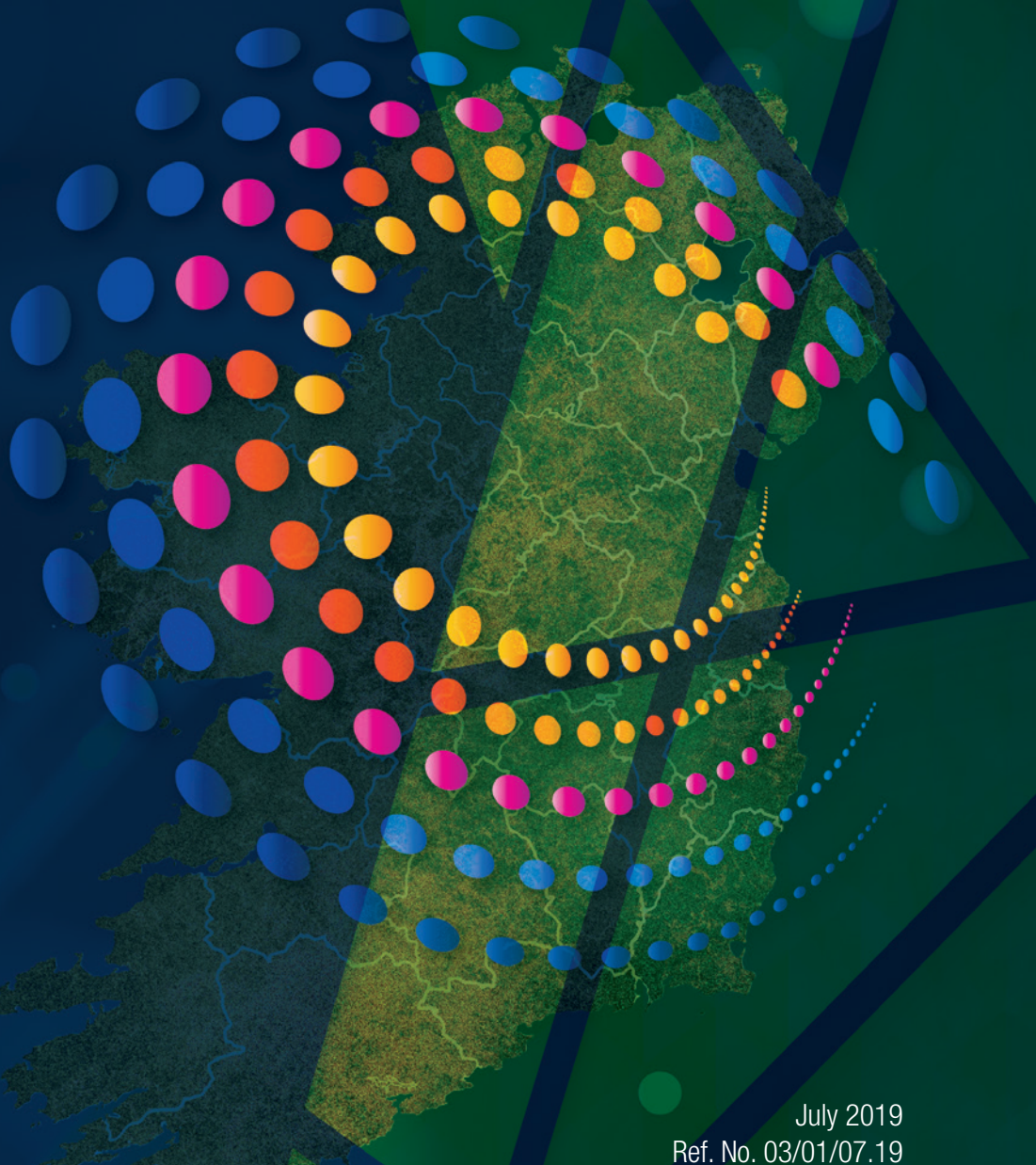
Irish Academy of Engineering

INNOVATING for Growth

Improving Ireland's Innovation Ecosystem



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THE IRISH ACADEMY OF ENGINEERING

The Irish Academy of Engineering is an all-island body, concerned with long-term issues where the engineering profession can make a unique contribution to economic, social and technological development.

Its members are Irish Engineers of distinction, drawn from a wide range of disciplines, and membership currently stands at 169.

Drawing on the experience and knowledge of its distinguished members, the Academy works to facilitate communication and dialogue on engineering-related matters. It regularly publishes reports and analyses, some jointly with other learned and professional bodies.

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FOREWORD

The opportunities and the challenges facing the Irish economy are complex, urgent and require a commitment to developing and implementing long term strategies.

The Irish Academy of Engineering (IAE) is a body whose aim is to advance the wellbeing of the country by marshalling the expertise and insights of highly experienced professionals to provide independent advice to policy makers on matters involving engineering and evolving new areas of technology. The diverse expertise and experience of IAE fellows positions the academy well to contribute to building consensus on dealing with the current challenges of enterprise growth.

Brexit, potential trade wars, the policies of the current US Administration and the OECD's focus on BEPS (base erosion and profit shifting) all create uncertainty and will challenge the existing model of enterprise development. In these uncertain times we need to ensure that we retain and continue to attract Foreign Direct Investment (FDI) companies while improving the value-add and export performance of indigenous companies. As our tax advantage becomes less of a differentiator, talent and the innovation ecosystem become more significant factors in growing the economy.

The objective of the Enterprise, Innovation and Education Committee of the Academy is to generate dialogue and discussion on enterprise development, aimed at building consensus, momentum and creating a bias for action. Recently there have been a number of excellent analyses and reports on achieving sustainable enterprise growth. In Ireland, however, we appear to have an implementation deficit. Therefore the approach adopted by the IAE is to focus mainly on existing well thought-out recommendations that require action as opposed to further analyses.

This discussion paper, ***'Innovating for Growth - Improving Ireland's Innovation Ecosystem'***, is the first step in facilitating the necessary dialogue and debate. The paper will be the basis for a **seminar** scheduled for Q4 2019, which will bring together leading actors and policy makers to build consensus for action.

The IAE is also carrying out a review of the role of clusters in stimulating enterprise growth in Ireland. Clusters are a powerful force for development, with Irish success stories in areas like medtech, agri-food, aircraft leasing, software etc. Ireland's medtech cluster has created a successful innovation ecosystem that supports the creation and growth of Irish companies and that attracts and retains Foreign Direct Investment. An IAE subgroup, made up of individuals who helped create the medtech success story is currently conducting an analysis of the drivers and dynamics of this cluster This should provide important lessons for enterprise development in Ireland..... lessons on networks and collaboration that are relevant for Irish and Foreign companies and for Higher Education Institutes. This is an important story that needs to be explored and told through a number of different lenses. The IAE is planning a workshop for later in the year to share the findings and to discuss how we might extend/extrapolate the lessons learned to other sectors.

Our education and training system is fundamental to our future economic success. An IAE subgroup has been established to generate debate and discussion on how we can create long term sustainable competitive advantage through education and training.

This discussion paper is a first step in establishing a forum where interested parties can discuss and debate long term strategies to create a vibrant sustainable enterprise sector.

1. INTRODUCTION

To survive and thrive in these uncertain times, we need to ensure that we continue to attract and retain FDI companies while improving the value-add and export performance of Ireland's indigenous companies. Ireland's economy is small and open with a relatively high cost base. As a consequence, the nation's ability to provide well-paid jobs and good-quality public services, in an increasingly competitive globalised world, relies on our ability to sell our goods and services at a premium abroad. Northern Ireland's economy is also small, with a slightly lower cost base, and a similar need for export sales.

1.1 Success of the Past

Ireland's economy has been transformed over the past three decades as we embraced globalisation and provided an environment that proved attractive to foreign direct investment and local growth. As we now emerge from a period of austerity we again have over 2.2 million people in employment[1]. We enjoy living standards, as measured by gross domestic product (GDP) per capita, which exceed the European Union (EU) average. The European Commission's 2018 Interim Economic Forecast predicts GDP growth of 4% for 2019 - double the growth rate predicted for the EU[2].

> *'In these uncertain times we need to ensure that we retain and continue to attract FDI companies while improving the value-add and export performance of Ireland's SMEs.'*

1.2 The Challenge

Brexit, trade wars, the policies of the current US Administration and the OECD's focus on BEPS (base erosion and profit shifting) all create uncertainty and will challenge the existing model. In these uncertain times we need to ensure that we retain and continue to attract FDI companies while improving the value-add and export performance of Ireland's Small to Medium Enterprises (SMEs). As our tax advantage becomes less of a differentiator, talent and the innovation ecosystem become more significant factors in creating and growing the economy.

The Irish enterprise base is overly concentrated. We rely on a small number of companies to deliver performance on productivity, exports and tax. To minimise **vulnerability** we must increase the contribution from the indigenous sector of the economy while increasing the resilience and sustainability of the FDI sector. **Innovation has a key role to play**.

1.3 Meeting the Challenge

Innovation is widely acknowledged as a key driver of competitiveness, economic growth and export performance. The European Commission reports that two-thirds of economic growth from 1995 to 2007 derived from research and innovation[3].

Innovation, defined as – *'the development and application of ideas, technologies and business models that improve goods or services'* – is essential to Ireland's ability to compete as a relatively high wage economy in a competitive globalised world. To secure our future we must now raise the internationalisation of indigenous firms, increase the rate and innovation intensity of startups and raise skills levels of the workforce.

Over the past decade much progress has been made to improve Ireland as a location for innovative businesses. Ireland consistently ranks above the EU average on the EU Innovation Union Scorecard[4].

Ireland is still however ranked as an 'Innovation Follower'. We must now chart a course to becoming an 'Innovation Leader'.

In the Dec 2018 report **'Ireland's Competitive Challenge 2018'** the National Competitiveness Council (NCC)[5] states *"Economy-wide productivity gains are generated when innovations are diffused and widely adopted, making the strengthening of investment in R&D, innovation and technology-diffusion mechanisms a fundamental policy priority"*. The IAE believes that the island of **Ireland can and must now become an 'Innovation Leader'** and thereby create competitive advantage that can drive sustainable growth. The IAE Standing Committee on Enterprise, Innovation & Education has established working groups to look at how we can *'Optimise the Innovation Ecosystem'*. The output of the working groups will form the basis for a seminar to be held in Q4 2019.

> *Ireland - an International Innovation Hub that 'by 2020 will have a significant number of large, world leading, innovation-intensive companies, each having a global footprint, many of which are irish headquartered and owned'.*
>
> **... Innovation Taskforce**

Ireland's ambition as expressed by the Innovation Taskforce[6] is to position Ireland as an International Innovation Hub that *'by 2020 will have a significant number of large, world leading, innovation-intensive companies, each having a global footprint, many of which are irish headquartered and owned'*.

In this discussion paper we examine how Ireland can move from innovation follower to innovation leader. We look at recommendations for improving the innovation landscape across:-

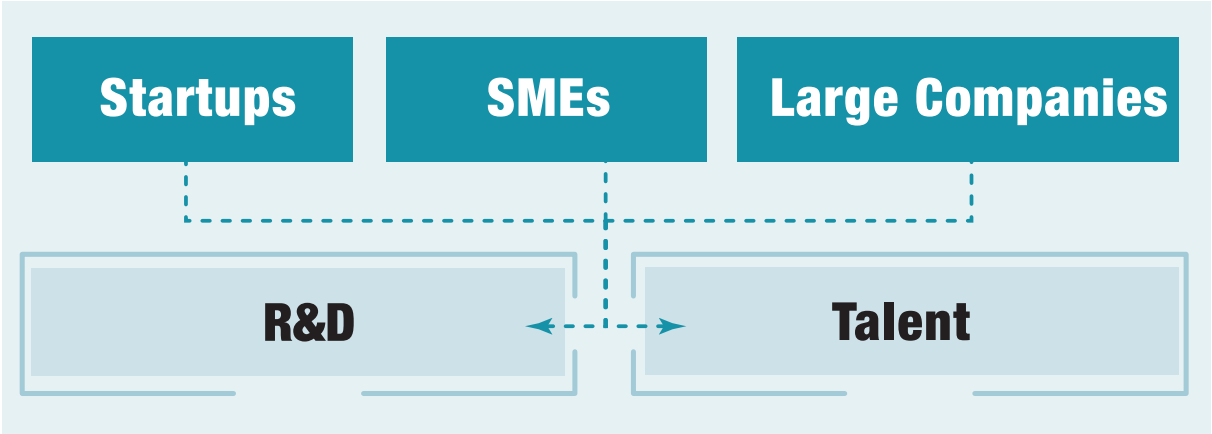
- Startups and the creation of new innovative companies
- Small and Medium Enterprises (SMEs) - Scaling & expanding the global Reach of Ireland's SMEs
- Large Companies & FDI

In the past there have been a number of excellent analyses and reports on achieving sustainable enterprise growth. In Ireland, however, we appear to have an **implementation deficit**. Therefore the approach adopted by the IAE is to focus mainly on existing well thought-out recommendations that require action as opposed to further analyses.

2. INVESTING IN THE FUTURE

In recent years the Government has seen windfall gains in corporation tax. Exchequer returns for the first 11 months of 2018 show receipts from the business tax are now €9.4 billion, 20 per cent ahead of the Government's target[7]. Now is the time to invest some of these gains in the future by building a leading innovation economy. Now is the time to invest in the basic pillars of an innovation economy; talent and R&D.

The IAE make systemwide recommendations for investment in the pillars of talent and R&D. In addition we make specific recommendations for Start-ups, SMEs and Large Companies.



2.1 Investing in the Future :- Talent

Top quality people are a prerequisite to the creation of a leading innovation ecosystem. To be successful with start ups, scaling SMEs and attracting mobile foreign investment, Ireland must be a location that produces, attracts and retains top quality talent. Talent and tax have been the cornerstones of enterprise policy for many decades. The Industrial Development Authority (IDA) in the current Strategy[8] states that ***"The availability of talent will be the key differentiator for locations to win foreign direct investment in the future."***

An innovative economy requires a wide spectrum of skills. We can learn from other economies on how we can improve engagement between industry and the third level sector **and** on the value of well designed and delivered apprenticeship programmes.

Whereas we should seek to maintain a competitive tax regime, international trends and actions may limit our competitive advantage in this area. Winning on talent is within our own control. Our Higher Education Institutions (HEIs) have a critical part to play. The education and research activities in HEIs drive creativity and innovation. Top class graduates are the raw material required to create and maintain a leadership innovation position. However our Universities are underfunded resulting in poor infrastructure and unsustainable staff student ratios. Funding for the Irish third level system lags well behind other countries in Europe and around the world. At 1.1% of GDP, Irish investment in third level education[9] is well below the OECD and EU averages and that of countries having the best third level education systems.

In March 2016 the **REPORT OF THE EXPERT GROUP ON FUTURE FUNDING FOR HIGHER EDUCATION - Investing in National Ambition: A Strategy for Funding Higher Education** stated[10] .....*".....it is clear that there is a need and a desire for urgent reform of the funding landscape. The funding system is simply not fit for purpose"*

The Irish Universities have recently issued a report entitled **Ireland's Future Talent - A Charter for Irish Universities**[11]. This charter commits the Universities to substantial change to meet the needs for future talent. Failure to act on the Expert Group (Cassell's) Report will severely jeopardise our ambition to build a leading innovation economy.

Recommendation 1

Government should respond to the Expert Group Report and adopt an appropriate funding solution to ensure a supply of talent to position Ireland as an innovation leader

2.2 Investing in the Future:- R&D

The Innovation 2020 Strategy[12], published by the Department of Jobs. Enterprise and Innovation, shared a *'vision of Ireland becoming a Global Innovation Leader, driving a strong, sustainable, high employment economy and a better society enjoying a good quality of life*'. This can be achieved by building on the very significant progress made over the past two decades in building up our Research, Development and Innovation (RDI) base and by a commitment to increasing public and private investment in research and development. However this investment, fundamental to becoming a global innovation leader, is not happening.

Irish expenditure on R&D in 2016 as percentage of GDP (1.18%) was below the EU average (2.03%) and the UK (1.69%)[13]. This expenditure is well below that required to be an innovation leader. The Governments Innovation 2020 Strategy set appropriately ambitious targets – *'Key to delivering our vision is a commitment to increasing public and private investment in research to reach Ireland's intensity target of 2.5% of GNP by 2020'*.

We need to accelerate action in this area. Commenting on the publication of the EU Innovation Scoreboard Minister Halligan stated *"We need to continue to build on this success and ensure that effort and investment in research, development and innovation is prioritised to realise our ambition of joining the ranks of the Innovation Leaders"*.

> *".....State's failure to invest sufficiently in R&D and innovation over the past decade"*
>
> **...NCC Dec 2018**

As advocated by the NCC we need to ensure that *'windfall gains from the exchequer are invested wisely in the future productive capacity of the economy'*.

Recommendation 2

Use the buoyancy in corporation tax to invest in the future by narrowing the R&D investment gap between Ireland and the global Innovation leaders

3. START UPS

Since the publication of the Report of the **Innovation Taskforce** in 2010, the start up ecosystem in Ireland has improved dramatically. As recommended by the Taskforce, the entrepreneur is now at the centre of an innovation ecosystem as shown in Fig. 1.

Public policy is promoting a significant number of innovation centres, business accelerators and startup incubators. Pre-seed and seed stage startups in Ireland have access to this excellent ecosystem and can tap into pre-seed investment, office space and mentoring, Supporting investment is being provided through Enterprise Ireland's High Potential Start-Up (HPSU) and Competitive Start Funds (CSFs).

Ireland now has an IP Protocol that helps industry to access the research and development carried out in Ireland's universities and institutes of technology. The Protocol is designed to get impact from the Government funded excellence in research.

Investment in R&D is a critical part of the ecosystem. Meeting our ambition as a vibrant location for startups will require increasing investment to 2.5% of GNP by 2020 as targeted by the Government's Innovation 2020 Strategy. See Recommendation 2.

Figure 1 - Innovation Ecosystem

Ambitious talented people with appropriate attitudes and skills are essential to accelerating the quality and quantity of start ups in Ireland. Our education system needs to further evolve to create a spirit of entrepreneurship from an early age. Creative highly-skilled graduates play a critical part the creation of a vibrant startup community. However our 3rd Level system is underfunded with no immediate agreed plan on funding. We must agree a funding model for education. See Recommendation 1.

> *"Education has a role both in developing the skills necessary for innovative export-led firms and more generally in engendering cultures and attitudes which are supportive to innovation more broadly. All levels of the education system must contribute to embedding these values in our population from the very young to the older members of our workforce. A particular focus must be on the development of creative, highly-skilled graduates as well as life-long learning, mentoring and continuous professional development"*
>
> **... Innovation Taskforce**

Access to startup and growth capital is now constraining the number, the quality and the scaling of startups. Relative to alternative competing locations, the tax treatment of risk capital, is not competitive and does not encourage entrepreneurs and investors.

In a recent interview[14], Julie Sinnamon, CEO of Enterprise Ireland stated *"we compare ourselves a lot with our nearest neighbour and I think the UK at this stage has a more attractive package of incentives in the tax side for growing companies than we have"*.

Recommendation 3

Improve the tax regime to promote entrepreneurship and investment

There is a lack of available venture capital in Ireland. Therefore it is important that the state continues to intervene. Until Ireland establishes a reputation as an innovation leader there is a need to continue Government support on funding.

> *"The Enterprise Ireland Seed & VC scheme is an essential ingredient in the start up in Ireland. Its continuation is critical to the VC industry in Ireland and EI should continue to have a central role in the scheme. The IVCA believes that in order to allow venture capital to further drive indigenous growth, the EI Seed and VC scheme should be continued and paired with measures aimed at mobilizing additional private sector capital for the VC industry."*
>
> **....IVCA[15]**

Recommendation 4

Continue to use Enterprise Ireland (EI) schemes to leverage private sector capital for the venture capital (VC) industry.

Ireland is a relatively small market. Therefore startup companies must, from a very early stage, generate a substantial proportion of revenue from the sale of products/services in global markets. In addition, given the small size of the domestic market, startups often struggle to get early stage customers. Demanding, early stage customers are important to help startups in the creation of innovative products, services and processes. These demanding customers can provide validation of products or services and act as an important reference to help secure funding and to secure customers abroad and so expand reach beyond Ireland.

The State can provide the initial customer endorsement of the product or service and thereby act as a reference for other potential customers abroad. The EU Pre-commercial procurement (PCP) approach, whereby public procurement is used to stimulate innovation, is an important initiative in assisting startups. Small Business Innovation Research **(SBIR)** Ireland is the national innovation pre-commercial procurement initiative administered by Enterprise Ireland. The state should expand this programme.

Recommendation 5

Expand the Small Business Innovation Research (SBIR) Programme

4. SMEs

Over recent years Irish industry has benefitted from well executed strategies by Enterprise Ireland. Exports have grown significantly to €22bn in 2016 (Fig. 2) and over the period 2000 to 2015 the export intensity of Irish firms has grown from 38% to 52%.

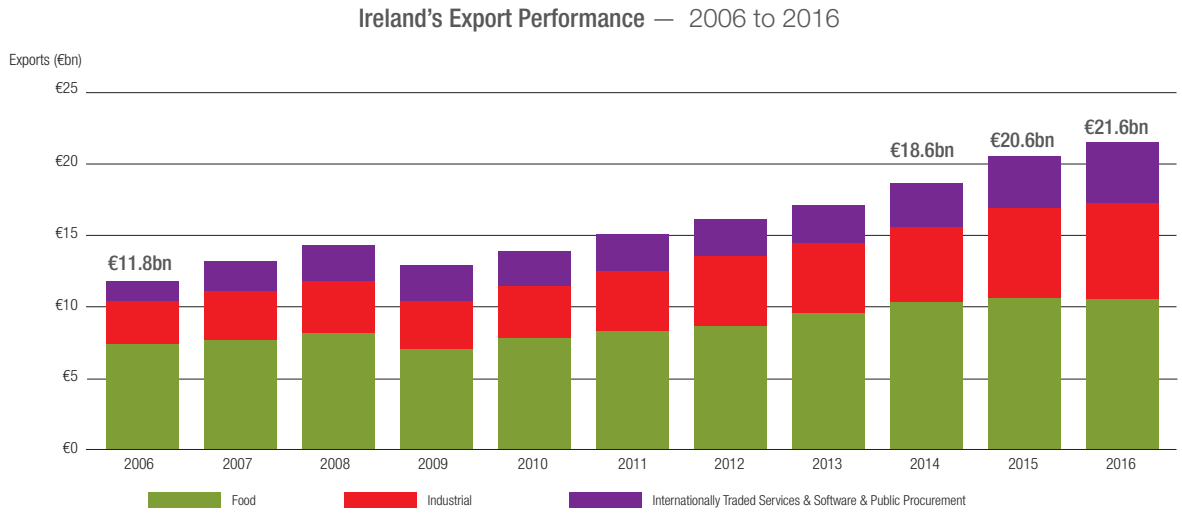


Figure 2 - Ireland's Performance 2006 - 2016
(Source : https://www.enterprise-ireland.com/en/Publications/Reports-Published-Strategies/ABR-2017.PDF)

But significant challenges remain. Operating in a relatively high cost economy, Irish industry cannot compete on the basis of cost alone. It must compete on the basis of value and differentiation. It must provide innovative products and services that meet the needs of customers/markets in a superior differentiated way.

Irish SMEs must invest in innovation to develop the necessary products and services. In addition Irish SMEs must introduce innovative processes that boost productivity.

As part of the policy of generating economic value from publicly-funded research, the Government has established Science Foundation Ireland Research Centres and industry-led Technology Centres. The 14 Technology Centres are collaborative entities established and led by industry.

In 2012 the Advisory Council for Science Technology & Innovation observed that Research and Technology Organisation (RTO) capacity should be developed within the research landscape, in synchronisation with and actively supporting the maturing capability and capacity in particular of the Irish-owned company base to engage in external applied R&D.

In 2013 the OECD observed[16] that *"Although the centre landscape is evolving, it does not seem that the gap is being filled in Ireland. The new larger SFI Research Centres (merging CSETS and SRCs) fulfill a different and important role of longer-term strategic research and academic performance metrics remain dominant. Enterprise Ireland's new Technology Centres are industry rather than firm focused and their scale is relatively small and project based and therefore not likely to build the critical mass and continuity that an RTO can bring. The government should move to setting up a pilot RTO".*

Recommendation 6

The Government should move to set up a pilot Research & Technology Organisation (RTO) to assist Irish owned companies engage with external R&D

The leaders of SFI and Technology Centres have a requirement to have industry matching as part of their operating budgets. Therefore there is a tendency to focus on partnerships/collaboration with resource rich FDI Companies rather than on scaling SMEs.

Recommendation 7

Examine ways to ensure that Centres devote adequate resources to building innovative capacity in Irish-owned companies.

Public procurement represents an important market for Irish business. Public bodies in Ireland spend €12 billion annually on goods, services and works and the wider European market is worth €2 trillion. Public procurement is a major instrument by which Government can encourage and stimulate innovation in the Irish economy. There are opportunities to tailor our procurement practices towards promoting innovation in the enterprise sector while at the same time delivering better and more efficient public services. Developing a more SME-friendly approach to public procurement will allow SMEs to make the most of their potential for job creation, growth and innovation.

SBIR is an Enterprise Ireland Programme which enables public sector bodies to connect with innovative ideas and technology businesses, to provide innovative solutions for specific public sector challenges and needs. As well as providing an important validating customer, public procurement also subsidises the cost of developing innovative products, services and processes.

Recommendation 8

Increase the use of public procurement as a way to drive the development of innovative products, services and processes

Scaling SMEs requires **leadership and management**. Enterprise Ireland has greatly improved the ambition of Irish companies through programmes like Leadership4Growth. Leadership ambition must now be backed up by first class management. We are not investing appropriately in training or management development. In-work training for agency supported enterprises was €618 per head (2015) against a target of €1,100 (Source: DBEI). Dated information from IMD and McKinsey & Co suggests that Irish SME management lags behind leading performers.

Irish owned companies need to address relatively low levels of productivity if they are to compete against global competition (Fig. 3). To provide focus on the quality of management we should reestablish the Management Development Council.

Figure 3 - Ireland's Productivity Gap

(Source : Department of Business, Enterprise and Innovation)

We also need to improve the quality of SME management in the short term.

Managers in Large Companies (Irish & FDI) companies have many of the sales, distribution, engineering management and operations skills (& experiences) required to enhance productivity, drive innovation and to scale companies. However Large Companies offer a level of status, security and remuneration that Irish SMEs find difficult to match. Enticing leading managers to move from multinationals to SMEs is an important step in driving growth and innovation. Very often, SMEs can't compete with the salaries that established companies and multinationals are offering. Therefore being able to offer an attractive share ownership package is really important to level the playing field. Recently the Government introduced the Key Employee Engagement Programme (KEEP). Anecdotal evidence suggests that the programme is not having the desired effect.

Recommendation 9

Enhance the management capability of SMEs.

Re-establish the Management Development Council.

Review and revise the Key Employment Engagement Programme (KEEP) to encourage employee mobility from Large Companies to SME's

5. LARGE COMPANIES

The Irish economy benefits from a small number of large companies that are highly productive, employ significant numbers and generate the bulk of our exports and corporation tax.

Attracting Foreign Direct Investment (FDI) has been a cornerstone of our enterprise strategy for a number of decades. The FDI sector is an important contributor to Ireland's economic performance. Ireland is home to many of the world's leading high-performance companies, including 17 of the top 20 global software companies, 14 of the top medical tech companies and all 10 of the top 10 pharma companies. Employing over 229,000 people[17], FDI companies, contribute €175bn in exports in 2016 (90% of all exports[18]) and the bulk of our corporation tax. The top ten payers of corporate tax represented 39% of the corporation tax take in 2017.

Our success in attracting FDI is welcome but it does make the economy vulnerable. The NCC warns *'Our heavy dependence on the performance of a narrow base of firms and economic sectors, the narrow range of products and services exported, and the reliance on a small number of export markets pose a serious concern'*.

It is imperative that we continue to attract FDI and that we ensure that existing companies continue to see Ireland as a location of choice in a rapidly changing competitive environment. The IDA in their strategy document[8] recognise that *"success, however hard won, is by definition fleeting"*. A favourable tax environment has been a pillar of Ireland's positioning. We now need to build on our innovation ecosystem to offer compelling value in the future. We need to build hooks that embed our success in FDI.

In spite of our success in attracting some of the worlds most innovative companies to Ireland there is no evidence that significant innovative activity is carried out here. There are some notable exceptions.

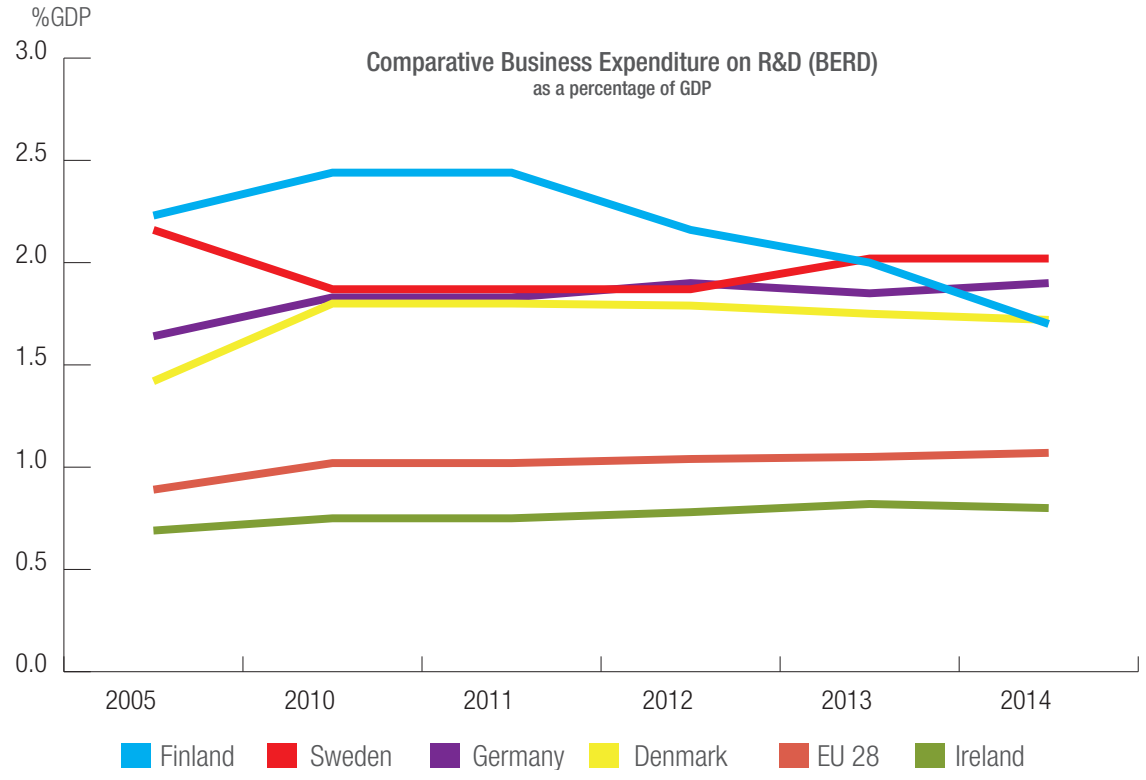


Figure 4 - Comparative Business Expenditure on R&D (BERD) as a percentage of GDP

(Source : OECD, https://read.oecd-ilibrary.org/science-and-technology/main-science-and-technology-indicators/volume-2017/issue-1_msti-v2017-1-en#page32)

Business expenditure on Research and Development (BERD) is well below the EU average (Fig. 4, previous page); patenting activity is low and Ireland lags on the number of R&D employees as a % of the total labour force when compared to the leaders.

> *Patenting in particular is noticeably low compared to the innovation leaders.*
>
> **...Technopolis**

If we hope to retain innovative foreign companies in Ireland we need to offer an attractive innovation ecosystem where they can tap into a vibrant RDI infrastructure and access the best talent. In addition to the investments required in R&D and Education, there are other steps that we can take to ensure success.[19]

5.1 Knowledge Development Box

The Knowledge Development Box (KDB) was introduced by the Finance Act 2015 for companies whose accounting period commences on or after 1 January 2016. This scheme is designed to incentivise the carrying out of R&D in Ireland by reducing the tax on profits arising from the scheme to 6.25% (ie 50% of the 12.5% corporation tax rate). This should make it highly attractive for FDI firms to carry out R&D in Ireland thereby strengthening their roots here and enhancing the innovation ecosystem in a virtuous circle. However the scheme is not having impact. In April 2018, Irish Finance Minister Paschal Donohoe told the Dail[20] that fewer than 10 taxpayers had claimed tax relief under the Knowledge Development Box scheme.

Recommendation 10

Examine and amend the Knowledge Development Box scheme to promote increased business expenditure on R&D.

5.2 Grand Challenges

Ireland has a strong track record of providing an agile, flexible pro-business environment. Networking, collaboration, access to policy makers are strengths that combine to create a powerful 'sandbox' where innovative solutions to some of the grand challenges facing society can be developed, tested and implemented. Ireland is small enough to make things happen and big enough to make a difference. Therefore it can be an ideal sandbox for innovative solutions to major grand challenges. This sandbox can create innovative clusters and networks.

Grand challenges are widely used internationally to align private and public actors and to inspire engineers and scientists to create interdisciplinary partnerships in exciting research areas leading to the deployment and commercialisation of disruptive technologies.

As part of the UK Industrial Strategy[21], four grand challenges are identified, in artificial intelligence and big data; clean growth; the future of mobility; and meeting the needs of an ageing society. The Industrial Strategy Challenge Fund with matched commercial investment is providing financial support.

Science Foundation Ireland (SFI) is currently in dialogue with government, industry and international funders with the aim of launching an initiative in 2019 on 'challenge based' research. The American Chamber of Commerce in Ireland in their report **Establishing a Grand Innovation Challenge for Ireland** state that *"Ireland should establish a globally significant challenge centric development and innovation programme by 2020 as the next logical step in evolving the country's innovation-led economy."* Grand Challenges should be pursued to drive further investment in R&D by Foreign Direct Investment companies located here. In addition to strengthening the links with existing FDI companies and transforming their value add, a well designed grand challenge programme can act as an important attractor for future high tech FDI.

Recommendation 11

Establish a globally significant challenge-centric programme that attracts significant business expenditure on research and development.

5.3 Collaboration

Ireland's Medtech cluster has created a successful innovation ecosystem that supports the creation and growth of Irish companies and that attracts and retains FDI. An analysis of the drivers and dynamics of this cluster should provide important lessons for enterprise development in Ireland..... lessons on networks and collaboration that are relevant for Irish and Foreign companies and for Higher Education Institutes. The IAE has established a working group.

Recommendation 12

The IAE should examine and document the factors that led to the successful creation of a medtech cluster in Ireland and, using the lessons learnt, make recommendations for developing Ireland's innovation ecosystem.

6. CONCLUSION

The Irish enterprise base is overly concentrated. We rely on a small number of companies to deliver performance on productivity, exports and tax. To minimise vulnerability we must increase the contribution from the indigenous sector of the economy while increasing the resilience and sustainability of the FDI sector.

Innovation has a key role to play. Ireland is still however ranked as an 'Innovation Follower'. We must now chart a course to becoming an 'Innovation Leader'. Now is the time to invest in the basic pillars of an innovation economy; talent and R&D.

Top quality people are a prerequisite to the creation of a leading innovation ecosystem. To be successful with start ups, scaling SMEs and attracting mobile foreign investment, Ireland must be a location that produces, attracts and retains top quality talent.

The Irish research landscape has been transformed over the past two decades by our investment in Research, Development and Innovation. We must now build on this foundation to become an innovation leader.

July 2019

GLOSSARY OF ACRONYMS AND ABBREVIATIONS

BEPS	Base Erosion Profit Sharing
BERD	Business Expenditure on Research and Development
CSF	Competitive Start Fund
DBEI	Department of Business, Enterprise and Innovation
EI	Enterprise Ireland
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNP	Gross National Product
HEI	Higher Education Institution
HPSU	High Potential Start-Up
IAE	Irish Academy of Engineering
IDA	Industrial Development Authority
IP	Intellectual Property
IVCA	Irish Venture Capital Association
KDB	Knowledge Development Box
KEEP	Key Employee Engagement Programme
NCC	National Competitiveness Council
OECD	Organisation for Economic Cooperation and Development
PCP	EU Pre-commercial Procurement
RDI	Research, Development and Innovation
RTO	Research and Technology Organisation
SBIR	Small Business Innovation Research
SFI	Science Foundation Ireland
SMEs	Small and Medium Enterprises

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