

Review of RD&I Supports available to Businesses in Ireland to Maximise Business Expenditure on Research and Development

Executive Summary

Submitted to

**Department of Business, Enterprise and
Innovation**

By

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Executive Summary

Background to Review

This report is submitted to the Department of Business, Enterprise and Innovation by Indecon International Research Economists. The objective of this report is to provide an independent review of Research, Development and Innovation (RD&I) supports for businesses in Ireland.

The aim of this current assignment is to independently assess the range of existing RD&I supports in Ireland, and to identify how best to increase RD&I activity in firms so as to help Ireland meet the targeted 2.5% of GNP of research intensity as set in the *Innovation 2020* strategy. Specific objectives of this report are:

- ❑ Profile RD&I activity in the industrial development agency client base firms and identify the cohorts of firms by size, sector and ownership. This is important in identifying where there may be opportunities to increase the number of RD&I performers and increase the RD&I intensity of firms.
- ❑ Complete a mapping exercise of the existing direct and indirect RD&I supports and prepare a profile covering a set range of dimensions and examine firms' engagement across multiple RD&I supports. While the study originally envisaged only a short profile of companies, more detailed analysis has been undertaken which provides additional insights.
- ❑ Review the RD&I challenges facing firms based in Ireland, particularly those that have a low/no RD&I profile currently.
- ❑ Review international supports for RD&I to ensure that Ireland's offering is competitive and to identify best practice in terms of policies and instruments that enhance the RD&I activity in firms.
- ❑ Provide policy recommendations at programme level to achieve the high-level goal of increasing BERD and to identify if there are opportunities to streamline, strengthen or introduce new supports that respond to the needs of SMEs and larger companies in Ireland.

RD&I Policy Interventions in Ireland

RD&I indicators are increasingly used as explicit policy targets by governments, to facilitate international comparisons and to inform the design of micro-policies aimed at stimulating research. *Innovation 2020*, Ireland's strategy for research, development, science and technology, sets out the Government's commitment to supporting greater engagement in RD&I in both indigenous and foreign-owned enterprises and in both SMEs and large-scale enterprises. This strategy set a target for RD&I for Ireland at 2.5% of GNP. The European Union's research and innovation policy agenda states that the EU should spend 3% of gross domestic product (GDP) on RD&I, two-thirds of which should come from the private sector.

The rationale for setting an RD&I target for Ireland is that RD&I expenditures play a key role in determining the differences in productivity across firms and the evolution of firm-level productivity over time. Indecon believes it is also important to consider these targets in the context of evidence on the extent to which enterprises in Ireland are actively engaged or not in RD&I. Firm-level competitiveness promotes RD&I and technological development, leading to further productivity and profitability, which provides resources to invest in RD&I. The resultant increased effectiveness of RD&I investment, together with a higher propensity to invest in RD&I, allows for enhanced competitiveness of these firms.

Clarity on the key policy instruments was presented in a publication produced by the Department of Business, Enterprise and Innovation as summarised the next table.

Summary of Irish RD&I Policy Interventions								
Building in Company RD&I Capacity		Access to RD&I Skills for Companies			Collaborative on Research Projects			
Tax Incentives	RD&I Grants and Funds	Graduate	Post Graduate Research	Highly Skilled Researcher	New Product or Service Development	Industry Led Research	Stand Alone Research Initiative or Scale	Partnership with World Class Research centres
RD&I Tax Credit Knowledge Development Box	IDA Ireland RD&I Programme and Feasibility Support Enterprise Ireland Business Innovation Initiative Enterprise Ireland RD&I Fund	InterTrade Ireland FUSION Programme	Irish Research Council Employment based Programme Irish Research Council Enterprise Partnership Scheme (Postgraduate) Horizon 2020 Marie Skłodowska Curie Actions	Science Foundation Ireland Industry Fellowships Irish Research Council Enterprise Partnership Scheme (Postdoctoral) Horizon 2020 Marie Skłodowska Curie Actions	Enterprise Ireland Innovation Vouchers Enterprise Ireland Innovation Partnership Programme	Enterprise Ireland Technology Gateways Enterprise Ireland and IDA Technology Centres	Science Foundation Strategic Partnership Programme	Science Foundation Ireland Research Centres Science Foundation Ireland Research Centre Spokes
Source: Adopted from Directory of Innovation Supports, Research Centres and Technology Centres 2016, Department of Business, Enterprise and Innovation								

As well as profiling existing RD&I activity and completing the mapping exercise of RD&I supports, it is useful to examine the underlying rationale of each of the main categories of supports using a programme logic model. This approach highlights the importance of evaluating impacts as well as the levels of resource inputs or levels of activity. In examining RD&I policy it is important to take account of the need to tailor supports to the areas of potential and to address the specific needs of different cohorts of enterprises. It is useful in this context to consider a taxonomy of enterprises taking account of both ownership and firm size and to examine the levels of RD&I investment and whether firms have internationally traded activities in Ireland. Relevant categories of firms considered in our analysis include:

- (i) Large foreign and indigenous firms;
- (ii) Medium sized foreign and indigenous firms;
- (iii) Small foreign and indigenous firms;
- (iv) Micro enterprises.

We also considered enterprises who are involved in SFI Research Centres who may not have manufacturing or internationally traded services activity in Ireland.

Profile of RD&I Activity Among Agency Clients

Our analysis included evidence on the profile of RD&I activity in the industrial development agency client firms. This study utilises extensive new data analysis to establish a firm level evidence base to inform the evolution of Ireland's structure of RD&I supports. Key findings are outlined below.

- ❑ RD&I activity is driven in the main by large firms. The majority of expenditure on RD&I, are provided by such firms. While smaller firms constitute a small share of overall RD&I, these firms are however an important element of the enterprise base. As a result, overcoming the barriers for small firms to invest in cost effective RD&I should continue to be a focus of policymakers to ensure the wider benefits of RD&I are secured. However, increasing the overall level of RD&I expenditures will require additional investment by large and medium sized enterprises.
- ❑ The distribution of RD&I expenditure in Ireland is heavily influenced by firm ownership. Among smaller firms, almost three-quarters of all RD&I expenditure is by Irish firms. Among large firms, where the majority of RD&I takes place, a large majority (90%) is conducted by foreign-owned firms, reflecting the dual structure of the Irish industrial base. Impressive achievements have been made in recent years in attracting large overseas firms to locate RD&I activity in Ireland. As a result, 74% of large overseas firms conduct RD&I in Ireland.
- ❑ Despite the success of foreign firms in engaging in RD&I in Ireland, over 400 foreign firms do not engage in RD&I. Nearly half of medium sized overseas firms (155) do not engage in RD&I. This may be indicative of a potential area of opportunity for Ireland.
- ❑ From an RD&I infrastructure perspective Ireland constitutes a region. The evidence in this report indicates that the location of RD&I expenditures in part reflects the geographic patterns of industrial development. In order to maximise the benefits of scarce public expenditure enterprises should be able to access resources regardless of their location.
- ❑ The largest single sector for RD&I in Ireland is Computer Programming, which represents 22% of all RD&I activity. The sectors that have shown the highest growth rates since 2000 are Business Services and Medical Device Manufacturing. The lower levels of RD&I in some sectors including Food, Drink and Tobacco, highlights the importance of targeted programmes reflecting the need to support firms in such sectors.

Mapping of Engagement across RD&I Supports and Firms

In order to ensure that appropriate opportunities to enhance RD&I are realised in a way which contributes to the Irish economy, it is important to map the engagement of enterprises across RD&I supports. Our analysis provides new evidence which investigates how the existing supports interact and the type of business activities they serve. Key findings are outlined below:

- ❑ Ireland now has a range of supports for businesses, with each of these supports typically tailored to particular segments of the business community or to particular types of research endeavour.
- ❑ There are significant linkages between a number of the RD&I support schemes, in that firms that avail of one scheme have a high probability of participating in another. This can be based on the agency that operates the scheme; firm type; institutional structures; and progression in terms of RD&I sophistication. The evidence demonstrates that many small firms may engage with some programmes such as innovation vouchers do not engage in more intensive RD&I initiatives.

- ❑ The support programmes¹ can be grouped as follows:
 - *Group A: Innovation Vouchers.* The Innovation Voucher Scheme can be thought of comprising a cluster in and of itself, and captures largely small firms with little or no engagement with RD&I.
 - *Group B: EI HPSU Supports.* These companies are small with a large majority having fewer than 10 employees and are 99% Irish-owned. The Internationally Traded Services sector makes up a large proportion of firms.
 - *Group C: EI RD&I Fund, InterTrade Ireland FUSION Programme:* These are taken up by firms with relatively low in-house RD&I employment levels, though the size range of these firms captures a broad range of firms for both sets of support.
 - *Group D: IDA RD&I Fund, EI Technology Centres, EI Innovation Partnerships, IRC Enterprise Partnerships (Post Doc):* The average RD&I employment in firms of this group is around 30-60, indicating a significant internal capacity, though some firms have a significantly larger number of RD&I personnel. These firms are particularly heavily located in services, though representation can be observed across a range of sectors.
 - *Group E: IRC Employment Based Programme, IRC Enterprise Partnership Post Graduate Programme, SFI Research Centre Programme, SFI Industry Fellowships:* The firms in this category include many of the largest firms engaged with RD&I in Ireland, though these supports are also taken-up by many smaller and medium-sized firms.
- ❑ The analysis demonstrates the growing utilisation by enterprises of R&D tax credit, highlighting the importance of taking account of tax incentives in the assessment of the economic costs and benefits.

Review of RD&I Challenges Facing Firms

In addition to identifying specific groups of firms and their characteristics, it is important to examine the likely barriers to firms engaging in RD&I. Key findings are as follows:

- ❑ There are a range of barriers to RD&I take up impacting on firms who are currently not research active. These include financing costs, lack of RD&I culture and gaps in the RD&I absorptive capacity within the enterprises. These barriers are particularly likely to apply to small enterprises.
- ❑ A barrier which exists for firms who are not engaged in RD&I relate to a lack of knowledge on the benefits of RD&I and how their firms could engage in such activities. This may suggest a need for integrated programmes involving audits of their requirements, demonstration initiatives on the benefits of RD&I, and assistance with implementation of such activities. Without such tailored initiatives, firms may engage in very minimal research and may fail to conduct more research-intensive activities.
- ❑ For firms who are engaged in RD&I, barriers to becoming more active also relate to financing costs or risks. Personnel constraints may also hinder an expansion of RD&I for such firms.
- ❑ In the Irish context, other issues may apply to medium-sized foreign firms where they do not currently have a mandate to engage in RD&I in Ireland. This may apply even though such companies operate in high technology sectors and where absorptive capacity is unlikely to be an issue.

¹ SFI Strategic Partnerships were not included in this analysis because of the very small number of firms in the database.

Review of International RD&I Support Programmes

Our key findings of the range of supports offered in other countries are included below:

- ❑ The suite of RD&I supports provided to companies in Ireland is relatively comprehensive compared to similarly-sized advanced countries.
- ❑ All of the countries examined are continually adapting their programmes to ensure competitive effective supports. In some countries including the UK high levels of R&D supports are provided.
- ❑ A closer review of the UK and four other comparator countries of a similar size (namely Denmark, New Zealand, Sweden and Austria) revealed a number of similar over-arching strategic goals in terms of developing RD&I, along with a number of innovative new policies. This issue of ensuring that the number of supports was understood by companies and easy to navigate was identified as an important theme. In a number of countries this has led to a streamlining of funding institutions and/or supports.
- ❑ Of particular interest in the Irish context is the development in Denmark of an integrated programme to encourage SME engagement in RD&I. This InnoBooster programme replaced two existing programmes. Also of interest is the Swedish Innova fund programmes and the sectorally focussed initiatives in Denmark.

Recommendations

A number of recommendations are presented for consideration based on the evidence and analysis in this report. These are designed to assist in meeting the target of 2.5% of GNP of research intensity as set in “Innovation 2020” and to address the evidence which highlights the significant percentage of both indigenous and overseas firms in Ireland who do not engage in significant RD&I. A summary of Indecon’s recommendations on RD&I supports is presented in the table overleaf. These are designed to achieve the high-level goal of increasing BERD in the most cost-effective way taking account of the need to maximise the use of scarce economic resources. The recommendations are set out to address the issues faced by the different types of firms.

Summary of Recommendations on RD&I Supports

Recommendations to Increase/Deepen RD&I Expenditures

1. Ireland should continue to provide significant support to leverage enhanced RD&I activity in FDI and indigenous firms.
2. Greater clarity is needed to highlight pathways between schemes for SMEs based on a life cycle approach.

Recommendations to Increase Number of RD&I Performers

3. Changes are needed in policies for small firms with no RD&I activities.
4. Potential for mid-sized FDI firms to increase RD&I in Ireland should be investigated by IDA Ireland.
5. New focus is needed to assist those indigenous sectors with low RD&I activity to diversity export markets and prepare for Brexit.

Recommendations Re Current RD&I Supports

6. Integrated approach to both RD&I and tax and other supports should be considered by development agencies in supporting company expansions.
7. Existing RD&I placement programmes should be streamlined.
8. A national approach to RD&I should continue and should ensure that infrastructure is accessible to firms in all regions.
9. Improved data on RD&I impacts should be collected to enhance evaluation.

Recommendations to Enhance Wider Economic Benefits of RD&I Supports

10. Investigate opportunities to leverage participation by firms in SFI Research Centres.

RECOMMENDATIONS TO INCREASE/DEEPEN RD&I EXPENDITURES

Recommendation 1: Ireland should continue to provide significant support to leverage enhanced RD&I activity in foreign and indigenous firms.

There is a need to build on the momentum achieved to date in enhancing RD&I activities. The analysis in this report has highlighted the benefits of RD&I activities and has shown that Ireland's RD&I policies have resulted in a significant growth in RD&I activity since 2000. However, there are strong international supports for RD&I in other countries and it is important to ensure that Ireland's offering remains competitive for projects which have a positive net benefit-to-cost ratio for Ireland. As a small open trading economy with an unusually high dependence on internationally traded sectors, ensuring that competitive supports for appropriate projects are available is important. This is likely to require continuing investment in technology and research centres and other programmes, and may lead to the development of one or more sectoral industry RTOs (Research and Technology Organisations). This issue was raised in the consultation workshops.

The review of international supports for RD&I in other European countries demonstrated that high performing countries on innovation criteria such as Denmark and Sweden invest a higher percentage of GDP on public expenditure on RD&I than in the case for Ireland. Indecon is aware of the constraints on public expenditure and the importance of stable public finances for Ireland's macroeconomic performance. Ensuring such stability impacts on the attractiveness of Ireland as a location for R&D investment by both indigenous and foreign companies. However, the analysis in this report suggests the need to continue to give priority to ensuring that RD&I supports in Ireland are aligned with other locations for projects which have a net benefit for the economy. The recent introduction of the Knowledge Development Box tax incentive is important in this context. While this recommendation is focussed primarily on deepening RD&I in those companies that are already RD&I active it is also relevant to attracting new projects given that a significant percentage of both indigenous and foreign firms do not currently actively engage in RD&I in Ireland and this remains a challenge

for economic development.

Recommendation 2: Greater clarity is needed to highlight pathways between schemes for SMEs

Ireland, like many countries, has a range of RD&I supports for businesses. These are provided by a number of different agencies. Consultations undertaken by Indecon for this assignment, including insights provided at the workshop, indicate that while significant improvements have been made in recent years in raising the awareness on the levels of supports, there are still some gaps in understanding among SMEs on what supports are provided at different stages of the life cycle of companies. This is also evident from the profile of firms utilising different supports. This is likely to be a particular issue for firms with lower levels of RD&I and who are not ongoing clients of the development agencies. These firms need as much clarity as possible on how to navigate the range of supports and what agencies to contact. One of the challenges of the current system is that the entry point for some firms is through an Innovation Voucher, though few of these firms go on to participate in other support programmes. This does not appear to be a sector-specific issue, but rather relates to the challenge of deepening RD&I in firms that are already active but have not progressed to further stages of RD&I. Further, there is evidence of particular sets of firms mostly participating in the different supports of a single agency. Good examples already exist of strong cross-over between agencies, particularly the Technology Centres which attract a large number of both EI and IDA clients.

The Directory of Innovation Supports, Research Centres and Technology Centres, published by the Department of Business, Enterprise and Innovation provides a clear pathway of supports to help companies build in company RD&I capacity, access skills and undertake early stage research. It is important that all of the agencies and support programmes provide a clear outline of these supports and the linkages to additional information.

As part of our analysis Indecon considered the merits of reducing the number of funding supports as for example is being considered in Finland and has been implemented in some of the other countries reviewed. While some rationalisation of Irish RD&I programmes has already taken place, we considered the merits of additional streamlining. On balance, we believe that existing agencies have distinct roles but that enhanced co-ordination of programmes including the provision of information on pathways between schemes is required. This will facilitate companies to access other programmes necessary to deepen their RD&I expenditures. We also believe there is a case for considering streamlining of RD&I placement programmes as discussed in Recommendation 7.

RECOMMENDATIONS TO INCREASE NUMBER OF RD&I PERFORMERS

Recommendation 3: Changes are needed in policies for Small firms with no RD&I

For SMEs who have not engaged in RD&I, building capacity is often of key importance. A barrier to achieving this is capacity within companies to identify their needs and the benefits of increased RD&I activity. This may require firms first to undertake an audit of their innovation capacity. Providing support for such audits by technology specialists is likely to help overcome the barriers to RD&I which exists in small firms arising from the lack of absorptive capacity. These are easy to understand and probably can be accessed by firms regardless of their level of RD&I readiness. Our analysis indicates that a large number of small firms do not engage in RD&I. Some changes are needed in policies to assist these firms to become RD&I active.

The Enterprise Client Engagement Model (CEM) already adopts a six-pillar approach to firm engagements, one of the pillars being innovation. Each CEM focusses on two pillars only, and often innovation is not one of the two. Consideration should be given as how to expand the number of firms which focus on innovation as one of their pillars. Further, additional audit capacity could be considered modelled on international schemes such as the Danish Innovation Agents Scheme, which includes the following features:

- SMEs can be contacted pro-actively by Innovation Agents, as well as directly applying;
- A full innovation diagnostic can be carried out based on a standard methodology;

- ❑ A short report is prepared for the SME setting out opportunities/challenges, and identifying relevant research organisations and public support schemes; and
- ❑ The Innovation Agent can then actively support the SME in establishing contacts with relevant research organisations or engaging with the relevant public agencies, as appropriate.

The building of capacity development in innovative SMEs who have little or no RD&I experience is also likely to require an expansion of employment placement schemes for technology specialists in innovative SMEs. These should, however, be supported with enhanced links with research institutions. The Swedish capacity development programmes operated by VINNOVA are relevant in this context. Indecon would also point out that encouraging innovation directly relevant to the challenges faced by these companies is likely to be a good initial fit given their lack of experience in RD&I.

While small firms contribute a relatively small share of overall RD&I, their impact on the economy and on wider innovation should not be underestimated. By supporting innovation in SMEs through audits and other targeted means, RD&I supports can also impact the resilience and productivity of this cohort of firms. Targeted supports should also be provided for micro firms which are clients of local enterprise offices, for example, via provision of innovation audits or online tools.

Recommendation 4: Potential for medium-sized foreign-owned firms to increase RD&I should be investigated by IDA Ireland

There is a noticeable gap in the level of RD&I activity conducted by medium-sized foreign-owned firms in Ireland compared to the level of RD&I activity by large foreign firms. IDA Ireland should investigate if there is potential to increase the level of RD&I activity in such firms. This may require some adjustments in the support programmes provided or enhanced marketing of the benefits of such activity in Ireland. This should be investigated further by IDA Ireland following engagement with medium-sized client companies.

The distribution of RD&I expenditure in Ireland is heavily influenced by firm ownership. Among smaller firms, almost three-quarters of all RD&I expenditure is by Irish firms, though this falls to less than half for medium-sized firms. Among large firms, where the majority of RD&I takes place, a large majority (90%) is conducted by foreign-owned firms, reflecting the dual structure of the Irish industrial base. The evidence in this report is that medium-sized foreign-owned firms in Ireland conduct little RD&I here. This may simply reflect the nature of the current mandates given to these firms by their parent companies. It is likely that the relatively low level of RD&I activity by these firms in Ireland is not because of low absorptive capacity. We are aware that IDA Ireland continually seeks RD&I and other mandates from all of their client base. This has led to a significant growth in RD&I investment particularly by large overseas firms. However, a renewed emphasis on medium sized foreign firms may be worthwhile in view of the evidence in this report. Of this cohort of non-performing firms, over half are in one of three IT related categories: ‘Computer Programming’; ‘Computer Consultancy’ or ‘Other Information, Communication and Computer’.

In the first instance, the existing suite of widely used supports for foreign firms can be used (e.g. IDA R&D Fund or the R&D Tax Credit), though given the prevalence of this issue in computer services firms, an engagement with these firms to understand if there are any particular barriers to conducting RD&I in Ireland may be useful.

In terms of specific actions, IDA Ireland might consider examining their portfolio of key mid-size strategic clients to identify potential new opportunities to drive additional RD&I investments and mandates from these clients. This could inter alia involve proactively utilising the existing IDA Client Development Programme (CDP) for opportunity identification and the implementation of an RD&I focussed marketing plan to pursue the potential opportunities. This action would represent a focussed continuation of existing IDA work and should involve engagement with IDA global team.

Recommendation 5: New focus is needed to assist those indigenous sectors with low RD&I activity to diversity export markets and prepare for Brexit

A low level of RD&I activity in a sector may be the result of the presence of firms with low absorptive capacity which will limit a firm's ability to identify, assimilate, transform, and apply valuable knowledge. Addressing this problem of a lack of absorptive capacity is a long-term challenge, and is unlikely to be addressed in the short to medium run by a realignment or reprioritising of RD&I supports. For example, simply identifying a sector where RD&I activity is low does not necessarily represent an 'opportunity' for a rapid growth in RD&I, nor does it necessarily point to an obvious gap that needs to be addressed. We therefore recommend a more targeted approach based on sectors where there is potential for greater innovation or where innovation can assist in the challenges facing such enterprises.

An area which merits greater focus concerns potentially innovative sectors where RD&I is low and where the impact of Brexit is likely to be significant. A number of these sectors are significant indigenous industries which have a high dependence on the Irish and UK markets and may be particularly impacted by Brexit depending on the nature of any Brexit agreement. For many of these firms, market diversification may be the best viable option for survival and growth. This is likely to be particularly relevant to food processing (12% of all non-performing firms) and to specialised internationally traded construction services (6% of non-performing firms). Other categories which show a large percentage of all non-performing firms where there may be potential relate to traditional manufacturing (29%) and business/financial services (30%).

Providing a sectorally focused RD&I programme which would highlight through demonstration projects the benefits of RD&I is recommended. Indecon envisages that such a programme might represent a joint initiative between existing high RD&I performing companies in these sectors, development agencies and research organisations. Operationalising this programme would involve a lead-in time but this would be reduced by building on aspects of existing initiatives already provided by development agencies and research organisations. This should also be viewed as only one of the intervention measures aimed at mitigating the effect of Brexit in these industries.

In some countries such as Denmark sectorally focused initiatives have been successfully utilised. For example, in the Green Development and Demonstration Programme (GUDP), Danish companies can undertake development, demonstration and networking projects that develop and/or demonstrate business oriented thinking in the Danish food industry through green transition that simultaneously supports both environmental sustainability and economic sustainability. Such a programme in the food sector could be operationalised jointly by Enterprise Ireland, Teagasc, Bord Bia, Science Foundation Ireland and involve existing firms in the sector.

RECOMMENDATIONS RE CURRENT RD&I SUPPORTS

Recommendation 6: Integrated approach to RD&I tax and other supports should be considered

The take-up of the RD&I Tax Credit has risen over time across firms of different size classes. In particular, while the RD&I Tax Credit used to be taken up by a minority of firms, a large majority of firms captured by the Annual Business Survey of Economic Impact (ABSEI) now avail of it. This rise reflects in large part a steady increase in the proportion of all firms which engage in RD&I, which has risen from 49% of surveyed ABSEI firms in 2000, to 63% by 2014. Further, the extent of RD&I expenditure by firms has also risen significantly. This incentive is an important element to Ireland's strategy to leverage additional scale and depth of RD&I investment and to ensure Ireland's offering is competitive with other countries. It, however, is important that the assessment supports for projects by individual firms should reflect the costs of these RD&I tax incentives so that the net benefits can be accurately estimated, as otherwise there is a risk of economic deadweight. All supports should be included in this appraisal, to arrive at a more precise measure of the level of leverage that the State is achieving taking account of the interaction between these schemes. This rate of leverage should continue to be differentiated based on the type of firm and/or research being undertaken, for example higher rates for small firms, and higher rates for collaborative research. It should be noted that the supports and Tax Credit may not necessarily have been availed of in the same period. However, the proportion of firms availing of

each support programme who have taken-up the R&D Tax Credit has risen sharply in recent years. This issue should be considered in the context of the current review of enterprise agency appraisal models.

Recommendation 7: Existing RD&I placement programmes should be streamlined

A number of separate schemes and supports exist to promote industry/academic student mobility which contribute to a pipeline of researchers orientated towards the needs of industry/enterprise. The placement schemes cover a spectrum of skills from graduate to post doc fellowship. They are currently provided by two agencies, namely Science Foundation Ireland and the Irish Research Council. The data suggests that these programmes appear to be attractive to largely the same type of firms², many of which already have an academic linkage through, for example, the SFI Research Centre programme. The creation of a pool of highly skilled researchers is one of the key benefits of the funding of HEI/enterprise collaborative research in Ireland, and having a flexible, well-funded and high-profile placement programme can help better leverage these investments and help firms to achieve the benefits to investing in RD&I. In order to focus on the best use of scarce resources it would be important to ensure that most of the RD&I placement programmes are also directed to SMEs and are focused on increasing the growth of internationally traded enterprises that have the potential for innovation. This should be done while maintaining the quality of placements. As such, the range of firms who engage in these programmes could usefully be extended to typical Enterprise Ireland/IDA firms (Ireland) who may not traditionally have engaged in academic-enterprise collaboration. This would extend the benefit of the programme beyond simply improving the flow of industry-relevant research skills, but might also raise awareness among a broader number of firms of the advantages of collaborative research with an academic institution.

Indecon believes there is a need to have one application process for enterprises for such programmes. Indecon notes that researchers also represent applicants and a coordinated approach is needed, but enterprises seeking R&D placements should be able to apply to one organisation. There is also merit in Enterprise Ireland/IDA Ireland actively promoting participation among their client companies in the context of overall company development plans. Indecon accepts that from the perspective of the researchers there are some differences in the objectives of the schemes but given the need to increase the number of RD&I performers and to build capacity this recommendation is required to facilitate this enterprise objective. A streamlined application process could combine the strengths and particular focus of the existing schemes and retain the same core objectives, for example in having elements that capture both academia-to-enterprise and enterprise-to-academia placements; support scholars at different stages of their study; while being open to a range of businesses. By combining the scheme into a single application process for enterprises, more awareness can be raised of the potential of the scheme among enterprises.

Recommendation 8: A national approach to RD&I should continue and should ensure that infrastructure is accessible to firms in all regions

Indecon is very supportive of actions to accelerate enterprise regional investment in Ireland. While policy on RD&I should continue to be determined at a national level, our analysis indicates that the geographic spend of RD&I activity reflects the distribution of industrial investment. With an increase in regional investment it is likely that this will be correlated with enhanced RD&I in the regions.

What is most noticeable about Irish regions is that the level of RD&I activity in Ireland by region largely reflects the distribution of industrial production. As of 2014, two-fifths (41%) of RD&I activity in Ireland is conducted in the South-East (ex-Dublin), though this region includes areas of Dublin's hinterland, as well as significant urban areas such as Cork, Waterford and Wexford. The remainder of RD&I activity is split between Dublin, constituting 38% of the total in 2014, and the BMW region accounting for one-fifth of all RD&I conducted in Ireland (21%). Growth across the regions has been highest in the South and East (ex-Dublin) which has seen a

² In particular, the firms' distribution when referenced by size, sector or ownership is very similar across these programmes.

quadrupling of activity since 2014, followed by the Dublin region that saw a doubling of activity, albeit from a larger base.

The absence of a region which constitutes an 'Innovation Leader' may reflect itself in Ireland's ranking in terms of national RD&I. If there are agglomeration effects or positive localised spill-overs, then the clustering of RD&I activity makes it more productive, boosting aggregate productivity and output. Feedback from the National Workshop suggested that Ireland was simply too small to consist of sub-regions in planning of RD&I infrastructure. While research institutes may be located in specific regions a national approach, as is current policy, helps ensure that duplication of scarce resources is avoided. It is, however, important that strategy should continue to ensure that RD&I infrastructure is accessible to firms in all regions regardless of where any centre or infrastructure is located.

Recommendation 9: Improved data on RD&I Impacts should be collected to enhance Evaluation

Ensuring that enterprise related RD&I expenditure supports are focused on enterprises which have the potential to maximise the economic return is a key challenge for policymakers. Given the evidence in this report of the use by many firms of a range of RD&I programmes it is important to enhance data availability on RD&I impacts on a cross programme basis. In view of the evidence presented in this report on the importance of the RD&I tax credit and the potential significance of the Knowledge Development Box, it would be worthwhile collating data from enterprises on quantified impacts of these incentives as well as on the agency RD&I programmes. Indecon recommends that there is an annual publication of the evidence on the impact of RD&I supports.

In order to minimise the administrative burden on companies, data allocation should be focused on medium/large enterprises who obtain most significant levels of RD&I supports. While designing data monitoring requirements is outside the scope of this study, the profiling data presented in this report should be of assistance in designing and targeting enterprises for enhanced monitoring.

Given the significant public expenditure allocated to RD&I supports both via agency programmes and through the tax foregone, an annual impact assessment is appropriate.

RECOMMENDATIONS TO ENHANCE WIDER ECONOMIC BENEFITS OF RD&I SUPPORTS

Recommendation 10: Investigate opportunities to leverage participation by firms in SFI Research Centres

Indecon understands that a number of firms who participate in SFI Research Centres do not currently have other internationally traded activities in Ireland. We therefore recommend that SFI and IDA Ireland share information on companies participating in SFI Research Centres and IDA should investigate if these provide potential leads for other investments in the Irish economy.

Overall Conclusions

The detailed empirical evidence presented in this report on the profile of firms RD&I activity and their utilisation of different RD&I support programmes provides important new insights into enterprise RD&I activity in Ireland. A number of recommendations have been proposed for consideration based on the findings. These are designed to further accelerate the significant progress which has been made in expanding business research and development expenditures in Ireland in recent years. The recommendations are also designed to assist in overcoming the barriers to RD&I faced by some firms and to enhance the effectiveness of state investment in this area.