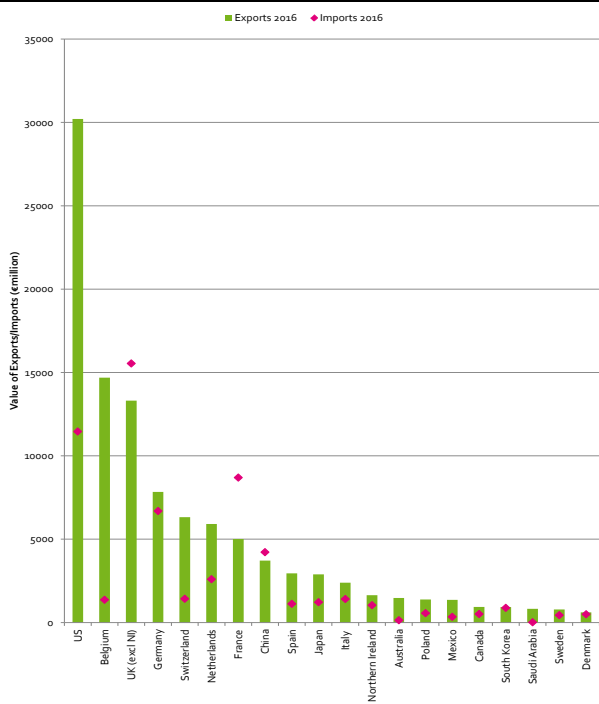
Product and Market Diversification

Export diversification strategies can help economies militate against economic shocks. The World Bank defines export diversification as the change in the composition of a country's existing export product mix or export destination or as the spread of production over many sectors. Economic complexity research proposes that countries grow by expanding their knowledge and capability base, enabling them to diversify into new products, industries and economic activities. The theory suggests that it is not the volume of products which a country exports that is the key, it is the type or sophistication of those products. Highly developed countries export products that are more complex: those requiring rare capabilities and inputs processed by only a handful of economies. In recent years the range of manufactured products that Ireland has exported competitively (i.e. the number of products exported with a Revealed Competitive Advantage-RCA) has been shrinking. Since 1995, Ireland has specialised, exporting fewer and fewer products with RCA. It has fallen from over 200 to under 130³⁰. Increasing the range of exported goods and services by developing competence in new and emerging sectors would reduce Ireland's exposure to demand led external shocks. Supporting the internationalisation and market diversification of Irish enterprise will contribute to making the economy more resilient to external market shocks such as Brexit. Exporting also fuels the domestic economy and delivers more sustainable job opportunities than could otherwise be achieved by an economic model dependent on

consumption or government expenditure. The Council has for some time emphasised the importance of Irish enterprise evolving into new products, markets and sectors, whilst maintaining the competitive advantages we enjoy in existing ones. This message has acquired further urgency in the context of shifting global growth patterns and new trade dynamics post Brexit. Research by the ESRI³¹ estimates the median number of products exported by Irish owned firms (4) is low relative to foreign-owned firms (11). The median number of destination countries per firm is 3 for indigenous firms, the UK being their main export market, and 12 for foreign firms.

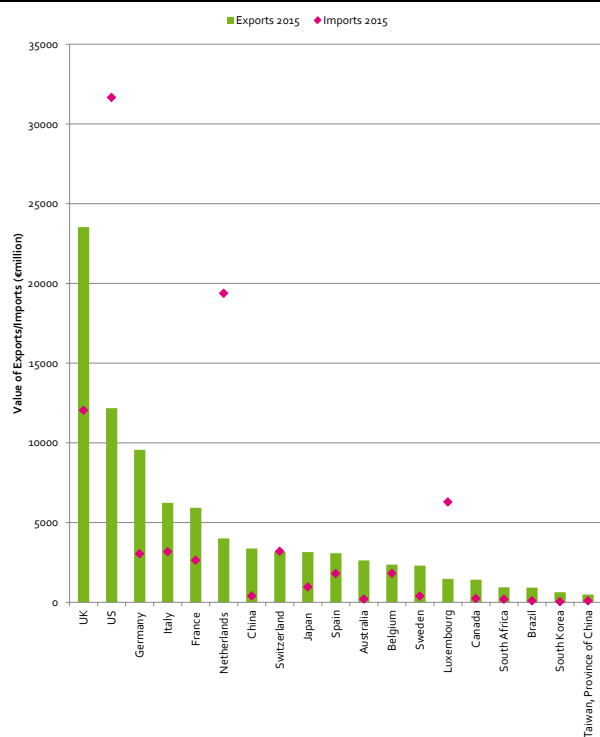
Market diversification presents opportunities for SMEs in international markets but sustainable internationalisation is a significant challenge. There has also been a marked increase in exports to newer markets by the client companies of Enterprise Ireland between 2009 and 2015. The UK remains the largest export market, for companies supported by Enterprise Ireland but exports to the UK as a proportion of total client exports has declined from 44 per cent in 2009 to 37 per cent in 2015, as more companies have diversified their export strategies into the Euro area, the USA and high growth markets including China, India, the Gulf and Brazil. Brexit means further company-led expansion into new markets and a deepening of trade links with the world's leading emerging economies is likely to be required³². Entering new and emerging markets presents Irish enterprises with challenges in terms of their institutional environment, language, and distance related overheads such as transport. Experience suggests, not all exporters will be in a position to successfully diversify without State support. While Irish exporters are heterogeneous, there are a number of common internal and endogenous factors affecting their ability to export which Brexit is likely to intensify. Internal obstacles can include the lack of managerial skills and qualified/experienced staff; access to finance constraints and limited presence in foreign markets. Endogenous factors include language barriers, tariffs and quotas, rules of origin, IP enforcement and exposure to exchange rate fluctuations. Non-tariff measures such as standards compliance, licensing procedures may also affect SMEs disproportionately due to fixed compliance costs and the inability of small companies, particularly start-ups to absorb costs. SME exporters may also suffer from relatively higher costs and challenges than larger exporters due to economies of scale. The costs of entering and establishing in high-growth markets may in some cases exceed the fixed costs of entry and consolidation in established markets.

Figure 4.1: Irish Goods Trade by Country 2016



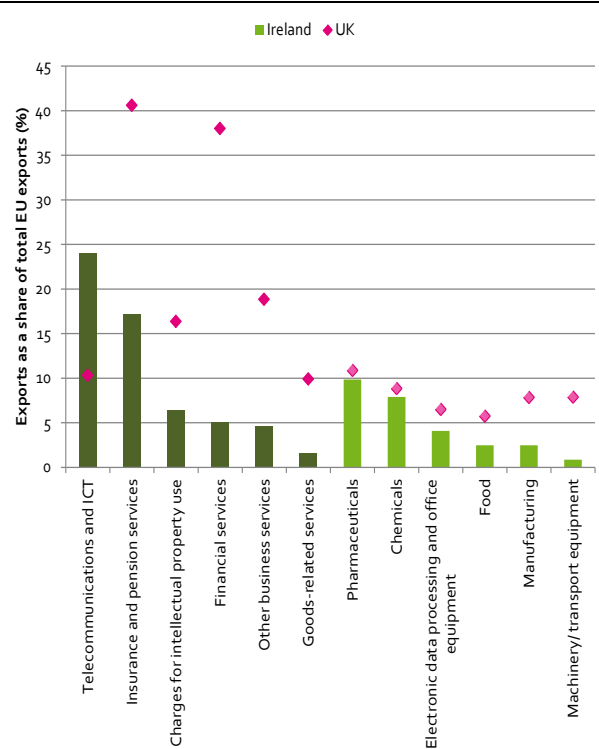
Source: CSO

Figure 4.2: Irish Services Trade by Country 2015



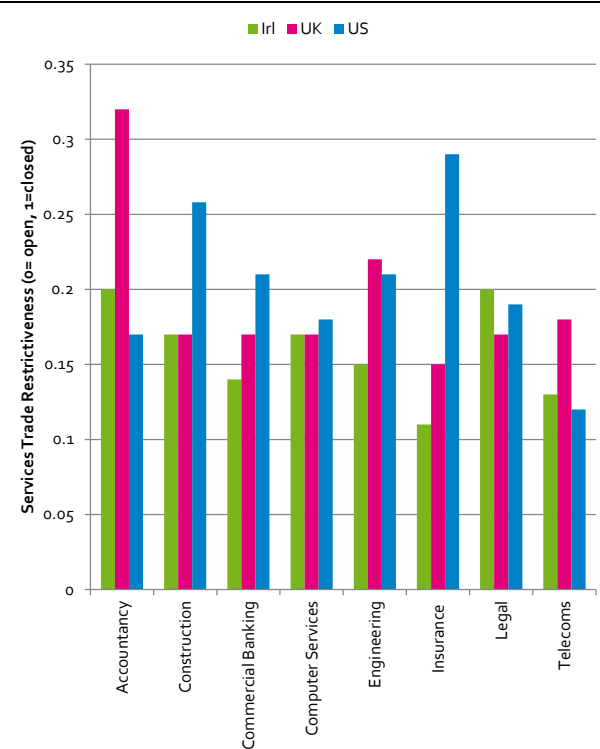
Source: CSO

Figure 4.3: Share of EU Services and Goods Exports 2015



Source: WTO

Figure 4.4: Services Trade Restrictiveness Index 2015



Source: OECD

5. Enterprise and Entrepreneurship

- The performance of the indigenous enterprise sector is critical to economic growth and employment. Ensuring the environment for enterprise supports start-ups, and developing a cadre of firms of sufficient scale and capability to succeed in international markets is integral to competitiveness.
- In both Ireland and the UK, SMEs account for approximately 99 per cent of the total enterprise population in 2014/2015. The majority of enterprises operate in the services sector. In Ireland, SMEs account for nearly 69 per cent of total persons engaged.
- The proportion of self-employed in Ireland (14.9%) is above the level in the UK (13.6%) and the Euro area average (14.2%). At 4.5 per cent, the proportion of self-employed persons with employees is almost double the level in the UK (2.3%).
- It is estimated that 67 per cent of all new job-creation comes from businesses in the first five years of existence. The 5-year survival rate of enterprise births was 61.4 per cent in Ireland and 41.7 per cent in the UK. The 1-year survival rate in Ireland was 84.7 per cent and 93.5 per cent in the UK.

The Environment for Enterprise and Entrepreneurship

Supporting enterprise and entrepreneurship is an essential component of increased competitiveness. While no single policy intervention can be expected to generate critical impact on the environment for enterprise or increasing start up levels, various coordinated interventions taken together can combine to create an environment that facilitates the creation of start-ups of scale. This requires institutional arrangements that facilitate efficient firm entry, growth, and exit. In addition, improving the administrative and regulatory environment and well-developed capital markets for seed and early stage finance; bankruptcy laws that do not excessively penalise failure; and low entry barriers to entrepreneurship are fundamental for enterprise growth. Assessing the relative quality of a country's enterprise and entrepreneurial environment is difficult; however two international benchmarks usefully highlight Ireland's performance.

The European Commission's annual Small Business Act (SBA) report benchmarks regulatory trends and national policies which affect entrepreneurs and SMEs across Europe. The SBA assesses elements such as entrepreneur supports, State Aid, procurement, education and training, female entrepreneurship, bankruptcy procedures, support services and the operational environment for business creation. In 2016, Ireland maintained its competitive SBA profile. In five of the SBA's principle areas — Entrepreneurship, 'Second chance', 'Responsive administration', Single market and Skills and Innovation — the European Commission reports that Ireland performs well above the EU average and is among the top three performers in the EU. In three other areas — State aid & public procurement, Access to finance and Environment — it performs on a par with the EU average. In the area of internationalisation Ireland is behind the EU average, however, the Commission attribute this to technical reasons.

The UK's profile reflects the country's very business-friendly environment. Specific strengths are the areas of 'Second chance', 'Responsive administration', Access to finance, and Skills & innovation. In all of these areas the UK is among the top performers in the EU. State aid & public procurement and Environment are the only SBA areas where the UK trails the EU average. In each case, the reasons for the relatively weak performance are very specific policy issues. In the case of public procurement, it is the low proportion of SMEs involved in public tendering, while in Environment there was a steep fall in the share of SMEs receiving public support for investment in resource-efficiency.

The Global Entrepreneurship & Development Index (GEDI) is an international benchmarking of entrepreneurial ecosystems based on analysis of indicators relating to entrepreneurial attitudes, aspirations, and activity³³. The 2017 GEDI identifies the US as having the most developed entrepreneurial system in the world. Ireland's performance in this Index has improved in recent years from 19th in 2014 to 9th in 2016, out of 75 countries, with the UK 8th (Ireland is

4th and the UK 3rd in the EU respectively). The analysis shows Ireland is performing relatively well in overall terms, with particular strengths in human capital. Relative to the UK, Ireland is regarded as better in such areas as start-up skills, internationalisation and product and process innovation. The UK is a stronger performer in technology absorption, cultural support and networking.

The European Commission's Survey on the access to finance of enterprises (SAFE) sheds light on the varied set of potential problems enterprises may encounter, and which problems are considered most pressing. The most recent survey covers the period April to September 2016 and in Ireland, the UK and most other European countries the following are the most pressing problems encountered:

- The urgency of finding customers is consistently cited by SMEs. Some 29 per cent of Irish SMEs consider this the most pressing problem. The corresponding figure in the UK is 30 per cent.
- The second most pressing problem in Ireland is the availability of skilled staff or experienced managers cited by 14 per cent of SMEs, compared with 19 per cent in the UK.
- Access to Finance is the most pressing problem for 12 per cent of Irish SMEs compared to 6 per cent in the UK.
- Competition remains an important problem in the experience of SMEs (12% in both the UK and Ireland).
- Regulation and the costs of production or labour are considered among the most pressing problems by 12 per cent respectively in Ireland and the UK.

In the SAFE survey an enterprise is considered to be an exporter when at least some percentage of its turnover is accounted for by exports of goods or services. In 2016, 41 per cent of all SMEs in the EU28 were exporting enterprises. It is notable that both Ireland and the UK are behind the EU28 average in this metric, (38% and 39% respectively). The proportion of exporting SMEs is relatively high in small-sized countries, such as Slovenia, Estonia and Luxembourg.

In both Ireland and the UK, SMEs account for approximately 99 per cent of the total enterprise population in 2014/2015. In Ireland, SMEs account for nearly 69 per cent of total persons engaged, compared with 60 per cent in the UK. Approximately 90 per cent of enterprises in the Irish business economy are micro-enterprises. Micro and small firms are involved in a broad spectrum of sectors and activities; including: software, medical technologies, food production, digital content, tourism, retail and wholesale, business, professional and personal services – many of which while low in terms of export share and value added components are strong generators of employment. The most recent comparable EU data, 2013, shows that 51 per cent of active enterprises in Ireland operate in the services sector. This proportion is higher than the EU average (46.5%) but lower than the UK (57%). The services sector is also the UK's largest sector of active enterprises. Ireland had the largest percentage share of active enterprises in the EU at 20 per cent compared with 15 per cent in both the UK and the EU. The proportion of enterprises active in manufacturing in Ireland and the UK is the same (7%).

Trading On Line

CSO/Eurostat data shows Ireland is one of the best performing countries in Europe in terms of SMEs trading on line.

In 2016, 30 per cent of Irish enterprises reported e-Commerce sales compared with 22 per cent in the UK and an EU-28 average of 20 per cent. 31 per cent of Services enterprises reported e-Commerce sales which accounted for 38 per cent of total turnover for that sector. The Manufacturing sector reported 36 per cent of enterprises had e-Commerce sales which accounted for 31 per cent of all sales generated in that sector.

Despite being a comparatively strong performer, growth in online sales is coming from a very low base. There would appear to be considerable scope for more rapid growth in digital trade, particularly amongst SME and micro-enterprises.

Entrepreneurship and Ease of Starting a Business

A continuous flow of new business start-ups that can survive and thrive in international markets strengthens the enterprise base not only through the creation of new businesses, products and services but also by stimulating improved performance in existing businesses. Supporting entrepreneurship is critical to increasing employment and productivity growth. It is estimated that 67 per cent of all new job-creation comes from businesses in the first five years of existence and start-up firms are a key driver of productivity³⁴.

Figure 5.1 examines the number of self-employed persons and those self-employed who also have employees (as a proportion of total employment). The proportion of self-employed in Ireland remains slightly below pre-recession levels (from 15.1% to 14.9% in 2015), but remains above the level seen in the UK (13.6%) and the Euro area average (14.2%). It is estimated that 67 per cent of all new job-creation comes from businesses in the first five years of existence. At 4.5 per cent, the proportion of self-employed persons with employees is almost double the level seen in the UK (2.3%).

Analysis by the World Bank shows that Ireland has a relatively supportive environment for starting a business compared with many of our international competitors. Ireland has improved its ranking in terms of Ease of Starting a Business to 10th with the UK in 16th place. Reforming the requirements for starting a business is by far the most common area for reform and international competition is intense. Ireland improved its ranking by 9 places in 2017. Figure 5.2 shows Ireland outperforms the UK and the US with regard to the number of procedures involved and administrative costs of starting a business but lags in terms of time taken to start a business.

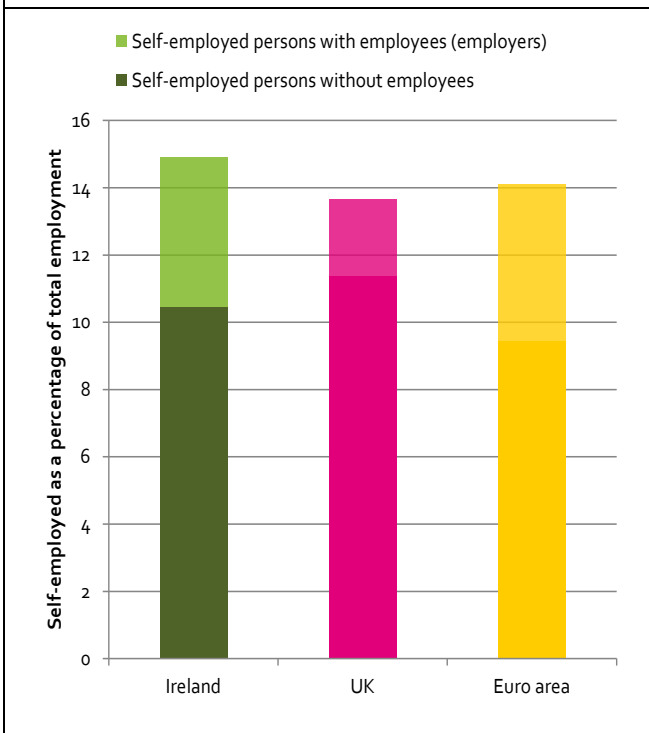
Enterprise Births and Survival Rates

Enterprise births are when an enterprise starts from scratch and commences activity. Enterprise creation can be considered an enterprise birth if new production factors, in particular, new jobs, are created. Births do not include entries into the population due to mergers, break-ups, split-off or restructuring of a set of enterprises or from a change of activity. There were 16,256 new enterprise births in Ireland 2014, (employing 19,382 persons) an increase of 17.6 per cent on 2013 which is high in an EU context and compares favourably to the UK rate of 14.3 per cent. In broad industry terms, the majority of births in both jurisdictions are in services. Figure 5.3 shows that at sectoral level, the rate of enterprise births is highest in Ireland in construction (42% compared to 15% in the UK). The Irish birth rate is higher in the transport sector and at 15 per cent the birth rate in professional services is the same in Ireland and the UK. UK Birth rates are higher than Ireland in the retail, food and accommodation services, manufacturing and ICT sectors.

Simply measuring the number of individual entrepreneurs or company incorporations is insufficient. Policies that fail to consider the quality of entrepreneurial activity are not likely to succeed. The 5-year survival rate also underlines the importance of policies which support start up activity being accompanied by complementary approaches which facilitate new firms surviving and scaling. Figure 5.4 sets out data on the survival rates of enterprise births followed for 5 years (2009 to 2014) and followed for 1 year (2013-2014) to assess their survival rate. In Ireland, over 29 per cent of all enterprises that were active during 2014 began trading in the period 2009 – 2014 inclusive. Of the 17,845 enterprises birthed in 2009, 61.4 per cent survived to reference year 2014. The UK 5-year survival rate for enterprises born in 2009 and still active in 2014 was 41.7 per cent. In Ireland 84.7 per cent of enterprises birthed in 2013 were still active in 2014. The corresponding figure for the UK was 93.5 per cent.

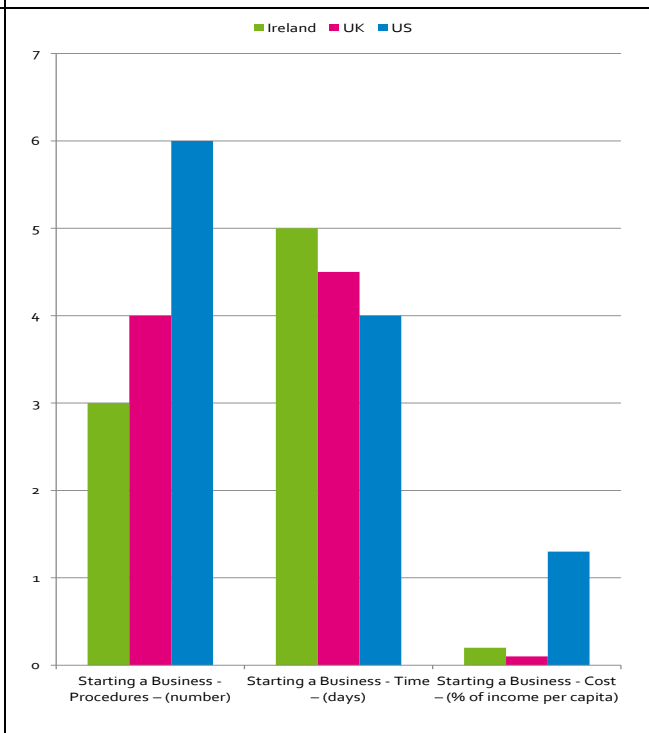
An enterprise is considered a high-growth enterprise when it has experienced average annualised growth of 20 per cent per annum over a three-year period. The fast growth, these high-growth enterprises experience, makes them an important source of employment but also of special policy interest as certain conditions have to be in place to facilitate this degree of enterprise growth. The Commission's SAFE survey data indicates that in 2016, 27 per cent of all Irish SMEs were considered high-growth enterprises compared to 20 per cent in the UK and 17 per cent in the EU 28.

Figure 5.1: Self-employed in the economy 2015



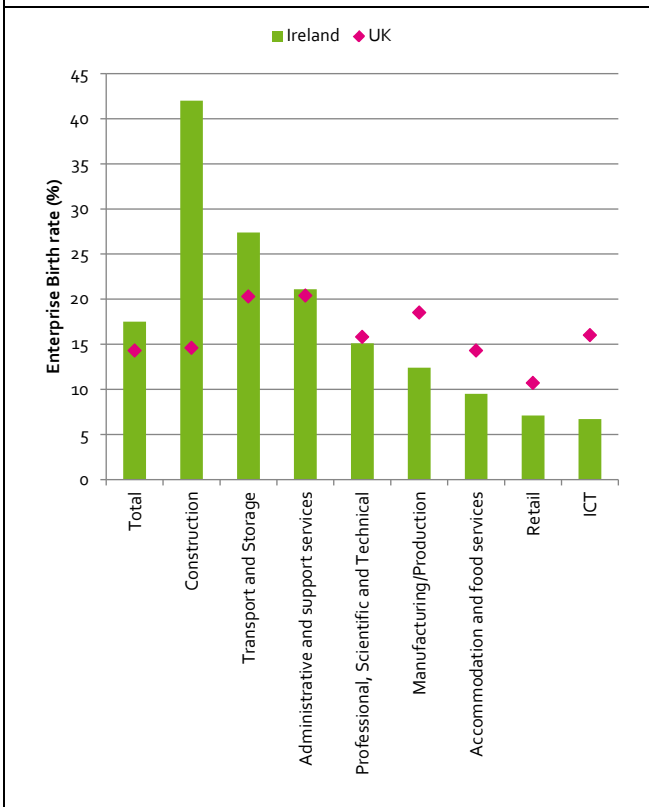
Source: Eurostat

Figure 5.2: Ease of Starting a Business 2017



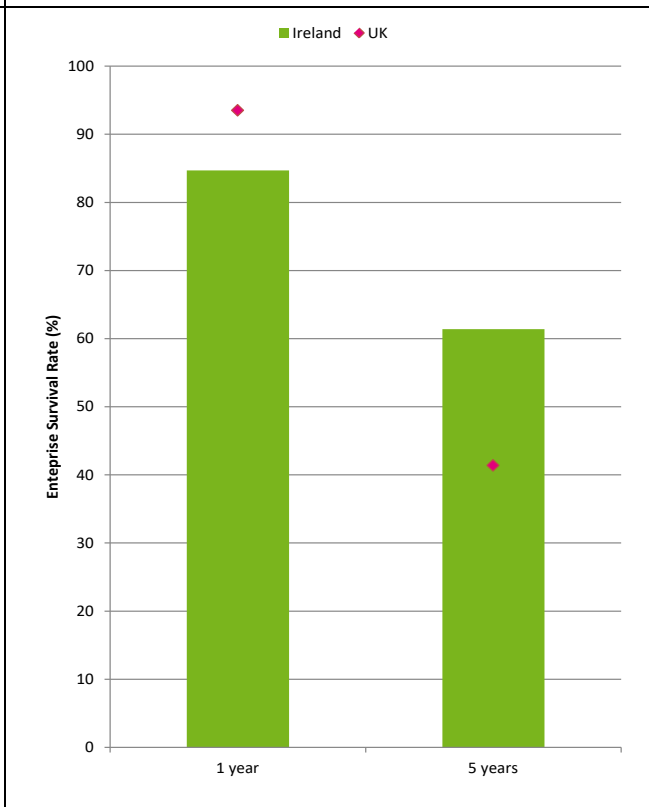
Source: World Bank

Figure 5.3: Business Birth rate 2014



Source: CSO/ONS

Figure 5.4: Survival Rates for new Businesses 2014³⁵



Source: Eurostat

6. Inward Investment

- Despite increasing international competition for globally mobile investment, Ireland has maintained a remarkably strong performance in terms of per capita FDI levels. The contribution of inward investment, to employment, innovation activity, expenditure in the wider economy (on payroll, Irish goods and Irish services) and taxation revenue remains vital.
- Ireland and the UK are competing for and winning inward investment in similar sectors. In both countries, in recent years, Software & IT services, Business Services, Financial Services and Communications account for the majority of inward investment projects and job creation. The share accounted by services FDI stock is 77 per cent, compared to 64 per cent in the UK.
- However, continued success cannot be taken for granted. Competition for inward investment is global and intensifying. In addition, policy changes regarding the taxing of MNCs in the US would have a major impact on global FDI. The competitiveness and consistency of our tax offerings, our legal, regulatory and administrative environment, cost base, the availability of talent, technology and property solutions are crucial to attracting and retaining inward investment post Brexit.

Inward Investment Challenges and Opportunities

Competition for inward investment is global and intensifying. Globalisation and technology development mean the composition of FDI is in a process of constant transformation. An increasing share of FDI is originating outside Ireland's traditional markets of the US and Europe and countries are continually developing their FDI offerings particularly with regard to incentives that reward talent, encourage innovation and investment and enhance tax competitiveness. Despite current geopolitical developments and uncertainty, the competitiveness of the Irish economy will remain fundamental to our FDI performance. There are potential FDI opportunities for Ireland in the context of Brexit. The long term foundations underpinning Ireland's track record as a location for enterprises, such as cost competitiveness, infrastructure, education, workforce productivity and adaptability and membership of the single market, will remain vital. In addition, the competitiveness and consistency of our tax offerings, our legal, regulatory and administrative environment, cost base and the availability of talent, technology and property solutions are crucial to attracting and retaining inward investment post Brexit.

However, it should be noted that a great deal will also depend on global demand conditions and the nature of the change in the UK's trading relationship with the EU. In addition, the US represents the single largest source of FDI for both the UK and Ireland and policy changes regarding the taxing of multinational companies in the US would have a major impact on global FDI.

A key challenge for Ireland is sustaining and enhancing investment from established investors, while at the same time diversifying Ireland's FDI portfolio by tapping into new opportunities and investments from new markets. In 2015, announced global Greenfield investments reached \$766 billion – an 8 per cent rise from the previous year but 6 per cent below 2010 levels. UNCTAD (United Nations Conference on Trade and Development) data shows that in value terms, in 2015, the EU remains the world's largest source of Greenfield FDI investment (31% down from 41% in 2010) followed by the US (14% down from 18%). China and South East Asia (7%) are an increasingly important source of global Greenfield FDI. The UK has a 6 per cent share.

Ireland and the UK current performance

Ireland has an established track record of inward investment. In 2015, Ireland's share of world FDI stocks was 1.7 per cent and Ireland is 10th in the world in terms of FDI stock per capita. The UK has the second largest FDI stock in the world and the largest stock within the EU. In terms of the absolute value of the flow of inward investment, the UK, as a

destination for FDI, given its size and location has been a major global player. In 2016 it was second only to the US with inward flows of FDI of US\$179 billion, up from 12th position in 2015. A key part of the UK's attractiveness for foreign investors was access to the EU's Single Market. The positive effect of EU membership on FDI is robust, ranging between 14 per cent and 38 per cent³⁶. Estimates suggest that losing EU membership could substantially reduce FDI into the UK, particularly intra-EU FDI. In light of Brexit, several EU countries are competing to attract business, particularly financial services from the UK. For both Ireland and the UK, the US is the most important source of inward investment.

The ESRI³⁷ recently examined the extent to which Ireland and the UK are perceived as similar with respect to factors that determine the location choice of foreign affiliates. The ESRI found that over and above the effect of corporate tax rates, a number of other location characteristics are found to significantly increase countries' chances of being chosen as a location for FDI, including the following:

- market size,
- access to the European Single Market,
- production costs,
- high R&D capacity, and
- cultural and geographical proximity relative to investors.

The IMD's World Talent Report 2016 shows Ireland is first in the world in terms of the attractiveness of investment incentives to foreign investors, and openness to foreign investors, the UK is 5th and 3rd respectively. Ireland is ranked 5th best in the world for the availability of skilled labour and 1st for the availability of finance skills. The UK is ranked 33rd and 11th respectively. Ireland has a similar perceived performance with respect to: the quality of institutions; the performance of the primary education sector; quality of higher education and training; and efficiency of product markets. WEF data shows that relative to Ireland, in addition to its larger market size, the UK has better scores with respect to: its infrastructure; financial market development; labour market efficiency; technological development; innovation; and business sophistication. The UK is perceived as the best EU performer with respect to labour market efficiency. The WEF and IMD findings suggest that further holistic competitiveness improvements will remain integral to enhancing Ireland's value proposition for inward investment.

Figure 6.1 covers the period 2010-2016 and shows Ireland and the UK are competing for and winning inward investment in similar sectors. In both countries, in recent years, Software & IT services, Business Services, Financial Services and Communications account for the majority of inward investment projects and job creation. In Ireland, these 4 sectors account for 70 per cent of recent projects and a similar share of job creation. There are some notable differences in the sectoral composition of FDI as the chart illustrates. In Ireland, Medical Devices and Pharmaceuticals are particularly important and account for 5 per cent and 4 per cent respectively of FDI projects over the last 6 years. In the UK, the share of Industrial Machinery, Equipment & Tools Transportation and Real Estate is above that of Ireland. Ireland's principal sources of inward investment are the US, UK, Germany and France. In the UK, the principal sources of inward investment are the US, Germany, France and Ireland. London is the leading destination for FDI, accounting for almost two-fifths of projects. Manchester, Edinburgh and Belfast are other key locations for FDI projects. In Ireland, Dublin accounts for the largest share of inward investment projects, followed by Cork, Galway, Limerick and Waterford.

Figure 6.2 uses the 2015 results from the OECD's FDI Restrictiveness Index which gauges the restrictiveness of a country's foreign direct investment (FDI) by assessing all discriminatory measures affecting foreign investors including market access restrictions and departures from national treatment.³⁸ Ireland, with a score of 0.043 is regarded as being more conducive to FDI than the UK (0.061) and the US (0.089). However Ireland is a mid-table performer under this

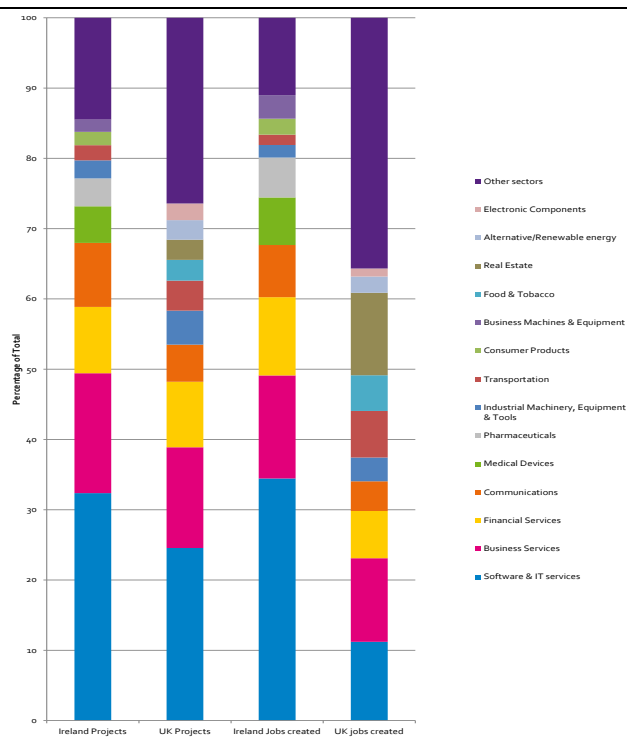
Benchmarking Competitiveness: Ireland and the United Kingdom, 2017

Index in a Euro area context. FDI inflows record the value of cross-border transactions related to direct investment during a given period of time, usually a quarter or a year. Financial flows consist of equity transactions, reinvestment of earnings, and intercompany debt transactions. FDI inflows to Ireland were 83 per cent in 2015 up from 14 per cent in 2014. The corresponding figure for the UK was 1.5 per cent.

The CSO reported that flows of direct investment into Ireland in 2015 were €170bn – up from a €28bn inflow in 2014. Equity investment amounted to €117bn with reinvested earnings and other capital investment at €39bn and €14bn respectively. Investment from US increased from €6bn in 2014 to €100bn in 2015. Similarly investment from Europe increased from €12bn to €62bn in the same period. Investment from Asia increased from a disinvestment of €4bn in 2014 to an investment of €7bn in 2015. The share of specific sectors in total net FDI stock varies across countries. In the OECD, the Netherlands has the highest shares of FDI in manufacturing. The highest share in services is in Germany.

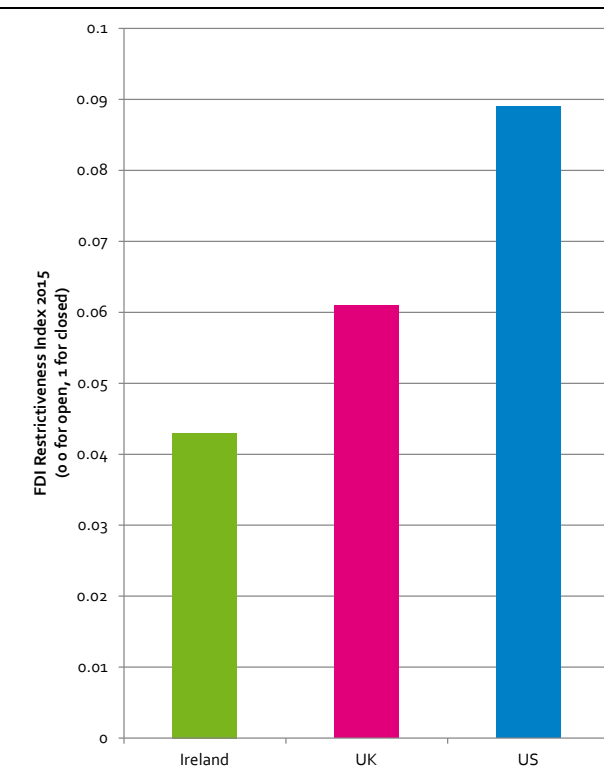
Figure 6.3 shows the sectoral share of manufacturing in net Inward FDI Stock in Ireland is 22 per cent, UK (20%). The share accounted by services FDI stock is 77 per cent, compared to 64 per cent in the UK. Notwithstanding cyclical factors such as exchange rate movements and sector specific developments, the gain or loss on an FDI investment may be assessed using rates of return. The rate of return on FDI is the ratio of income on inward FDI (income on equity, or earnings, and interest from debt) over total inward FDI stock in each sector. In the OECD, the highest rates of return on inward FDI (all sectors) in 2014 are recorded in Ireland (14%), UK (6%). Figure 6.4 shows Ireland has the highest rates of return in the manufacturing sector (25%), UK (5%). The rate of return in services in Ireland was 6 per cent, compared to 4 per cent in the UK.

Figure 6.1: Composition of FDI Investment 2010-2016



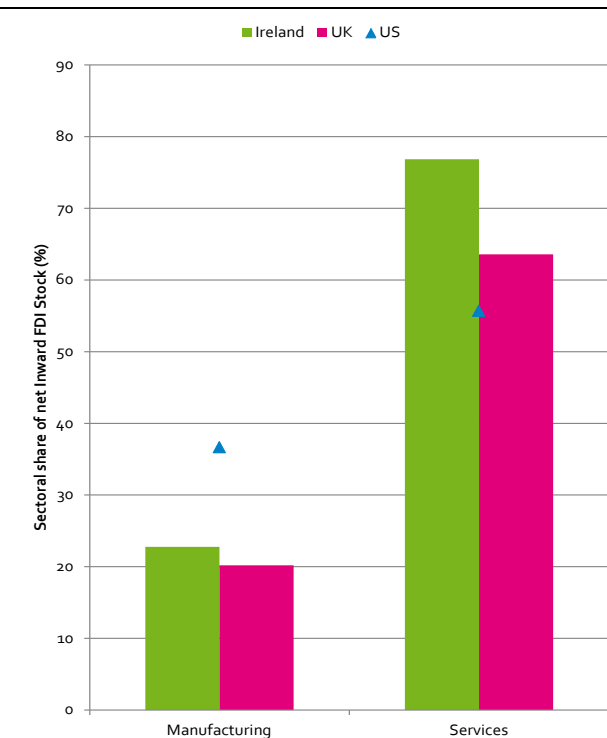
Source: UNCTAD/Financial Times

Figure 6.2: FDI Restrictiveness 2015



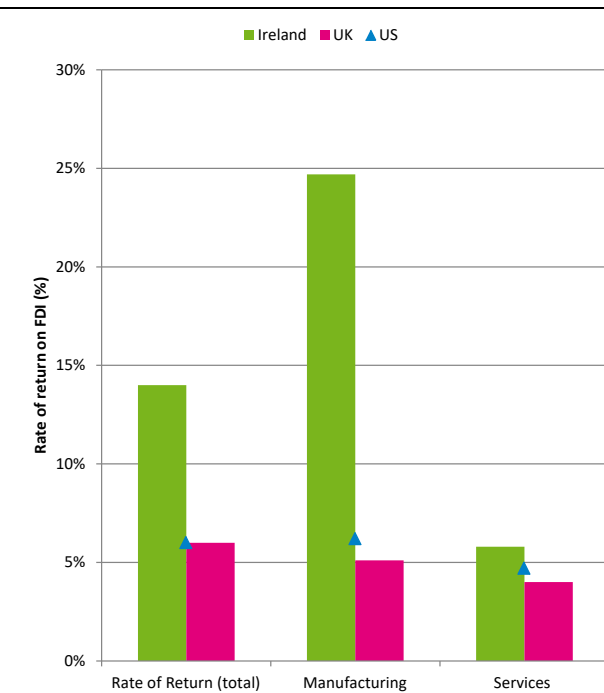
Source: OECD

Figure 6.3: Sectoral share of net FDI Stock 2014



Source: OECD

Figure 6.4: Rate of return on FDI investment 2014



Source: OECD

7. Labour Market

- Labour market performance is a key barometer of current national competitiveness. The Irish Q4 2016 employment rate for those aged 15-64 was 65.6 per cent and the seasonally adjusted unemployment rate was 6.9 per cent in December 2016. UK labour market performance has been impressive with an employment rate of 74.5 per cent and unemployment at 4.8 per cent. Tightening labour market conditions in the UK and Ireland have the potential to lead to skills shortages and wage inflation which would undermine competitiveness.
- The recovery in the Irish labour market has seen net inward migration for the first time since 2009. Geographic proximity, language and cultural and historical ties mean the Irish and UK labour markets have deep linkages. While the proportion of total outward migration to the UK has declined, as a destination it accounts for more than a fifth of emigrants from Ireland. Changes in the bilateral flow of labour between Ireland and the UK and changed intra EU migratory flows could have significant potential labour market impacts for Ireland.
- There is considerable overlap with the UK in terms of skills shortages. The sectors reporting skills shortages are identified in ICT, Science and Engineering, Financial Services, Health and Craft and Technical occupations.

Labour Market Performance

Since 2013 a resurgent labour market has underpinned Irish economic growth. The most recent CSO data³⁹ shows seasonally adjusted employment in Ireland has now grown for ten consecutive quarters. In the year to Quarter 4 2016 employment increased by 3.3 per cent, bringing total employment to 2.048 million having risen above 2 million, for the first time since 2009, in Quarter 2 of 2016. UK labour market performance has been impressive in recent years and the impact of Brexit does not yet appear to be evident in headline labour market data. The most recent data shows an employment rate of 74.5 per cent. The Office of National Statistics, UK, reported an unemployment rate of 4.8 per cent in Q3 2016, down from 5.2 per cent on a year-on-year basis.

Figure 7.1 shows that the UK outperforms both Ireland and the Euro area in the employment rate for each age cohort of the labour force. Europe 2020 sets an employment rate target of 75 per cent of 20-64 year olds by 2020 for member states. The UK's employment rate for this cohort was already above this target in 2015 (76.8%) significantly outperforming both the EU average (70.1%) and Ireland (68.7%). Youth employment rates are generally much lower than average headline employment rates for all ages. The UK's total employment to youth employment rate was in the order of 3/2 – the comparable ratios for both the EU and Ireland were closer to 3/1. In Ireland, the overall employment rate among persons aged 15-64 has also been increasing since 2013 and was 65.6 per cent in Q4 2016. The Central Bank is forecasting employment growth of 2.2 per cent in 2017.

In Ireland employment gains continue to be broad based with all 14 economic sectors posting greater numbers employed in Q4 2016. The largest increases were recorded in Construction, Industry, Professional, Scientific and Technical activities. Figure 7.2 shows Irish employment growth in 2015, according to the OECD, was spread relatively equally across the different sectors of the economy with employment growing in 9 of 11 economic sectors – only in Agriculture, Forestry and Fishing and Finance & Insurance were decreases recorded. The headline growth rate in Ireland in 2015 was 2.5 per cent whereas the corresponding growth figure for the UK was 1.7 per cent.

QNHS data for Q4 2016 shows the participation rate, which has remained relatively unchanged since 2012, was 60.2 per cent in Q4 2016 – up from 60.1 per cent in Q4 2015. In Q4 2016, the male participation rate was 67.3 per cent (down from 67.6% in Q4 2015) and the female rate was 53.4 per cent (up from 52.9% in Q4 2015). Despite growth in the Irish labour market, participation rates have not yet rebounded in Ireland to pre-crisis levels. The participation of

marginalised groups (e.g. the low level of labour market participation for females aged 35 and over, in particular females without a third level education; the low level of participation amongst older males) is low relative to the UK. Irish unemployment continues to decline. The unemployment rate was 7.1 per cent in Q4 2016, down from 7.8 per cent in Q3 2016, and 9.1 per cent in Q4 2015 bringing the total number of people unemployed to 154,900 in Q4 2016. On an annual basis, the number of people unemployed declined by 41,300. The long term unemployment rate declined year on year – from 4.7 per cent in Q4 2015 to 3.6 per cent in Q4 2016. Youth unemployment declined to 15.2 per cent in January 2017 from 17.7 per cent in January 2016.

Figure 7.3 highlights the current strength of the UK labour market where the unemployment rate has not been lower than the current rate since Q3 2005. Ireland's unemployment rate in 2015 was five percentage points higher than the corresponding period recorded a decade previously. Long term unemployment continues to decrease in Ireland and while the rate currently (5.3%) is now below the Euro area average (5.5%) and well below the high levels seen five years ago,(9%); it remains high relative to the UK (1.6%).

Movement of labour

As a consequence of the recession, net emigration returned as a feature of the Irish labour market in 2010. In addition to the social loss associated with emigration, the migratory outflow of skills represents a significant loss of talent and undermines competitiveness and growth potential. CSO data shows the number of immigrants to the State in the year to April 2016 is estimated to have increased by almost 15 per cent from 69,300 to 79,300, while the number of emigrants declined over the same period, from 80,900 to 76,200. These combined changes have resulted in a return to net inward migration for Ireland (+3,100) for 2016.

Geographic proximity, language and cultural and historical ties mean the Irish and UK labour markets have deep linkages. The UK has been an important outlet for the Irish labour market, particularly during economic downturns. The proportion of total outward migration to the UK has declined in recent decades. In 2016, the UK was the destination for 22 per cent of emigrants, down from 25 per cent in 2011 and 2005 and 39 per cent in 1995. CSO data⁴⁰ shows that between 2009 and 2016 net migration to the UK was 56,700, comprising 143,100 persons emigrating, and 86,400 emigrating from the UK to Ireland. Traditionally, net flows from Ireland to the UK have tended to increase when the Irish unemployment rate rises relative to the UK rate. Figure 7.4 shows that over the period 2009-2016 total net outward migration from Ireland peaked in 2012 (-34,400 persons). Over the height of the recession, 2011-2013, outward migration to the UK increased and peaked in 2013 (-21,900). Net outward migration to the UK also peaked in 2013 (-12,200).

Brexit has created great uncertainty regarding the future of free movement of labour between the UK and EU member states. Depending on the final negotiated agreement, changes in the bilateral flow of labour and changed intra EU migratory flows could have significant potential labour market impacts for Ireland. As set out by the ESRI, depending on the format of a changed migration situation, for Ireland there could be significant adjustments in terms of unemployment and wages⁴¹. The ESRI's migration analysis examined the labour market effects generated by the migration link between Ireland and the UK, specifically, 60,000 people staying in Ireland who would otherwise have migrated in the period 2011-2013. The ESRI model estimates the impact would have been a 4 per cent fall in wages and a 0.4 per cent increase in unemployment. The closure of the UK labour market for emigrants from Ireland and other EU member states could potentially put upward pressure on Irish unemployment rates and possibly exert downward pressure on wage levels.

Skills availability

The job vacancy rate is a useful barometer of labour market conditions and skills availability, reflecting in part, the unmet demand for labour and potential mismatches between the skills and availability of those who are unemployed and those sought by employers. Over the past year, Eurostat data shows Irish job vacancy levels are fairly constant at around 1 per cent compared to rates of 1.6 per cent for the Euro area and 2.5 per cent for the UK.

The European Commission's CEDFOP Skills Panorama reports that in 2016 across the EU, the top five skill shortage occupations are ICT professionals; medical doctors; science, technology, engineering and mathematics (STEM) professionals; nurses and midwives and teachers⁴². In Ireland, notwithstanding an increasing supply of graduates across many key fields, shortages are identified by the Commission in:

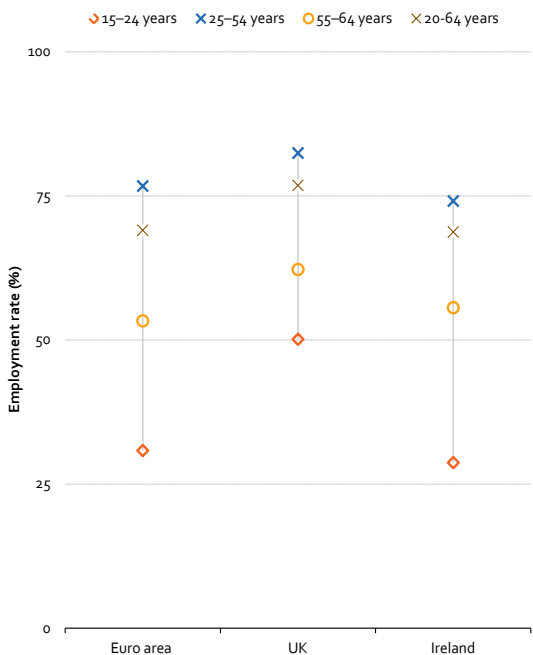
- ICT Managers, Professionals and Technicians; software developers, cloud, databases/big data, testing, security, technical support, networking and infrastructure.
- Engineering Professionals and Technicians; production, process, quality, validation, product design/development, electronic, electrical, mechanical and chemical engineers.
- Financial and Business Services Professionals; shortages are evident in risk, compliance, accounting, business intelligence, data analytics.
- Healthcare Professionals and Technicians; shortages are identified among Doctors, Nurses and Midwives, Radiographers.

Other shortages in Ireland identified by national stakeholders such as the Expert Group on Future Skills Needs⁴³ include:

- Science (analytical development chemist, formulation scientist, microbiologist, QC analyst/validation technician).
- Tool making at craft level particularly for high-end manufacturing, particularly in medical devices.
- Multi-lingual occupations in sales and marketing, customer care, and supply chain management for export markets.
- Skilled tradespersons particularly for electricians and carpenters and surveyors.
- Clerical (multilingual financial clerks in fund accounting/administration, credit controllers, payroll specialists).
- Skilled trades (chefs, tool making, welding (TIG, MIG), butchers/de-boners, steel-erectors).
- Sales (technical sales, multilingual customer support).
- Operatives (CNC, drivers (fork lift and special vehicle)).

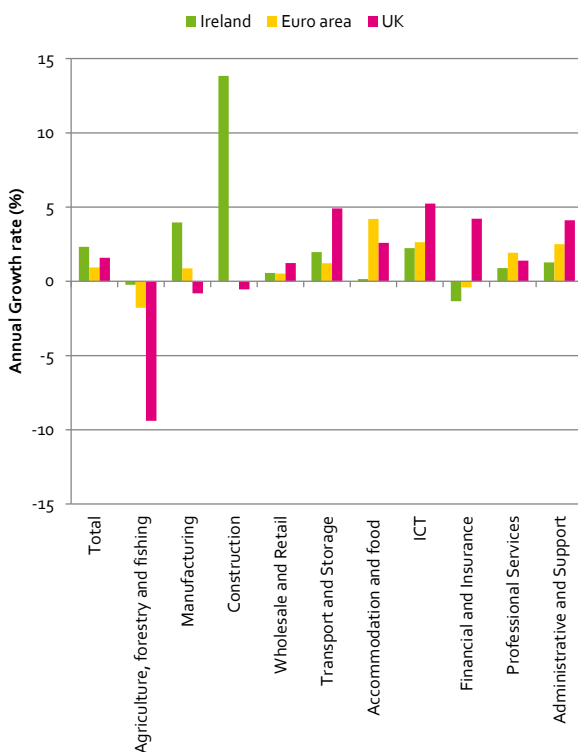
CEDFOP estimate shortages are evident in 2016 in the UK in the following occupations, Finance; ICT; Other health professionals (e.g. related to dentistry, pharmacy, chiropractor; osteopathy) and Nursing and Midwifery. Other shortage occupations include building and related trade's workers excluding electricians; metal, machinery and related trades workers and electrical and electronic trades workers. Surplus occupations include: domestic, hotel and office cleaners, manufacturing labourers; building and housekeeping supervisors; cashiers and ticket clerks; car, van and motorcycle drivers.

Figure 7.1: Employment Rates by Age 2015



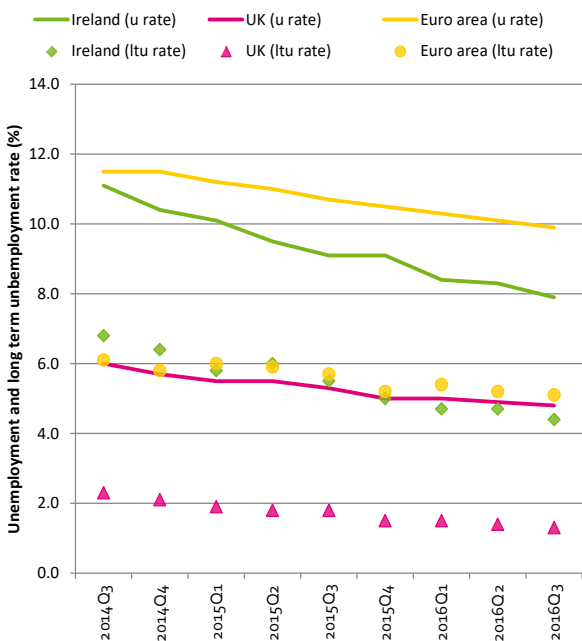
Source: Eurostat

Figure 7.2: Employment Growth Rate by Sector 2015



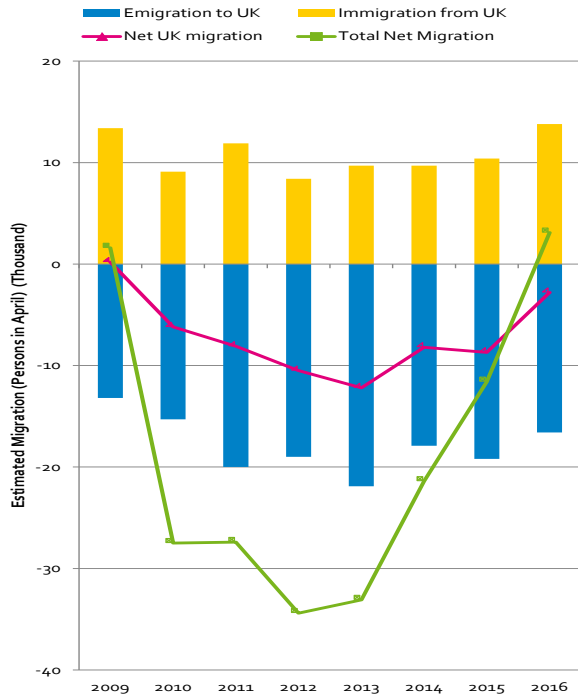
Source: OECD

Figure 7.3: Unemployment Rate 2014-2016



Source: Eurostat

Figure 7.4: Migration flows with the UK 2009-2016



Source: CSO

8. Prices and Business Costs

- As a small open economy, any deterioration in our cost competitiveness will have a major negative impact upon economic growth, employment and our standard of living. The UK's Brexit decision brings into sharp focus the need for Ireland to maintain and improve cost competitiveness.
- The services sector is likely to remain the main source of upward price pressure in Ireland, with the price pass through impact of exchange rates and an expected increase in energy prices in 2017. Residential rents are also projected to increase due to continued limited supply of residential property.
- In Ireland, the hourly labour cost was €30 in 2015, €25.7 in the UK and €29.5 for the Euro area. The relative change in hourly labour costs 2014/15 was 0.8 per cent compared to 3.8 per cent in the UK.
- Commercial property prices in Dublin compare favourably to comparable cities in the UK with the exception of Belfast. In the three years to 2014 the increase in commercial property prices in the UK cities grew in the range of 4 to 8 per cent. Prices were stationary in Cork but both Dublin locations, D2 / D4 and the IFSC recorded increases of 15.6 and 19 per cent respectively.
- Business fixed-broadband charges are cheaper in the UK than Ireland by almost 10 per cent. Ireland's cost advantage in relation to mobile broadband charges has eroded, over the six Quarters to Q3 2016, with UK costs converging with those levied in Ireland in the second half of 2016.

Prices

CSO/Eurostat data⁴⁴ shows that between 2011 and 2014 consumer prices in Ireland increased (2.7%) but the rate of change was lower than the UK (7.1%) and in the EU (4.8%). Ireland had the third highest price levels among EU countries in 2015, after Denmark and the UK. Price levels in Ireland fell in 2010 to 18.1 per cent above the EU average and since then they have increased to 22.5 per cent more than the EU average in 2015, the UK was 31.3 per cent above the EU average.

The Harmonised Index of Consumer Prices (HICP) gives comparable measures of inflation for countries and comprises a set of consumer price indices (CPI) calculated according to a harmonised approach and a single set of definitions. Prices on average, as measured by the EU Harmonised Index of Consumer Prices (HICP), decreased by 0.2% compared with December 2015. The most notable changes in the year were decreases in Furnishings, Household Equipment & Routine Household Maintenance (-4.9%), Clothing & Footwear (-3.8%) and Food & Non-Alcoholic Beverages (-2.8%). There were increases in Housing, Water, Electricity, Gas & Other Fuels (+2.3%), Restaurants & Hotels (+1.9%) and Education (+1.8%). In the UK, inflation increased by 1.6% in the year to December 2016, compared with a 1.2% rise in the year to November. The main contributors to the increase in the rate were rises in air fares and the price of food, along with prices for motor fuels, which fell during 2015.

Figure 8.1 shows that Ireland compares favourably in HICP terms compared to the UK, US and the EU 28. The UK's new relationship with the EU post-Brexit will have a significant bearing on inflation there over the next few years through several channels. UK inflation recently soared to its highest level in two and a half years and is forecast to rise to 2.5 per cent in 2017. Much of the rise to date reflects the elimination of past drags from food, energy and import prices, together with renewed rises in oil prices. The projected path for inflation over the next three years in large part reflects the impact of higher import prices following Sterling's depreciation. Conversely, Irish inflation rates are forecast to rebound modestly to about 0.8 per cent in both CPI and HICP terms for 2017 according to the Central Bank. The services sector is likely to remain the main source of upward price pressure in Ireland, with the price pass through impact of exchange rates and an expected increase in energy prices in 2017 also possible sources of upward pressure. In addition, residential rents are also projected to increase due to continued limited supply of residential property.

The experimental Services Producer Price Index (SPPI) measures changes in the average prices charged for a range of business services⁴⁵. The index covers transaction costs from business to business and excludes consumers who are covered in the Consumer Price Index (CPI). CSO data shows services prices in Quarter 2, 2016, as measured by the SPPI, were on average 1 per cent higher in the year when compared with the same period last year. The most notable changes in the year were: Architecture, Engineering and Technical Testing (+3.9%), Security and Investigation (+2.8%), Warehousing, Storage and Cargo Handling (+2.3%) and Sea and Coastal Transport (-6.9%). Figure 8.2 charts the evolution of service prices over the course of a five year period from 2010. Following a period of decline during the recession, an upward trend has been evident in Ireland since 2011 and inflation in services prices has therefore outstripped similar costs in both the UK and the EU. In 2016 the CSO data indicated that increases in the Irish SPPI were being driven by computer programming, consultancy, air transport and legal costs. The cost of the latter did not adjust downwards to the same extent as accountancy fees in the wake of the economic downturn⁴⁶. The ONS has attributed the recent rise in the UK's SPPI to Information and Communication Activities and Professional, Scientific and Technical Activities.

Business Costs

Stripping out cost elements determined internationally, location sensitive business costs focus on those costs which are primarily determined domestically. The significance of the location-sensitive cost factors differs by sector, with significant variations occurring between services and manufacturing firms as evidenced in Table 8.1.

Table 8. 1: Relative Significance of Location Sensitive Costs (% of total location sensitive costs), 2016

	Services	Manufacturing
Labour & Benefits	72-86%	40-57%
<i>Of which: Salaries & Wages</i>	52-61%	28-40%
<i>Statutory Plans</i>	8-10%	5-7%
<i>Other Benefits</i>	12-14%	7-10%
Facility Costs	4-15%	2-5%
Transportation Costs	-	6-21%
Utility Costs	0-1%	2-7%
Capital Costs	0-8%	11-25%
Taxes	3-16%	10-18%
<i>Of which: Income Taxes⁴⁷</i>	1-15%	9-15%
<i>Property Taxes</i>	1-2%	1-2%
<i>Other Taxes</i>	0-1%	0-1%

Source: KPMG Competitive Alternatives 2016⁴⁸

Labour Costs

Table 8.1 highlights the cost of labour as the most significant driver of business costs for most firms – particularly for services firms. Labour costs, which include wages and salaries, employer-paid statutory plans, and other employee benefits, for the services sub-sectors typically range from 72 to 86 per cent of location-sensitive costs, while for manufacturing operations the typical range is from 40 to 57 per cent of total location-sensitive costs.

Figure 8.3, shows Ireland is competitive relative to both the UK and Euro area with regard to average labour costs. While labour cost growth has been positive, the growth has been below EU and Euro area averages, representing a competitiveness gain for Ireland. Setting 2012 labour cost levels equal to 100, it is evident that Irish labour costs have

Benchmarking Competitiveness: Ireland and the United Kingdom, 2017

cumulatively increased by slightly less than EU and Euro area labour costs. However, an index such as this does not reflect the different starting levels of labour costs. There is considerable heterogeneity across Europe with regard to, average hourly labour costs in the whole economy, with the lowest hourly labour costs recorded in Bulgaria (€4.1), and the highest in Denmark (€41.3). Figure 8.4 shows labour costs per hour in Euro and for reference Sterling by broad level of economic activity in 2015. In Ireland, the hourly labour cost was €30 in 2015, compared to €25.7 in the UK and €29.5 for the Euro area. The relative change in hourly labour costs 2014/2015 for the whole economy was 0.8 per cent compared to an increase of 1.5 per cent in the Euro area, and (measured in Sterling) an increase of 3.8 per cent in hourly labour costs in the UK. At sectoral level, hourly labour costs in Ireland in 2015 were above the UK in business economy, services and industry but below the Euro area average. Hourly labour costs were below the UK in construction. Hourly labour costs in Ireland in 2015 were above the UK and the Euro area in the mainly non business activity class which includes Education, Human health & Social work activities; Arts, Entertainment & Recreation; and other service activities.

Property Costs

Table 8.1 shows after labour, facility or property costs represent the next significant cost factor in the profile of business costs. For services sub-sectors, office lease costs represent 4 to 15 per cent of total location-sensitive costs. For manufacturing sub-sectors, industrial lease costs range from 2 to 5 per cent of location-sensitive costs. Strong demand and falling vacancy rates have been evident in Dublin in recent years resulting in increasing rents for many companies. Despite this Figure 8.5 shows commercial property prices in Dublin compare favourably to comparable cities in the UK with the obvious exception of Belfast. In the three years to 2014 the increase in commercial property prices in the UK cities cited grew in the range of 4 to 8 per cent, with the highest growth recorded in London's West End. Commercial prices were stationary in Cork but both Dublin locations, D2 / D4 and the IFSC recorded increases of 15.6 and 19 per cent respectively. Utility costs represent 1 to 7 per cent of location-sensitive costs. Electricity and natural gas costs are considered in Chapter 15.

Broadband Costs

The widespread provision of high speed broadband services is critically important to support economic growth and job creation and competitiveness. The UK's headline broadband target for 2017 is for 95 per cent coverage with 24 Mbps. Under the National Broadband Plan Ireland has a target of 100 per cent coverage with 30 Mbps by 2020. Figure 8.6 shows that prices of mobile business broadband are comparable in both Ireland and the UK but fixed business broadband is significantly cheaper in the UK. Despite the fall over the last six quarters to Q3 2016 in the prices businesses are charged for fixed-broadband in Ireland, the UK was still cheaper by almost 10 per cent. Ireland's cost advantage in relation to mobile broadband charges has eroded over the corresponding period with UK costs converging with those levied here in the second half of 2016.

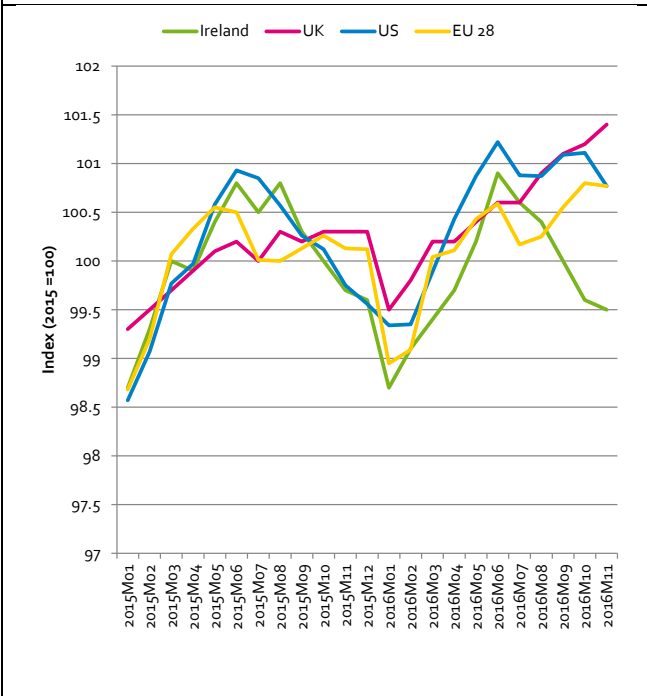
Housing and Childcare Costs

From an employee perspective both housing and childcare costs have a significant bearing on labour market participation and mobility. Housing impacts upon the attractiveness of countries as locations for investment and directly impacts on enterprise costs through wage effects, and indirectly determines the price of Irish goods and services. The cost of renting influences labour mobility and contributes to an economy's ability to adjust to adverse shocks. In 2016 the Council commissioned research on housing and renting affordability as measured by examining the proportion of household income that is spent to meet housing need, whether purchasing a home or renting. The research found that of the 12 national and international cities compared, 5 had a higher price-to-income ratio than Dublin. Taking account of the higher cost of mortgage finance in Ireland, only 2 cities (Amsterdam and London) had a

higher “mortgage affordability index” than Dublin (i.e. this index combines a price-to-income ratio and the cost of a mortgage; the higher the index, the less affordable property is to purchase). In terms of rent as a percentage of income, 3 international cities were found to be less affordable than Dublin, while 8 were more affordable. Rent affordability is more challenging than mortgage affordability in several Irish cities such as Galway and Cork (i.e. residents are required to spend relatively more of their incomes on rent than they would on a mortgage). Figure 8.7 shows there were three cities (London, Amsterdam and Manchester) which had a higher “rent affordability index” than Dublin.

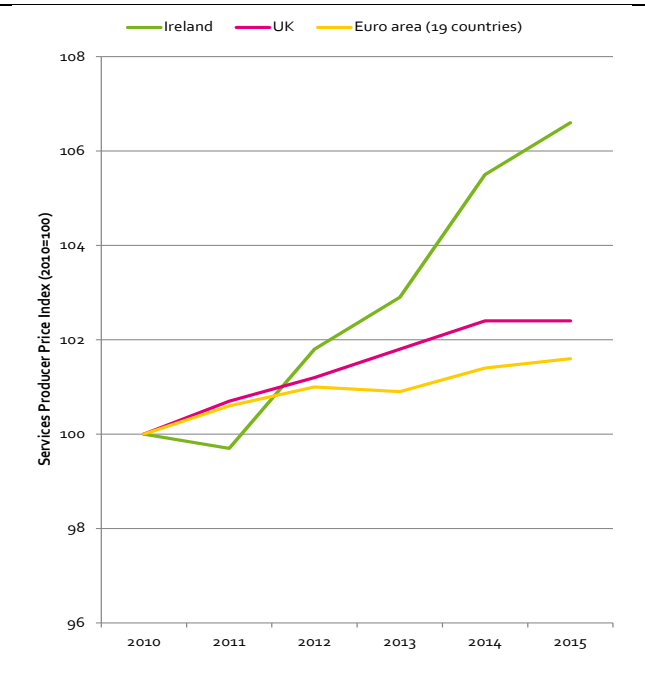
Insufficient access to affordable, full-time childcare represents a significant barrier to increasing labour market participation. Figure 8.8 shows childcare-related costs and benefits for couples, earning 167 per cent of the average wage, Ireland is the 2nd most expensive in the OECD just ahead of the UK and the overall benefits for workers availing of childcare in Ireland were negative in 2012. The introduction of the new Single Affordable Childcare Scheme aims to enhance the provision of quality and affordable childcare in Ireland and ultimately support increased labour market participation.

Figure 8.1: Harmonised Consumer Index of Prices 2015-2016



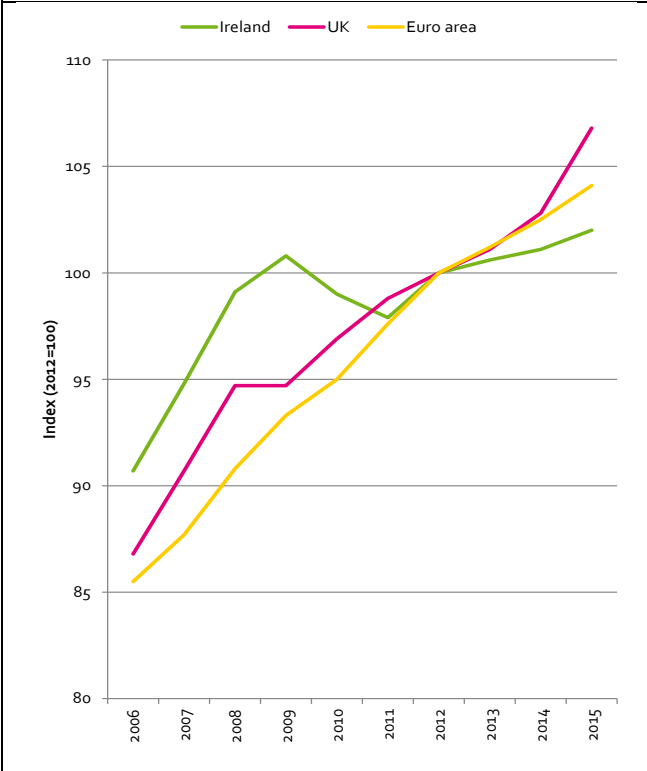
Source: Eurostat

Figure 8.2: Services Producer Price Index 2010-2015



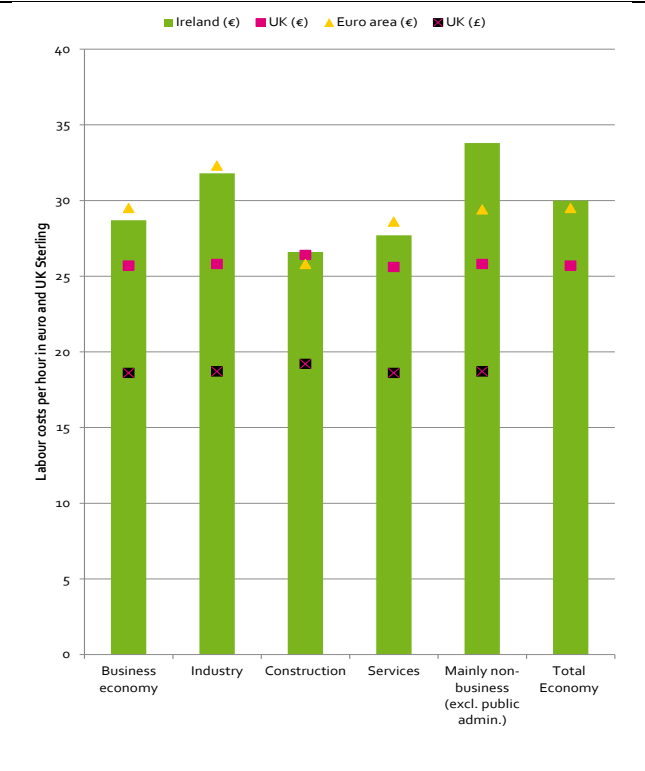
Source: Eurostat

Figure 8.3: Business Economy Labour Cost Index 2006-2015



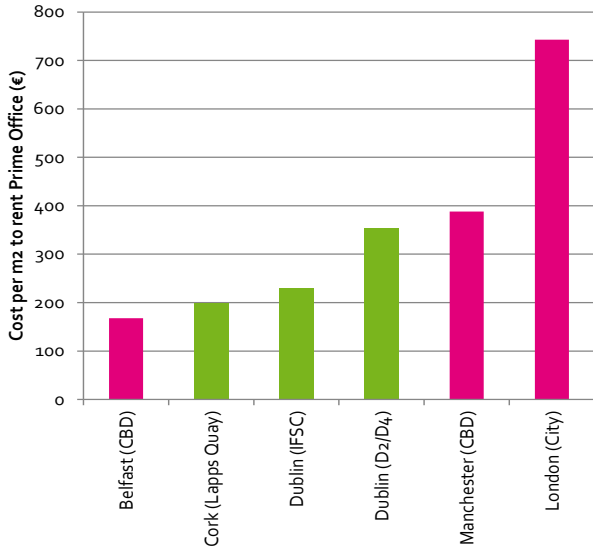
Source: Eurostat

Figure 8.4: Labour costs per hour, national currency, 2015



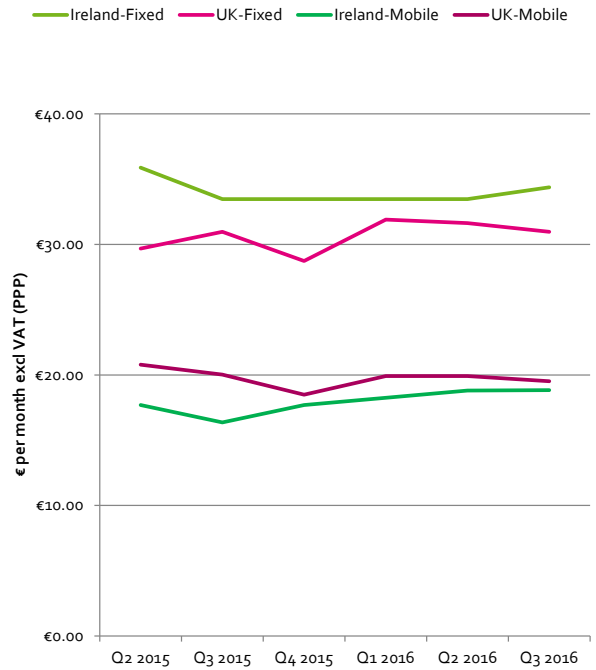
Source: Eurostat

Figure 8.5: Cost of Renting a Prime Office 2014



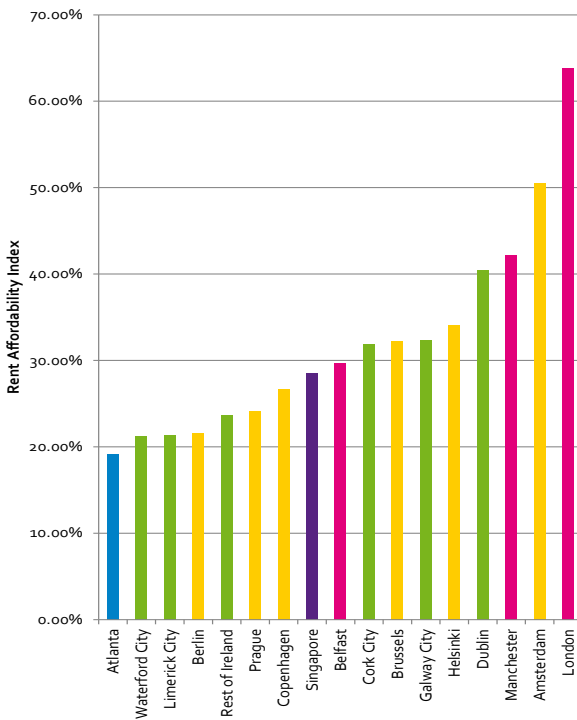
Source: Cushman and Wakefield

Figure 8.6: Business Fixed and Mobile Broadband 2016



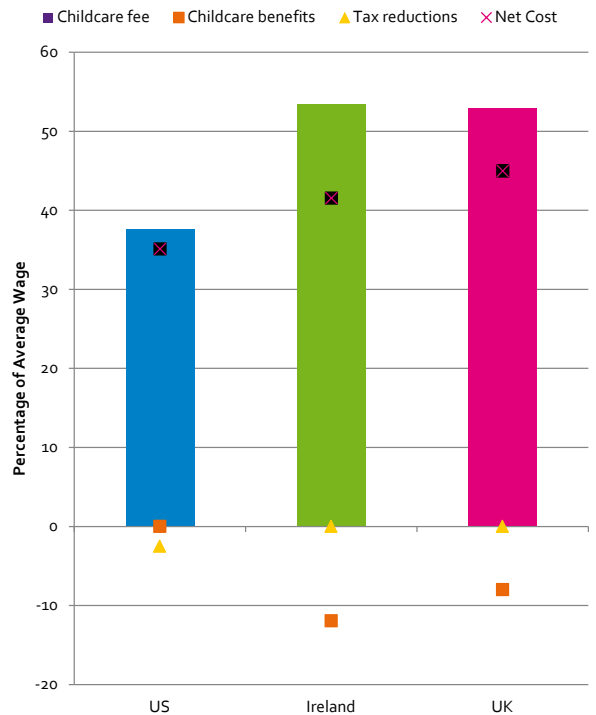
Source: Comreg

Figure 8.7: Rent Affordability Index 2016 - Housing



Source: NCC/Indecon

Figure 8.8: Childcare Costs and Benefits for Couples Earning 167% of Average Wage 2012



Source: OECD

9. Productivity

- **Productivity growth is a driver of national competitiveness, as it enables firms based in Ireland to compete successfully in international markets by facilitating output to be produced in a more efficient and effective manner.**
- **Despite the severe impact of the economic crisis on output and employment levels, Ireland has continued to demonstrate strong levels of labour productivity. At 3.1 per cent, the growth rate of Irish productivity exceeds growth rates in the UK and Euro area.**
- **Ireland's performance is heavily influenced by the performance of the Manufacturing and ICT sectors. Performance is weaker amongst domestically focused firms and sectors, particularly sectors such as Accommodation, Retail, Agriculture, and Construction. The narrow base of enterprises in high value added sectors (Pharma and ICT) disguises, to a degree, underperforming sectors and overstates Ireland's productivity performance.**

Labour Productivity

Productivity is a multi-dimensional concept; it reflects our ability to produce more output by better combining inputs, thanks to new ideas, technological innovations and new business models. The challenges in improving the quantity and quality of human and productive capital, and enhancing productivity are complex and significant but key to achieving sustainable economic growth, jobs and improved living standards. In recent years productivity growth has slowed across the OECD. The slowdown in productivity levels and growth in major advanced economies such as the UK has been attributed to a mix of cyclical factors such as weak global demand and declining capital investment, as well as structural factors such as inefficient markets, low levels of innovation and skills mismatches.

Ireland's labour productivity performance is strong in an international context. Despite the severe impact of the economic crisis on output and employment levels, Ireland has continued to demonstrate strong levels of labour productivity. Measured in GDP per hour worked, Ireland's output per hour was \$62.02 in 2014. This represents the fifth highest labour productivity level among OECD member states. Despite considerable shifts in the composition of economic activity in recent years, Figure 9.1 shows that Irish productivity levels exceed those of many of our key competitors. Overall, Irish productivity levels have been above the levels seen in the UK and the Euro for a number of years. However, Ireland's performance has been greatly influenced by shifts in the composition of employment and the influence of a number of high value added sectors on output. In addition, increased measurement challenges in calculating the level of economic activity in Ireland and the complexity of value added complicate the process of calculating accurate productivity estimates for Ireland. At present, Ireland's overall productivity performance measured in terms of GDP per hour worked is likely to be positively skewed by certain sectors and multinational firms.

The ONS estimate that output per hour in the UK was 18 percentage points below the average for the rest of the major G7 advanced economies in 2014, and 30 percentage points behind Ireland. Figure 9.2 shows that at 3.1 per cent, the growth rate of Irish (GDP) productivity per hour work in 2014 exceeded the growth rates in the UK and Euro area. Over the course of the recession, as output and employment collapsed, labour productivity growth increased at a strong rate. The factors driving productivity growth over time are difficult to measure and growth can be cyclical and counter cyclical depending on the drivers of economic growth in individual countries. The economic cycle and more generally trends in the composition of value added and employment – can have a significant effect on measured productivity levels. On an annual basis as figure 9.2 illustrates growth rates can be volatile. However, the overall trend in Ireland has seen productivity growth average around 2 per cent per annum over the last decade.

In Ireland, productivity growth slowed from above 4 per cent between 1995 and 2003 to less than 1.6 per cent per annum in 2004 and 2005. It dipped to -0.4 per cent in 2008 before recovering strongly in the period 2009-2012. Labour productivity growth has slowed considerably in the last decade in the UK, US and Euro area.

Sectoral Productivity

There is considerable heterogeneity between sectors in terms of productivity growth. There are many possible factors which can influence diverging growth patterns. These can include the intensity of competition and regulation in the market, the degree of skilled labour and capital in production, propensity to innovate and export, degree of standardisation, economies of scale, and participation in global value chains. OECD analysis suggests that the rate of productivity growth varies across economic sectors, with global (exporting) sectors and firms tending to perform best and larger indigenous domestically traded sectors performing poorly. In most countries there is a divergent productivity performance at sectoral and national level between the most productive enterprises and the long tail of relatively poorly performing firms with low or no productivity growth.

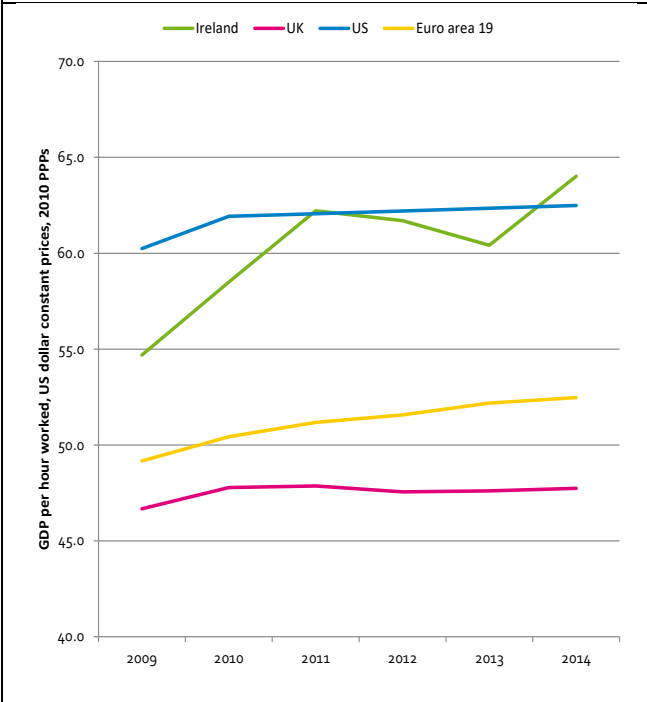
The contribution of an individual sector to overall productivity growth is dependent on its productivity growth rate, and its share of total value added and hours worked. In Ireland's case, the narrow base of enterprises in high value added sectors (particularly in Pharma and ICT) disguises, to a degree, underperforming sectors and boosts Ireland's productivity level. The narrow base of sectors driving productivity performance leaves Ireland vulnerable to shocks and serves to highlight the scope to enhance productivity at sector and firm levels.

Increasing productivity across all sectors remains a significant challenge. Ireland can take advantage of a sizeable competitiveness opportunity if we can avoid the 'low productivity trap' being experienced by many developed economies. Facilitating enterprise and start-ups, trade, access to finance, skills and infrastructure are key elements in realising productivity and competitiveness gains.

Figure 9.3 shows that manufacturing accounts for approximately a third of productivity growth in Ireland. The relative contribution of ICT is also strong and the Financial Services and Professional Services sectors also made positive contributions to business sector productivity growth in Ireland. The Wholesale, Retail, Transport, Accommodation and Food sector contribution to Irish productivity growth is low, in contrast to the trend in the UK and other countries.

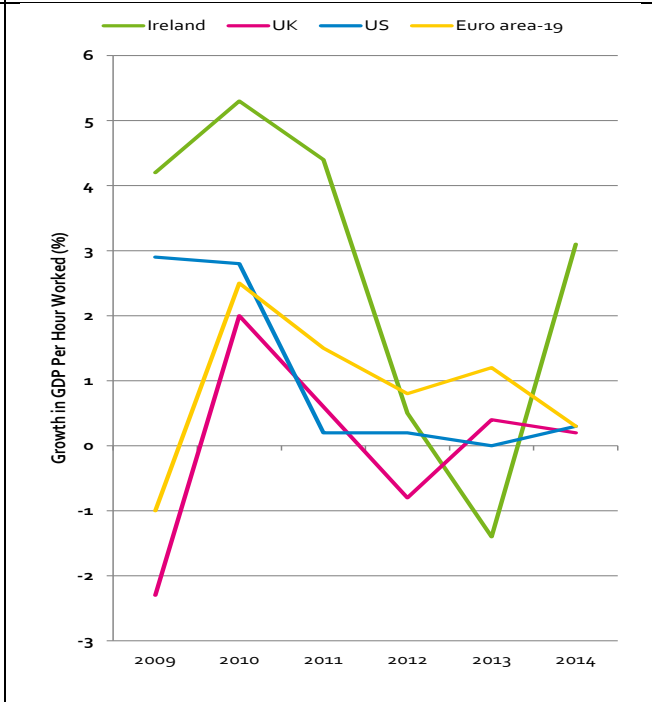
Measurement of hours worked in the economy and by sector is an essential element in the calculation of in productivity as labour is the single most important factor of production. Figure 9.4 shows that in terms of the average annual hours worked per worker, over the period 2009-2014., at 1,731 hours per annum Irish workers worked more hours than is the case in the UK (1,675). It shows that while the differential has narrowed over the recession Irish workers tend to work more than the Euro area average. The decline in average hours worked has been observed across Euro area countries and a wide range of sectors.

Figure 9.1: Labour productivity levels (total economy) 2009-2014



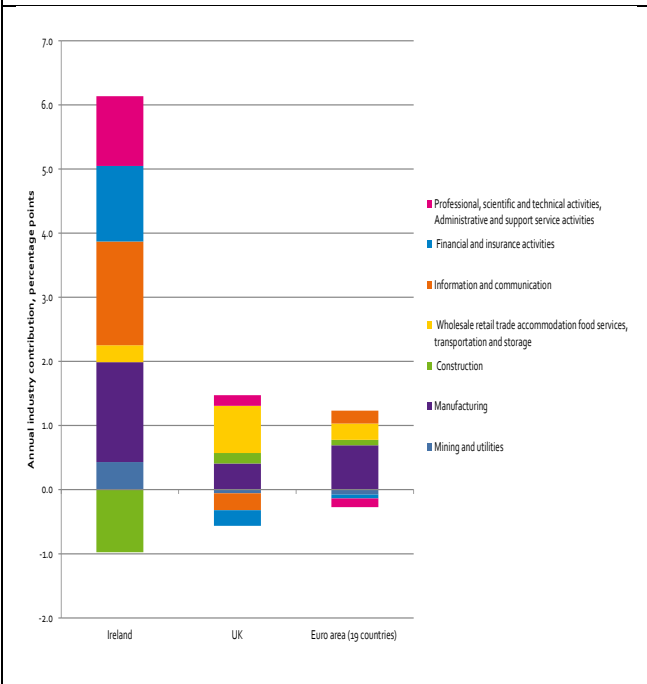
Source: OECD

Figure 9.2: Annual growth in GDP per hour worked 2009-2014



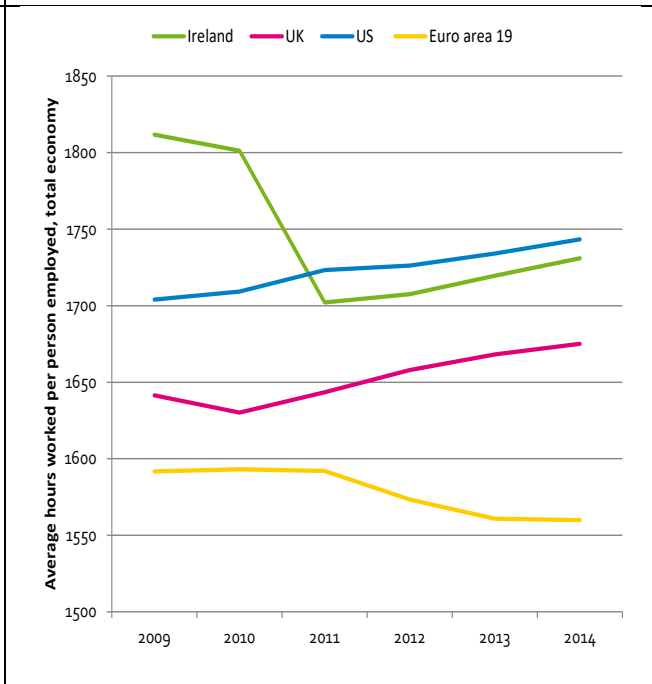
Source: OECD

Figure 9.3: Industry contribution to growth in business sector labour productivity 2014



Source: OECD

Figure 9.4: Average hours worked per person employed 2009-2014



Source: OECD

10. Tax

- Ireland's tax competitiveness relative to other jurisdictions is crucial as entrepreneurs and enterprises make decisions as to where to base their businesses. From an enterprise perspective, it is important that the taxation system is balanced, broad and provides certainty in a manner that supports and rewards employment, investment, innovation and entrepreneurship
- The Irish income tax system is progressive particularly at low and middle incomes. However, Ireland's marginal tax rate is high relative to the UK. The highest rate of income tax starts to apply at just below the average industrial wage; by comparison the UK top marginal rate applies at 4.2 times the average industrial wage.
- The standard rate of Irish VAT is 23 per cent, with reduced rates of 13.5, 9, 4.8 and 0 per cent. The UK standard rate of VAT is 20 per cent, with reduced rates of 5 and 0 per cent. By leaving the EU, the UK is no longer bound by the EU VAT Directive which mandates top and bottom rates of at least 15 per cent and 5 per cent respectively.
- Ireland's corporation tax rate remains internationally competitive at 12.5 per cent. However many competitors have reduced their rates and the UK is committed to further reducing its rate to 15 per cent.
- In 2016 Ireland had the 5th highest rate of capital gains tax in the OECD at 33 per cent. Ireland's CGT rate is particularly high relative to the UK's 28 per cent.

The Irish Tax Base

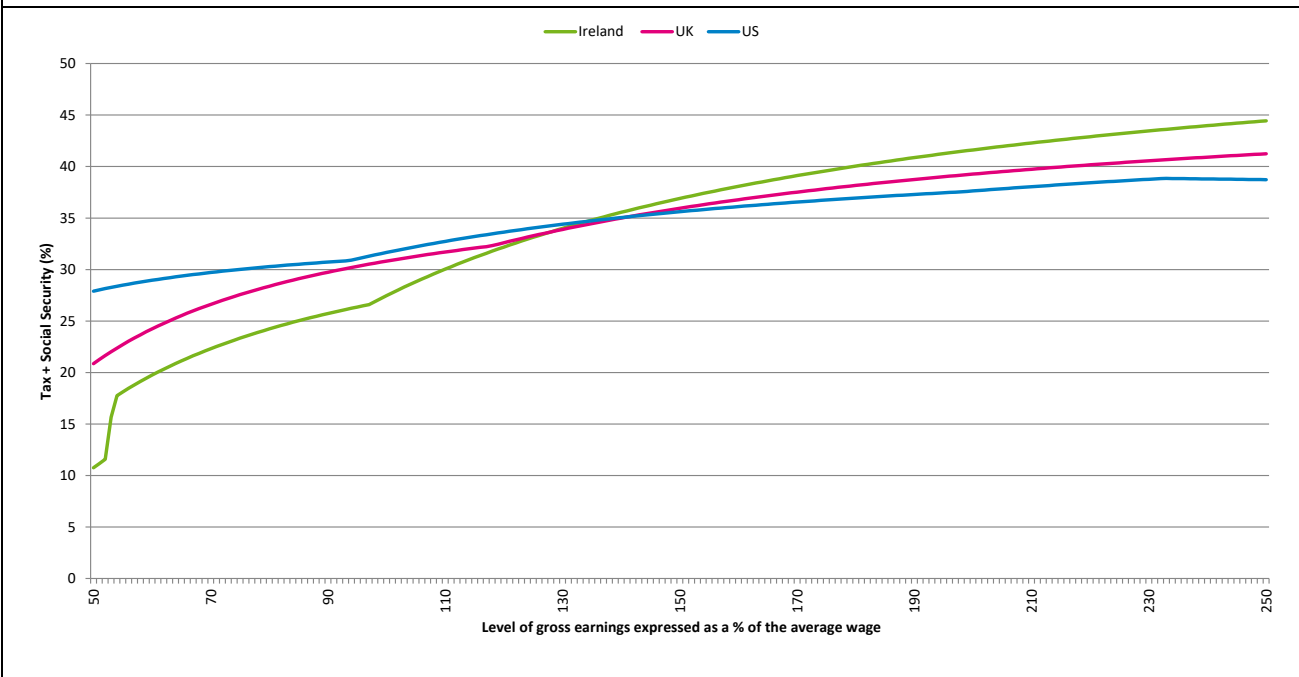
Exchequer returns data for 2016 shows that personal income taxes of approximately €19 billion represented 40 per cent of the total tax take. The second highest contributor to the overall tax take is VAT (€12,420 billion), which yields approximately 26 per cent of total Exchequer tax receipts. Corporation tax receipts (€7,351 billion) account for 15.4 per cent of total tax revenue. Excise duties yield approximately €5,711 billion 12 per cent of the total while Stamp Duties (€1,194 billion) and Capital Gains Tax (€822 million) yield 2.5 per cent and 1.7 percent of the total take respectively. Compared to our OECD peers, Ireland's tax system has a higher reliance on more distortionary direct taxes and is less reliant on property and wealth taxes; indirect taxes in Ireland are around the EU average. In particular, personal income taxation has a relatively narrow base (about 35 per cent of households are exempted) and a relatively rapid progressivity (i.e. the top marginal rates are among the highest in the OECD). To ensure the sustainability of the public finances, it is important that the principle of maintaining a broad tax base is applied. As noted by the European Commission⁴⁹, the use of a narrow base of revenues (particularly with regard to corporation tax receipts which can be volatile) to fund current expenditure makes public finances more vulnerable to the risk of future shortfalls in revenue.

Income Tax

A competitive income tax regime is essential to attract and retain individuals in Ireland and more generally to encourage people to remain in or return to the labour market. Receipts from income tax are the largest contributor to the Exchequer's tax take accounting for 40 per cent of tax revenue.

Figure 10.1 uses data published in the OECD's annual Taxing Wages publication. It facilitates a comparative illustration of the tax burden in Ireland as compared to the UK and US across a range of incomes. The tax burden for each jurisdiction includes both income taxes and personal social security contributions (in Ireland's case: income tax, USC and employee PRSI), and is calculated with respect to multiples of the average wage in each individual country in each year.

Figure 10.1: Single Person, no children, Tax Rate 2015



Source: OECD

Figure 10.1 shows the Irish income tax system is progressive. In 2015, the tax burden for single individuals in Ireland is comparatively low at income of up to 125 per cent of average earnings. It then surpasses the UK and USA at c.125 per cent and 150 per cent respectively of average earnings. Ireland’s highest rate of income tax starts to apply at just below the average industrial wage; by comparison the UK top marginal rate applies at 4.2 times the average industrial wage. Entry to the higher rate of income tax in Ireland occurs at a relatively low level - the standard rate band threshold for a single individual of €33,800 is now below the national average wage of €36,815 (Q1, 2016)⁵⁰. OECD analysis⁵¹ shows the average single worker in Ireland faced a net average tax rate⁵² of 19.7 per cent in 2015, compared with the OECD average of 25.5 per cent and 23.4 per cent in the UK. In Ireland, the take-home pay of an average single worker, after tax and benefits, was 80.3 per cent of their gross wage, compared with the OECD average of 74.5 per cent and 76.6 per cent in the UK.

Ireland remains competitive in terms of the levels of income tax and social security contributions as a proportion of total labour costs. The difference between labour costs to the employer and the corresponding net pay of the employee is the sum of personal income tax, social security contributions together with payroll tax, minus benefits as a percentage of labour costs. Employer social security contributions and – in some countries – payroll taxes are added to gross wage earnings of employees in order to determine a measure of total labour costs. Figure 10.2 shows that marginal rates in Ireland are competitive at lower wage levels but high for individuals earning the average wage or above. At 51 per cent, the top marginal tax rate in Ireland is high relative to the UK (47%) and the US (48.6%).

VAT

VAT is the primary source of indirect tax revenues for OECD countries and is the second highest contributor to the overall tax take in Ireland. Figure 10.3 shows the VAT rates both in Ireland and the UK. The standard rate of Irish VAT is 23 per cent. Exemptions and lower rates within a VAT regime affect the relative prices enterprise and consumers pay for different goods and services. There are also reduced rates of 13.5 per cent, 9 per cent, 4.8 per cent, and 0 per cent⁵³. The UK standard rate of VAT is 20 per cent. There are reduced rates of 5 per cent and 0 per cent⁵⁴. The VAT Gap is a

measure of VAT compliance and enforcement that provides an estimate of revenue loss due to fraud and evasion, tax avoidance, bankruptcies, financial insolvencies, as well as miscalculations. It is defined as the difference between the amount of VAT collected and the VAT Total Tax Liability and both rates are similar for Ireland (9%) and the UK (10%). The weighted average VAT rate⁵⁵ for the UK, at 9.2 per cent is two percentage points higher than the equivalent rate for Ireland. VAT is largely governed by EU directives, which require unanimity among Member States before changes can be permitted. By leaving the EU, the UK is no longer bound by the EU VAT Directive which mandates top and bottom rates of at least 15 per cent and 5 per cent respectively.

Corporation Tax

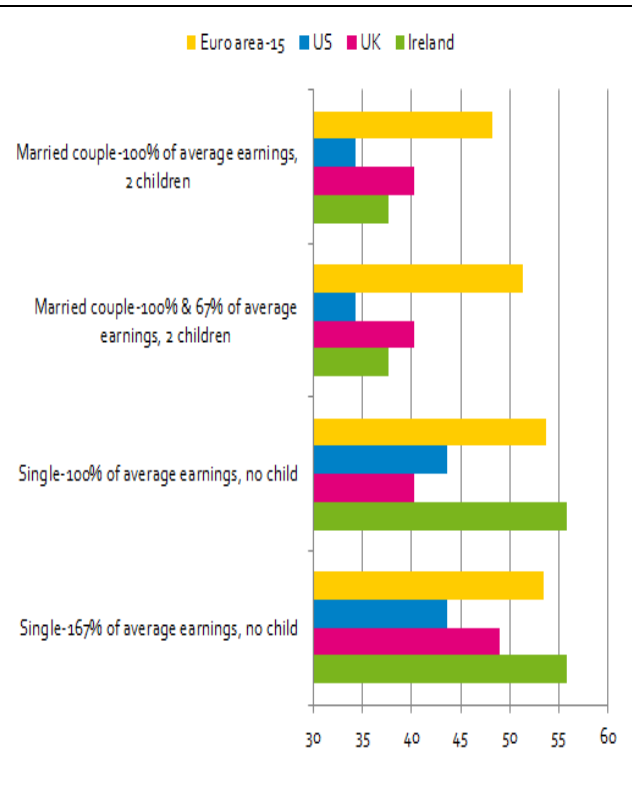
The Irish corporation tax regime remains competitive and stable. Figure 10.4 shows Ireland's corporation tax rate remains internationally competitive at 12.5 per cent. It reflects central statutory rates – effective rates in many countries can be significantly lower. Long term certainty, transparency and predictability with regard to the corporate tax regime are critical in informing enterprise investment plans. While Ireland's corporation tax rate has remained consistent over recent years, an increasing number of EU countries such as Spain, Denmark, and Sweden have reduced their rates. Since 2010, the UK has cut rates further and faster than other OECD countries. The main rate of corporation tax has already been cut from 28 per cent in 2010 to 20 per cent, and will be cut again to 17 per cent by 2020. In addition, the new US administration has signalled intentions to revise the US rate. The impact of any US tax reform on Ireland will clearly depend on the exact nature of the reform. Any reforms are likely to be complex. Similarly, proposals relating to the introduction of a Common Consolidated Corporate Tax Base would impact on Ireland. It is vital that Ireland's tax offering remains competitive for firms seeking an EU base for operations. Ireland also needs a competitive tax offering to attract and develop knowledge-based investment, related to research and development and intellectual property. Maintaining the competitiveness of our R&D tax credit and Knowledge Development Box also form part of Ireland's competitive offering to attract FDI and supports Irish enterprises to invest, innovate and compete internationally.

Capital Gains Tax

High rates of Capital Gains Tax (CGT) can impede entrepreneurship and talent. Capital taxes are not easy to compare across countries given differences in tax design and integration with other taxes. In 2016 data from the Tax Foundation⁵⁶ shows Ireland has the 5th highest rate of capital gains tax in the OECD at 33 per cent.

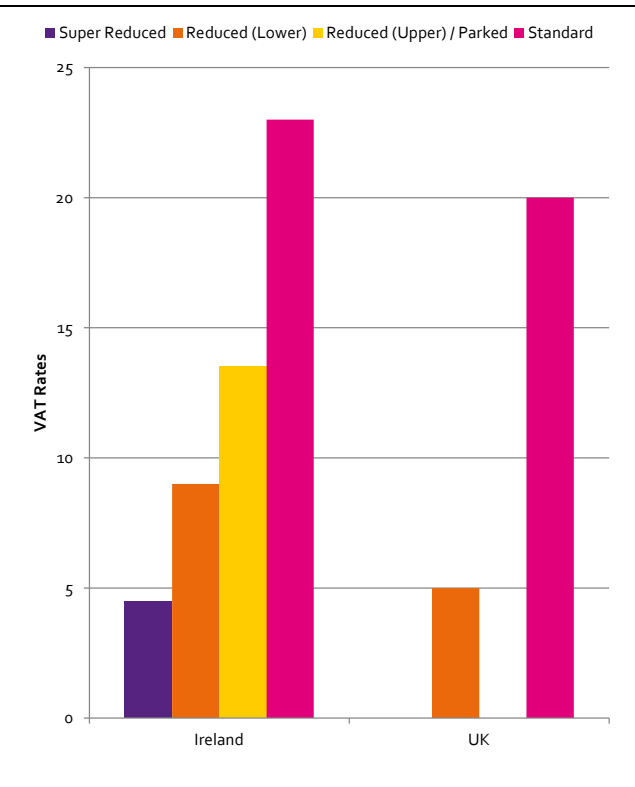
Figure 10.5 shows Ireland's CGT rate is particularly high relative to the UK's 28 per cent. It has increased considerably since 2009 when it was 20 per cent. The UK's Entrepreneur's Relief provides for a 10 per cent CGT rate on business investments by both entrepreneurs and passive investors, this relief is subject to a lifetime threshold of Stg£15 million per individual. Recent budgets have seen Ireland start to address the gap with the UK. CGT Entrepreneur Relief introduced in Budget 2017 provides for a reduced CGT rate of 10 per cent for entrepreneurs, (20% in 2016) and subject to a lifetime threshold of €1m in gains, and to certain criteria. The Programme for a Partnership Government commits to reducing CGT for start-ups to 10 per cent from 2017, held for 5 years up to a €10 million cap on gains.

Figure 10.2: Marginal Tax Difference Between Labour Costs for Employers and Net-Take Home Pay of Employee 2015



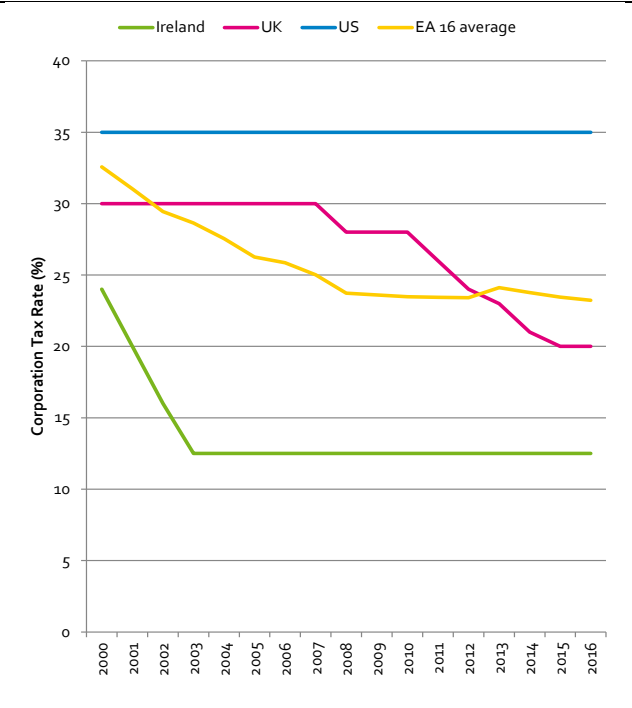
Source: OECD

Figure 10.3: Value Added Tax Rates 2016



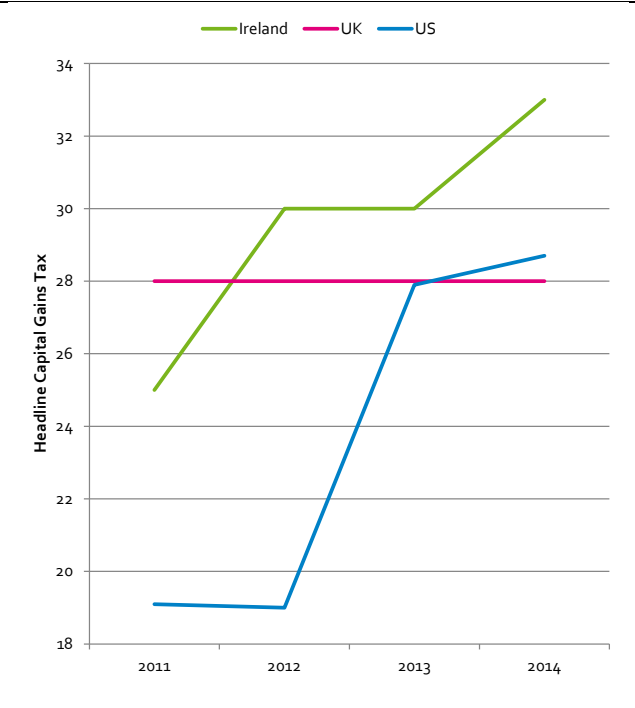
Source: Revenue Commissioners, HM Revenue & Customs

Figure 10.4: Corporation Tax Rates 2000-2015



Source: OECD

Figure 10.5 Capital Gains Tax Rates 2016



Source: Tax Foundation

11. Access to Finance

- Access to competitively priced sources of finance is essential to facilitate enterprises to establish and expand their operations, improve productivity and ultimately survive and scale. Limited or costly credit damages the environment for entrepreneurship, scaling and investment. Despite significant reductions, interest rates charges to Irish SMEs are 60 basis points higher than those charged to UK SMEs and 20 basis points higher than the average charge across the EU 28.
- Almost 27 per cent of SMEs surveyed across the EU28 had applied for a bank loan in the first half of 2016. The comparable figure for Ireland was 17 per cent and the UK 15 per cent. Of those EU28 SMEs who had applied for credit, 70 per cent were successful in obtaining the full required amount, compared to 68 per cent in the UK but only 60 per cent for Irish SMEs.
- Bank loans are the most popular type of finance sought by Irish SMEs and their preference and dependence on bank finance is significantly higher than the UK (53% versus 38%). Equity finance as a source of credit was more prevalent in Irish SMEs than the EU28 average in 2016 and just one per cent lower than the comparable figure in the UK of 9 per cent.
- The UK lending market is more diversified with 9 per cent of SME financing coming from alternative sources in 2016, almost double the equivalent Irish rate.

Credit

The Central Bank's latest SME Market report⁵⁷ shows that rejection rates and the number of SMEs with bad debts continue to decline relative to previous years. Irish SMEs are still heavily reliant on bank loans with limited uptake of non-bank financing sources. In an international context, demand for credit in Ireland is relatively low, and while falling, SME interest rates are relatively high. Table 11.1 shows the evolution of SME interest rate charges over the past three years between Ireland and the Euro area 19. The interest rate differentials almost doubled year-on-year in 2015 but halved the following year. Mean interest rates charged on bank overdrafts and credit lines for SMEs in Ireland were still 30 basis points higher than the average across the Euro area 19 in 2016.

Table 11.1 SME Interest Rates

	2014	2015	2016
Ireland	6.1	5	2.4
Euro area 19	5.5	3.9	2.1

Source: ECB/European Commission SAFE survey, NCC Calculations

According to the latest annual ECB SAFE Analytical Report for 2016, SMEs across Europe reported that interest rates decreased year-on-year between 2015 and 2016. As evidenced in Figure 11.1, between 2014 and 2016 the interest rates charged on bank overdrafts and credit lines for SMEs in Ireland fell from 6.1 per cent to 2.4 per cent. Despite this significant reduction interest rates charged to Irish SMEs were 60 basis points higher than those charged to their UK equivalents and 20 basis points higher than the average charge across the EU 28. This enduring interest rate differential between SMEs here over those in the UK places Irish based enterprises at a distinct competitive disadvantage. The determinants of the cost of credit in Ireland are complex and varied but the concentrated lending market coupled with higher credit risk premiums in Ireland have been cited as the reasons for higher interest rates here over the Euro area average⁵⁸.

Figure 11.2 is based on OECD⁵⁹ data and shows the interest rate spreads between loans to large enterprises and SME across Ireland, the UK and the US over the period from 2008 to 2014. Before the onset of the economic downturn the

rates levied on both business cohorts were similar in Ireland with a spread of roughly 50 basis points, less than half of the comparable rate in the UK. However, in the aftermath of the economic downturn banks in Ireland are more risk averse in lending to SMEs and the interest rate differential in 2014 rose to 180 basis points, almost double the equivalent spreads in both the UK and the US. The Government has intervened to address the cost of credit to SMEs through a number of new initiatives such as the Microenterprise Loan Fund, Credit Guarantee Scheme and recently the establishment of the Strategic Banking Corporation of Ireland. Only 1 per cent of the SMEs that did not seek State supported credit stated this was because it was too expensive, according to the most recent Department of Finance SME Credit Demand Survey report. It remains vital that the cost of credit in Ireland continues to be monitored to ensure it does not act as a drag on the enterprise sector, inhibiting investment and growth, particularly amongst start-ups and SMEs seeking to scale and expand.

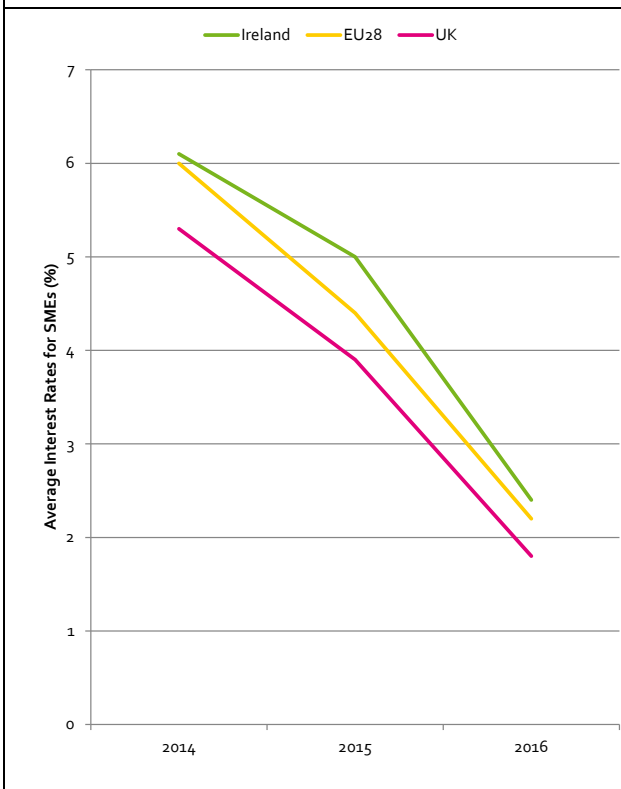
Demand and Sources of Finance

The latest Department of Finance SME Credit Demand Survey also shows continued decline in the demand for bank financing. The latest Red C SME credit demand survey indicates that business sentiment is positive and performance (turnover, profit and employment) is robust. While SME demand for credit has fallen, the survey finds that the main reason that SMEs do not apply for bank finance is that they consider they do not need it or already have finance in place, rather than cost, or banks not lending or fear of rejection. In Q2 2016, 23 per cent of SMEs requested bank finance in the past six months – down from 30 per cent during the same period last year. The Central Bank reports gross new lending to SMEs is currently high relative to the average since 2010. Annualised quarterly new lending in Q3 2016 was 5.1 per cent higher than Q3 2015. Central Bank data shows the Agriculture and Wholesale/Retail sectors consistently have the highest shares of new lending. Year-on-year new lending in Q3 2016 increased the most in the Manufacturing sector (37%). Increases are also observed in Hotels/ Restaurants (25%), in Construction (14%) and in the Agriculture sector (2.6%). Decreases are observed in Wholesale/ Retail and Business and Administrative Services by -19 per cent and 4.9 per cent, respectively.

Figure 11.3 shows demand in Ireland remains muted and significantly lower than the comparable rate for the EU28. Almost 27 per cent of SMEs surveyed across the EU28 had applied for a bank loan in the first half of 2016. The comparable figures for Ireland and the UK were 17 and 15 per cent respectively. Figure 11.3 also outlines the results in relation to the success of those SMEs who sought funding. Of those EU28 SMEs who had applied for credit, 70 per cent were successful in obtaining the full required amount. The comparable success rate for the UK was 68 per cent but only 60 per cent of the Irish SMEs were successful in obtaining the full amount sought, again highlighting the credit restrictions evident for Irish SMEs. SAFE data shows the purpose for which SMEs have been using the external financing obtained. It shows that borrowing for inventory or other working capital by SMEs is relatively high in Ireland at 42 per cent compared to 36 per cent in the UK. Finance for fixed investment (property, plant or equipment) by SMEs is 31 per cent in Ireland (UK 32%, EU 28 38%).

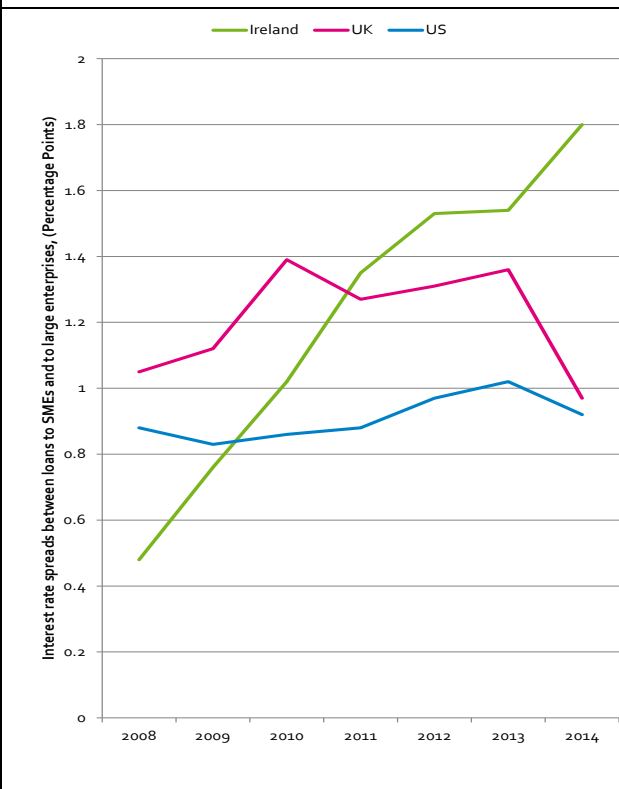
Central Bank analysis shows the Irish SME lending market is highly concentrated with the three main lenders accounting for approximately 90 per cent of market share. Figure 11.4 shows bank loans are the most popular type of finance sought by Irish SMEs and their preference and dependence on bank finance is significantly higher than the UK. The CSO's Access to Finance Survey, March 2016, indicates that there is a correlation between size and sector and growth trajectory in successfully accessing finance. It also highlights how relatively few SMEs (particularly, non-exporting SMEs) seek funding from non-bank sources: for example only 4.7 per cent of medium sized enterprises looked for equity finance compared to 39.8 per cent of similar sized enterprises who looked for bank finance. Increasing levels of private equity, crowdfunding and venture capital funding remains a challenge. The UK lending market is more diversified with almost double the amount of SME financing coming from alternative sources in 2016 than in Ireland. Ireland compares well in relation to equity finance and as a source of credit it was more prevalent in Irish SMEs than the EU28 average in 2016 and just one per cent lower than the comparable figure in the UK.

Figure 11.1: Interest Rates for SMEs 2016



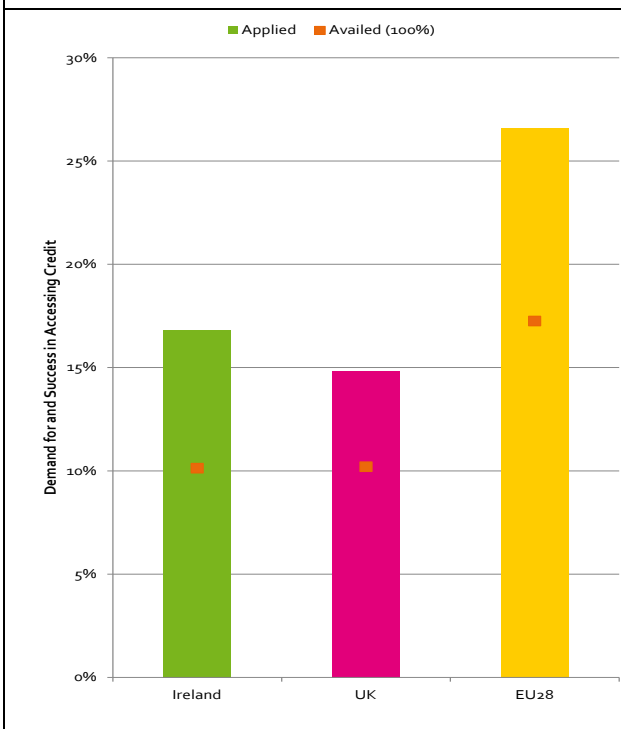
Source: ECB/European Commission SAFE Annual Report

Figure 11.2: Interest Rate Spreads for Business



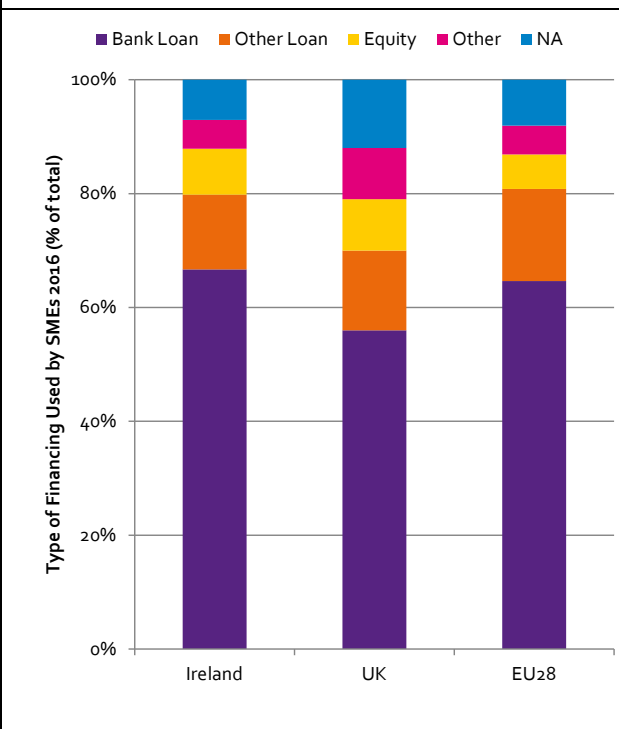
Source: OECD

Figure 11.3: Demand & Success in Accessing Credit 2016



Source: ECB SAFE

Figure 11.4: Sources of Finance for SMEs 2016



Source: ECB SAFE

12. Talent

- The availability of qualified work ready skills and talent is a fundamental source of competitive advantage. Demographic change means increased investment in education is necessary over the medium term. Whilst public expenditure on education in Ireland as a percentage of GDP is above the UK, the level of resourcing per student remains significantly lower than the UK, particularly at tertiary levels.
- The attainment profile of those exiting the formal Irish educational and training system has been improving steadily. Ireland has made significant progress in reducing the proportion of early school leavers. At tertiary level Ireland has a higher attainment rate than the UK.
- Ireland is a relatively poor performer in relation to lifelong learning levels. Ireland has scope to expand the range and participation levels in apprenticeship programmes. Ireland outperforms the UK in relation to reading and mathematical competency and proficiency scores but is behind on science. Irish adults rank below the UK in terms of digital skills.
- According to the IMD's 2016 Competitiveness Report, Ireland is ranked 18th out of 61 countries in the world for education. Ireland's position was slightly ahead of the UK (20th), up one place year-on-year, but behind the US which remained 14th. The IMD Report ranks Ireland highly in many areas, including availability of financial skills (1st), attracting and retaining talent (5th) and the education system meeting the needs of the economy (9th).

Expenditure

Data from the Department of Education and Skills shows that the numbers of enrolments of full-time students at all levels increased by 11 per cent to over 1.1 million in the period 2011-2016. In proportionate terms, enrolment is highest in primary (50% of all enrolments), secondary (31%) and third level (17%). The number of students in Irish primary and secondary schools increased by 8 per cent respectively and third level numbers have increased by 11 per cent. The CSO has projected the secondary school aged population of 13-18 year olds could increase by between 105,700 and 116,800 by 2026. This represents increases of between 31 and 34 per cent on the 2011 figure of 342,400. While educational quality and talent outcomes are not simply a function of the level of expenditure, national expenditure levels are core components in international measures of talent competitiveness. Demographic trends mean Ireland will require additional investment in schools, staff and related facilities.

The 2016 OECD Education at A Glance report⁶⁰ shows that among OECD countries, in 2013, the UK spent the highest proportion of its GDP on primary to tertiary educational institutions (6.7%, compared to 5.2% in Ireland, 5.2% is also the OECD average). Expenditure on education in Ireland is largely publicly funded (95% compared to 84% in the UK).

Figure 12.1 uses Eurostat data for 2014 which shows the following:

- As a percentage of Total Government Expenditure, Ireland (11.1%) spends slightly more than the UK (11%).
- The level of resourcing per student for education is significantly lower than the UK. In Ireland expenditure per student at primary to tertiary level was (USD\$10,065) below the OECD average and the UK (USD\$11,545).
- Ireland spends more on primary and pre-primary education. It spends a comparable amount to the Euro area on secondary education but significantly less than the UK.
- When it comes to the public funding of tertiary education, as a proportion of Government expenditure, Ireland spends more than the rate of the UK. In the UK an above-average proportion of expenditure on educational institutions comes from private sources, particularly at tertiary level where 57 per cent of expenditure on educational institutions comes from public funding, compared to 78 per cent in Ireland.

Demographic trends and increasing third level enrolment rates mean the demands Ireland currently places on the tertiary education system are increasing while the level of resourcing per student for tertiary education in Ireland is

significantly lower than the UK. In the UK expenditure per tertiary student (USD\$25, 744), is approximately 40 per cent above Ireland (USD\$ 15,704) and the OECD average USD\$15, 772).

Education Performance

In terms of ratios of students to teaching staff⁶¹, at primary (Ireland 16:1, UK 20:1) and secondary (Ireland 14:1, UK 16:1) levels Ireland outperforms the UK. Ireland is behind in tertiary education (Ireland 20:1, UK17:1). Enrolment in early childhood education in Ireland is low relative to the UK and in expenditure terms Ireland (0.1% of GDP) is one of the lowest in the OECD and well behind the UK (0.8%).

Overall, the attainment profile of those exiting the formal Irish educational and training system has been improving steadily over recent years (and indeed decades) as follows:

- Ireland has made significant progress in reducing the proportion of early school leavers (i.e. the proportion of the population aged 18-24 that have not completed post-primary education), and the rate has fallen from 11.5 per cent in 2010 to 6.9 per cent in 2015, well below the rate in the UK (10.8%).
- 91 per cent of 25-34-year olds in Ireland had completed upper-secondary education or higher compared to 85 per cent in the UK.
- Attainment at tertiary education level (whether university or other higher education) is a crucial determinant of employment and earnings prospects and is above the OECD and EU average in Ireland and the UK. In Ireland among 25-34-year olds, 52 per cent have attained a tertiary education compared to 49 per cent in the UK. Among 25-64 year olds the rates are the same (43% in both).

Figure 12.2 shows the population with tertiary education which is defined as those having completed the highest level of education, by age group⁶². In both the 25-34 and 35-44 age cohorts, Ireland (52% and 50.8%) outperforms both the UK (49.1% and 49.1%) and the US (46.5% and 46.7%). However, a significant and more pronounced inverse correlation between educational attainment and age exists in Ireland compared with both other jurisdictions with a lower proportion of 45-54 and 55-64 year olds having attained tertiary education here than in the UK and the US. In both the UK and Ireland the proportion of 25-34 year olds with a doctoral or equivalent qualification is 1 per cent.

Notwithstanding the vital and continued importance of tertiary level education and its critical role in competitiveness, the Council considers increasing the availability of technical, craft and professional skilled workers, particularly apprentices, is critical for growth, employment and competitiveness. International comparable data on apprenticeship and traineeship participation and outcomes is unavailable. In Ireland, apprenticeship training is currently concentrated in the broad field of engineering manufacturing, construction and the motor sector with currently 27 apprenticeship programmes. The number of new apprentices declined significantly with the onset of the economic crisis in 2007 (falling from a peak of 8,300 in 2006 to 1,200 in 2010⁶³). Intake into apprenticeship programmes has begun to recover, with over 3,000 new registrations in 2015. The range of apprenticeships is currently being expanded and as set out in the 2016 Action Plan for Education, a process of significant structural reform is being undertaken. In particular, the Plan seeks to work with employers to expand the range of apprenticeships significantly across all major economic sectors, and double enrolments. Apprenticeship data is not available for the UK as a whole. Scotland, Wales and Northern Ireland have their own arrangements for supporting employers to access apprenticeships. Data⁶⁴ for England shows approximately 150 apprenticeships frameworks available for employers and training organisations across a wide range of economic sectors⁶⁵. In England, the majority of apprenticeship starts were in the service sectors. Almost three quarters (71%) of all starts were concentrated in three sectors: Business, Administration and Law; Health, Public Services and Care and Retail and Commercial Enterprise⁶⁶. The UK Government has also committed to reforming the apprenticeship funding model and increasing the quality and quantity of apprenticeships in England, reaching three million starts in 2020.⁶⁷

Reading, Science and Mathematics Proficiency

Figure 12.3 highlights the most recent OECD PISA score for Reading, Science and Mathematics which shows that Irish students score above the OECD average in all three categories. Ireland outperforms the UK, the US and the OECD average in relation to reading and mathematical competency and proficiency. It is only in the area of science that Ireland is outperformed by the UK. Overall, Ireland is ranked 18th for Mathematics, nine places above the UK and 5th for Reading (UK ranked 22nd) and 19th for Science (UK ranked 15th). Table 12.1 shows gains in maths scores in Ireland since the previous survey. Ireland's scores for both science and reading have fallen, most significantly in the former category; however, the data should be treated with some caution⁶⁸.

Table 12.1 PISA Scores 2012 - 2015

Competency	Science 2015	Science 2012	Reading 2015	Reading 2012	Maths 2015	Maths 2012
Ireland	503	522	521	523	504	501
UK	509	514	498	499	492	494
US	496	497	497	498	470	481
OECD Average	493	501	493	496	490	494

Source: OECD

Digital Skills and Lifelong learning

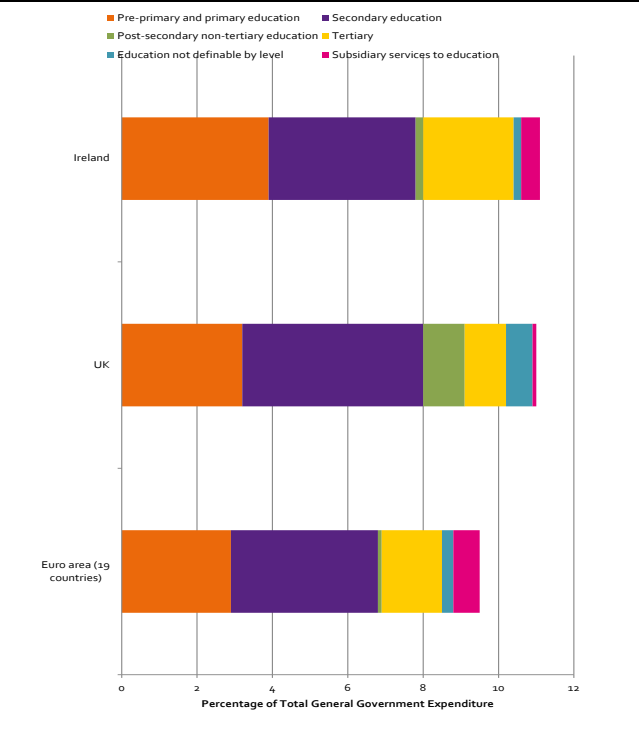
Increasing digital skills in the general population can facilitate greater levels of productivity and greater participation in society. Figure 12.4 shows Irish adults rank above the Euro area average in terms of possessing low digital skills and conversely the proportion with good digital skills is below our UK and European counterparts. Furthermore, survey data from the OECD's Programme for the International Assessment of Adult Competencies (PIAAC) shows the levels and distribution of skills among the Irish working-age population are relatively low compared with competitor countries in digital skills. It shows the levels and distribution of skills among the Irish working-age population are relatively low compared with competitor countries in terms of literacy, numeracy and digital skills.

Lifelong learning is important to competitiveness as it facilitates structural adjustment, productivity growth, innovation and effective career progression. Ireland's workforce lags behind that of most EU countries to the extent to which it engages in lifelong learning activities, ranking 20th for participation⁶⁹. Based on Eurostat data, in 2015, the proportion of persons in Ireland receiving some form of education or training in the four weeks preceding the labour force survey was 6.5 per cent, compared with the EU28 average of 10.7 per cent and 15.7 per cent in the UK.

How Ireland ranks for talent competitiveness

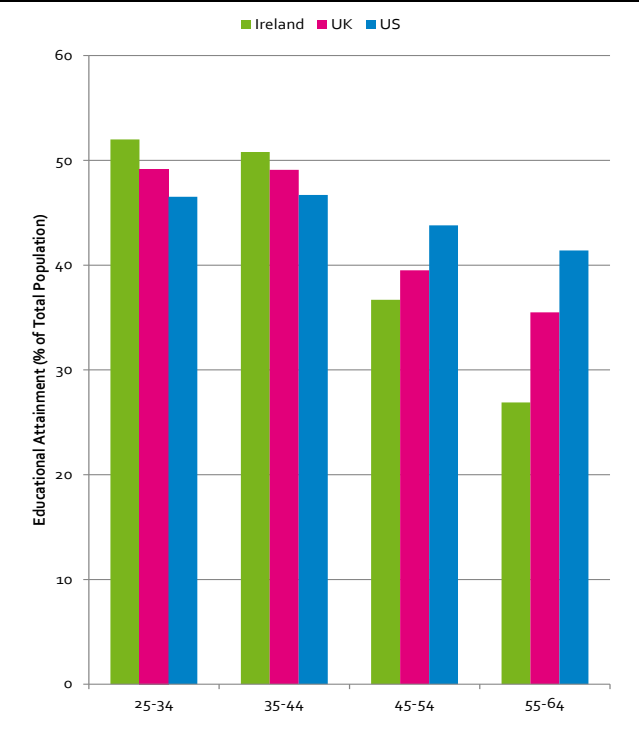
The IMD's 2016 World Talent Report ranks Ireland 18th out of 61 countries for the availability of talent⁷⁰. Ireland's position was slightly ahead of the UK (20th), up one place year-on-year, but behind the US which remained 14th. Ireland outranks the UK on 2 out of the 3 factors used to reach rankings (6th for Appeal – UK is 16th, 12th for Readiness, UK is 20th). The one factor where the UK outperformed Ireland was in Investment and Development. Ireland is ranked 1st for perceived availability of finance skills and 5th in perceptions that attracting and retaining talent are a priority for companies. The UK ranks 11th and 16th respectively in these criteria. Ireland scores well on perceptions of the education system meeting the needs of the economy (9th) compared to the UK (18th). Ireland ranks 43rd with regard to perceptions that language skills⁷¹ meet the needs of business, (UK is ranked 51st) and 48th on perceptions that apprenticeships are sufficiently implemented (UK 32nd). In perceptions regarding management education meeting the needs of the business community, Ireland is ranked 13th some eight places higher than the UK.

Figure 12.1: Expenditure by level 2014



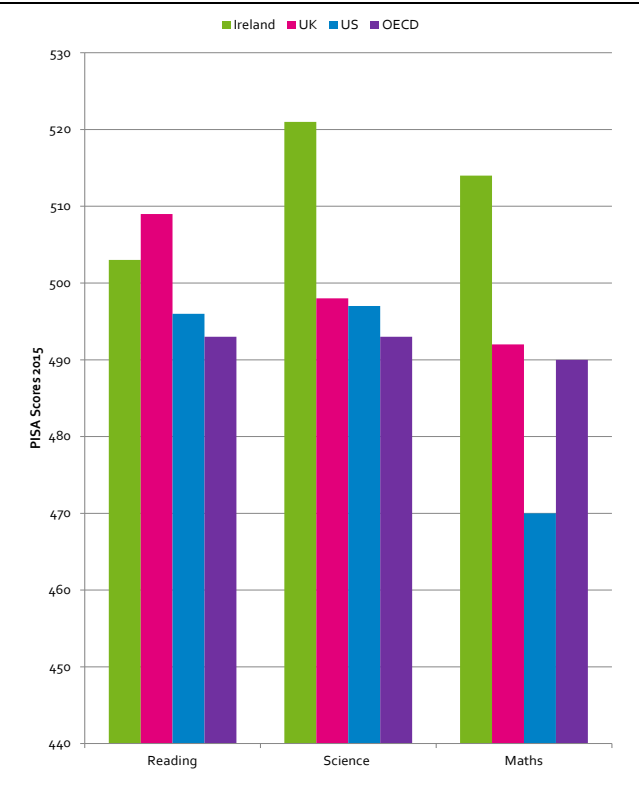
Source: Eurostat

Figure 12.2: Tertiary Educational Attainment 2015



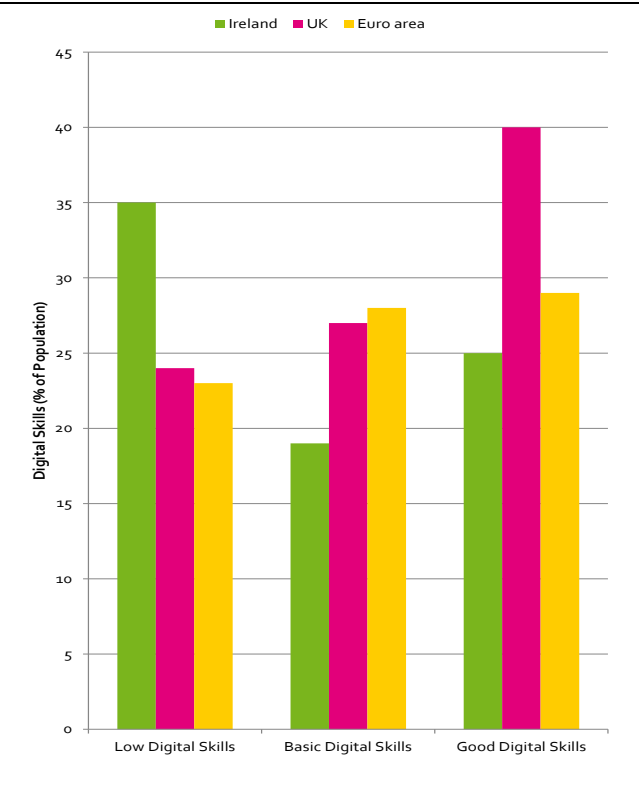
Source: OECD

Figure 12.3: PISA Scores 2015



Source: OECD

Figure 12.4: Digital Skills 2015



Source: Eurostat

13. Infrastructure

- The level of investment projected over the medium term represents a significant challenge in light of demographic pressure, EU budgetary commitments and clear deficits in telecommunications, innovation, and transport and water infrastructure.
- Public investment as a proportion of gross fixed capital formation (2%) is below both the UK and Euro average (2.7%).
- The WEF ranks Ireland's overall quality of infrastructure 38th, significantly lower than both the UK (24th) and the US (11th) in terms of perceptions. The IMD's 2016 Competitiveness Yearbook ranks Ireland's infrastructure, 23rd compared to the UK (16th) and US (1st).

Infrastructure Investment

Ireland's economic infrastructure and related networks have a strong bearing on the competitiveness of indigenous enterprises and as a driver of inward investment. Public investment is essential to maintain and expand Ireland's capital stock; it is also a significant driver of long term productivity growth and plays a crucial role in driving competitiveness – after all, the gains from public investment accrue not just to those undertaking the investment, but to a wide range of people and enterprises

Although the quality and level of infrastructure investment is heterogeneous, across the OECD, there is a need for upgrading and modernisation in most economies. There was a significant reduction in public capital expenditure over the course of the recession from approximately €9 billion in 2008 to €3.4 billion in 2013, although weaker demand for infrastructural services (e.g. reduced road traffic, declines in energy demand), partially mitigated the impact of this reduction. As the economy returned to growth, and the public finances recovered, the level of capital expenditure is increasing. The Capital Plan 'Building on Recovery: Infrastructure and Capital Investment 2016-2021' committed total state-backed capital investment of €42 billion. An additional €5 billion was allocated in last year's Summer Economic Statement. Absolute levels of Irish investment are recovering. Over the medium term, capital investment as a percentage of GDP is projected to increase but will remain low relative to pre-crisis levels. Developing our infrastructure base, while complying with the EU's fiscal rules, is a fundamental challenge to enhancing competitiveness relative to countries such as the UK.

Gross fixed capital formation includes spending on land improvements (e.g. fences, ditches, drains); plant, machinery, and equipment purchases; the construction of roads, railways, private residential dwellings, and commercial buildings. Following a sharp drop during the recession, private investment activity in Ireland has increased significantly. Figure 13.1, shows that Irish private investment (21%) exceeds the Euro area average (17%), and the level seen in the UK (14%). It should be noted that the private sector investment data for Ireland for 2015 is influenced by a substantial increase in intangible investment mainly attributable to the bringing onshore of intellectual property assets. Public investment as a proportion of gross fixed capital formation (2%) is however below both the UK and Euro average (2.7%). In common with most other OECD countries, general Government capital expenditure in Ireland declined significantly as a result of the crisis and remains relatively weak. Figure 13.2 shows that, as a percentage of GDP, Ireland's inland infrastructure expenditure (transport infrastructure) declined from 0.8 per cent in 2009 to 0.3 per cent in 2014 and since 2011 has been well below the UK's level of investment in 2014. The corresponding reduction in spending in both the UK and the US was much less pronounced and investment in the UK was 0.7 per cent in 2014. The level of investment projected over the medium term represents a significant challenge in light of demographic pressure, EU budgetary commitments and clear deficits in telecommunications, innovation, transport and water infrastructures. Boosting investment would help address competitiveness bottlenecks, and would increase potential

growth in the medium term, while also increasing aggregate demand in the short term. Investment can also contribute towards unlocking the potential of the regions to grow.

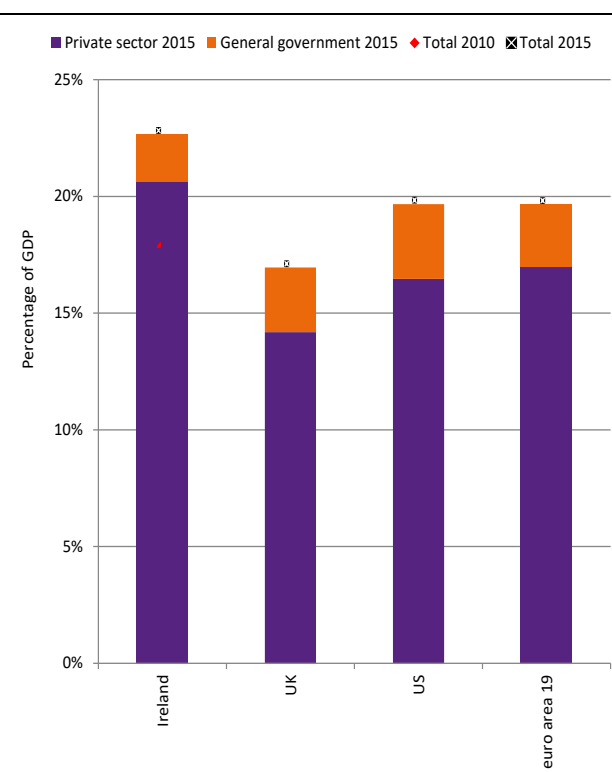
Ireland's likely demographic profile also necessitates an increase in investment. Based on CSO projections⁷², Ireland's population is expected to increase from 4.57 million in 2011 to between 4.85 and 5.31 million by 2026, and to between 5.0 and 6.7 million by 2046. Additional infrastructure will be essential to meet the demand generated by this growing population

Infrastructure Quality

In terms of the impact of infrastructure investment, a range of international benchmarks, mostly qualitative in nature, are available comparing the stock and quality of infrastructure in Ireland with our competitors. Ireland's diminished investment is evident in declining and low scores in relation to the perception of overall infrastructure quality. Reflecting a period of sustained capital investment, there was a strong improvement in perceptions up until 2010. Ireland's score fell over the five years to 2015. Figure 13.3 shows the disparity of perceptions of Road, Rail, Port and Air transport facilities between Ireland and both the UK and the US. Ireland performs poorly in terms of perceptions regarding the overall quality of infrastructure according to assessments by the World Economic Forum (WEF). In this category Ireland was ranked 38th significantly lower than both the UK (24th) and the US (11th). The WEF's Report identifies the 'inadequate supply of infrastructure' in Ireland and this deficiency was cited by Executives as the most problematic factor for doing business.

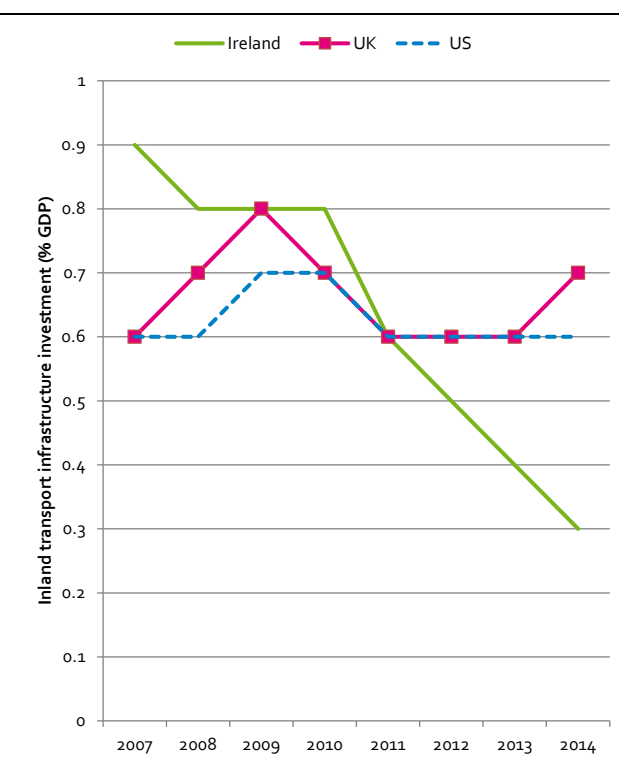
The IMD's 2016 Competitiveness Yearbook report shows that while Ireland's overall performance and ranking in Infrastructure, (23rd) is an improvement of 1 place on 2015 we perform relatively poorly in an EU context and lag the UK (16th) and US (1st). Ireland ranks behind the UK in all three infrastructure sub factors benchmarked by the IMD. Figure 13.4 shows infrastructure component rankings as benchmarked by the IMD using a mixture of quantitative and qualitative Executive Survey data. On basic infrastructure, Ireland (41st) lags the UK (27th) across most indicators of stock, investment levels and quality perceptions. Perceptions regarding the adequacy of Irish infrastructure maintenance and development have fallen from 17th to 33rd with the UK in 27th place. In technological infrastructure, Ireland (19th) ranks behind the UK (11th) in areas such as average bandwidth speed (23rd and 17th) and perception of ICT skills availability (40th and 30th). Ireland is ranked 25th for expenditure on research and development as a percentage of GDP (UK 22nd). In Scientific Infrastructure, Ireland (21st) remains well behind the UK (9th). While Ireland and the UK are relatively similar with regard to innovation investment and output metrics, the UK outperforms Ireland in measures relating to the perceived quality of knowledge transfer (9th and 20th) and attractiveness as a location for science and research personnel (3rd and 16th).

Figure 13.1: GFCF as a % of GDP 2010-2015



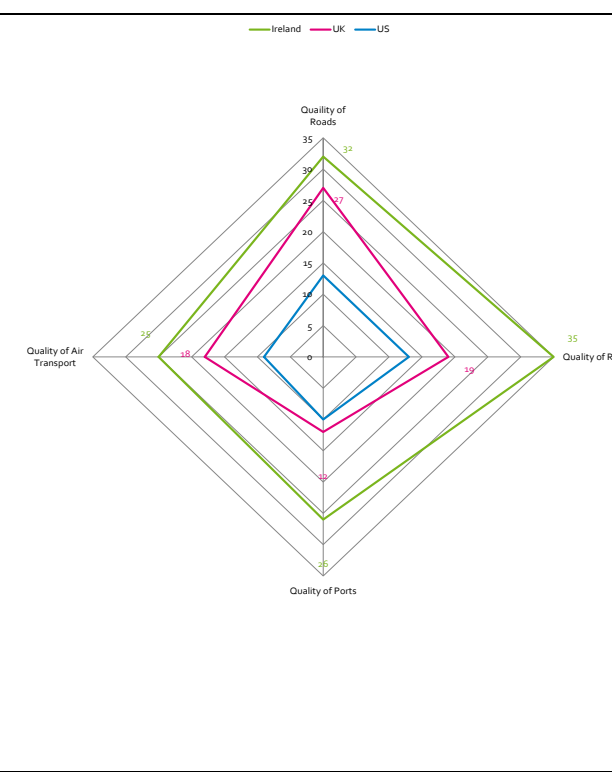
Source: European Commission AMECO

Figure 13.2: Inland Infrastructure Investment 2007-2014



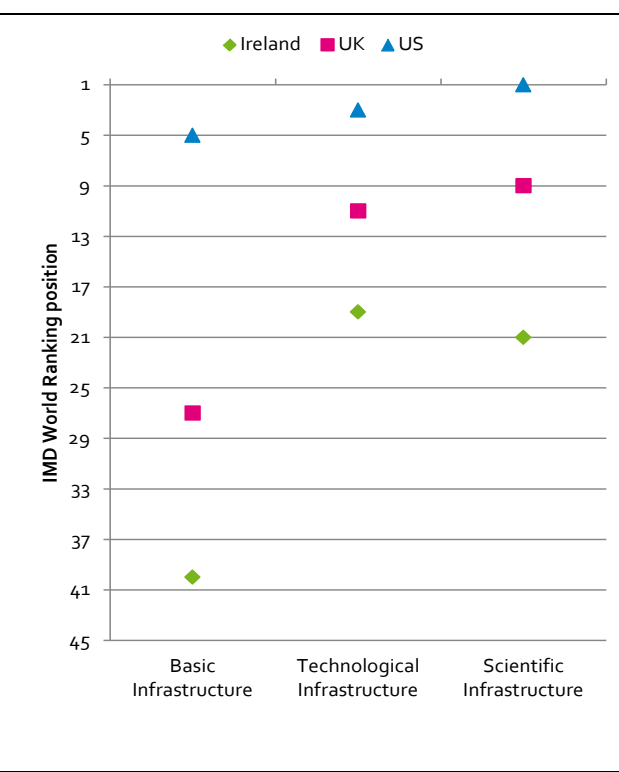
Source: OECD

Figure 13.3: WEF Quality of Infrastructure 2016/2017



Source: WEF

Figure 13.4: IMD Infrastructure Rankings 2016



Source: IMD

14. Innovation

- From a competitiveness perspective, the returns from knowledge based capital (KBC) are a vital component in securing productivity growth, diversifying and broadening the enterprise and exports base, growing FDI, and creating competitive advantage in intellectual property and commercial products and services. Levels of investment in R&D in Ireland remain below the best performing countries.
- Except for Business Expenditure on R&D in 2014 where both Irish and UK levels were the same, the UK spent more than Ireland in every R&D category. The gap in Government Expenditure on R&D was the most pronounced with the UK spending almost two-and-a-half times the Irish rate.
- In the WEF Global Competitiveness Report 2016-2017, the UK ranks 6th, nine places higher than Ireland. In the World Intellectual Property Organisation's Global Innovation Index, Ireland is ranked 7th in 2016 behind the UK (3rd) and the US (4th).
- The UK spends 14.8 per cent of sectoral Gross Value Added on Knowledge based capital compared to 7.7 per cent in Ireland.
- In terms of marketing innovation, Irish firms were more than four times more likely to be innovative than their UK counterparts. For organisational innovation, seen as critical in boosting productivity, Ireland had 22 per cent of organisations engaged in innovative practices compared with 17.5 per cent in the UK.

Innovation Expenditure

An essential component of supporting an innovative and enterprising economy, innovation is crucial to creating and maintaining high-value jobs and attracting, developing and nurturing business, scientists and talented people, ensuring Ireland is connected and respected internationally. From a competitiveness perspective, the returns from knowledge based capital (KBC) are a vital component in securing productivity growth, diversifying and broadening the enterprise and export base, growing foreign direct investment, and creating new competitive advantage in intellectual property and commercial products and services. In terms of the public role for supporting KBC, OECD research suggests that the strongest evidence for private under-investment exists for R&D-related spending – suggesting a continued important role for public investment. Gross expenditure on R&D (GERD) as a percentage of GDP ranged from 0.46 per cent to 3.26 per cent across the EU in 2015. Figure 14.1 shows that in 2014 GERD in Ireland accounted for 1.51 per cent of GDP (1.75% of GNP). The comparable 2014 European range for Business Expenditure on R&D (BERD) was between 0.18 and 2.16 per cent and amounted to 1.09 per cent of Irish GDP. Irish Higher education (HERD) and government sector (GovERD) spending on R&D accounted for 0.28 and 0.05 per cent respectively in 2015. Except for BERD in 2014 where both Irish and UK levels were the same, the UK spent more than Ireland in every R&D category. The gap in GovERD funding was the most pronounced with the UK spending almost two-and-a-half times the Irish rate. Competitive economies require sufficient and effective investment in R&D, especially by the private sector; the presence of high-quality scientific research institutions; extensive collaboration in research between universities and industry; and sophisticated business practices and effective clusters. However, overall levels of investment in research and development in Ireland remain below the best performing countries.

Innovation 2020 is Ireland's five year strategy on research and development, science and technology. A key ambition of Innovation 2020 is to increase total investment in R&D in Ireland, led by the private sector, to 2.5 per cent of GNP. On current official projections, this would mean that over €5 billion will be invested per year in R&D by the private and public sectors by 2020. This will represent a doubling of levels of investment (€2.9 billion in 2014). However, as shown in Figure 14.1, overall levels of investment in GERD and BERD in Ireland in 2014 remained below the comparable levels in both the UK and the Euro area.

Innovation Performance

The Innovation Union Scoreboard 2016 provides a comparative assessment of innovation performance (Figure 14.2). Both Ireland and the UK are classed as Strong Innovators with an above EU28 average performance. Overall, Ireland is ranked 6th in the EU, (with a score of at 0.60854) ahead of the UK (at 0.60177) in 9th place.

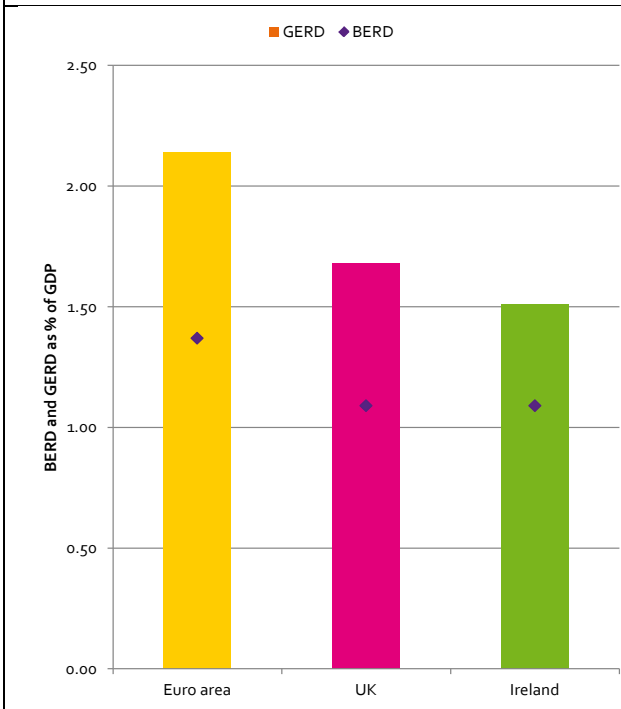
- Relative strengths noted for Ireland are in Human Resources and Economic Effects. Ireland performs well above the EU average on License and Patent Revenues from abroad and International Scientific Co-publications. Other strong performing indicators are Exports of Knowledge Intensive Services and Employment in Knowledge Intensive Activities.
- Relative weaknesses are in Finance and Support, Firm Investments, Community designs, Non-R&D innovation expenditures, and R&D expenditures in the public sector.
- In the UK, the best performing dimensions are Open, excellent and attractive research systems and Human Resources. The UK performs better than the EU average for most dimensions, and above or close to the average for the indicators. Relative best performance is in International Scientific Co-publications, Innovative SMEs collaborating with others, Non-EU doctorate students, and Venture capital investments.
- A relative weakness in the UK is the dimension of Firm investments, especially due to bad relative performance in Non-R&D innovation expenditures.
- In terms of the University-Industry Quality of R&D Collaboration, which is widely regarded as an effective method of enhancing economic returns from publicly-funded research programmes and thereby improving competitiveness, Ireland lags both the UK and the US.

In its latest Global Competitiveness Report 2016-2017 compiled by the WEF, the UK ranks 6th some nine places higher than Ireland. Ireland continues to improve in the World Intellectual Property Organisation's Global Innovation Index moving up one place to 7th in 2016, behind the UK (3rd) and the US (4th). The latter's universities were ranked 2nd and 1st respectively with Ireland in 17th position.

Investment in Knowledge Based Capital (KBC) is a broad measure which includes investment in computerised information, innovative intellectual property and economic competencies. Such investment has grown over time in Ireland, as in other countries, but Ireland remains in the lower half of OECD countries for which data is available, and significantly behind the UK in this regard as shown in Figure 14.3. As a percentage of the business sectors' GVA, some 11 per cent spending is the average across the OCED countries benchmarked. The UK spends 14.8 per cent of sectoral GVA on KBC – Ireland spends 7.7 per cent.

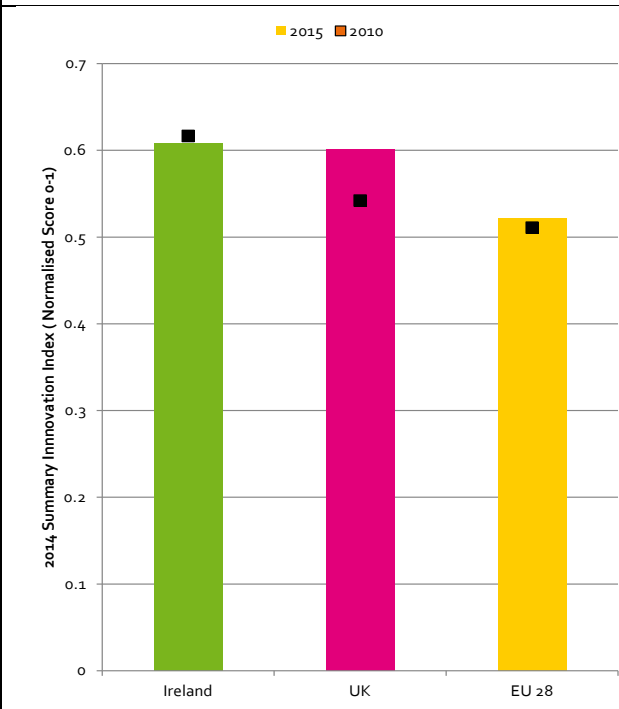
Figure 14.4 shows that Ireland had more product, process, market and organisational innovative firms, as a percentage of all firms, than the UK. Irish firms were more than four times more likely to be innovative in terms of marketing than their UK counterparts. Incidences of innovation in Ireland surpassed the Euro area averages except in organisational innovation. Organisational innovation, which is defined as the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations, is seen as critical in boosting productivity. In 2015 Ireland had 22 per cent of its organisations engaged in innovative practices compared with 17.5 per cent in the UK.

Figure 14.1: BERD and GERD as a percentage of GDP 2014



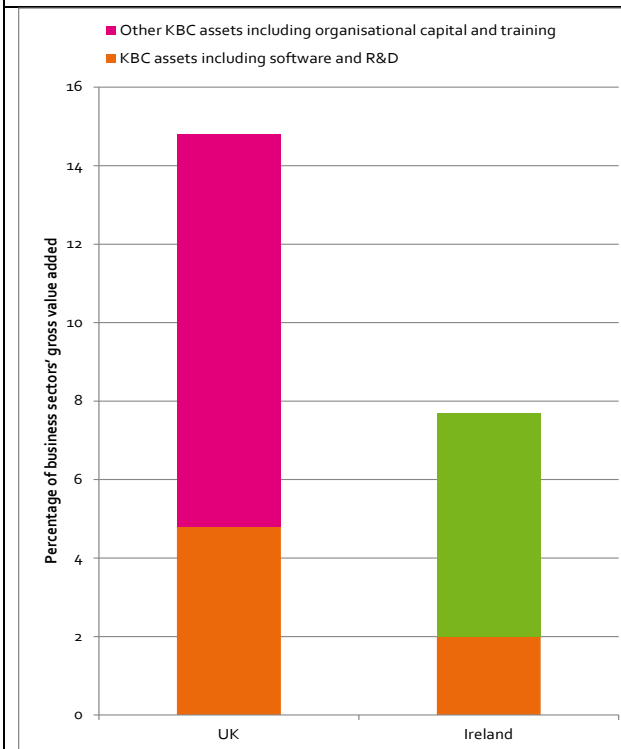
Source: OECD

Figure 14.2: Summary Innovation Index Scores 2015



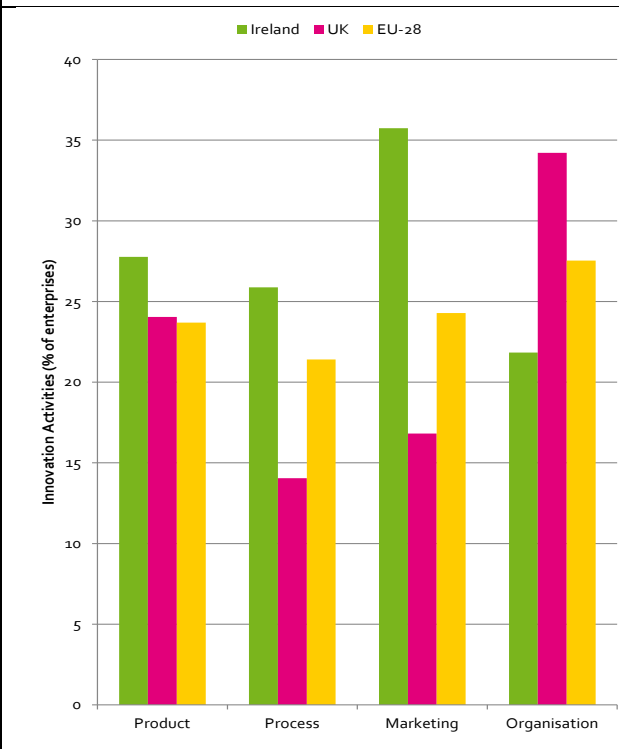
Source: European Commission

Figure 14.3: Investment in Knowledge Based Capital⁷³ 2013



Source: OECD

Figure 14.4: Enterprises undertaking Innovative Activities 2015



Source: EU Community Innovation Survey

15. Energy

- Ireland continues to have a very high dependence on imported fossil fuels, particularly oil on which 48 per cent of our energy consumption is based. As a small peripheral EU economy, with limited resources, factors outside of our control such as international oil prices exert a significant influence on energy prices.
- The energy implications for Ireland of Brexit could be significant given our dependence on energy imports from the UK, the source of 76 per cent of our oil imports. In terms of our electricity generation, 46 per cent is generated using natural gas, and 96 per cent of our gas is imported from the UK.
- Excluding VAT, the differential average price for electricity between Ireland and the UK has gone from a point where we are almost 12 per cent more expensive in 2012 to a situation where in the first half of 2016 electricity prices are 6 per cent cheaper in Ireland. Whilst industrial gas prices are now equal to the average prices across the Euro area, comparable prices are over 15 per cent lower in the UK.
- Meeting Ireland's climate change commitments presents significant challenges and opportunities at sectoral level.

Energy Consumption

A reliable and competitively priced supply of energy is vital for business and its ability to compete successfully in international markets. Ireland's indigenous sources of energy are not sufficient to meet its needs. In 2015 Ireland had an import dependency of 88 per cent – and the UK is the source of much of this energy. The energy policy implications for Ireland of Brexit are of great significance as Ireland remains extremely dependent on energy imports from the UK. The energy systems of Ireland and the UK are highly interdependent with a large amount of Ireland's energy supply being imported from the UK and a single electricity market in operation across the island of Ireland. However, Ireland currently imports the majority of its energy needs and has relatively low levels of interconnection and storage capacity despite the creation of an all-island energy market and interconnection with the UK in 2007. Ireland relies heavily on oil and 76 per cent of oil imports come from the UK. In terms of electricity generation, 46 per cent is generated using natural gas, and 96 per cent of our gas is also imported from the UK.

Figure 15.1 outlines the fuel mix for the Irish, UK, US and EU markets. The share of renewable energy production in Ireland continues to grow (albeit from a low base) with 9.1 per cent of gross final consumption derived from renewables in 2015, the highest percentage of the countries benchmarked. Although it is declining, Ireland continues to have a very high dependence on imported fossil fuels, particularly oil: 48 per cent of Ireland's energy consumption is based on oil. This is over 10 per cent higher than comparable dependence in the UK and the US. While maintaining the trade in secure supplies of energy with the UK must remain a priority, Brexit means diversifying energy sources and supplies is critical to ensure security of supply.

Energy Cost Competitiveness

Energy cost competitiveness is vital for business and its ability to compete successfully in international markets, particularly SMEs and manufacturing enterprises in energy intensive sectors. Energy intensive pharma-chemical products make up half the total goods exported from Ireland making the sector critical from an FDI and external trade perspective. For less energy-intensive industries, particularly SMEs, any increase of energy cost shares may still affect export competitiveness on the margin. Effective regulation and the timely availability of world-class energy infrastructure (including energy generation, supply, transmission, distribution, and interconnection) and related services are also critical to support energy cost competitiveness. However, ultimately, as a small peripheral EU economy, with limited natural energy resources, factors outside of our control such as international oil prices exert a significant influence on energy prices. While cost varies depending on the band of consumption examined, the latest

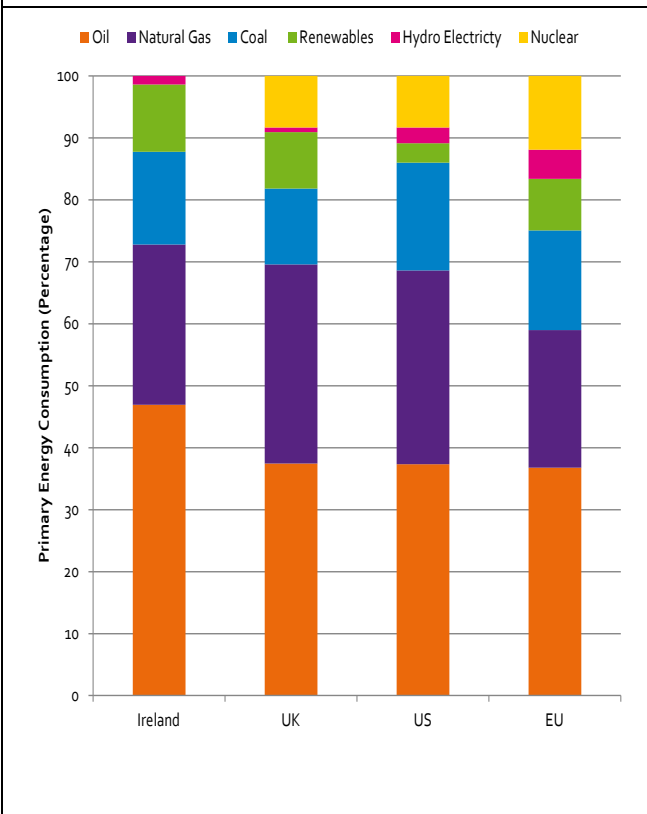
statistical data from SEAI illustrates that electricity prices in Ireland are broadly competitive with the UK and Euro area averages. As Eurostat's industrial electricity and gas price is collected and presented in many consumption bands, it is therefore difficult to present a simple message on trends and comparison. One interim solution is to present weighted average prices. This calculation is possible for Ireland now but weightings for other countries will not be available until later in 2017. Figures 15.2 and 15.3 show the weighted average prices for Ireland, together with the simple arithmetic average prices for both the UK and the Euro area. Weighted average prices for the UK will not be available until later in 2017. These different averages are not directly comparable but the simple average should not differ significantly from a weighted average.

Figure 15.2 shows the SEAI's weighted average electricity prices across all bands for Ireland and the average prices in both the UK and the Euro area. All prices exclude VAT. The average price for electricity in Ireland was almost 10 per cent higher than the comparable charge across the Euro area in the second half of 2012. By the first half of 2016 Irish prices had fallen by 3 per cent and this differential had more than halved. The differential between Ireland and the UK has gone from a point where we are almost 12 per cent more expensive in 2012 to a situation where in the first half of 2016 electricity prices are 6 per cent cheaper in Ireland. Figure 15.3 shows the weighted average industrial gas prices in Ireland fell by 20 per cent between the second half of 2012 and 2016, slightly below the average Euro area decrease of 24 per cent. Industrial gas prices are now equal to the average prices across the Euro area. Comparable prices are lower in the UK than in both Ireland and the Euro area by over 15 per cent. Both Figure 15.2 and 15.3 exclude VAT charges and it is important to note that the EU VAT Directive requires a standard rate of VAT across Europe to be at least 15 per cent, and a reduced rate, which can only apply to certain specified goods and services, be at least 5 per cent. It is important to note that outside the EU, the UK Government could reduce the VAT rates levied on gas and electricity bills giving them a significant competitive advantage in the price of utilities. Standard VAT rates currently apply to both business electricity and gas prices in both Ireland and the UK.

Climate Change

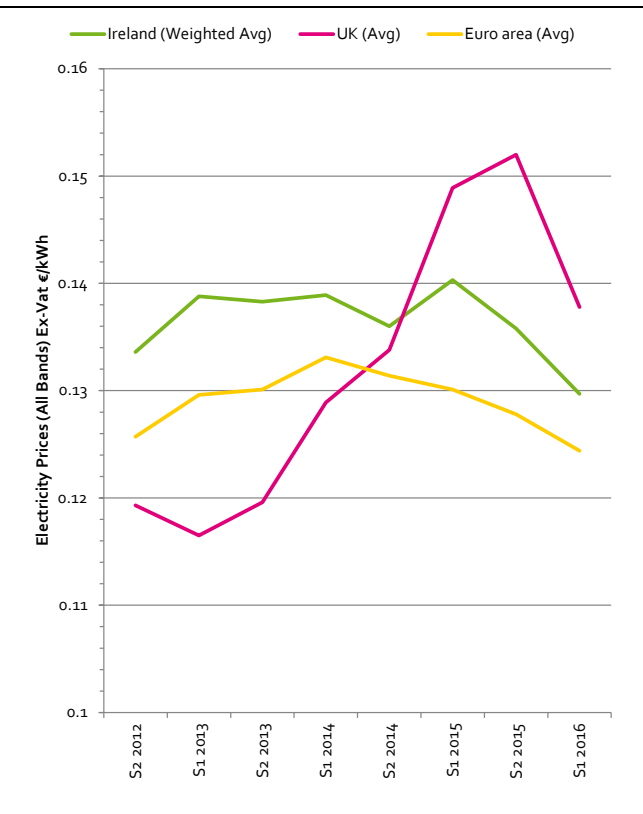
Climate change presents very significant challenges for Ireland, both in terms of mitigating our emissions and achieving national and international binding targets, as well as adapting to the effects of a changing climate. On the other hand, successful carbon mitigation policies offer potentially significant rewards. Ireland's 2020 target is to achieve a 20 per cent reduction of non-ETS sector emissions on 2005 levels, with annual binding limits set for each year over the period 2013 to 2020. The Environmental Protection Agency in March 2016 published projected emissions for 2020 which indicate that Ireland's emissions at that stage could be in the range of 6 per cent to 11 per cent below 2005 levels, with the likely outcome at the lower end of that range (i.e. 6%). Energy-efficiency improvements and increasing use of renewable energy can help Ireland lower its dependence on fossil fuel imports. The EU's Renewables directive sets difficult targets for combatting climate change, such as achieving a 20 per cent share of energy from renewable sources by 2020. Figure 15.4 shows that in 2015 Ireland was 6.8 per cent behind its 2020 target (16%) for the share of renewable energy as a proportion of gross consumption. The UK was also 6.8 per cent away from its target (15%). It should be noted that outside the EU, the UK would not be strictly bound by EU targets and the significant costs associated with non-compliance. The Paris Agreement, which entered into force in November 2016, aims to limit global average temperature rise to well below 2 degrees Celsius above pre-industrial levels, with an ambition of 1.5 degrees Celsius. The EU is committing to a reduction of at least 40 per cent in EU-wide emissions by 2030 compared with 1990 levels, which will be met through reductions of 43 per cent in the Emission Trading System (ETS) and 30 per cent in the non-ETS sector compared with 2005 levels. Targets have been proposed for Member States based on GDP per capita, which have then been adjusted to reflect cost-effectiveness. In the case of Ireland an initial target of 39 per cent has been proposed, which has been adjusted downwards to 30 per cent to reflect cost-effectiveness. Proposals on both the ETS and non-ETS for Ireland are currently under negotiation.

Figure 15.1: Primary energy-consumption by fuel 2015



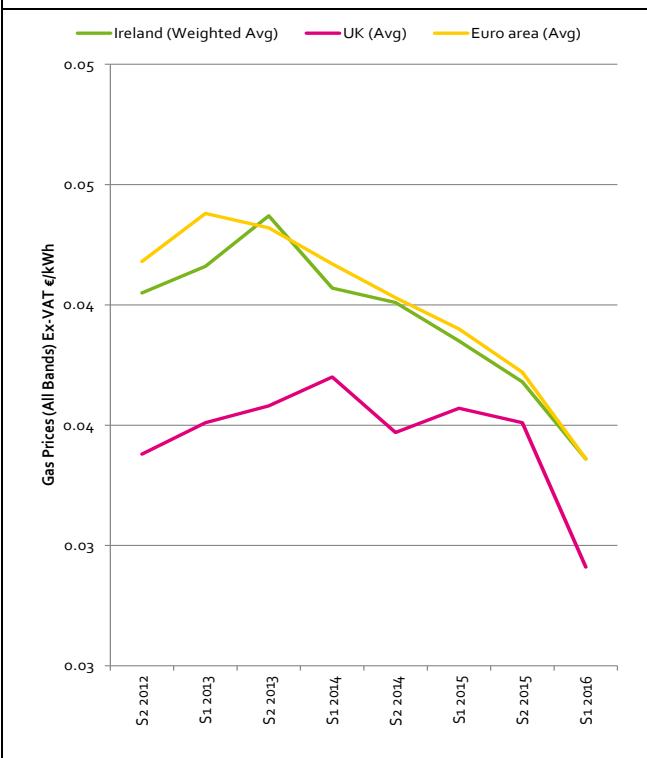
Source: BPBP Statistical Review of World Energy 2016

Figure 15.2: Electricity Prices for Industrial Customers



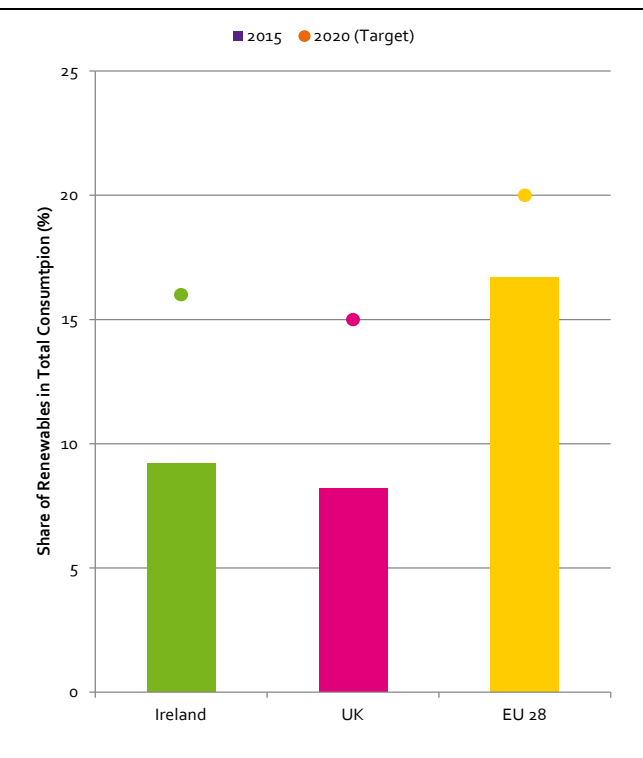
Source: SEAI, Eurostat

Figure 15.3: Gas Prices for Industrial Customers



Source: SEAI, Eurostat

Figure 15.4: Renewable Energy Targets 2015



Source: Eurostat

References

¹ Where Euro area data is not available, EU 28, OECD averages are presented for reference.

² Indices are not perfect measures of competitiveness and can be subjective in nature. In addition, the methodology and data used in these benchmarking reports differ significantly. It should also be noted that the methodologies are frequently revised and this can have an impact on Ireland's ranking. Over the past two years, the World Bank's Doing Business Report has been incorporating changes in methodology and improvements in the indicators used, which can make comparison with previous years very difficult.

³ The Global Competitiveness Index report analyses competitiveness along 12 pillars: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication and innovation. These are, in turn, organized into three subindices in line with three main stages of development: basic requirements, efficiency enhancers, and innovation and sophistication factors. The three subindices are given different weights in the calculation of the overall index, depending on each economy's stage of development, as proxied by its GDP per capita and share of exports represented by mineral raw materials. The GCI uses the World Economic Forum's annual Executive Opinion Survey to capture concepts that require a more qualitative assessment, or for which comprehensive and internationally comparable statistical data are not available. It also uses statistical data from internationally recognised agencies. The WEF state that in general, approximately two-thirds of the data used in the GCI 2015-2016 are derived from the Executive Opinion Survey and one-third is derived from international data sources.

⁴ The IMD's World Competitiveness Yearbook divides the national environment into four main factors: Economic Performance, Government Efficiency, Business Efficiency and Infrastructure. In turn, each of these factors is divided into 5 sub-factors which highlight every facet of the areas analysed. These 20 sub-factors comprise more than 340 criteria, although each sub-factor does not necessarily have the same number of criteria (for example, it takes more criteria to assess Education than to evaluate Prices). Each sub-factor, independently of the number of criteria it contains, has the same weight in the overall consolidation of results, which is 5% (20x5 =100). Criteria can be hard data, which analyses competitiveness as it can be measured (e.g. GDP) or soft data, which analyses competitiveness as it can be perceived (e.g. Availability of competent managers). Hard criteria represent a weight of 2/3 in the overall ranking, whereas the survey data represent a weight of 1/3.

⁵ Doing Business data are based on domestic laws, regulations as well as administrative requirements. For several indicators cost, time and procedures components are based on actual practice rather than the law on the books. To collect data for these indicators the Doing Business project works with legal practitioners or professionals who regularly undertake the transactions involved.

⁶ It should be noted that methodologies are frequently revised and this can have an impact on Ireland's ranking. Over the past two years, the World Bank's Doing Business Report has been incorporating changes in methodology and improvements in the indicators used, which can make comparison with previous years very difficult.

⁷ Data and rankings for the year 2016 were adjusted by the World Bank in 2016 and as a result Ireland is now ranked 15th in 2016 as opposed to 17th, which was the original ranking for 2016. The data reflect the situation as of June 1 of the respective year of publication. Previously published data points may be revised as new information is available.

⁸ Central Statistics Office (CSO), Quarterly National Accounts 2016

⁹ CSO Quarterly National Accounts Quarter 4 2016 and Year 2016 (Preliminary) and Balance of Payments results for Quarter 4 2016 and Year 2016 Press Statement

¹⁰ Office of National Statistics, National Accounts 2016

¹¹ <https://www.bea.gov/newsreleases/glance.htm#natacct>

¹² Barrett, A., et al, Scoping the Possible Economic Implications of Brexit on Ireland, November 2015

¹³ Central Bank of Ireland, Quarterly Bulletin 01, January 2017

¹⁴ Ibid

¹⁵ Ibid

¹⁶ CSO, Business in Ireland, 2016

¹⁷ Report of the Economic Statistics Group, 2016

¹⁸ Department of Finance, Monthly Economic Bulletin, February 2017

¹⁹ Central Bank of Ireland Quarterly Bulletin No. 3 2016.

²⁰ ESRI, Bergin, A., et al, Modelling the Medium to Long Term Potential Macroeconomic Impact of Brexit on Ireland, ESRI, Working Paper No. 548, 2016

²¹ WTO, World Trade Statistical Review, 2016

²² CSO, Goods Exports and Imports, December 2016¹¹

²³ *Suppressed for confidentiality reasons but included in the higher level aggregates.

²⁴ Irish Exporters Association Impact of the UK Referendum on Membership of the European Union on the Irish Agri-Food & Fisheries Sectors, submission to The Joint Committee on Agriculture, Food and the Marine, 2016

²⁵ World Bank, Connecting to Compete, Trade Logistics in the Global Economy, 2016

²⁶ The LPI relies on a structured online survey of logistics professionals from the companies responsible for moving goods around the world: multinational freight forwarders and the main express carriers. The World Bank considers freight forwarders and express carriers are best positioned to assess how countries perform.

In 2016, 1,051 logistics professionals participated in the survey for the LPI.

²⁷ Department of Finance, Getting Ireland Brexit Ready, 2016

²⁸ ESRI, The Product and Sector Level Impact of a Hard Brexit across the EU, 2016

²⁹ Department of Finance, Getting Ireland Brexit Ready, 2016

³⁰ A Tale of Two Clusters: The Evolution of Ireland's Economic Complexity since 1995

³¹ Lawless, Martina, Iulia Siedschlag and Zuzanna Studnicka (2017), 'Expanding and Diversifying the Manufactured Exports of Irish-owned Enterprises'

³² Enterprise Ireland's Strategy Statement for the period 2017-2020 sets out a target to accelerate exports to markets outside the UK to 67% of total exports. Enterprise Ireland is also working to deepen and consolidate activities in the UK & US markets, intensify activities in the EU markets and increase and diversify growth in to other international markets in Asia, North America and Africa.

³³ In the GEDI Index 1, Entrepreneurial attitudes (ATT) are believed to be influenced by the crucial institutional factors of market size, education, the riskiness of a country in general, the usage rate of the internet in population, and culture. 2. The entrepreneurial activity (ACT) sub-index is principally concerned with measuring high growth potential start-up activity. This high growth potential is approached by quality measures, including opportunity start-up motives, belonging to a technology intensive sector, the level of education as well as the uniqueness of the offered product/service. The institutional variables used include the ease of doing business, the availability of the latest technology, the level of human development, and the freedom of business operation. 3. The entrepreneurial aspiration (ASP) sub-index refers to the distinctive, qualitative, strategy related nature of entrepreneurial activity. The newness of the product and of technology, internationalization, high growth ambitions and finance variables are included in this subindex. The institutional variables measure the R&D potential, the sophistication of business and of innovation, the level of globalization, and the availability of venture capital.

³⁴ Age or Size? Determinants of Job Creation, Martina Lawless, Central Bank of Ireland, 2013

³⁵ Number of enterprises in the reference period (t) newly born in t-3 having survived to t divided by the number of enterprise births in t-3

³⁶ The impact of Brexit on foreign investment in the UK, London School of Economics, 2016

³⁷ ESRI, "Corporate Taxation and Foreign Direct Investment in EU Countries: Policy Implications for Ireland",

³⁸ Implementation issues are not addressed and factors such as the degree of transparency or discretion in granting approvals are not taken into account. The index here shows the total and nine component sectors taking values between 0 for open and 1 for closed.

³⁹ Quarterly National Household Survey Q4, 2016, CSO

⁴⁰ Population and Migration Estimates, April 2016, CSO

⁴¹ Scoping the Possible Economic Implications of Brexit on Ireland, ESRI, November 2015

⁴² European Commission, Cedefop, Skills Panorama, Skill shortage and surplus occupations in Europe, 2016

⁴³ Expert Group on Future Skills Needs, National Skills Bulletin 2016

⁴⁴ CSO, Measuring Ireland's Progress 2015

⁴⁵ The individual price indices are aggregated together to create a "service industry" index that is limited in coverage. The indices are still under development and may be subject to methodological improvement. Figures should therefore be treated as provisional and subject to revision. These indices are being published to engage users in the ongoing development of the SPPI methodology.

⁴⁶ NCC, Cost of Doing Business 2016, 2016

⁴⁷ Effective income tax rates are calculated to reflect combined corporate tax rates (national, regional and local), net of generally applicable tax credits, grants and other common government incentives.

⁴⁸ KPMG's 2016 Competitive Alternatives report explores the most significant business cost factors in more than 100 cities and 10 countries around the world. This study measures 26 key cost components, across 7 business to business service segments and 12 significant manufacturing sectors. The 10 countries included in the KPMG report are Australia, Canada, France, Germany, Italy, Japan, Mexico, Netherlands, UK and US. While Ireland is not included in the project, Figure 3 provides data based on the average contribution of each cost factor for the 10 countries included in the study. This provides an indication of the importance of each cost factor to the average firm. All figures in this report are expressed in US Dollars and so results are sensitive to exchange rate movements – while exchange rate changes do not affect local business costs expressed in local currency, they do impact international comparisons when local costs are converted to US Dollars.

⁴⁹ European Commission, Country Report, Ireland 2017

⁵⁰ Department of Finance, Income Tax Reform Plan, 2016

⁵¹ OECD Taxing Wages, Ireland 2016

⁵² The employee net average tax rate is a measure of the net tax on labour income paid directly by the employee.

⁵³ The main reduced rate of 13.5 per cent applies to, for example supplies of immovable goods, building services and repair and maintenance services. The second reduced rate of 9 per cent applies to certain goods and services in the tourism sector such as hotels accommodation and restaurant meals and the supply of live horses except those intended to be used for foodstuffs/agricultural production. The 4.8% rate will continue to apply to other livestock and horses intended for use as foodstuffs/agricultural production only. The export of goods, basic foodstuffs, oral medicines, medical equipment, and appliances are liable to the 0 per cent rate. There is a special farmer's flat rate addition of 5.2 per cent (with effect from 1 January 2015 - previously 5%) which applies to certain sales by unregistered farmers. In addition, supplies of certain goods and services are exempt from VAT, such as financial, insurance, passenger transport, education, and health and welfare services.

⁵⁴ which apply to, for example children's car seats, certain contraceptive products, domestic fuel and power, and renovations/conversions of residential properties (5 per cent); and food and animal feed, books and newspapers, prescription drugs and medicines, children's clothes, passenger transport, and exports of goods (0 per cent). Supplies of certain goods and services are exempt from VAT, for example financial and insurance services; education services supplied by eligible bodies; certain cultural services; betting, gaming, and lotteries; subscriptions; and health and welfare.

⁵⁵ The Weighted Average VAT Rate is the ratio of the VAT Total Tax Liability (VTTL), the theoretical tax liability according to tax law, to the total tax base. See more at European Commission, Study and Reports on the VAT Gap in the EU-28 Member States: 2016 Final Report, August 2016.

⁵⁶ Tax Foundation, International Tax Competitiveness Index 2016

⁵⁷ Central Bank of Ireland, SME Market Report, H2, 2016

⁵⁸ See Doheny, G., and Flaherty, R., An Overview of the Enhanced Interest Rate Statistics for Ireland, Quarterly Bulletin No.2 2016, Central Bank, April 2016, Carroll, J., McCann, F., Understanding SME Interest rate variation across Europe, Quarterly Bulletin No.2 2016, Central Bank, April 2016

⁵⁹ OECD, Financing SMES and Entrepreneurs 2016, An OECD Scoreboard, 2016

⁶⁰ The latest available international data on expenditure refer to 2013 financial year and reflect the position of the economic downturn.

⁶¹ OECD data on students per teacher ratios refers to the 2012 for Ireland and the UK

⁶² This includes both theoretical programmes leading to advanced research or high skill professions such as medicine and more vocational programmes leading to the labour market. The measure is percentage of same age population.

⁶³ Expert Group on Future Skills Needs, Monitoring Ireland's Skills Supply, November 2016

⁶⁴ <https://www.gov.uk/government/publications/apprenticeship-frameworks-live-list>

⁶⁵ The plan sets out specific annual targets as well as bringing forward a range of specific actions to enable and support the development of new apprenticeships and traineeships in areas such as insurance, medical devices, polymer processing and financial services.

⁶⁶ Apprenticeship Statistics: England, House of Commons Briefing Paper, November 2016

⁶⁷ HM Government, English Apprenticeships: Our 2020 Vision – UK Government, 2016

⁶⁸ See <http://www.education.ie/en/Publications/Statistics/International-Statistical-Reports/PISA-2015-Briefing.pdf>. This report notes that the comparison between Science scores should be between 2006 and 2015 (2006 being the last time that science was a "major" element of PISA. In this case, the decrease in score for Irish students in Science is non-significant. The mean scores in 2006 were: Ireland 508, UK 515, US 489, OECD average 500 The report also notes that while the UK outperforms Ireland in science in 2015, the difference in the mean score is not considered significant

⁶⁹ Expert Group on Future Skills Needs, SOLAS Lifelong Learning Participation Among Adults in Ireland, 2016

⁷⁰ Ireland was also 6th in 2014. There was a change in the indicators which were assessed from 2015 onwards, including health infrastructure (under investment and development heading), remuneration in services professions and management, effective personal income tax rate, personal security and private property rights (under the appeal factor heading), student mobility inbound and educational assessment via PISA (under the readiness factor heading). These may have had a considerable impact on Ireland's score. Ireland outranks the UK on 2 out of the 3 Factors used to reach rankings (6th for Appeal – UK is 16th, 12th for Readiness, UK is 20th). The one factor where the UK outperformed Ireland was in Investment and Development, which includes areas such as investment in third level education

⁷¹ In relation to the languages indicator, with the exception of Ireland, all the major English-speaking countries have dropped in this ranking since 2015 (Canada 13th to 17th, Australia 27th to 34th, New Zealand 35th to 36th, USA 42nd to 44th, UK 49th to 51st);

⁷² The CSO has produced projections of both the total population (classified by age and sex) at five year intervals for the period 2016 to 2046 and of the total labour force (classified by age, sex and female marital status) for the years 2016, 2021 and 2026. These ranges reflect various assumptions relating to future trends in fertility, mortality, migration and labour force participation. Two sets of assumptions were chosen for fertility, one for mortality and three for migration up to the year 2046, giving six sets of results. See CSO, Population and Labour Force Projections, April 2013

⁷³ KBC assets consistent with the definition in the System of National Accounts (SNA) include: software, R&D, entertainment, literary and artistic originals, and mineral exploration. Other KBC assets include: design, new product developments in the financial industry, brands, firm-specific training and organisational capital.

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