technopolis |group

ESRI

*August 2020*

# Evaluation of the Enterprise Ireland Research, Development and Innovation Programme

**Final report**

*August 2020*

# Evaluation of the Enterprise Ireland Research, Development and Innovation Programme

## Final report

**Technopolis**

Martin Wain

Cristina Rosemberg

Pascal Halbeisen

Billie-Louise Schlich

Vivek Seth

Costanza Tiriduzzi

Aaron Vinnik

**ESRI**

Iulia Siedschlag

Weijie Yan

# Table of Contents

# Tables

# Figures

# Executive summary

## Introduction

This report presents the evaluation of Enterprise Ireland's (EI) RD&I Programme, commissioned by the Department of Business, Enterprise & Innovation (DBEI) in July 2019 to Technopolis. The report is organised into chapters that correspond to the evaluation objectives.

## This evaluation

This independent evaluation focused on the suite of direct financial supports to firms through the EI RD&I Programme. It does not cover RD&I supports provided to High Potential Start-Up firms through the RD&I Programme, since these are out of scope of the evaluation. The evaluation has three main objectives:

Objective 1: a) Determine the appropriateness of the Programme, b) Determine the effectiveness of the Programme in achieving the desired or any impact, c) Determine the effectiveness of the Programme at increasing the number of companies investing in RD&I, d) Determine whether the Programme can be delivered more efficiently, and e) Assess the performance of the Programme relative to similar programmes available in other comparator countries

Objective 2: a) Compare the role and performance of the direct-to-firm financial supports of the EI RD&I Programme in terms of achieving increased BERD to indirect supports, b) Explore the synergies of the EI RD&I Programme with indirect supports

Objective 3: Develop findings, conclusions and recommendations from the evaluation of the RD&I Programme and the comparison of the role and performance of enterprise RD&I supports

This study used a mixed-methods approach, comprising desk research, secondary data analysis, econometric analysis, a series of high-level interviews, online surveys of Enterprise Ireland client firms, and a programme of semi-structured interviews with Enterprise Ireland client firms.

The assessment of impact of the RD&I Fund, and the counterfactual analysis has been done via econometric analysis rather than cost-benefit analysis, which some previous evaluations have used.

## Support for RD&I

The RD&I agenda has been championed by successive ministers and policy teams within the Department of Business, Enterprise & Innovation (DBEI), through a series of national strategies that sought to underpin sustainable growth and stimulation of innovation and entrepreneurship.

Ireland has a comprehensive suite of direct financial enterprise supports to deliver on policy goals, delivered primarily through Enterprise Ireland. The RD&I Programme is one of the most long-running supports in this space, with the current iteration now in its twelfth year of operation. The Programme is comprehensive, and includes the following schemes: The Exploring Innovation Grant, the Research and Development (R&D) Fund, The Intellectual Property Strategy Offer, The Agile Innovation Fund, and The Business Innovation Offer. These may be delivered as standalone grants or as part of a tailored package of supports. Over the period

2007-2018, a sum of €464.7m was awarded via 2,005 grants to a total of 1,562 individual firms through the RD&I Programme. On average, 5% of EI clients have been awarded a grant in a given year over the period.

Sitting around these direct financial supports are a range of indirect supports. These include two procurement-based schemes administered by Enterprise Ireland: European Space Agency (ESA) funding[1] and Small Business Innovation Research funding,[2] as well as two tax-based R&D supports, in the form of the R&D Tax Credit and the Knowledge Development Box.

## Appropriateness (Objective 1a)

The assessment of the RD&I Programme's appropriateness is addressed through two main avenues: i) An examination of alignment with national policies and strategies, and ii) Consultation on current and anticipated firm needs.

The RD&I Programme demonstrates good levels of appropriateness toward both national policy and firm needs. The Programme has been consciously developed over its lifetime, in response to both client feedback, including the introduction of the Agile Innovation Fund and Business Innovation Offer in 2016/17. These two new strands of the Programme address support requirements for shorter lifecycle projects and non-technical, business innovations. This – and the support available from Development Advisors – makes the RD&I Programme among the most comprehensive support schemes available when compared to similar schemes in other countries.

## Effectiveness (Objectives 1b, 1c, 2a and 2b)

Evidence from our econometric analysis and consultation with firms reveal that the Programme evidently has a positive impact on a number of innovation and economic performance indicators.

When compared to similar, matched firms that had not received support through the Programme, awardees of grants show a significant boost to their R&D performance in the five years after receiving their grant(s). We find that the programme has had substantial positive effect on R&D expenditure after five years (between 138% - 157.6% across different measures). The increment is quite substantive and partly reflects the fact that the programme has attracted a good number of non-RD&I performers (between 8%-14% according to our calculations). We also find that the programme has led to positive effects on R&D employment albeit a milder one (36%). This milder impact on R&D employment could reflect more extra-mural R&D and collaboration with external partners among awardees.

Furthermore, our analysis shows that over the five years since awarding of their grant(s), the economic performance of awardees is significantly better than that of matched non-awardees in terms of turnover (19.5%), Total value added (35.2%), Employment (18.9%), Export sales (69.3%) and Export intensity (49.6%).

| Indicators | Average effect after 5 years (increment, in comparison with control group) |
|---|---|
| **R&D performance** | |

---

[1] The included assessment of the ESA Programme does not include MNCs and non-EI Client firms, and as such the analysis should not be construed as an assessment of Ireland's return on investment in ESA as a whole

[2] Over the period examined, a total of €46.5m was awarded via 98 grants were awarded to 25 firms through the ESA programme, and €0.075m was awarded to four EI client firms

| | |
|---|---|
| **Net R&D expenditures** | 156.9% |
| **Net R&D expenditures/ turnover** | 137.8% |
| **Net R&D expenditures/ employees** | 138.0% |
| **R&D employees** | 36.0% |
| **R&D employees / total employees** | 17.0% |
| **Economic performance** | |
| **Turnover** | 19.5% |
| **Employment** | 18.9% |
| **Total value added** | 35.2% |
| **Export sales** | 69.3% |
| **Export / turnover** | 49.6% |

*Only statistically-significant results are shown

However, the impact of R&D support on overall productivity is less clear. Although productivity (as measured by Value Added per Employee) was 16.5% higher among awardees compared to the control group, the difference was not statistically significant[3]. There are two potential explanations for this. First, literature suggests that this may be related to the timeframe under examination. Secondly, productivity effects may also vary across sectors. For example, sectors such as ICT and services tend to be in constant cycles of innovation, meaning almost-perpetual reinvestment, which may mask measures of productivity.

In alignment with results found via econometric analysis, interviews with companies reveal that clients do associate positive effects to participation in the programme. The majority of firms also suggested that the Programme had allowed them to undertake their RD&I projects at a larger scale and sooner than if the support had not been available. The RD&I Fund in particular was regarded positively for its contribution to experienced benefits.

As mentioned above, the Programme is also attracting non-RD&I performers, and appears to help a proportion of them to become RD&I-active post-award.

There is evidence of synergy and positive interaction between the direct financial support available through the RD&I Programme and the indirect support for RD&I available particularly through the R&D Tax Credit. Firms and stakeholders believe that a holistic approach – i.e. the presence of both types of support – is the optimal way to achieve an uplift in RD&I expenditure.

## Efficiency (Objective 1d)

The examination of the programme's efficiency through this evaluation was underpinned by three dimensions of investigation: i) The processes and procedures related to the implementation of the programme, through the lens of awardee satisfaction, ii) the extent to which awardees experienced barriers to accessing support and maximising the benefits or impact of that support, and iii) the main routes through which firms learn about and access the support available through the programme. This approach was taken, as an examination of cost-effectiveness was not possible, due to a lack of data available on personnel costs per scheme/programme.

---

[3] The p-value (probability value) is used in hypothesis testing. Since the p-value is above 0.05, this means that we have less than 95% confidence that the results are different from zero

Awardees are predominantly satisfied with the processes and procedures associated with accessing support. Where concerns were raised in consultation, these were largely seen as being a reasonable cost for accessing the support, though some consultees noted that the turnaround times of agile-track applications where committees are not used to their maximum strengths. The main concern raised in terms of procedures related to the recently-introduced Business Innovation Offer, whose criteria some firms felt were difficult to grasp. Firms' Development Advisors were the most common routes to access support from the RD&I Programme. Among client firms that had not accessed the Programme, the main barrier to doing so was a lack of relevance or low awareness.

## Comparative view of RD&I supports (Objective 1e)

The study selected a range of international programmes with which to compare the RD&I Programme. Comparators operate in countries that are either members of the Small Advanced Economies Initiative of which Ireland is also a member, or rank well in the latest Global Innovation Index (2019) published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO). The programmes selected as comparators are: Frontrunner (Austria), InnoBooster (Denmark), Research, development and piloting for SMEs & midcaps (Finland), R&D Fund (Israel), the SME+ Innovation Fund (Netherlands), R&D Project Grant (New Zealand), Innovation projects in small and medium-sized companies (Sweden), Innovation projects (without innovation partner) (Switzerland), and Smart Grants (UK).

The Enterprise Ireland RD&I Programme is among the most comprehensive support available to firms for RD&I within this set of comparators. This is largely due to the features of the international comparator programmes, which in general focus more narrowly on technological innovations. The RD&I Programme is made up of more components and supports a broader range of activities, from specific IP support to support for business innovations. The addition of the Agile Innovation Fund for firms in sectors with short product cycles also stands out among the comparators, as does the explicit eligibility of commercialisation costs. The support available through Enterprise Ireland appears to be more holistic in nature, due to the presence of dedicated Development Advisors that work with firms to identify and signpost additional support attached to their funding.

## Recommendations (Objective 3)

Drawing on the analysis above, we have formulated nine recommendations, broken down across appropriateness, effectiveness, efficiency and further monitoring and evaluation. These are set out in turn below.

**Appropriateness**

1. Our examination of the support available for RD&I, in light of both policy objectives and firm needs, suggests that the holistic approach to RD&I support (a mix of both direct and indirect supports) is optimal and appropriate. It is clear that the individual supports address different objectives and are used differently by firms. Similarly, Ireland appears to be a frontrunner among comparators in the ways in which a broad range of firms are addressed via its RD&I support. Ireland should continue to invest in both direct and indirect support for RD&I, rather than focusing solely on directional grants or indirect supports

**Effectiveness**

2. Our econometric analysis and consultation with firms has revealed the RD&I Programme to be effective when considering the economic and innovation performance of beneficiaries as compared to firms that have not accessed the programme. While the effect of the programme on firms' productivity is less visible, this is likely related to the time period of data

examined in this study. Therefore, the current constitution of the Programme should be maintained, with sensitivity to the productivity issue – some consideration may need to be given to how productivity is addressed in some sectors

3. While our analysis shows that the RD&I Programme performs well in attracting and supporting new performers, a recent OECD review suggested that there is untapped entrepreneurial potential within the firm base. The review suggests a further role for the Local Enterprise Offices across Ireland in order to better tap into this potential for innovation among firms. We would mirror this and suggest a review of the role or the Local Enterprise Offices to attract firms in the regions, or firms that have not yet applied for RD&I support

**Efficiency**

4. It is clear that continual efforts are being made to improve turnaround times for the approval of grant applications, however some issues were revealed in consultation regarding the use of the R&D Committee for agile-track applications. We recommend that these efforts are maintained, and that some  consideration should be given to procedures to ensure no barriers exist to accessing appropriate funding along optimal timescales (e.g. in scenarios where serial innovators apply for Agile Innovation Fund grants)

5. Furthermore, we would suggest that efforts are continued to simplify the application process to encourage greater up-take among less-experienced firms. It is clear that firms expect a learning curve in applying for (and managing) public grants, but consultation revealed that some Development Advisors believe that application systems could be improved, including the online system

6. Consultation with firms revealed a high degree of connectedness and trust in Development Advisors, who were the most-commonly reported route to finding out about, and applying for support through the RD&I Programme. In order to further broaden the base of firms accessing the Programme, more active communication about the Programme and its benefits could be instrumented via Development Advisors

**Future monitoring and evaluation**

7. Like the expected learning curve in applying to public grants (see above), consulted firms also largely reported an expectation to participate in monitoring activities as part of accessing public money. Many found this to be manageable once learned, though some found difficulties in fulfilling the requirements to complete project timesheets in addition to their own systems (leading to duplication), while others found the requirement for an external audit of claims to be financially challenging. Some consideration could be given to simplifying these requirements in some cases

8. Linked to the second recommendation, above, we believe that there is merit in seeking to further understand the link between RD&I and productivity across sectors within the economy. This research project would ideally feed into the ways in which data are collected through applications and monitoring, as well as broader on-going data collection exercises. We would also recommend further monitoring with sensitivity at the sectoral level, in order to better assess impact across the programme in the future

9. Finally, in order to gain a better view of the effects of the RD&I Programme on firm productivity, we recommend that this evaluation (and specifically the econometric exercise) is repeated in two or three years. This would enable the evaluation to examine data across a larger time period, ideally seven or nine years after grant award, which literature suggests is a more appropriate window to observe productivity effects for such activities. The repeated evaluation would also be in a position to take in additional monitoring at the sectoral level, as set out in the preceding bullet point

# 1 Introduction

## 1.1 This evaluation

This evaluation was commissioned by the Department of Business, Enterprise & Innovation (DBEI) in July 2019. This is an independent evaluation focused on the Enterprise Ireland Research, Development and Innovation (EI RD&I) Programme, and runs from July 2019 to March 2020.

The evaluation focuses specifically on direct financial supports to firms through the EI RD&I Programme but does not cover RD&I supports provided to High Potential Start-Up firms through the RD&I Programme. The evaluation has three main objectives, presented in the table below. Each report section includes a cross-reference to the specific evaluation objective that is to be addressed. It should be noted that addressing Objective 2 was hampered by data issues.[4]

| Objective | Evaluation scope |
|---|---|
| Objective 1 | a) Determine the appropriateness of the Programme, including: an assessment of the Programme in relation to Ireland's enterprise and Innovation policies (past, current and future policy challenges), and the economic context that applied during the time period under review; assessment of the Programme's fit with the emerging needs of enterprises |
| | b) Determine the effectiveness of the Programme in achieving the desired or any impact, including: measuring as accurately as possible the direct relationship between the EI RD&I Programme supports and increased business expenditure on R&D (BERD); quantifying as accurately as possible the full benefits relative to the cost of the programme |
| | c) Determine how effective the EI RD&I Programme has been at increasing the number of companies investing in RD&I and the intensity of these RD&I investments: determine the factors that limit the take-up of direct financial supports that can be accessed through the EI RD&I Programme |
| | d) Determine whether the Programme can be delivered more efficiently |
| | e) Assess the performance of the Programme relative to similar programmes available in other comparator countries. |
| Objective 2 | a) Compare the role and performance of the direct-to-firm financial supports of the EI RD&I Programme in terms of achieving increased BERD, to the roles and performances of: The Knowledge Development Box; The R&D Tax Credit; European Space Agency Funding; and Small Business Innovation Research. |
| | b) Explore the synergies with the above RD&I supports to the EI RD&I Programme |
| Objective 3 | Develop findings, conclusions and recommendations from the evaluation of the RD&I Programme and the comparison of the role and performance of enterprise RD&I supports |

## 1.1 Methodology

This study used a mixed-methods approach, comprising desk research, secondary data analysis, econometric analysis, a series of high-level interviews, online surveys of Enterprise Ireland client firms, and a programme of semi-structured interviews with Enterprise Ireland client firms. The evaluation was commissioned to focus on econometric analysis rather than cost-benefit analysis, which some previous evaluations have used. Details of each strand are presented below.

- **Desk research:** A rapid review of key national strategies and policy documents was undertaken to formalise our understanding of Ireland's current ambitions regarding the

---

[4] Data issues included a lack of access to data for the indirect supports, and a low number of observations in ESA and SBRI data that precluded econometric analysis

development of knowledge-based competitiveness. This has informed several aspects of the evaluation, including: the understanding of the rationale and appropriateness of the intervention, informing the design of data collection tools (e.g. developing the programme logic model), and feeding into the international comparators for the programme

- **Secondary data analysis:** Programme data have been analysed to establish uptake of support for RD&I by firms

- **Econometric analysis:** The econometric analysis identifies and quantifies the direct impact of the RD&I Programme on a range of performance outcomes of Enterprise Ireland client firms. The impacts have been estimated year by year up to five years after the award of the RD&I financial supports

- **Two surveys of Enterprise Ireland client firms:** The survey of awardees was launched to 1,058 firms on Wednesday 27th November 2019, and remained open for three weeks. The survey received 220 responses, representing a final response rate of 21%. The survey of client firms that had not accessed the RD&I Programme was launched on Wednesday 4th December to a random sample of 300 EI client firms drawn from the control group identified through the descriptive analysis. This survey ran for two weeks and received 53 responses, representing a final response rate of 18%.

  The survey questionnaires covered motivations to access the RD&I Programme, access to other instruments and their complementarity, the main benefits emerging from access, experienced barriers, and levels of satisfaction with the offer and its process.

  A breakdown of the survey population is available in Appendix A.

- **Interviews:** The study team conducted 40 interviews with **Enterprise Ireland client firms,** identified via the online surveys. The 40 interviews were divided between firms that had benefitted from the Programme (34) and firms that had not accessed the Programme (6). A total of 88 invitations were sent to recruit firms for interview. The interview programme was used to collect more detailed responses and concrete examples of benefits, impacts and barriers, as well to explore issues such as the impact of the support on firm productivity.

  Interviews with stakeholders and comparators: The study team conducted eight interviews with **Enterprise Ireland Development Advisors** (identified and recruited with the support of Enterprise Ireland), and four interviews with **representatives of international comparator programmes** in Austria, Denmark, the Netherlands and Sweden.

  A breakdown of the interview group populations is available in Appendix B.

## 1.2   This report

The report presents the evaluation of Enterprise Ireland's RD&I Programme. The report is organised into chapters that correspond to the evaluation objectives. The remainder of this report is set out as follows:

**Chapter 2** includes a discussion of the policy context in Ireland and a mapping the support that is available through the RD&I Programme, as well as the uptake of support by client firms

**Chapter 3** sets out an assessment of the appropriateness of the RD&I Programme, including alignment with national policy objectives and firms' needs

**Chapter 4** sets out an assessment of the effectiveness of the RD&I Programme, including the results of an econometric analysis and firms' views drawn from consultation. The chapter also explores synergies between the RD&I Programme and other available RD&I supports

**Chapter 5** sets out an assessment of the efficiency of the RD&I Programme, covering firm satisfaction, barriers experienced and access routes for support

**Chapter 6** sets out a brief overview of international comparators

**Chapter 7** sets out conclusions and recommendations

# 2   Support for RD&I in Ireland

## 2.1   Policy context

### 2.1.1   Overview of key policies

The RD&I agenda has been championed by successive ministers and policy teams within the Department of Business, Enterprise & Innovation (DBEI), through a series of national strategies that sought to underpin sustainable growth and stimulation of innovation and entrepreneurship (e.g. Government's Strategy for Science, Technology and Innovation 2007-2013). Since 2012, a more focused approach has been adopted in the public funding of research and innovation activity. The national Research Prioritisation exercise identified 14 major areas in which to focus competitive funding,  as they were deemed likely to yield the greatest economic and societal impact[5]. Figure 1, below, sets out a timeline of recent relevant policies and strategies at the national level.

*Figure 1    Timeline of recent relevant national policies and strategies*
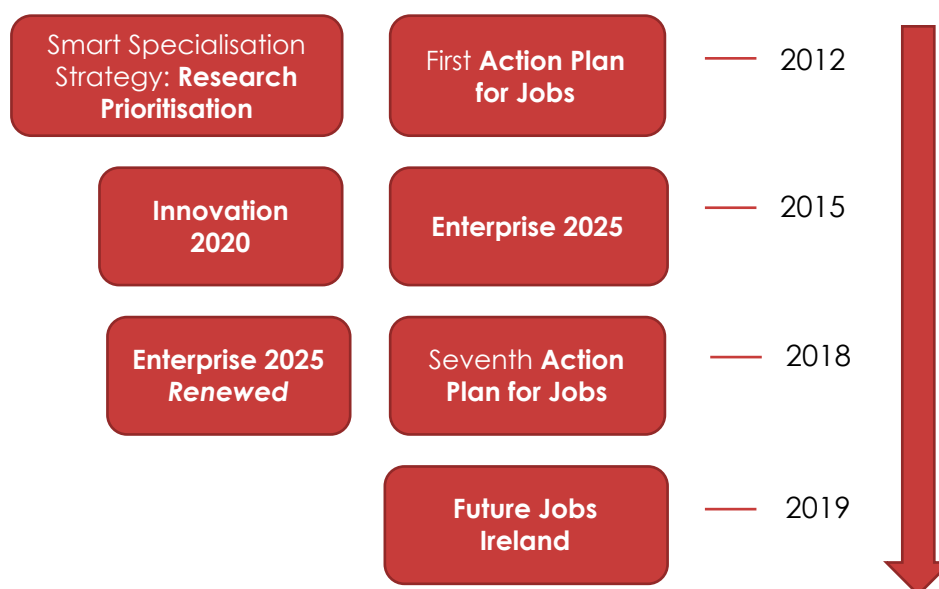


Source: Technopolis

The current suite of policies and strategies that pertain to the RD&I Programme include the Action Plan for Jobs, Innovation 2020 (including its Mid-term Review), Enterprise 2025 and Future Jobs Ireland. The main policy objectives of these strategies are to increase the number of people in employment in all regions, while developing entrepreneurship, increasing productivity and positioning Ireland as a global innovation leader. Innovation 2020 and Enterprise 2025 also contain two specific statements related to firms' investment in RD&I:

- Irish firms' investments in RD&I remain below competitor countries, and the proportion of enterprises engaging in R&D is too low (Enterprise 2025)

---

[5] See: https://dbei.gov.ie/en/Publications/Publication-files/Innovation-2020.pdf

- Firms under-invest in research and focus more on 'new to company' innovations rather than 'new to market' innovations (Innovation 2020)

The Innovation 2020 Strategy, adopted in 2015 as Ireland's overarching policy framework for research and innovation covers the implementation of 140 actions by Enterprise Ireland (EI), Science Foundation Ireland (SFI), the Local Enterprise Offices (LEOs) and other government departments and agencies. The Strategy sets out the government's 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.

As part of the Strategy, DBEI aimed to increase gross expenditure on R&D to 2.5% of GNP, of which a significant portion was envisaged to come from the business sector investing more in R&D.

The five high-level goals it set out to achieve are:

- Excellent research in strategically important areas that has relevance and impact for the economy and society

- Achieving a strong innovative and internationally competitive enterprise base, growing employment, sales and exports

- A renowned pool of talent both in Ireland's public research system and in industry that maximises exchange of talent and knowledge

- A coherent joined-up innovation ecosystem, responsive to emerging opportunities, delivering enhanced impact through the creation and application of knowledge

- An internationally competitive research system that acts as a magnet and catalyst for talent and industry

A Mid-term Review of Innovation 2020 was carried by DBEI out in 2019,[6] to ensure that the Strategy could continue to deliver the vision and objectives for Ireland's RD&I system whilst acknowledging important changes in the policy environment, such as the impact of the UK leaving the EU, changes in US trade and investment policy, the commitment of transitioning to a low-carbon and climate-resilient society and the increased role of technologies such as robotics, virtual reality and artificial intelligence.

The review found that until June 2019, 22% of the actions in the Strategy had been completed or nearly completed, 65% of actions were progressing or ongoing, 6% of actions (8 actions) were delayed and 2% of actions (three actions) remained to be initiated. The review concluded that the goals of Innovation 2020 remain appropriate, and stressed the continued importance of ensuring that public investment in R&D translates into economic and social returns, including the development of the skills base in enterprise. The review also notes the on-going importance of increasing R&D intensity and the number of R&D performers.

In addition, the Action Plan for Jobs has been published and refreshed every year since 2012, with the most recent one dated 2018. These documents outline the government's approach to maximising employment across Ireland, by reducing regional disparities, improving the innovative capacity of its firms, improving productivity and increasing trade.[7]

Despite a significant decrease in the unemployment rate from 16% in 2012 to 5.7% at the end of 2018, the domestic economy retains a number of vulnerabilities such as low productivity

---

[6] See: https://dbei.gov.ie/en/Publications/Mid-term-Review-of-Innovation-2020.html

[7] See: https://dbei.gov.ie/en/Publications/Publication-files/Action-Plan-for-Jobs-2018.pdf

levels, especially in indigenous firms. As a result, in 2019 the government published the first of a series of annual reports - Future Jobs Ireland 2019 - which is part of a multi-annual framework to support enterprises and workers in adapting to a changing economy. This includes preparing for the challenges of adapting to a low-carbon future and the increasing adoption of digitalisation and automation.

Five pillars are identified as central in adapting to the future economy:

- Embracing Innovation and Technological Change
- Improving SME Productivity
- Enhancing Skills and Developing and Attracting Talent
- Increasing Participation in the Labour Force
- Transitioning to a Low Carbon Economy

The increasing focus on RD&I over successive periods has enabled Ireland to begin to compete on an equal footing with major European and global economies.

## 2.2  Overview of support available for RD&I

Ireland has a comprehensive suite of enterprise supports to deliver on these policy goals, delivered primarily through Enterprise Ireland. The RD&I Programme is one of the most long-running supports in this space, with the latest iteration of the programme now in its twelfth year of operation. Using a rough typology, the RD&I Programme supports three categories of projects: R&D projects; Business Innovation projects; and 'Agile Innovation' projects. This typology demonstrates the development of the programme over its years of implementation, with the latter two supports added in recent years. This has an important impact on the programme objectives, and reflects required changes to eligibility, the application and approvals processes, and the ways in which the State is able to support firms.

### 2.2.1   Overview of direct financial support

The EI RD&I Programme provides direct financial supports to firms for in-company RD&I activities. Since it was established in 1998, EI has provided RD&I support to firms in various configurations and under several names.

The RD&I Programmes aims to achieve a significant uplift in investment in RD&I, and to enable firms to innovate. The table below summarises the direct financial supports available to firms through the RD&I Programme, provided through equity or grants, and via standalone support or as part of a package of supports. Via its constituent parts the programme supports firms to address a number of aspects of RD&I activity, ranging from understanding and planning RD&I within a firm, to conducting projects, and onto protection of intellectual property. The objectives of the individual aspects of the programme are broken down below.

*Table 1     Overview of the objectives of constituent parts of the EI RD&I Programme*

| Support name | Specific objective |
|---|---|
| Exploring Innovation Grant[8] | - Help firms to understand the role of RD&I in their firm<br>- Encourage firms to better plan RD&I through strategic thinking and prototyping |

---

[8] See: https://www.enterprise-ireland.com/en/funding-supports/Company/Esetablish-SME-Funding/Feasibility-Study.html

| | |
|---|---|
| The Research and Development (R&D) Fund[9] | • Help firms to develop new or improved products, processes or services |
| Intellectual Property Strategy Offer[10] | • Encourage firms to develop an IP strategy to help maximise the value of RD&I activities |
| Agile Innovation Fund[11] | • Encourage firms to engage in RD&I in certain sectors or those with short product lifecycles to develop new or improved products, processes or services |
| Business Innovation Offer[12] | • Help firms to develop new or improved business innovations, including production methods, service delivery or organisational methods |

Source: Technopolis, based on Enterprise Ireland webpages and validated in interview

The constituent parts of the RD&I programme are set out below, as agreed with Enterprise Ireland. The table sets out funding amounts and funding rates, as well as eligibility information.

*Table 2    Overview of details of constituent parts of the EI RD&I Programme*

| Support name | Funding available | Funding rate | Eligibility |
|---|---|---|---|
| Exploring Innovation Grant | Up to €35,000 | Up to 50% | Clients or potential clients HPSUs have own feasibility grant |
| The Research and Development (R&D) Fund | Up to €650,000 fir RD&I projects Up to €150,000 for Business Innovation projects | 25% / 35% / 45% for R&D projects 50% for Business innovation projects | Irish-based manufacturing or internationally traded services company Possible collaboration bonus (15%) |
| Intellectual Property Strategy Offer | IP Start: €2,160 IP Plus: €35,000 | IP Start: 80% of the cost of employing an IP advisor IP Plus: up to 50% of the cost of up to 18 months of consultancy and training | EI clients, SMEs only Applicants must provide details of a 'linked' RD&I project which received support from EI within the preceding 7 years HPSUs eligible in limited circumstances |
| Agile Innovation Fund | Up to €150,000 | Up to 50% of total project cost of €300,000 | Irish-based manufacturing or internationally traded services company R&D projects and Business Innovation projects are eligible Accessible to non-EI clients, via an outline proposal Possible collaboration bonus (15%) HPSUs are eligible |
| Business Innovation Offer | Up to €150,000 | Up to 50% of the eligible costs | Irish-based manufacturing or internationally traded services company |

---

[9] See: https://www.enterprise-ireland.com/en/funding-supports/Company/Esetablish-SME-Funding/R-D-Fund-Large-Projects-.html

[10] See: https://www.enterprise-ireland.com/en/funding-supports/Company/Esetablish-SME-Funding/Intellectual-Property-Strategy-Offer.html

[11] See: https://www.enterprise-ireland.com/en/funding-supports/Company/Esetablish-SME-Funding/Agile-Innovation.html

[12] See: https://www.enterprise-ireland.com/en/funding-supports/Company/Esetablish-SME-Funding/Business-Innovation.html

| | | | Available through the routes of Agile Innovation, RD&I Fund, or Operational Excellence Offer[13]) HPSUs not eligible to apply |
|---|---|---|---|

### 1.2.1 R&D Funding as part of Package Supports Client offers

Support for R&D is also included in tailored packages to client firms. Client offers are often shaped via bi-lateral conversations with Development Advisors (DAs), though clients can also apply without speaking to a DA.[14] Once an application is received, it is assigned to a DA to process. The DA would visit the company, conduct an analysis, model the company, and see where support could or should be applied. If the company requires more than one type of support, then a package would be put together.

One example of a client offer is the Company Expansion offer, which is intended for firms undertaking or planning to undertake an ambitious expansion that will create employment and grow sales in international markets. Several things are supported through these packages, including: i) RD&I, ii) Capital assets and job creation, iii) Training, iv) Management Development, and v) Consultancy.

### 2.2.2 Overview of indirect financial supports

Alongside the RD&I Programme are a number of other, indirect supports for RD&I. These include the R&D Tax Credit, the Knowledge Development Box and two procurement-based schemes administered by Enterprise Ireland: European Space Agency (ESA) funding and Small Business Innovation Research funding. Each of these are set out below, followed by an overview table of objectives for each support.

The R&D Tax Credit is part of the national tax offering, aimed at developing a strong, innovation-driven business sector and attracting investment into Ireland via foreign direct investment (FDI). The R&D Tax Credit operates against a primary policy objective of increasing business R&D (BERD) in Ireland, with a particular view to generate increased innovation and productivity (Department of Finance, 2016).[15] The R&D Tax Credit is available to companies that have spent money on R&D activities. The credit is used to reduce firms' corporation tax, and is calculated at 25% of qualifying expenditure. Irish Tax and Customs sets criteria for eligible expenditure.[16] Firms claim an R&D Tax Credit via an online service, but must check eligibility before completing the application. These criteria state that claiming firms' R&D activities must be in the field of science or technology, and:

- Involve systemic, investigative, or experimental activities

- Involve basic research, applied research or experimental development

- Seek to make scientific or technological advances

---

[13] See: https://www.enteirprise-ireland.com/en/funding-supports/Company/Esetablish-SME-Funding/Operational-Excellence.html

[14] The amount of funding is determined by the need for financial support for the stated project, the client's anticipated growth targets, potential employment, and the regional location of the company in Ireland

[15] See: https://igees.gov.ie/wp-content/uploads/2014/01/R-and-D-Credit-Evaluation-2016.pdf

[16] See: https://www.revenue.ie/en/companies-and-charities/reliefs-and-exemptions/research-and-development-rd-tax-credit/index.aspx

- Involve the resolution of scientific or technological uncertainty

Similar to the R&D Tax Credit, the Knowledge Development Box is corporation tax relief for firms. In the 2015 announcement of the Knowledge Development Box by the Department of Finance, the main objective of the scheme was described as contributing to the attraction and retention of firms with real economic substance, with a particular view to encourage the generation of knowledge-based capital in Ireland (Siedschlag, 2015; EY, 2015).[17] As with the R&D Tax Credit, this presents a dual policy objective of further developing the Irish economy through endogenous growth and FDI by achieving a 'best-in-class' and sustainable tax instrument. The Knowledge Development Box allows firms to apply for a deduction against corporation tax of 5% of qualifying profits.[18] Eligible profits include qualifying patents, computer software and some other certified intellectual property. This means that to apply for tax relief, firms must have created a useable qualifying asset.

The two other indirect supports available for RD&I in Ireland are procurement-based schemes that seek to encourage firms to conduct RD&I activities in specific priority areas or in response to specific challenges. Enterprise Ireland assists Irish companies to successfully bid for ESA contracts.[19] In 2018, ESA had awarded a total of €19.3m to 27 Irish companies. Most of the activity of Irish companies in the space sector focuses on downstream applications, both in terms of equipment and services/products for consumers. DBEI also published its National Space Strategy for Enterprise 2019-2025 to support the growing capabilities of Irish firms in the space sector. Enterprise Ireland also administers the recently-launched Small Business Innovation Research (SBIR) funding.[20] This is a pre-commercial procurement which focuses on addressing specific 'Challenges'. Under the first two calls, the maximum funding available via SBIR was €200,000. The third call, launched in 2019, offers a minimum of €200,000 in funding. Funding is administered in two phases: in phase 1 a number of companies undertake a technical feasibility study to understand the challenge and identify a potential solution; in phase 2, a smaller number of companies prototype a specific project, through extensive R&D.

*Table 3    Overview of objectives of indirect RD&I supports*

| Support name | Specific objective |
| --- | --- |
| R&D Tax Credit | - Encourage firms to invest in RD&I activities |
| Knowledge Development Box | - Encourage firms to manage and protect intellectual assets from RD&I |
| ESA funding | - Encourage firms to conduct R&D to develop products in priority areas |
| SBIR funding | - Encourage firms to conduct R&D to develop solutions to societal challenges |

Source: Technopolis, based on Enterprise Ireland webpages and validated in interview

---

[17] See: https://www.esri.ie/publications/submission-to-the-department-of-finance-public-consultation-paper-the-knowledge-development-box and
https://www.ey.com/Publication/vwLUAssets/Irish_Department_of_Finance_launches_Knowledge_Development_Box_consultation/$FILE/2015G_CM5108_Irish%20Department%20of%20Finance%20launches%20Knowledge%20Development%20Box%20consultation.pdf

[18] See: https://www.revenue.ie/en/companies-and-charities/reliefs-and-exemptions/knowledge-development-box-kdb/index.aspx

[19] See: https://www.enterprise-ireland.com/en/Research-Innovation/Companies/Access-EU-Research-Innovation-reports/European-Space-Agency-.html

[20] See: https://www.enterprise-ireland.com/en/Research-Innovation/SBIR-Ireland/

## 2.2.3 Implementation of the EI RD&I Programme

Figure 2, below, sets out the Programme Logic Model (PLM) developed for the EI RD&I programme. The PLM draws on desk research and scoping interviews, and sets out the objectives, inputs, activities, outputs, outcomes and impacts of the programme. Each category is discussed in the following dedicated sub-sections.

*Figure 2   Programme Logic Model of the RD&I Programme*
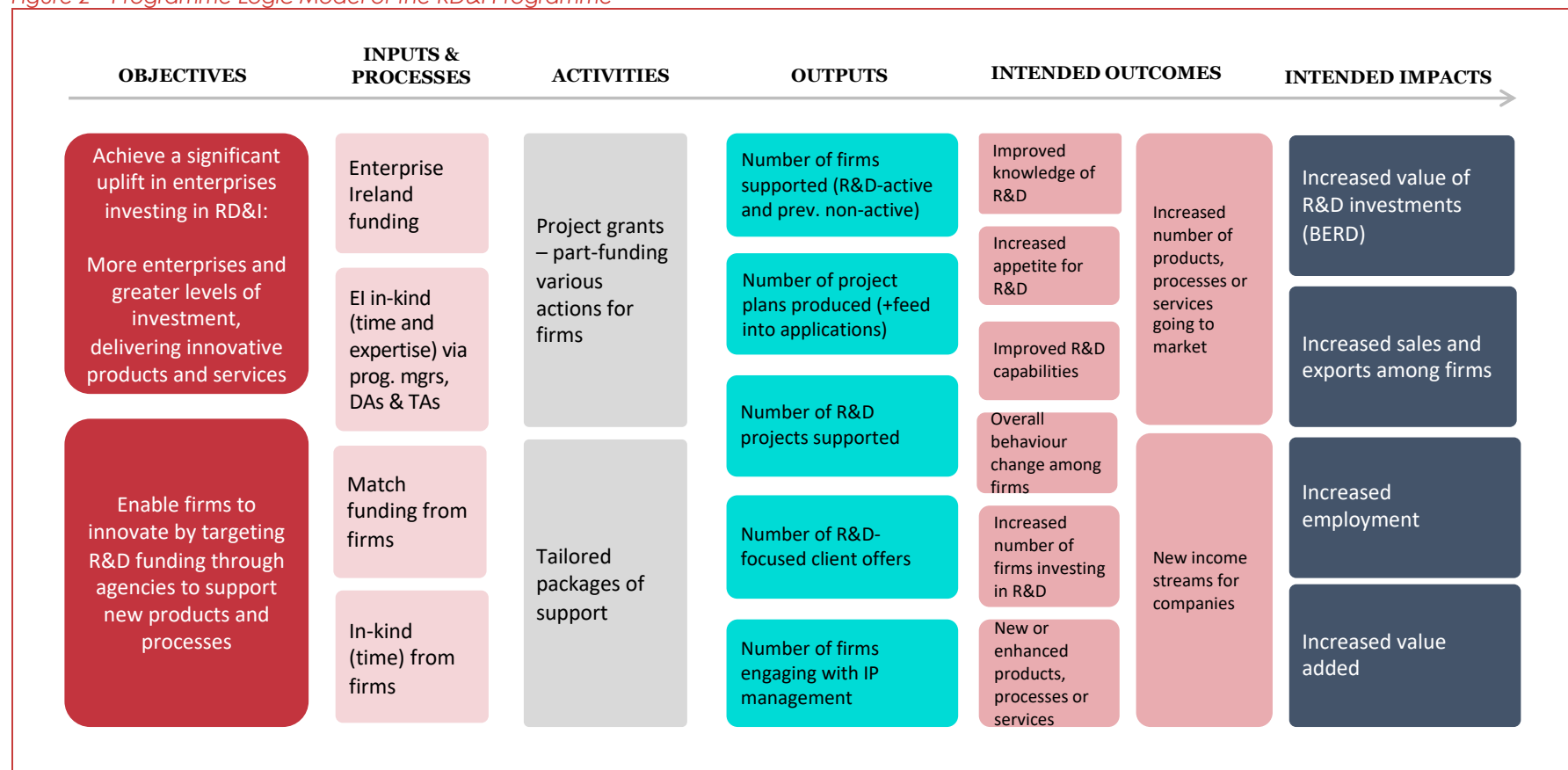


Source: Technopolis, based on desk research and interview

**Programme inputs and processes**

In common with other programmes, the EI RD&I programme is resourced by agency funding and staff time (via Programme Managers, Development Advisors and Technology Advisors), as well as match funding secured by applicants and awardees, plus the in-kind contributions from firms in the form of time spent on the application for (and eventual implementation of) grants. The Enterprise Ireland budget for the programme is set as an overall envelope, with the lines within the budget kept flexible in order to maintain responsiveness.

Staff time toward the programme is in the form of both management staff and technical staff. Development Advisors (DAs) signpost companies to supports and also handle the commercial analysis of applications for support.[21] Technologists and Technology Advisors are also key to helping formulate supported projects, being responsible for preparing the technical analysis of proposals for EI's approval committees. The decision-making processes and relevant committees are detailed below:

- Decisions on funding amounts under €120,000 are approved through an internal line management sign-off process. A client would make an application online and approved by the grants administration team
- Grants under €150,000 can be approved through the Agile Innovation Fund
- The R&D Committee approves amounts up to €650,000, meeting once per month.
- The Investment Committee approves amounts over €650,000, meeting every 2 weeks
- The Management Approval Committee meets weekly and approves Agile Innovation Fund grants that are too large to be approved online. (i.e. over €150,000) or those where the client has received cumulative funding greater than €150,000 in the preceding 12 months
- The Financial Products Committee approves Programme changes and new instruments, focusing on the consistency and operation of the changes

**Programme activities**

The RD&I programme is a comprehensive suite of supports for firms looking to undertake in-house R&D. As set out in the programme logic model in Figure 2, support is offered in two ways: project grants from the five constituent 'standalone supports', or tailored packages of support.

While the grants offered do not make a distinction between experimental research and more traditional R&D activity, there is a distinction to how EI supports firms of different levels of maturity. EI funds firms on a grant basis that are generally three-plus years old and EBITDA[22] positive, while younger firms are funded on an investment basis.

In consultation, the number of programme participants (awardees) was seen to have fallen, due to lower numbers of proposals. This is reinforced by the descriptive analysis of programme data (see section 2.3), which shows that the number of awardees decreased from 2012 to 2017, before reverting to prior levels in 2018. This may be explained by the cyclical nature of RD&I activities, whereby applicants receive support for projects and then do not apply to the programme again until another project idea and the resources to support it are ready. The increase of awardees in 2018 may additionally be contributed to by the launch of the Agile Innovation Fund and Business Innovation Offer strands.

---

[21] Many companies have one-to-one relationship with a Development Advisor, though there are also companies (i.e. in the Core and Export Develop departments) that engage on a one-to-many basis as per Enterprise Ireland's new Client Engagement Model, implemented in recent years. For these companies, the engagement with a Development Advisor usually involves the R&D Core Unit and/or the Innovation Department

[22] A company's earnings before interest, taxes, depreciation, and amortisation

**Expected outputs, outcomes and impacts**

The series of outputs presented in the draft programme logic model represents the comprehensive nature of the RD&I fund. The draft programme logic model presents simple outputs that reflect the expected countable outputs of each individual support, from project plans produced (Exploring Innovation) to the number of R&D projects supported (R&D Fund, Agile Innovation Fund, Business Innovation projects. The specific focus on IP has been relatively recent, and is represented by a count of the number of firms engaging in IP management.

The expected outcomes are similarly wide-ranging, from increased knowledge, awareness and appetite, to increased capabilities and higher levels of investment. These outcomes map relatively clearly to the individual supports. For example, the Exploring Innovation Grant is focused on raising awareness of RD&I, its benefits to a business, and capacity building. The Exploring Innovation Grant is not always a pre-cursor to further R&D funding, but is also awarded to SMEs where an R&D Fund grant is less appropriate. The Agile Innovation Fund supports RD&I projects in industries with shorter cycles, such as ICT, and is intended to speed up projects. As such, the Agile Innovation Fund is also intended to increase the number of SMEs undertaking RD&I activities.

Finally, the intended impacts set out in the programme logic model represent the goals of the RD&I Programme, which form the areas of examination for this evaluation.

**Changes to the programme over time**

The EI RD&I has evolved continuously, in line with the direct experience of running the programme, but also to take advantage of developments seen elsewhere. For example, since the 2017 review conducted by Indecon, the programme has been modified to include the Agile Innovation Fund and Business Innovation projects strands.

The introduction of the Agile Innovation Fund was a notable change, brought in response to both client sentiment and following an Enterprise Ireland examination of similar programmes, such as those offered via BPI France and FFG (Austria). Based on feedback from their own clients, Agile was introduced to help clients in industries with shorter lead-in times or product cycles, such as those in the ICT industry. We gathered similar feedback in our consultation, with stakeholders stating that funding had often arrived too late for these types of companies, at a time when RD&I projects were nearly complete. This emphasises the need for Ireland, like other countries, to have smaller, more flexible and responsive funding pots available.

The second main change to the programme is the addition of the Business Innovation Offer strand. This was introduced in response to changes in State Aid rules, as well as due to a desire to focus on an a more 'holistic' approach to supporting RD&I (i.e. beyond products and services). Following a change to the rules, State Aid only applied when grants provided 50% of funding, an increase from the previous threshold of 15%. This change saw the introduction of 20 new pilot projects under the Business Innovation Offer grant in the space of one year, though there has reportedly been little uptake since, due to a perceived lack of clarity as to what is eligible (from both companies and assessors). Nonetheless, there is still a strong desire within EI to support these projects as part of supporting uptake of RD&I across a broad range of firms (see objectives above).

A more minor change was the launch of the IP strategy offer, which recently completed its pilot period. Firms have been able to claim IP-related costs from their EI R&D grants for some time, though there is a perceived lack of awareness of this, as only a small proportion of firms (estimated to be approximately one third) do so. The IP Strategy Offer was therefore introduced to provide more visibility to support for this aspect of RD&I activity (see objectives, above).

## 2.3 Uptake of direct supports for RD&I

In the following sections, we examine the uptake of direct financial supports for RD&I.[23] Additional data tables from this analysis can be found in Appendix A.1. Data are limited for the uptake of indirect supports, so we include a cursory overview of this in Appendix A.3.

### 2.3.1 Number and amount of grants

Over the period 2007-2018 **2,005 grants have been awarded** through the RD&I Programme. There is a variation in number of awards per year, ranging from a high of 224 grants in 2008 to a low of grants 107 grants in 2016. The **total number of awardees over the period amounts to 1,562**, ranging from a high of 176 awardees in 2009 to a low of 91 awardees in 2017. Both the number of grants and number of awardees increased again in the last year of data. This is summarised in Table 4, below. On average, **5% of EI clients have been awarded a grant** in a given year.

*Table 4    Number of grants and number of awardees of EI RD&I direct financial supports by year*

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | Total |
|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|
| **# grants** | 223 | 224 | 215 | 165 | 148 | 167 | 179 | 168 | 129 | 107 | 111 | 169 | **2,005** |
| **# awardees** | 134 | 143 | 176 | 124 | 128 | 148 | 142 | 132 | 105 | 92 | 91 | 147 | **1,562** |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland. Notes: Different projects of the same grant type and approved on the same date are aggregated to one grant.

Figure 3 and Figure 4 below show the annual numbers of grants and awardees, respectively, broken down by the constituent parts of the programme. Over the period 2008-2018 the largest numbers of grants and awardees were funded from the R&D Fund.

*Figure 3    Number of grants of EI RD&I direct financial supports by offer bundle and by year*
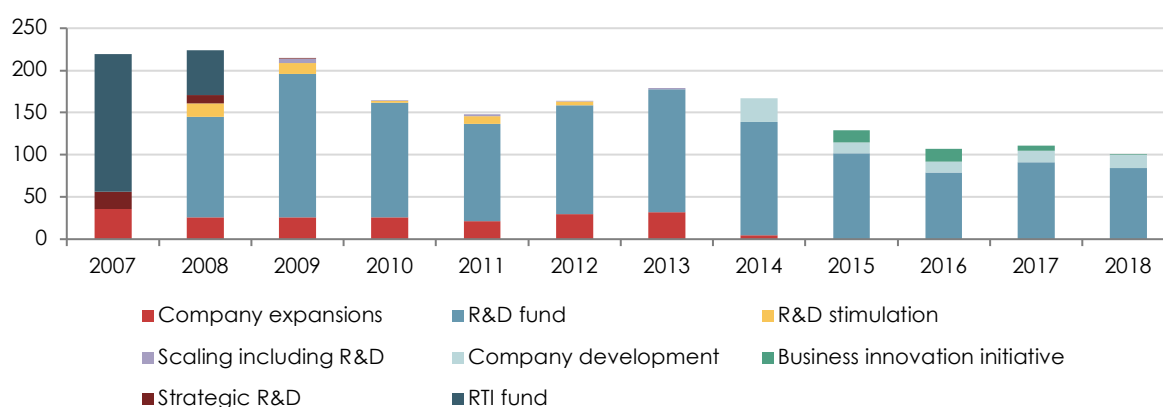


*Source*: ESRI elaboration based on the data provided by Enterprise Ireland. Note: Different projects of the same grant type and approved on the same date are aggregated to one grant.

---

[23] Our analysis covers the key characteristics of awardees based on the RD&I data set provided by Enterprise Ireland, and is subsequently extended to include additional information on awardees based on the linked EI RD&I and ABSEI data sets.

*Figure 4    Number of awardees of EI RD&I direct financial supports by offer bundle and by year*
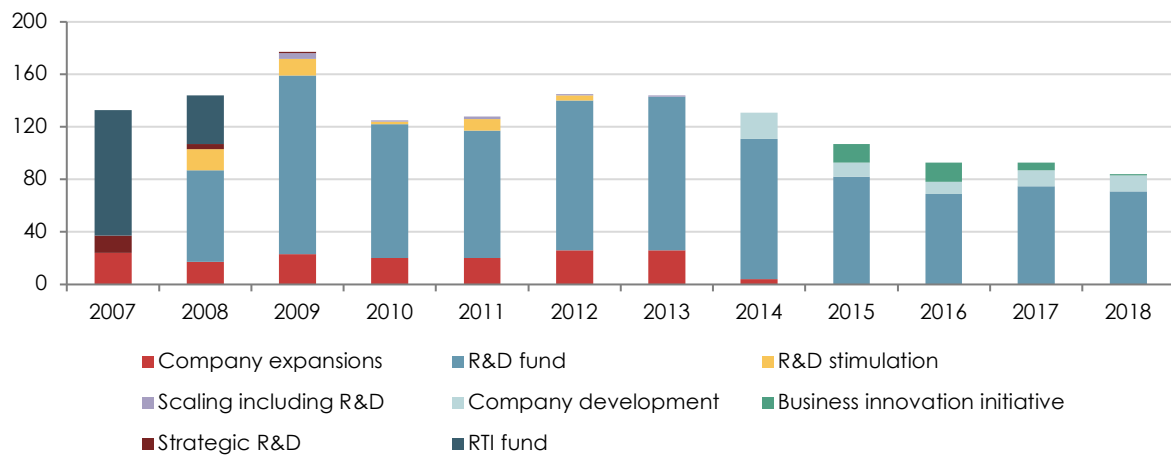
Legend:
- Company expansions
- R&D fund
- R&D stimulation
- Scaling including R&D
- Company development
- Business innovation initiative
- Strategic R&D
- RTI fund

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland. Note: Different projects of the same grant type and approved on the same date are aggregated to one grant.

**The total amount of the EI RD&I direct financial supports over the period 2007-2018 amounts to €464.7m, of which 66% has been drawn down on average**. The proportion of the drawn down amounts has declined over time with the highest shares of drawn down funding at the beginning of the period and the lowest at the end of the period. It should be noted that it is possible that full amounts have not yet been drawn down by awardees for years 2016-2018.[24] Figure 5 shows the evolution over time of the value of approved, paid and cancelled EI RD&I direct financial supports. As shown below, the uptake of these financial supports has declined over time.

*Figure 5    Total EI RD&I direct financial supports, 2007-2018*
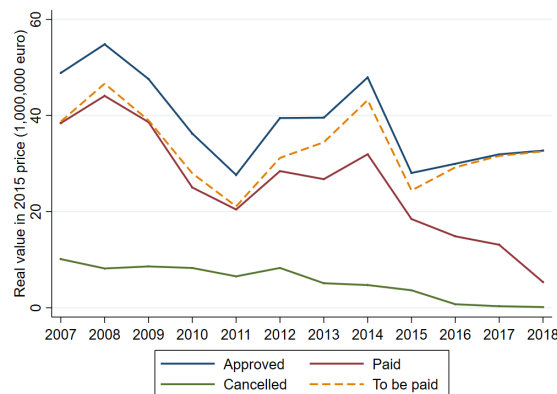


*Source*: ESRI elaboration based on the data provided by Enterprise Ireland. Note: Figures are in constant 2015 prices in million euros.

While a significant number of awardees have received funding for one RD&I project over 2007-2018, a slightly larger proportion still received direct RD&I funding for two projects. A smaller number of awardees received funding for more than three projects.

---

[24] The lower level of drawdown in 2018 may be expected, due to a proportion of funds yet to be drawn down
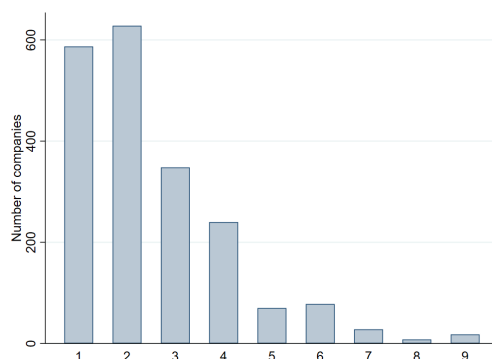
*Source*: ESRI elaboration based on the data provided by Enterprise Ireland. Notes: Different projects of the same grant type and approved on the same date are aggregated to one grant.

### 2.3.2   Types of support

Examining the distribution of support by non-equity grants and equity-type supports shows that the **majority of EI RD&I direct financial supports have been non-equity grants,** as opposed to equity-type supports. High Potential Start-Up supports are not within the scope of this evaluation. A few notes on the distribution of each type of support over the period are set out below:

- The largest number of awardees of non-equity grants was in 2009 (163) and the smallest in 2017 (78). The largest approved amount of non-equity support was in 2008 (€48.9m) and the lowest in 2011 (€24.2m)

- The number of awardees of equity-type financial supports was largest in 2018 (15) and the lowest in 2014 (1). There were no awards of equity type financial supports in 2015. The largest amount of financial support delivered as equity was approved in 2009 (€6.5m) and the smallest was in 2014 (€0.2m)

The drawing down of payments appears to be greater in the case of the equity type RD&I financial supports.

### 2.3.3   Support by firm characteristics

**In terms of sectoral split, awards have been allocated across 10 sectors, with 76% of the grants having been allocated across three of them**: "Traditional Manufacturing" (30%), "Information and Communication and other Internationally Traded Services" (28%) and "Food, Drink and Primary Production" (16%) sectors (see Table 21 in Appendix A.1).

As shown in Figure 5 below, the distribution of the total number of awardees across the 10 sectors over the analysed period closely matches the corresponding distribution of EI clients. There are only a few sectors where there a sizeable differences between the two distributions: compared to the profile of EI clients, the 'Business, Financial and Other Services' sector appears to be under-represented, while the 'Information and Communication and other Internationally Traded Services' and (albeit to a lesser extent) the 'Food, Drink and Primary Production' sectors are slightly over-represented. Table 23Table 22 in the Appendix shows the comparison of the two distributions year by year.

*Figure 7* *The distributions of awardees of EI RD&I direct financial supports and of EI clients by sector, 2007-2018*
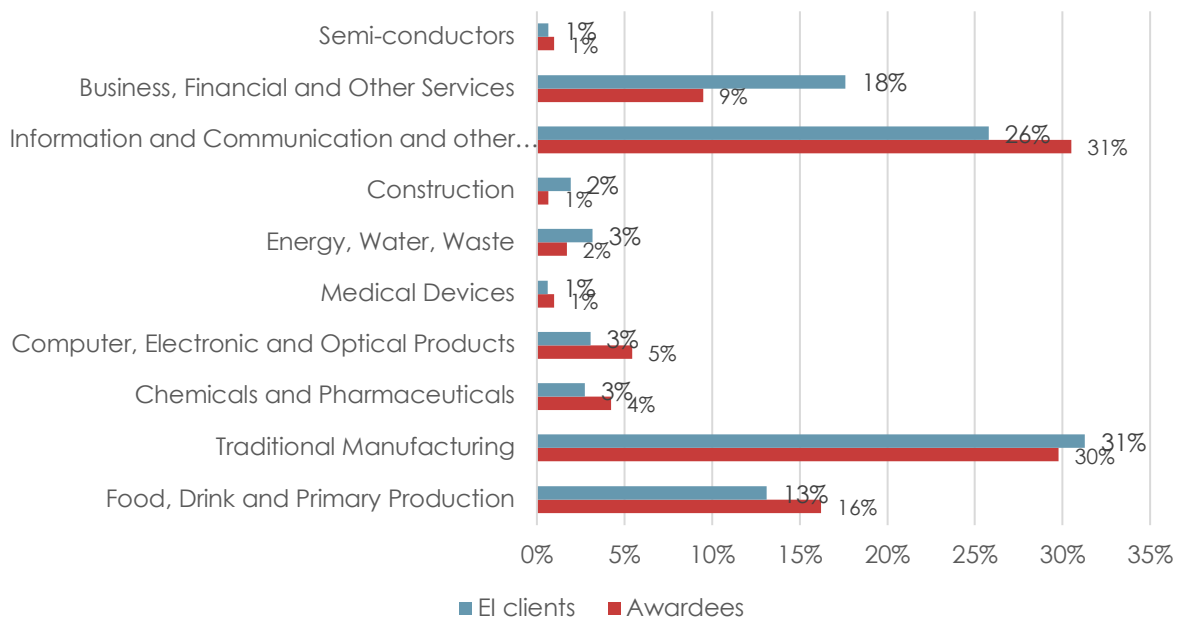
*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.

**In terms of regional split, grants have been allocated across six regions in Ireland**, with 34% allocated in Dublin, 21% in South/South East, 15% in the Midlands, 11% in the Mid-West, 10% in the North East/North West and 7% in the West (see Appendix A.1). Figure 8 shows the evolution over time of the number of awardees of EI direct financial supports by region. The Dublin region has the largest and most-increased number over the period while the West had the lowest number.

*Figure 8* *The number of awardees of EI RD&I direct financial supports by region (EI classification), 2007-2018*
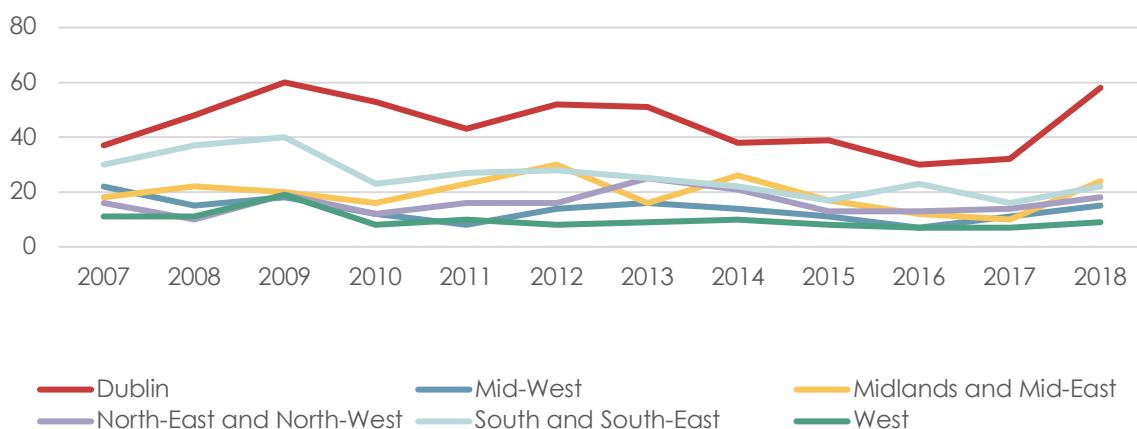


*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.

Figure 9 below compares the distribution of awardees by region with the corresponding distribution of EI clients. Again, overall, the distribution of awardees across regions matches

closely the profile of EI clients by region. Dublin appears to be under-represented while the Border region has a higher share in the total awardees compared with its share in the total number of EI clients. Table 18 in the Appendix shows the comparison of the two distributions year by year.

*Figure 9   The distributions of awardees of EI RD&I direct financial supports and of EI clients  by region, 2007-2018*
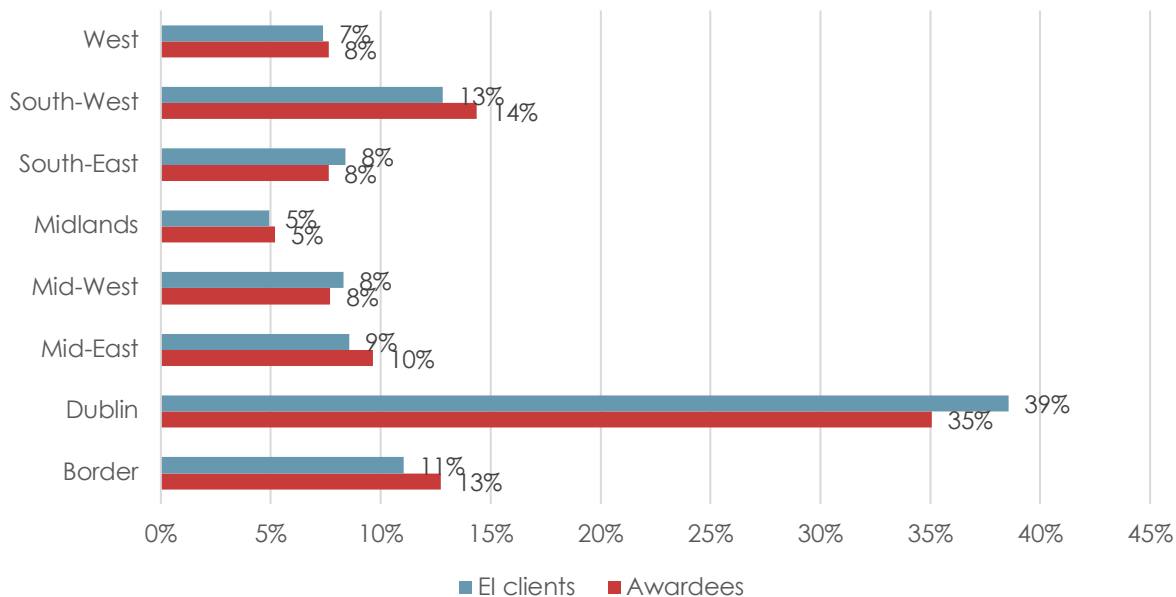


*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.

The analysis of data by enterprise group characteristics shows that **the largest numbers of awardees are Irish-owned (98%), small-sized (60%), and engaged in product innovation (76%) and exporting activity (97%).** This is summarised below in Figure 10. Year-to-year statistics are shown in in Appendix A.1.

*Figure 10  Percentage of awardees of EI RD&I direct financial supports based in enterprise group characteristics*

Export activity — 3% / 97%

Exporter / Non-exporter

Product innovation — 24% / 76%

Product innovators / Without product innovation

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.

### 2.3.4 Intensity of supports

Analysis shows that overall, the intensity of EI RD&I direct financial supports has declined over time. This is in contrast to the intensity of the net R&D expenditures which has remained fairly constant over the period (see Figure 12 below).

Relative to sales, on average, the intensity of EI RD&I direct financial supports ranges from 5.6% (2018) to 12.4% (2007). The intensity of EI RD&I direct financial supports appears less skewed over time when we consider the median statistics. These range from 2.7% (2018) to 4.5% (2010).

Relative to employment, the average intensity of EI RD&I direct financial supports range from €6,400 per employee in (2018) to €12,700 per employee (2008). The corresponding median statistics are again less skewed, ranging from €3,500 per employee (2018) to €7,200 per employee (2008).

Table 5, below, summarises the intensity of EI RD&I direct financial supports by year. The difference in the average and median statistics reflects the heterogeneity of awards and awardees.

*Table 5    Intensity of approved EI RD&I direct financial supports by year*

| Year | Approved EI RD&I funding / sales | | Approved EI RD&I funding / employment (thousand euros/employee, 2015 prices) | |
| --- | --- | --- | --- | --- |
| | Mean | Median | Mean | Median |
| 2007 | 12.4% | 4.3% | 9.7 | 6.7 |
| 2008 | 11.1% | 4.4% | 12.7 | 7.2 |
| 2009 | 8.5% | 4.6% | 10.3 | 6.4 |
| 2010 | 7.2% | 4.5% | 8.3 | 6.0 |
| 2011 | 8.8% | 3.6% | 9.4 | 5.1 |
| 2012 | 6.9% | 3.8% | 8.8 | 5.6 |
| 2013 | 6.8% | 3.4% | 8.8 | 6.2 |
| 2014 | 7.0% | 2.8% | 8.4 | 5.1 |
| 2015 | 6.2% | 3.2% | 7.0 | 5.3 |
| 2016 | 6.2% | 4.2% | 7.5 | 5.1 |
| 2017 | 10.0% | 3.5% | 9.2 | 5.7 |
| 2018 | 5.6% | 2.7% | 6.4 | 3.5 |

*Source*: ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same enterprise group. Approved grants and sales are in constant 2015 prices. Very large outliers (awardees with EI RD&I direct financial supports ten times greater than sales) are excluded from the analysis.

Figure 11 The intensity of EI RD&I funding, 2007-2018

*Figure 11 The intensity of EI RD&I funding, 2007-2018*

Approved EI RD&I funding / sales (log)  Approved EI RD&I funding / employment (thousand euros/employee in log, 2015 prices)
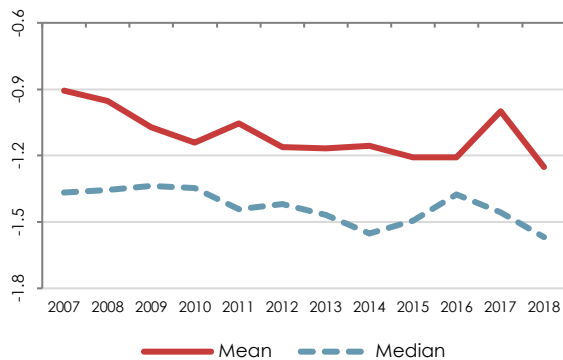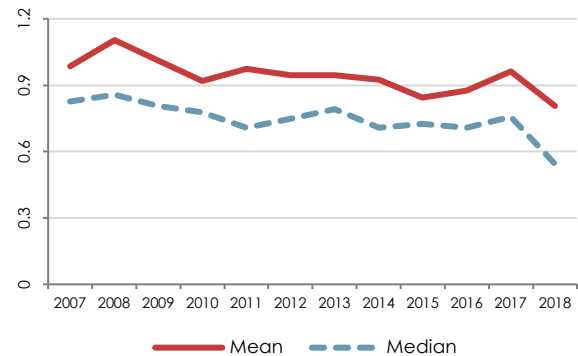


Additional descriptive statistics on EI RD&I funding are presented in Appendix A.1.

## 2.4 R&D and economic performance of awardees and of the other firms

Figure 12 and Figure 13 compare graphically the evolution over the analysed period of the R&D and economic performance of awardees of EI RD&I direct financial supports and the corresponding performance of the other firms. The graphs, taken together, show that the **awardees outperform substantially the other firms for all R&D, and economic and innovation performance indicators considered.**

The charts in Figure 12, below, show that over the analysed period, the awardees of EI RD&I direct financial supports substantially outperformed the control group firms ('others') with respect to R&D performance indicators such as: net R&D expenditures as well as the intensity of net R&D expenditures (measured as net R&D expenditures as a share of turnover and as net R&D expenditures per employee), R&D employment and the intensity of R&D employment (measured as the number of R&D employees in the total number of employees). While most indicators of R&D performance appear to demonstrate similar overall trends over time for both awardees and control group firms, the share of R&D employees within the total number of employees declined since 2010 in the case of awardees, while control group firms demonstrate a more volatile trend with a sharp decline after 2017. These trends are likely to reflect the pattern of economic recovery in Ireland with a fast increase in employment after 2014.

*Figure 12 R&D performance outcomes, 2007-2018*

*Net R&D expenditure (log)*  *Net R&D expenditure / turnover (log)*
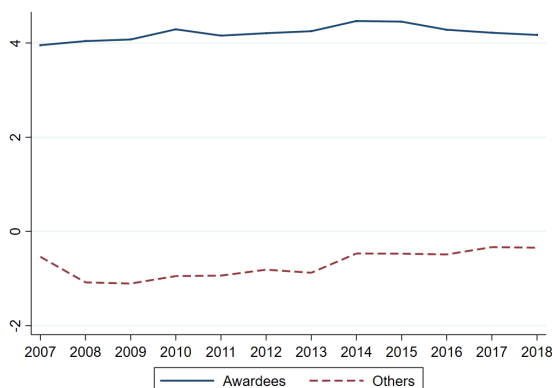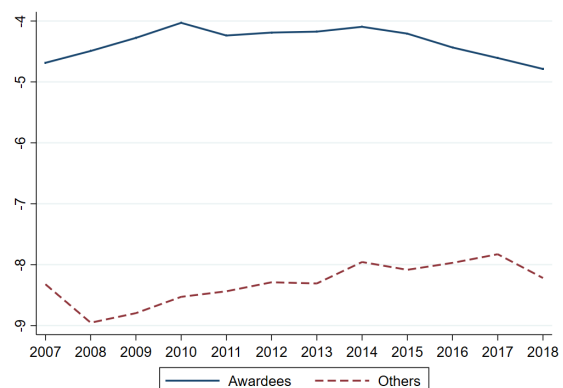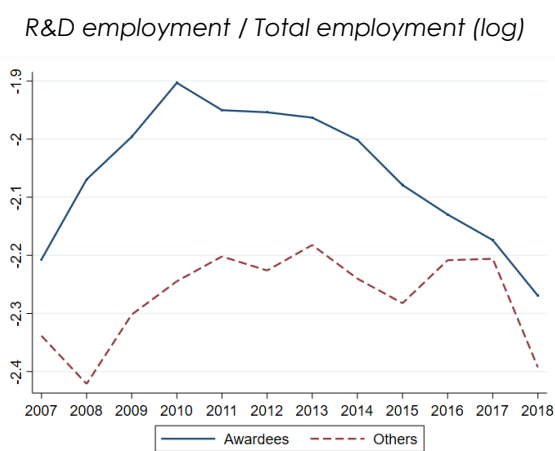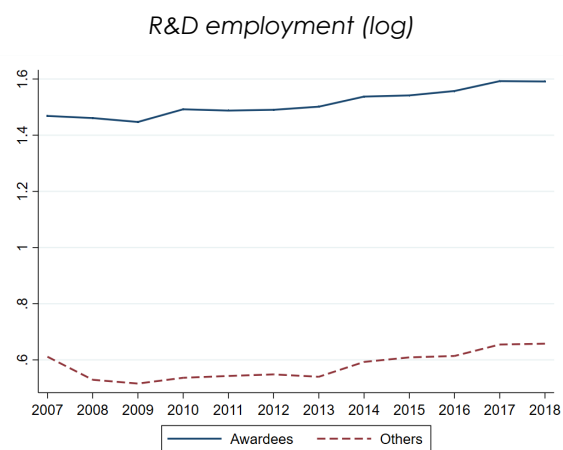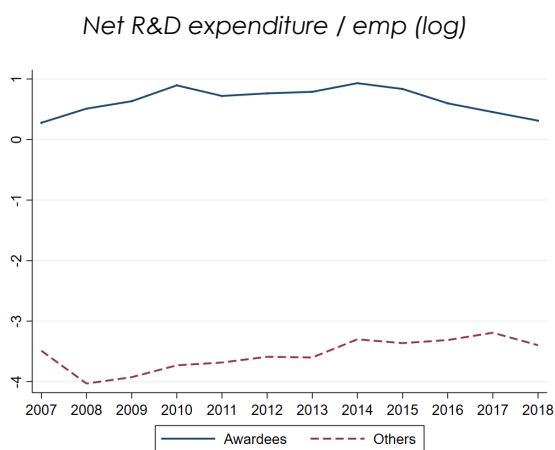
**Net R&D expenditure / emp (log)**



**R&D employment (log)**



**R&D employment / Total employment (log)**



*Source:* ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Notes: Individual awardees are integrated if they belong to the same enterprise group. An awardee-group is classified as recipient of RD&I financial support if it has been awarded at least once such financial supports between 2007 and 2018. Other firms are those that have never been awarded any RD&I financial supports. The numbers shown in graphs are average values at enterprise group. The monetary values are in thousand euros in 2015 prices. Data of sales of new products is available since 2012.

The charts in Figure 13, below, show that over the analysed period, the awardees of EI RD&I direct financial supports substantially outperformed control group firms ('others') with respect to a broad range of economic and innovation performance indicators such as: output (turnover and value added), employment, export activity (export sales and export intensity measured by the share of export sales in turnover), labour productivity (turnover per employee and value added per employee), and product innovation (new product sales and the share of new product sales in total sales). While in the case of awardees, the economic and innovation performance outcomes each trend upwards, the corresponding indicators for the control group firms are stable or trend downwards, with the exception of those for export activity, which demonstrate increases over time.

*Figure 13 Economic and innovation performance outcomes, 2007-2018*
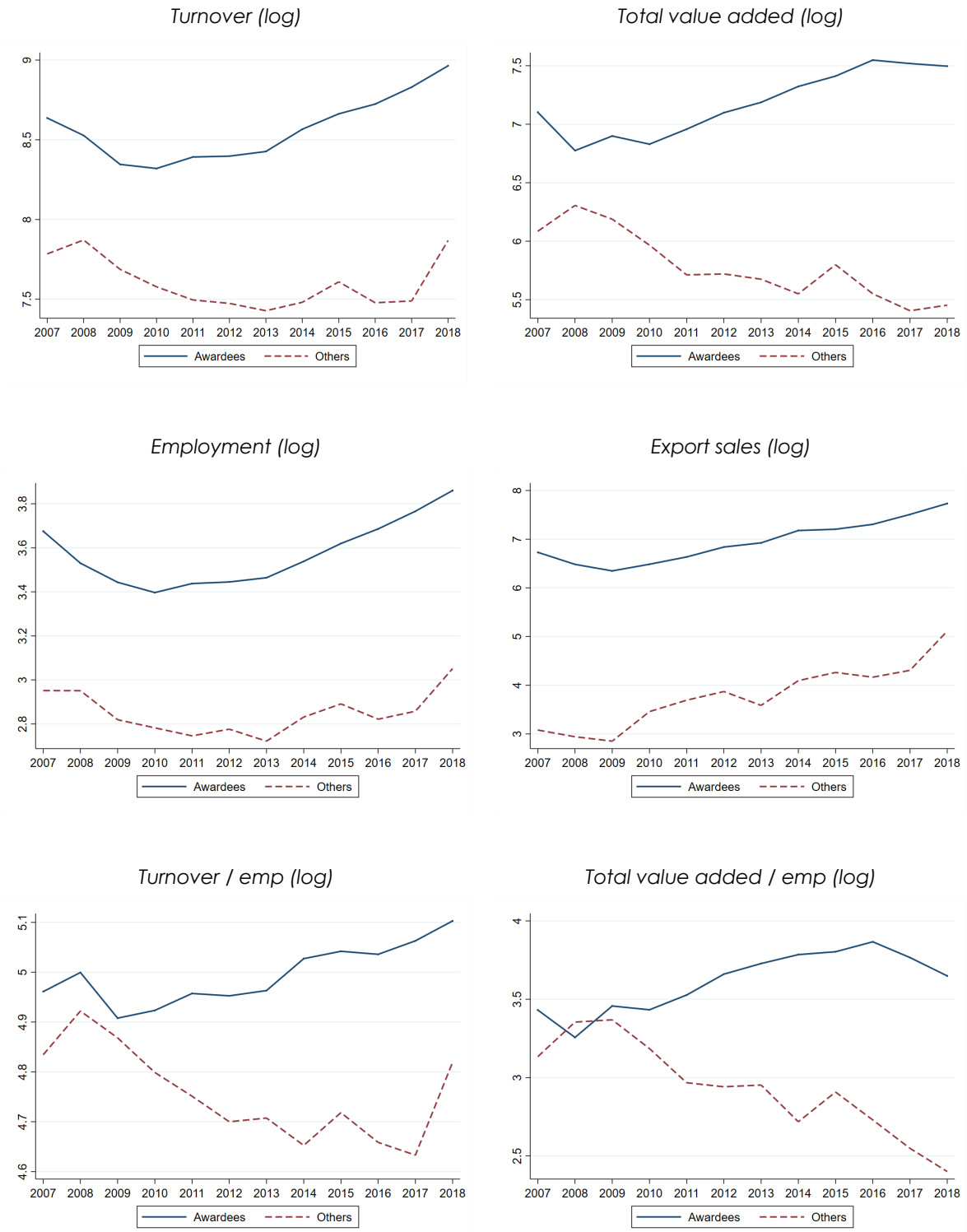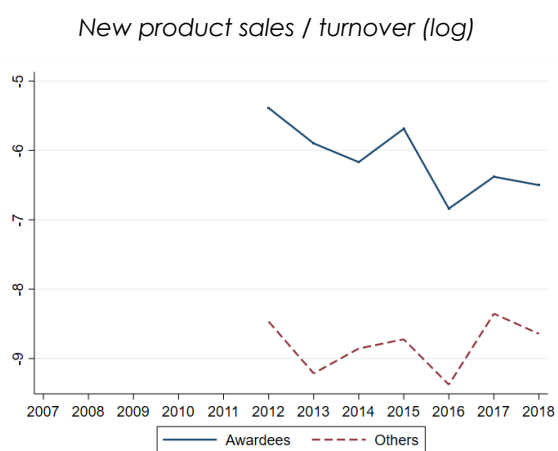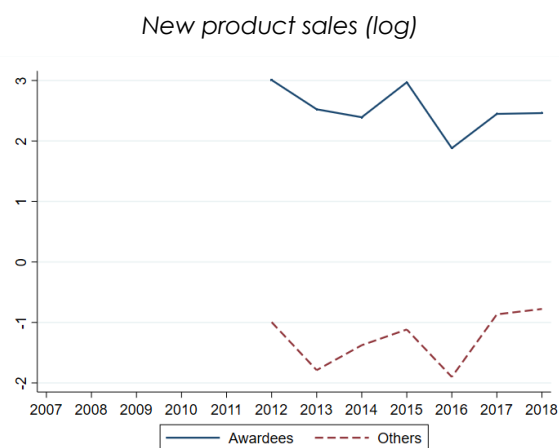


*Figure 13 Economic and innovation performance outcomes, 2007-2018*

## Export sales / turnover (log)



## New product sales (log)



## New product sales / turnover (log)



*Source:* ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Notes: Individual awardees are integrated if they belong to the same enterprise group. An awardee-group is classified as recipient of RD&I financial support if it has been awarded at least once such financial supports between 2007 and 2018. Other firms are those that have never been awarded any RD&I financial supports. The numbers shown in graphs are average values at enterprise group. The monetary values are in thousand euros in 2015 prices. Data of sales of new products is available since 2012.

The better performance of awardees could be the result of the RD&I intervention as well as other firm-specific factors. To accurately identify the impact of the RD&I interventions on the R&D and economic performance of awardees, we use econometric analysis as discussed in the next chapter.

## 2.5    Uptake of indirect supports for RD&I

This section summarises available data on indirect RD&I financial support from the European Space Agency (ESA) and the Small Business Innovation Research (SBIR) Programmes. The ESA data refers to EI client firms only.[25]

---

[25] Analysis of ESA data is firms on companies that are currently in the Enterprise Ireland client base, but there may be firms that were EI clients at the time of receiving funding that have since moved out of the Enterprise Ireland client base, e.g. if acquired by a foreign-owned multinational

*2.5.1    RD&I financial support from ESA programmes*

Table 6 shows that **the number of grants awarded to recipients that also are receiving the EI RD&I supports over the period amounts to 98 grants across 25 firms,** ranging from 5 (2008) to 18 (2018) grants per year, which is lower in comparison with direct supports (1,562). This amount of grants represents the 32.8% of the overall number of recipients of the ESA support.

The ICT and Computer sector accounts for the highest number of beneficiaries, 47, followed by Computer, Electronic and Optical with 20 awardees. Business and Financial services, Traditional Manufacturing and Chemicals and Pharmaceuticals are the other sectors in which the remaining ESA awardees operate.

**The total approved amounts equate to 46.5 million euros,** i.e. around one tenth of the RD&I direct financial supports, which is relatively high given that the ESA programme supports only a subset of EI client companies and the number of beneficiaries is quite low compared to those that received the RD&I supports. ESA supports received by the EI RD&I recipients represents nearly half (52%) of the overall ESA programme supports[26].

All companies in Ireland are eligible to respond to ESA tender opportunities. The funding is procurement-based rather than grant-based. The funding available varies depending on the specific project, but funding is limited by Ireland's financial contribution to the specific ESA programme.

*Table 6  RD&I funding from ESA Programmes, 2008-2018*

| Year | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **# awardees** | 5 | 6 | 8 | 6 | 6 | 8 | 10 | 9 | 13 | 9 | 18 | 98 |
| **Total approved amounts** | 2.63 | 2.33 | 1.83 | 2.67 | 2.32 | 2.83 | 4.11 | 3.95 | 6.08 | 3.36 | 14.38 | 46.5 |
| **Average approved amount per awardee** | 0.53 | 0.39 | 0.23 | 0.45 | 0.39 | 0.35 | 0.41 | 0.44 | 0.47 | 0.37 | 0.8 | 4.83 |

*Source*: DBEI elaboration based on ESA data provided by Enterprise Ireland. Notes: Projects by the same awardee in the same year are integrated. Monetary values are in constant 2015 prices in million euros. No information on payments is available.

In terms of geographical distribution, the table below shows that most of the funds concentrate in Dublin, with 66 awardees and 30 in the rest of the country.

*Table 7    RD&I funding from ESA Programmes, by area*

| | Participants | Total funding (€ 000s) | Average funding per awardee (€ 000s) |
|---|---|---|---|
| **Dublin** | 66 | 34.49 | 50.25 |
| **Rest of Ireland** | 30 | 11.39 | 20.70 |

*Source*: DBEI elaboration based on ESA data provided by Enterprise Ireland. Notes: Projects by the same awardee in the same year are integrated. Monetary values are in constant 2015 prices in million euros. No information on payments is available.

---

[26] Table 6 shows the number of firms that received both the EI RD&I and the ESA supports. The total number of ESA beneficiaries is higher, but those that are not also recipients of the EI RD&I funds, are not included in the table

In terms of firm size, the largest number of awardees of RD&I financial support from the ESA Programme is for small sized EI client firms (84%), while 3% are classified as large firms. See Figure 14, below.

*Figure 14 Percentage of awardees of ESA programmes by size*
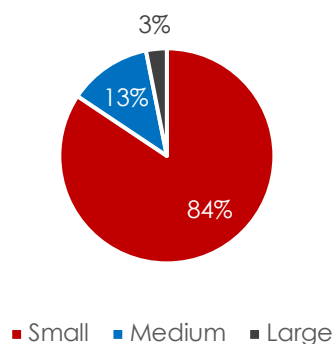


*Source*: DBEI elaboration based on ESA data provided by Enterprise Ireland.

Table 8 summarises the intensity of ESA funding over the period for which data is available. On average, relative to sales, the intensity of ESA funding ranges from 581% (2018) to 78% (2010). Looking at the corresponding statistics for the median awardee, the intensity of the ESA funding ranges 6.28% (2018) to 19.30% (2010) of sales. Relative to employment, the average intensity of the ESA funding ranges from €3,040 per employee (2016) to €900 per employee (2010). The corresponding statistics for the median awardee range from €41 per employee (2016) to €88 per employee (2017). The difference between the average and median statistics reflects the heterogeneity of awards and awardees.

*Table 8    Intensity of ESA funding by year*

| | ESA funding / sales | | ESA funding / employment (thousands euros/ employee, 2015 prices) | |
|---|---|---|---|---|
| Year | Mean | Median | Mean | Median |
| 2008 | 112% | 14.11% | 1.32 | 0.061 |
| 2009 | 116% | 12.45% | 1.16 | 0.062 |
| 2010 | 78% | 19.30% | 0.91 | 0.082 |
| 2011 | 88% | 18.24% | 1.34 | 0.059 |
| 2012 | 89% | 12.94% | 1.16 | 0.047 |
| 2013 | 132% | 15.11% | 1.42 | 0.049 |
| 2014 | 200% | 7.68% | 2.05 | 0.043 |
| 2015 | 168% | 12.15% | 1.98 | 0.043 |
| 2016 | 240% | 11.37% | 3.04 | 0.041 |
| 2017 | 146% | 17.47% | 1.46 | 0.088 |
| 2018 | 581% | 6.28% | N/A | N/A |

*Source*: DBEI elaboration based on linked ABSEI and ESA data sets provided by the DBEI and Enterprise Ireland. Notes: Individual awardees are integrated to awardee-group level. Monetary values are in constant 2015 prices in 1,000 euros.

Additional descriptive statistics on RD&I funding from the ESA Programme are presented in Appendix A.3

## 2.5.2    RD&I financial support from the SBIR programme

Table 9 shows that among the firms awarded funding from the SBIR Programme (in 2017 and 2018) four were EI clients, and eight were clients of Local Enterprise Offices (LEOs). 12 firms were high potential start-ups (HPSUs) and nine were other companies.  In the case of EI client companies, the total funding approved amounts to €74,500 with an average funding per participant of €18,600.  As shown in Table 10, of all awardees, 24 are located in Co. Dublin. The total funding for these awardees amounts to €568,000 with an average per awardee of €23,700.

*Table 9    Awardees of RD&I funding from the SBIR Programme by category*

| Category | # participants | Total funding (€ 000s) | Average funding per awardee (€ 000s) |
|---|---|---|---|
| **EI clients** | 4 | 74.5 | 18.6 |
| **HPSUs** | 12 | 300.1 | 25.0 |
| **LEO clients** | 8 | 225.6 | 28.2 |
| **Others** | 9 | 292.5 | 32.5 |

*Source*: ESRI elaboration based on the SBIR data provided by Enterprise Ireland. Notes: Total funding and average funding per participant are in thousand euros in current prices.

*Table 10  Awardees of RD&I funding from the SBIR Programme by region*

| Region | # participants | Total funding (€ 000s) | Average funding per awardee (€ 000s) |
|---|---|---|---|
| **Dublin** | 24 | 568.0 | 23.7 |
| **Other regions** | 9 | 324.8 | 36.1 |

*Source*: ESRI elaboration based on the SBIR data provided by Enterprise Ireland. Note: Total funding and average funding per participant are in thousand euros in current prices.

Information for 16 awardees of funding from the SBIR Programme could be linked to the ABSEI data set. The majority of these (11) of these are in the sector Information and Communication and other Internationally Traded Services. Among these 16 awardees, 7 were also awarded EI direct RD&I funding and 3 of them were awarded funding from the ESA Programme.

Given the limited data available for RD&I funding from the SBIR Programme, it is not possible to analyse the impact of this financial support on the R&D and economic performance of awardees.

# 3 Assessment of appropriateness

*Evaluation requirement: An assessment of the Programme in relation to Ireland's enterprise and Innovation policies (past current and future policy challenges) and the economic context that applied during the time period under review; assessment of the Programme's fit with the emerging needs of enterprises (Objective 1a)*

The assessment of the RD&I Programme's appropriateness is addressed through two main avenues: i) an examination of alignment with national policies and strategies, and ii) consultation on current and anticipated firm needs.

Across our analysis, the RD&I Programme demonstrates good levels of appropriateness with both national policy and firm needs. This is set out in turn in the following sub-sections

## 3.1 Prevailing economic context and alignment with national policy

Ireland has transformed its economy over the past 30 years with major success in attracting inward investment in the 1990s and the gradual movement of those multi-national corporations (MNCs) up the value chain, while also catalysing an ambition to innovate and export among Ireland's indigenous firms. Enterprise Ireland has been at the centre of this deliberate evolution of enterprise policy in Ireland, and its increasing focus on Research, Development and Innovation (RD&I) has enabled Ireland to begin to compete on an equal footing with major European and global economies, whether that is within the context of European RD&I programmes like Horizon 2020 or European Space Agency (ESA) or international trade with its partners). Ireland's enterprise base and economy have changed significantly over this period, with the emergence of a very much more dynamic indigenous industry characterised by high-productivity and innovation-intensive activities.

The RD&I Programme is a major support for firms, which has been consciously developed over time in order to address both feedback from client firms and changes to context conditions. Within this study, the development of the programme logic model for the RD&I Programme (see section 2.2.3) highlights the extent to which the objectives of the programme – as well as the anticipated outcomes and impacts – are aligned with the national policy context. However, when examining the relevance of supports for RD&I against national policy objectives, it is important to consider the full suite of supports (i.e. direct and indirect). It is our view this holistic approach, which works across several modes and models, is the optimal way to approach support to firms. Interviews with stakeholders and representatives of international comparator programmes substantiate this.

Taken together, Ireland's supports for in-house RD&I – the RD&I Programme and the in-direct supports that sit around it as set out in section 2.2.2[27] – are well-aligned with Ireland's national strategies and policy documents. RD&I remains a central pillar of Ireland's overall national strategies, an overview of which can be found in section 2.1. The individual components of the RD&I Programme, EI Client Offers and the indirect supports administered by EI each serve these objectives and demonstrate fit.

An examination of the objectives of individual direct and indirect supports (see  are broken down below.

---

[27] The R&D Tax Credit, Knowledge Development Box, support to access ESA funding, and SBIR funding

Table 1 and Table 3) reinforces the view that each contribute to the national policy objectives set out in section 2.1. This examination of individual support objectives demonstrates how each support addresses different aspects of the overarching policy objectives as well as difference subsets of the firm base. The examination also suggest that the direct supports are appropriate for both experienced and new or less-experienced RD&I performers. Indirect supports would appear to be more appropriate for experienced and repeat performers, or those in specific sectors or areas of application.

The view that Ireland's policy objectives are well-addressed through the programmes in place is further substantiated by the recent OECD report, "SME and Entrepreneurship Policy in Ireland",[28] which finds that Ireland has a strong set of policies and programmes in this area. Prior evaluative reports also highlight similar areas of success in the current (broad) set of available RD&I support, alongside a number of recommendations for future action.[29]

The changes enacted to the RD&I Programme (as detailed in section 2.2.3) also reflect positively on the strategic fit of the programme. It is clear from consultation with senior Enterprise Ireland personnel that the programme is continuously and consciously developed in line with client feedback and international good practice. The introduction of the Agile Innovation Fund, for example, seeks to address the needs of firms that operate in areas of shorter project lifecycles, which holds direct relevance for the sectors of high strategic importance to Ireland, such as ICT, among others. Similarly, the introduction of the Business Innovation Offer shows an awareness of the need to address non-technological innovations, though consultation with senior Enterprise Ireland personnel revealed some challenges in defining eligibility and thus the selection of projects to support.

The 2019 OECD report outlines that, while attitudes to entrepreneurship are positive and SME innovation rates are somewhat high in Ireland, clear challenges exist for addressing the 'untapped potential' for entrepreneurship among some groups in society, as well as addressing variations of performance across the regions of Ireland. It has so far been difficult to identify areas where the programme concretely addresses these areas, though it is clear that the involvement of the Local Enterprise Offices across Ireland could contribute to the latter area.

## 3.2   Programme fit with firm needs

In order to address the extent to which the RD&I Programme (in its current configuration) aligns with firm needs, the study team directly consulted EI client firms via three specific survey questions. The first of these questions addressed the motivations for firms to apply to the programme (i.e. which goals and aspirations firms were hoping to address through the support). The second question asked firms which challenges they anticipated facing in the future, while the third question asked firms to what extent they believe the current configuration of the RD&I Programme could address those anticipated challenges.

### 3.2.1   Motivations for accessing the RD&I Programme

Awardees of the RD&I Programme were asked via survey about their motivations for accessing the support they had received. The responses show a strong correlation with the stated purposes of the programme (see the draft programme logic model, Figure 1 in section 2.2.3).

---

[28] OECD (2019), SME and Entrepreneurship Policy in Ireland, OECD Studies on SMEs and Entrepreneurship, OECD Publishing, Paris, https://doi.org/10.1787/e726f46d-en.

[29] Indecon (2017), Review of RD&I Supports available to Businesses in Ireland to Maximise Business Expenditure on Research and Development

In the survey responses, 'Undertaking new RD&I projects in [their] core business area' proved to be the most relevant motivation, closely followed by 'Increase the company's capacity and capability to undertake RD&I activities', both of which were considered 'Important' or 'Very important' by almost 90% of respondents.

*Figure 15 Motive for grant application - awardees*
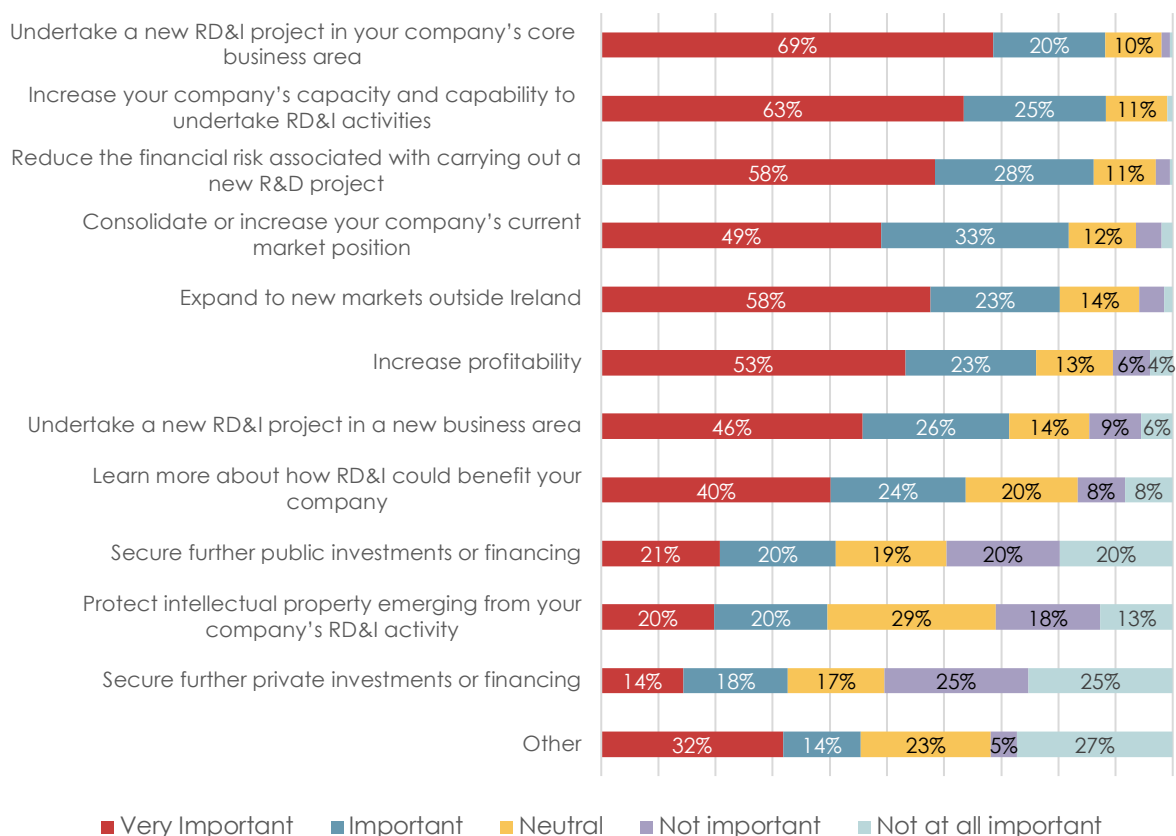
### 3.2.2 Appropriateness of direct financial support to address anticipated future challenges

Awardees were also asked via survey what they expected to be the main challenges they would face in the next five to ten years. This question was intended to uncover the extent to which the programme – in its current configuration – might be well-positioned to address those issues.

**Issues relating to recruitment appeared as the most common foreseen challenge, reported by 64% of all awardees. This was followed at some distance by 'Maintaining profit margins', 'Increased market uncertainty' and 'Technological advancement'** – see Figure 16. Respondents were given the opportunity to add their own self-identified challenges via an open text response. Responses submitted via this 'Other' option included Brexit (most common), as well as environmental issues and the pressure to compete financially with large multi-international organisations in terms of staff reimbursement.

The study team also asked the same question of EI clients that had not accessed the RD&I Programme. Respondents to that survey reported anticipated future challenges in similar proportionality to their counterparts that had accessed the programme.[30]

*Figure 16 Expected challenges - awardees*
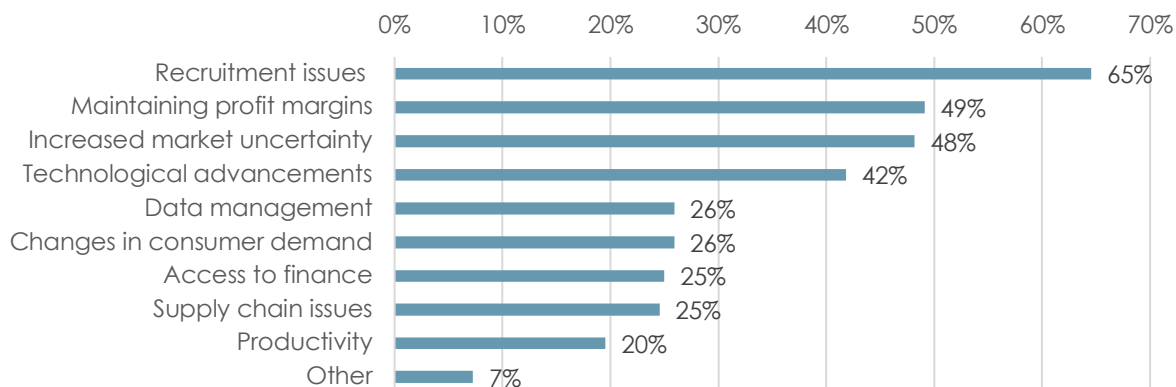
When asked about how appropriate the current support provided via the RD&I Programme is to addressing those anticipated challenges, awardees were generally positive. Two out of three respondents (66%, 109 respondents) stated that the support was 'Very appropriate' or 'Appropriate' compared to 14% (22 respondents) who felt the support was not appropriate to meet the challenges – see Figure 17. Perhaps unsurprisingly, non-beneficiaries were slightly less positive about the appropriateness of the programme to address anticipated future challenges.[31]

*Figure 17 Appropriateness of the (current configuration of the) RD&I Programme to address expected challenges – awardees*

---
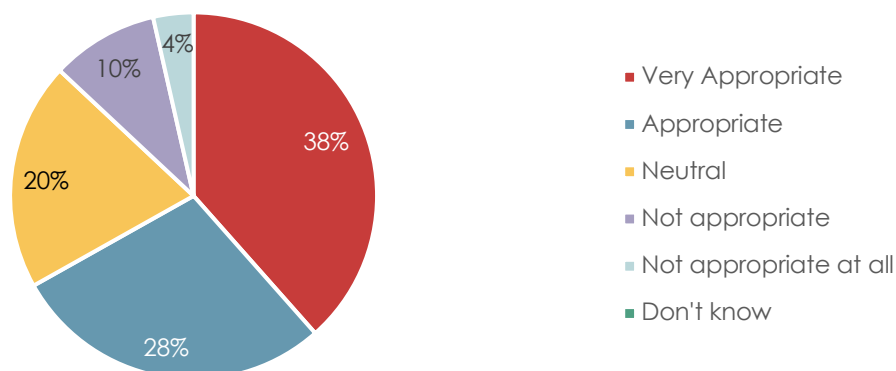
[30] This is not shown in the figure

[31] Of surveyed non-recipients, just under one half (49%, 19 respondents) stated that the support was 'Very appropriate' or 'Appropriate' to meet the challenges

# 4 Assessment of effectiveness

## 4.1 Role and performance in increasing R&D investment and intensity

The examination of the effectiveness of the RD&I Programme draws on a number of areas of consultation and analysis. To address this question, the study team conducted econometric analysis to compare the performance of awardees of EI RD&I financial supports in contrast to a control group, as well. EI client firms that have accessed the Programme were also consulted on aspects of effectiveness via survey and interview, and EI Development Advisors were also consulted.

In the following sub-sections, we address two evaluation requirements: i) the Programme's effectiveness in reaching desired impacts, and ii) the Programme's effectiveness in increasing the number of firms performing RD&I.

### 4.1.1 Effectiveness of the RD&I Programme in reaching desired impacts

*Evaluation requirement: Determine the effectiveness of the Programme in achieving the desired or any impact including: measuring as accurately as possible the direct relationship between the EI RD&I Programme supports and increased business expenditure on R&D (BERD); quantifying as accurately as possible the full benefits relative to the cost of the programme (Objective 1b)*

Econometric analysis[32] allows us to examine and measure the impact of EI RD&I financial supports on the performance of awardees (including R&D intensity), by drawing comparisons with an appropriate control group.[33] A control group is a purpose-designed group of firms with similar characteristics that have not accessed the RD&I Programme. The control group has been identified by using a technique called Propensity Score Matching, to select a group of firms that were similar to the treatment firms *before* the intervention. This process comprised matching each awardee of EI RD&I financial support over the period of investigation with a firm that had the same probability (Propensity Score) of being awarded such financial supports over the same period (conditional on firm characteristics) but which were not awarded supports. A total number of 654 awardees of EI RD&I financial supports have been matched with the same number of non-awardees with similar characteristics.[34] The econometric analysis shows that the awardees of EI RD&I Programme financial supports out-perform similar firms that have not received the support across all outcome performance indicators considered, including indicators of R&D inputs as well as economic and innovation outputs.[35]

**Overall, the results of the econometric analysis indicate that on average, <u>five years after the first approved awards</u>, the EI RD&I direct financial supports have boosted significantly the R&D**

---

[32] The approach taken by the study team uses information available from the linked ABSEI and RD&I Programme data sets provided by DBEI and EI. The analysis has been carried out at enterprise-group level.

[33] Due to time lag in the data, only the R&D Fund was included in the econometric analysis. The new elements of the Agile Innovation Fund and Business Innovation Offer were introduced too recently to be included

[34] More details about the Propensity Score Matching are provided in Appendix B.1

[35] This better performance could be explained by the impact of the EI RD&I direct financial support as well as other factors including enterprise group - specific characteristics. To identify the direct impact of EI RD&I financial supports on the performance of awardees, we compare the performance of awardees after the approval of such supports with the performance of firms with similar characteristics which have not been awarded RD&I financial supports using a technique called propensity score matching. The impact of the RD&I intervention is then the performance differential between these two enterprise groups. More information on this approach can be found in Appendix B.1

**performance of awardees as well as their performance with respect to sales, value added, employment, export sales and export intensity.** More specifically, we find that:

- Relative to a situation of no RD&I financial supports, on average, after five years the R&D performance of awardees increased by more than 100% with respect to net R&D expenditures, R&D intensity (net R&D expenditure relative to firm size measured as sales and employment and R&D employees as a share of total employees) while the number of R&D employees was higher by 36.1%

- On average, after five years the output performance of awardees increased by 19% in the case of sales, by 35.2% in the case of value added, while export sales were higher by 69.3% and the export sales as share of total sales increased by 50% .[36] In terms of employment, awardees grew by 19%

- Our results indicate an increase of the product innovation intensity three and four years after the first RD&I financial awards by more than 200% (more than two times higher). Given the more limited data availability for sales of new products (available since 2012) these results should be interpreted as indicative only

- There is no evidence of statistically significant productivity growth after five years as a result of the EI RD&I direct financial supports. This result might reflect the need for a longer time for the effects of RD&I interventions to translate into significant productivity growth (for example seven to nine years). Due to the limitations of the available data longer post-intervention time period could not be considered. A more detailed examination of the relationship between R&D and productivity can be found in section 4.1.3

These findings are substantiated by the results of direct consultation with firms via survey and interview, where consulted firms reported consistent benefits and impacts from their received support. Firms also noted high levels of attribution to the RD&I Programme support. The view on productivity effects was similarly muted, though we note that many firms consulted were still in the early stages of embarking on releasing new products or entering new markets, which could subsequently reveal productivity gains in the future.

Examining these in more detail, we estimated year-on-year impacts of the EI RD&I Programme supports on i) the innovation performance and ii) the economic performance of firms that have received RD&I Programme support (awardees) compared to those that have not.  This is set out in the following sub-sections.

### 4.1.2   Impacts on innovation performance

The figure below shows that the R&D performance of awardees is significantly better than the corresponding R&D performance of non-awardees with similar characteristics **indicating a significant positive impact of the EI RD&I direct financial supports.**

This conclusion holds for five measures of R&D and R&D intensity presented in the figure below: Net R&D expenditures; Net R&D expenditures as a proportion of turnover; Net R&D expenditures as a proportion of number of employees; R&D employment and R&D employment as a proportion of  number of employees. In all five cases, the difference (in the mean value of the indicators) between the treatment and control group increased over time.[37] In the paragraphs below we explain the results for each measure.

---

[36] The impact of the EI R&D intervention is significant each year up to three years after the first approved awards.

[37] The charts on the left ('panel a') show the average change in the R&D performance of awardees and matched non-awardees five years after the approval of the EI RD&I direct financial supports. The charts on the right (panel

Figure 18 below presents the mean value of **Net R&D expenditure** for the treatment (awardees) and control group increases (Panel a) in the years after the treatment. It shows that that the difference (in the mean value of) Net R&D expenditure between the treatment and control group increases over time (Panel b). The subsequent table shows that after five years net R&D expenditures of awardees increased by 157% (in comparison with the control group), i.e. that the programme has had a substantial positive effect on this measure of R&D performance. The increment is quite substantive and reflects in part the fact that the programme has attracted a good number of non-RD&I performers (between 8%-14% according to our calculations, see 4.2).

The results are statistically significant (since the p-value is lower than 0.05, which means that we have 95% confidence that the results are different from zero).[38] The results are shown using a logarithm scale (a treatment needed for the econometric analysis), as such their nominal values only provide a visual representation of the trends between the control and treatment group (but not the value of the impact). The value of the impact is show in the tables below the figures. The same applies for the subsequent indicators.

*Figure 18          Estimated impacts of the EI R&D direct financial supports on R&D performance on **Net R&D expenditures (log)***



| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **Net R&D expenditures** | beta | 0.997 | 1.425 | 1.517 | 1.757 | 1.975 | 2.295 | 1.569 |
| | s.e. | 0.172 | 0.194 | 0.214 | 0.250 | 0.268 | 0.288 | 0.168 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

'b') show the impact of EI RD&I direct financial supports on the R&D and on the economic and innovation performance of awardees. The results are shown using a logarithm scale (a treatment needed for the econometric analysis), as such their nominal values provide a visual representation of the trends between the control and treatment group (but not the value of the impact). The average value of the impact across the different performance outcomes is shown in Table 53 in Appendix B.1. The vertical red lines in the charts around the mean effects show the precision of the estimates, representing the 95% confidence interval. An effect is not statistically significantly different from zero at 95% confidence level if the vertical red line (indicating the error interval) crosses the zero line

[38] The p-value (probability value) is used in hypothesis testing. The gold standard in econometrics is to assume that any value above 0.05 means that the results are not statistically significant, as we would have lower than 95% confidence that the results are different from zero.

Figure 19 below presents the mean value the intensity of R&D expenditure (i.e. **Net R&D expenditure over turnover**) for the treatment and control group (Panel a). It shows that the difference in (the mean value of) Net R&D expenditure over turnover between those two groups increases over time (Panel b). **The subsequent table shows that after five years R&D intensity of awardees increased by 138% (in comparison with the control group),** i.e. that the programme has had a substantial positive effect on this measure of R&D performance. The results are statistically significant (since the p-value is lower than 0.05).

*Figure 19 Estimated impacts of the EI R&D direct financial supports on R&D performance on **Net R&D expenditures/turnover (log)***



| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **Net R&D expenditures/ turnover** | beta | 0.877 | 1.250 | 1.362 | 1.555 | 1.777 | 2.013 | 1.378 |
| | s.e. | 0.172 | 0.194 | 0.214 | 0.245 | 0.265 | 0.285 | 0.167 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Figure 20 below presents the mean value of a different measure of intensity of R&D expenditure (i.e. **Net R&D expenditure over employee)**, for the treatment and control group (Panel a). It also shows that the difference (in the mean value of) Net R&D expenditure over employee also increases over time (Panel b). **The subsequent table shows that after five years R&D intensity also increased by 138% (in comparison with the control group)** i.e. that the programme has also had a substantial positive effect on this measure of R&D performance. The results are statistically significant (since the p-value is lower than 0.05).

|  (a)  | (b) |
|---|---|

| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **Net R&D expenditures/ employee** | beta | 0.864 | 1.277 | 1.348 | 1.567 | 1.776 | 2.077 | 1.380 |
| | s.e. | 0.171 | 0.193 | 0.212 | 0.246 | 0.264 | 0.286 | 0.166 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Figure 21 below presents the mean value of the **R&D employment** for the treatment and control group (Panel a). It also shows that the difference (in the mean value of) the R&D employment between those two groups increases over time (Panel b). **The subsequent table shows that after five years R&D employment among awardees increased by 36% (in comparison with the control group),** i.e. that the programme has had a substantial positive effect on  R&D employment albeit a milder one in comparison with other measures of R&D performance. Taking into account the results shown above (in terms of R&D expenditure), this could mean more extra-mural R&D and collaboration with external partners. The results are statistically significant (since the p-value is lower than 0.05).

_Figure 21  Estimated impacts of the EI R&D direct financial supports on R&D performance on **R&D employees (log)**_



|  (a)  | (b) |
|---|---|

| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **R&D employees** | beta | 0.267 | 0.351 | 0.358 | 0.388 | 0.436 | 0.427 | 0.360 |
| | s.e. | 0.025 | 0.031 | 0.036 | 0.043 | 0.050 | 0.056 | 0.031 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Figure 22 below presents the mean value of the **R&D employment as a percentage of total employees** for the treatment and control group (Panel a). It shows that the difference (in the mean value of) the R&D employment as a percentage of total employees between the treatment and control group increases over time (Panel b), even though it has declined for both groups. **The subsequent table shows that after five years R&D employment as a percentage of total employees among awardees increased by 17% (in comparison with the control group),** i.e. that the programme has also had a positive effect on the proportion of R&D employment as compared to the employee base, albeit a milder one in comparison with other measures of R&D performance **.** The results are statistically significant (since the p-value is lower than 0.05).

*Figure 22  Estimated impacts of the EI R&D direct financial supports on R&D performance on **R&D employees/ total employees (log)***
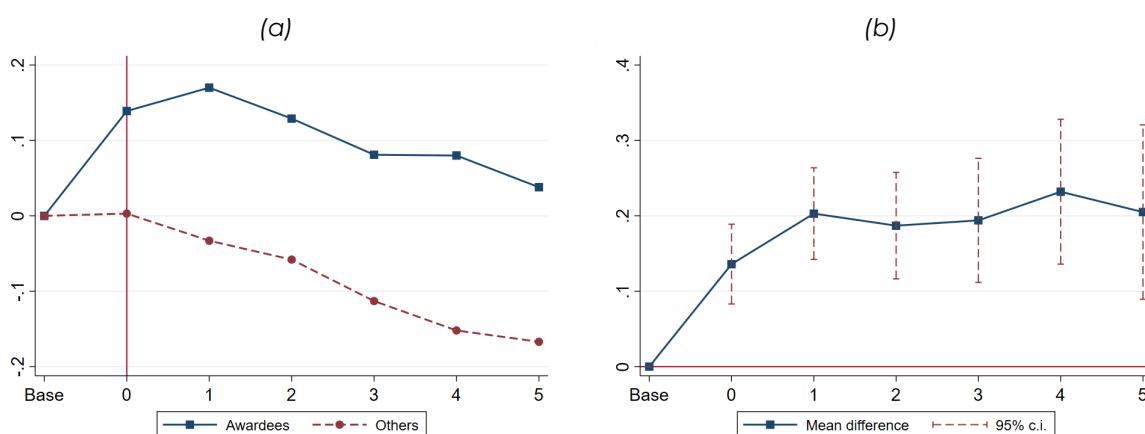


*Source*: ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland.

| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **R&D employees / total employees** | beta | 0.136 | 0.203 | 0.187 | 0.194 | 0.232 | 0.205 | 0.170 |
| | s.e. | 0.027 | 0.031 | 0.036 | 0.042 | 0.049 | 0.059 | 0.032 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

We consulted awardees via our online survey on the benefits and impacts that they had experienced through their interaction with the EI RD&I Programme. **The results of the survey resonate well with the findings of the econometric analysis set out in the preceding section, indicating a series of intermediate outcomes (related to RD&I capacity) have also been achieved thanks to the programme.**

The reported benefits experienced are summarised in Figure 23, which shows the most commonly-reported benefit being the 'Development of new or enhanced products, processes or services', 'Higher capability to undertake RD&I activities', 'Higher capacity to undertake

RD&I activities' and 'Improved knowledge on the benefits of RD&I for our company'. Each of these have been at least partially experienced by almost 90% of survey respondents. On the other end of the scale, less than half (49%) saw 'Development of new or enhanced IP strategy' to some extent, with the full realisation experienced by under one fifth (18%). Benefits reported under the open 'other' option include 'Business transformation' and 'strengthening of reputation and credibility'.

We also asked companies to estimate the effect of the programme on their R&D activities, and **the results show that the median respondent has increased their financial resources devoted to RD&I activities by 50.8% (44% average value).** This is lower than the findings from the econometric analysis, perhaps indicating that awardee companies are underestimating the effect of the grants on their investments in RD&I.

While the econometric analysis does not include micro companies (which do not feature in the ABSEI), further analysis of the survey data by company size reveals that micro companies (1 – 9 FTEs) do well in improving their RD&I knowledge but are less able to translate the knowledge gained into higher R&D capacity, higher R&D capability or the development of new products.

During analysis of the survey responses, the study team also examined the extent to which the number of grants received would (positively) impact on the benefits experienced. This analysis revealed some mixed results. Recipients of two grants have consistently reported a higher 'achievement rate' (Benefit has been experienced at some or at a large extent) than recipients of a single grant. The trend, however, does not continue for recipients of three grants, who exhibit a lower achievement rate than singe grant recipients in half of cases. The only exception to this pattern is observed for 'Development of business innovations' with an achievement rate of 59%, 59% and 64% for respondents with one, two and three received grants, respectively. Overall, the variations appear generally too small for a conclusive finding.

*Figure 23 Benefits experienced by awardee firms*
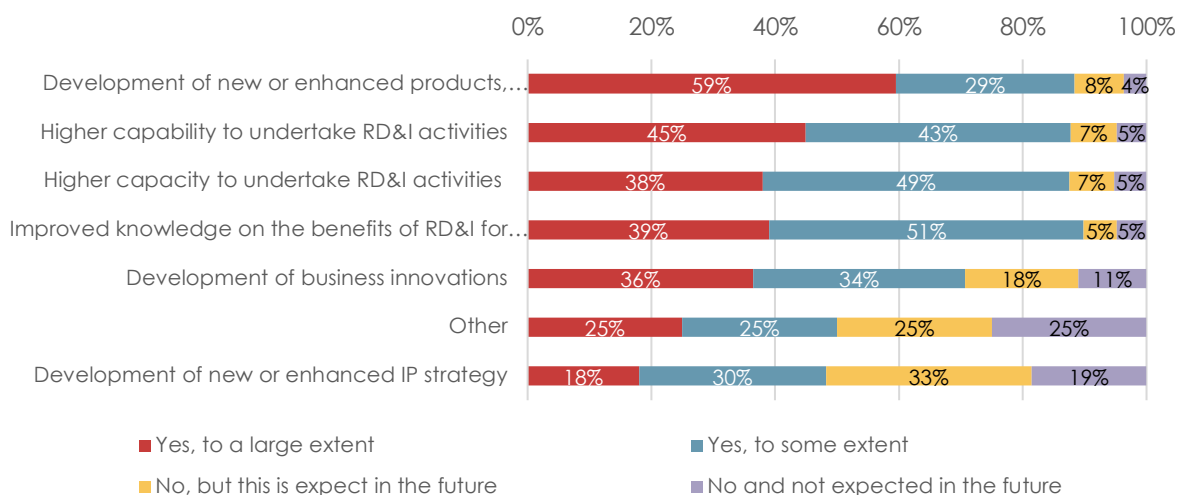


Source: Technopolis, based on survey data. Base = 181 – 186, base for 'Other = 5

The two boxes, below, set out illustrative examples of benefits experienced by awardees.

*A company used the Agile Innovation Fund to develop their current technology and integrate it with AI and machine learning. The company knew that the technology worked but wanted to develop it further and explore potential markets for it. They successfully applied for the Agile Innovation Fund to pursue these goals further.*

*The grant provided the company with €70k, a significant amount of money for them. They view their programme involvement as having been successful. They used the money to help develop a solution suitable for use across multiple sites, helping provide access to much more senior individuals at client organisations. The Agile Innovation Fund-supported technology has also helped the company become a leader in a new market. This in turn has opened up new export markets, as well as offering higher value chain opportunities amongst existing customers.*

Source: firm interview

*One company consulted has benefited from several RD&I programmes. The company provides nutritional supplements, and has been looking to enter new export markets, as well as improving and developing existing ones. Researchers for instance identified new active ingredients that could enhance their products.*

*EI's Exploring Innovation Grant helped fund much of the firm's recent R&D activity. The company recently secured a multi-million euro deal with a client in another continent, drawing in large part on research funded through the RD&I support. The company has also benefited from the Intellectual Property Strategy Offer, with company representatives highlighting how it has helped improve staff's IP capabilities, which in turn has made it easier to engage with collaborators.*

Source: firm interview

### 4.1.3   Impacts on economic performance

Using a similar approach to that above, the figures below, show a more mixed view of economic performance. The economic performance of awardees is significantly better than that of matched non-awardees for each year over the five year period after the first approval of EI RD&I Programme support in terms of:

- Turnover
- Total value added
- Employment
- Export sales
- Export intensity/(Export/turnover)

However, there is no evidence of a significant improvement of the performance of awardees in terms of productivity (turnover/employee), product innovation (new product sales) as well as product innovation intensity (new product sales/turnover).

In the paragraphs below we explain the results for each measure. The relationship between R&D investment and productivity is explored in more depth at the end of this section.

Figure 24 below shows that the mean value of **turnover** for the treatment and control group, in the years after the treatment (Panel a). It shows that the difference in (mean value of) turnover between those two groups increases over time (Panel b) and is always statistically significant. **The subsequent table shows that, over five years, turnover among awardees increased on average by 19.5% (in comparison with the control group), i.e. that the programme has had a positive effect on companies sales.** This result is also statistically significant (since the p-value is

lower than 0.05), which means that we have 95% confidence that the results are different from zero). The results are shown using a logarithm scale (a treatment needed for the econometric analysis), as such their nominal values only provide a visual representation of the trends between the control and treatment group (but not the value of the impact). The value of the impact is shown in the tables below the figures. The same applies for the subsequent indicators.

*Figure 24  Estimated impacts of EI RD&I direct financial supports on **Turnover (log)***
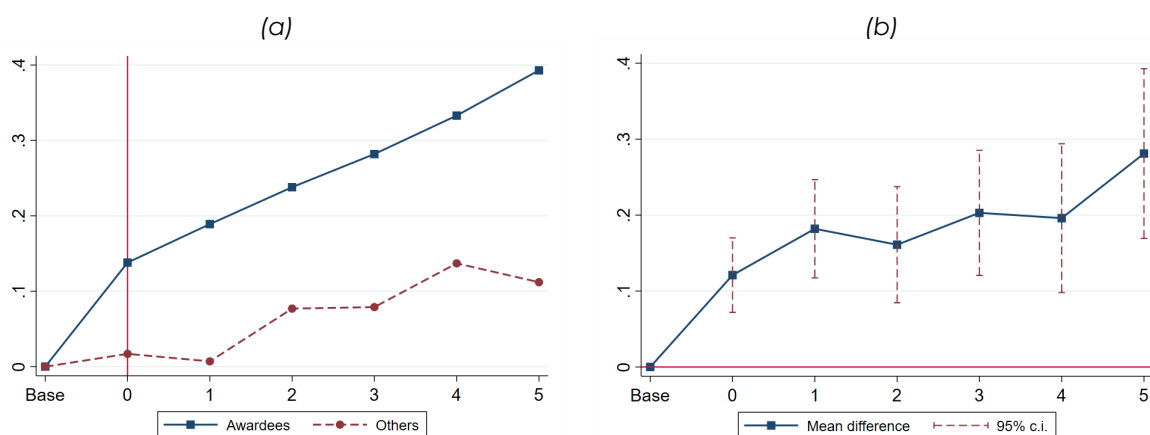


| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **Turnover** | beta | 0.121 | 0.182 | 0.161 | 0.203 | 0.196 | 0.281 | 0.195 |
| | s.e. | 0.025 | 0.033 | 0.039 | 0.042 | 0.050 | 0.057 | 0.032 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Figure 25 below shows that the (mean value of) **employment** for the treatment and control group (Panel a). It shows that the difference (in the mean value of) employment between those two groups increases over time (Panel b) and is always statistically significant. **The subsequent table shows that, over five years, employment among awardees increased on average by 18.9% (in comparison with the control group),** i.e. that the programme has had a positive effect on employment. This result is also statistically significant (since the p-value is lower than 0.05).

*Figure 25  Estimated impacts of EI RD&I direct financial supports on **Employment (log)***
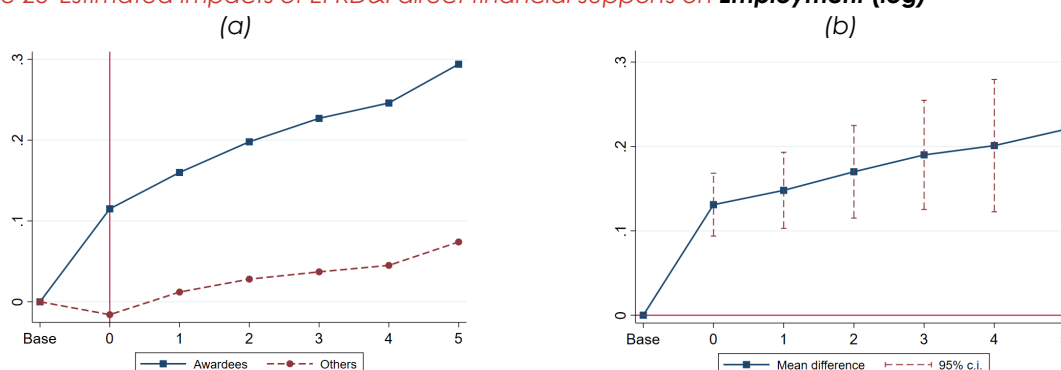
| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **Employment** | beta | 0.131 | 0.148 | 0.170 | 0.190 | 0.201 | 0.220 | 0.189 |
| | s.e. | 0.019 | 0.023 | 0.028 | 0.033 | 0.040 | 0.043 | 0.025 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |

Figure 26 below shows the mean value added for the treatment and control group (Panel a). It shows that the difference (in the mean value of) value added between the treatment and control group increases over time (Panel b), although this difference is not always statistically significant. **The subsequent table shows, however, that over five years, total value added among awardees increased on average by 35.2% (in comparison with the control group), i.e. that the programme has had a positive effect on this measure of economic performance.** This overall result (i.e. the average effect across five years) is statistically significant (since the p-value is lower than 0.05).

*Figure 26 Estimated impacts of EI RD&I direct financial supports on **value added (log)***
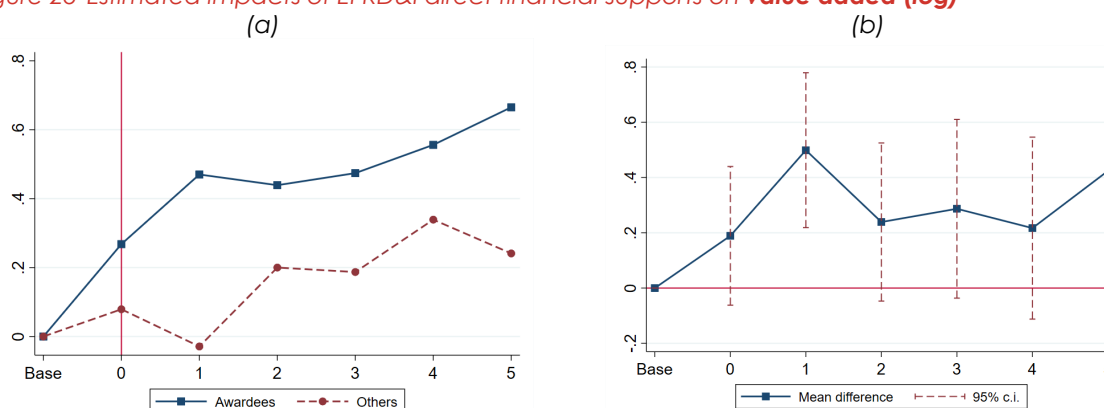


| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **Total value added** | beta | 0.189 | 0.499 | 0.239 | 0.287 | 0.217 | 0.424 | 0.352 |
| | s.e. | 0.128 | 0.143 | 0.146 | 0.165 | 0.168 | 0.167 | 0.111 |
| | p-value | 0.140 | 0.000 | 0.101 | 0.083 | 0.197 | 0.011 | 0.001 |

Figure 27 below shows the (the mean value of) **exports** for the treatment and control group increases (Panel a). It shows that the difference (in the mean value of) exports between those two groups increases over time (Panel b), albeit not steadily (but always statistically significant). **The subsequent table shows, however, that over five years export sales among awardees increased on average by 69.3% (in comparison with the control group).** This overall result (i.e. the average effect across five years) is statistically significant (since the p-value is lower than 0.05).

*Figure 27  Estimated impacts of EI RD&I direct financial supports on **Export sales (log)***
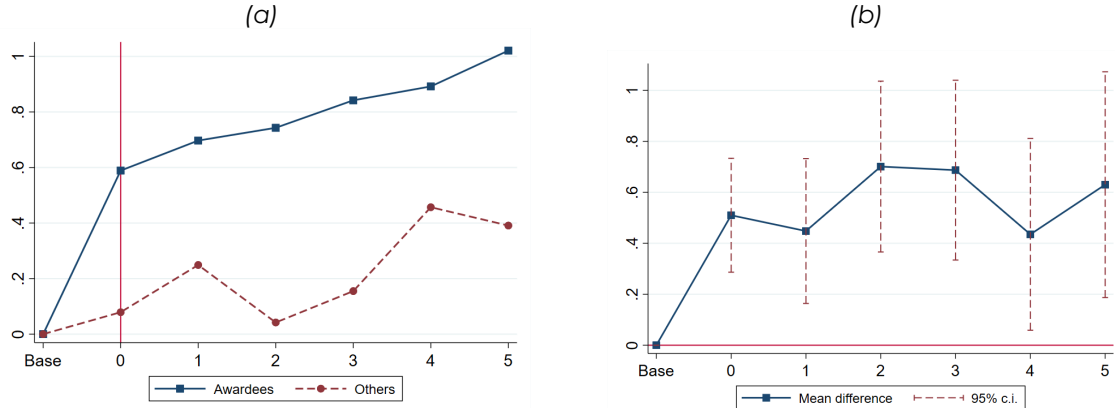
(a)

(b)



| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **Export sales** | beta | 0.510 | 0.448 | 0.701 | 0.687 | 0.435 | 0.630 | 0.693 |
| | s.e. | 0.114 | 0.145 | 0.171 | 0.180 | 0.192 | 0.226 | 0.131 |
| | p-value | 0.000 | 0.002 | 0.000 | 0.000 | 0.024 | 0.005 | 0.000 |

The results in terms of turnover and exports mean that **exports intensity (i.e. exports as a percentage of turnover) has also increased due to the programme, and this is further corroborated by** Figure 28 that shows that  the difference (in the mean value of exports intensity) between the treatment and control group increases over time (Panel b); albeit this difference is not always statistically significant (specifically in year 1, 4 and 5). **The subsequent table shows, however, that over five years the export intensity  among awardees increased on average by 49.6% (in comparison with the control group).** This overall result (i.e. the average effect across the five years) is statistically significant (since the p-value is lower than 0.05).

*Figure 28  Estimated impacts of EI RD&I direct financial supports on **Export / turnover (log)***
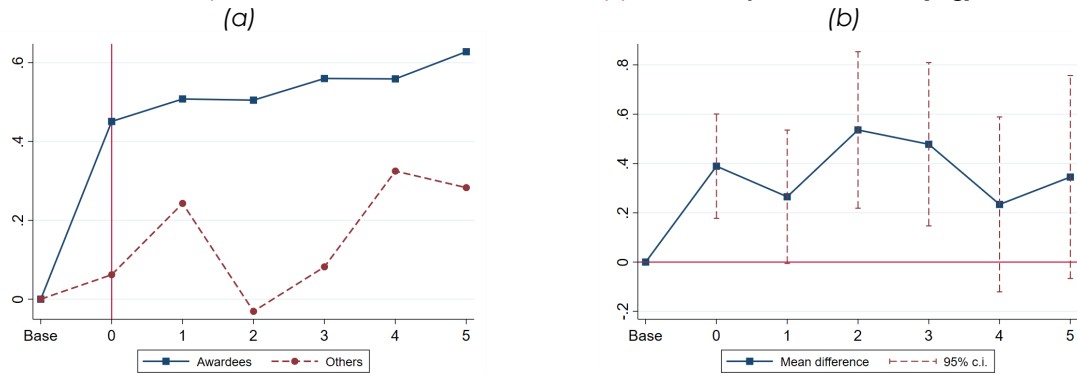
(a)

(b)



| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **Export / turnover** | beta | 0.389 | 0.265 | 0.536 | 0.478 | 0.234 | 0.345 | 0.496 |
| | s.e. | 0.108 | 0.138 | 0.162 | 0.169 | 0.181 | 0.210 | 0.122 |
| | p-value | 0.000 | 0.055 | 0.001 | 0.005 | 0.196 | 0.100 | 0.000 |

Figure 29 below shows that the difference (in the mean value of) **productivity (i.e. turnover per employee)** between the treatment and control group has been mixed, with awardees showing higher levels of productivity in comparison with the control group in only 3 years (Panel a and b). The differences however are not statistically significant. In line with this, the subsequent table shows, that the average effect on productivity over five years is 0.4%. However, this is not statistically significant (since the p-value is higher than 0.05).

*Figure 29 Estimated impacts of EI RD&I direct financial supports on **Turnover / employee (log)***
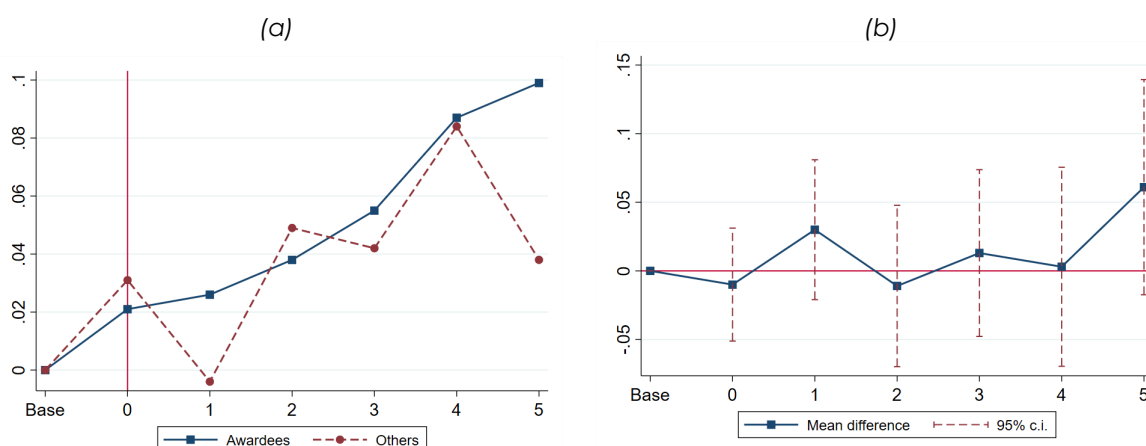


| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **Turnover / employee** | beta | -0.010 | 0.030 | -0.011 | 0.013 | 0.003 | 0.061 | 0.004 |
| | s.e. | 0.021 | 0.026 | 0.030 | 0.031 | 0.037 | 0.040 | 0.023 |
| | p-value | 0.624 | 0.253 | 0.710 | 0.678 | 0.925 | 0.133 | 0.859 |

The relationship between public R&D investment and productivity[39] has been researched extensively, particularly as governments have made efforts to stimulate growth through innovation funding. The results of this body of research have been mixed (Castellani, D., et al, 2016; Coccia, M., 2011; Czarnitzki, D. and O'Byrnes, N., 2007).[40] An analysis of the wider European research landscape suggests that R&D supports may positively impact productivity in some cases (Petrin, T., 2018).[41]

Studies focused on Ireland have indicated that R&D investment has been associated with long-term productivity gains, albeit over a longer period than the five years possible in our

---

[39] Productivity measures used in empirical analyses of the impact of public R&D investment include labour productivity and total factor productivity (TFP). While TFP more directly reflects technological progress linked to R&D investment and innovation, measuring TFP is challenging because it is not observed in reality. Estimates of TFP at firm level can be obtained using different econometric methodologies. Such methodologies require information on capital stocks at the firm level which are not available in the case of Ireland. See van Beveren (2012) for a review of most recent econometric methods to estimate TFP: Total factor productivity Estimation: A Practical Review. Journal of Economic Surveys, 26(1), pp. 98 - 128. Available at: https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1467-6419.2010.00631.x

[40] Castellani, D., et al, 2016. The Productivity Impact of R&D Investment: A Comparison between the EU and the US. Available at: http://ftp.iza.org/dp9937.pdf; Coccia, M., 2011. The interaction between public and private R&D expenditure and national productivity. Available at: https://www.tandfonline.com/doi/abs/10.1080/08109028.2011.601079; Czarnitzki, D. and O'Byrnes, N., 2007. The Impact of R&D on Productivity. Available at: https://core.ac.uk/download/pdf/6304277.pdf.

[41] Petrin, T., 2018. A literature review on the impact and effectiveness of government support for R&D and innovation. Available at: http://www.isigrowth.eu/wp-content/uploads/2018/02/working_paper_2018_05.pdf

current study (O'Malley, E., Hewitt-Dundas, N., Roper, S., 2008).[42] Further, literature also shows that firm-level spending on R&D, which we have seen across many of the awardees of RD&I Programme support, is also an indicator of future productivity improvements (Di Ubaldo, M., and Siedschlag, I., 2017).[43] Building upon this existing country specific research, it is possible that the RD&I Programme would see productivity gains over a longer timescale.

Our consultation with awardees and EI Development Advisors suggests that there are often sectoral considerations to the link between R&D investment and productivity. This suggests that productivity effects may not be seen in firms that work sequentially on R&D or where business models require continual investment in staffing to support the introduction of new products or services (e.g. in software, services and industries with short product lifecycles, or where firms are entering new markets).

Figure 30 below shows that the difference (in the mean value of) **the value of new product sales** (a proxy for innovation) between the treatment and control group has increased over time, however, this difference is only statistically significant in the year when the investment took place and for years 3 and 4 (Panel a and b). Furthermore, the subsequent table shows, that over five years the value of new product sales among awardees increased on average by 89.4% (in comparison with the control group), but again the overall result (i.e. the average effect across the five years) is not statistically significant (since the p-value is higher than 0.05).

*Figure 30 Estimated impacts of EI RD&I direct financial supports on **New product sales (log)***



| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **New product sales** | beta | 1.752 | 0.494 | 0.862 | 2.608 | 2.234 | 1.477 | 0.894 |
| | s.e. | 0.709 | 0.737 | 0.745 | 0.869 | 0.974 | 1.343 | 0.647 |
| | p-value | 0.013 | 0.502 | 0.247 | 0.003 | 0.022 | 0.271 | 0.167 |

Finally, Figure 31 below shows that the difference (in the mean value of) **the value of new product sales as a percentage of turnover** (a proxy for innovation intensity) between the treatment and control group has increased over time but, again, this difference is only statistically significant in the year when the investment took place and for years, 3 and 4. Furthermore, the subsequent table shows, that the average effect over five years on the

[42] O'Malley, E., Hewitt-Dundas, N., and Roper, S., 2008. High Growth and Innovation with Low R&D: Ireland, in: Edquist, C., and Hommen, L. (ed.), Small Country Innovation Systems. Edward Elgar Publishing. Available at: https://ideas.repec.org/h/elg/eechap/3981_5.html

[43] Di Ubaldo, M., and Siedschlag, I., 2017. The impact of investment in innovation on productivity: firm-level evidence from Ireland. Available at: https://www.esri.ie/publications/the-impact-of-investment-in-innovation-on-productivity-firm-level-evidence-from

value of new product sales among awardees increased by 85% (in comparison with the control group. However, this effect is not statistically significant (since the p-value is higher than 0.05).

*Figure 31 Estimated impacts of EI RD&I direct financial supports on **New product sales / turnover (log)***



| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| **New product sales / turnover** | beta | 1.721 | 0.447 | 0.873 | 2.642 | 2.212 | 1.513 | 0.851 |
| | s.e. | 0.713 | 0.735 | 0.744 | 0.861 | 0.959 | 1.341 | 0.644 |
| | p-value | 0.016 | 0.543 | 0.241 | 0.002 | 0.021 | 0.259 | 0.186 |

## 4.2   Increasing the number of firms performing RD&I

*Evaluation requirement: Determine how effective the EI RD&I Programme has been at increasing the number of companies investing in RD&I and the intensity of these RD&I investments: determine the factors that limit the take-up of direct financial supports that can be accessed through the EI RD&I Programme (Objective 1c)*

The study team examined the linked RD&I Programme and ABSEI dataset and survey data to understand the extent to which the Programme is i) attracting non-RD&I performers, and ii) is helping those non-performers to become active in RD&I.

The econometric analysis and the survey data both support the view that the Programme is attracting non-RD&I performers. Figure 32, below, shows the proportion of firms that were not previously RD&I active, that were awarded a grant in each year from 2007 to 2016. Across the period, anywhere between 8% and 14% of awardees were previously not RD&I performers.

Similarly, 9% of awardees that responded to the survey (20 respondents) reported having not spent any amount on RD&I prior to their grant award. A further 5% (10 respondents) reported having previously spent only negligible amounts (less than €300) on RD&I previously.

*Figure 32 Share of awardees with no previous R&D in total awardees by year*
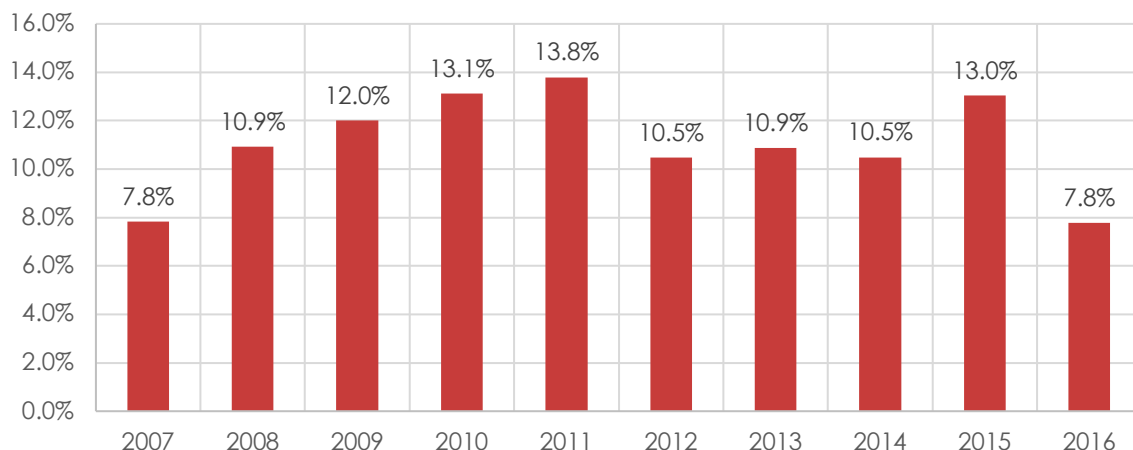


Bar chart showing share of awardees with no previous R&D by year:
2007: 7.8%, 2008: 10.9%, 2009: 12.0%, 2010: 13.1%, 2011: 13.8%, 2012: 10.5%, 2013: 10.9%, 2014: 10.5%, 2015: 13.0%, 2016: 7.8%

Source: ESRI estimates based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland

Further, the RD&I Programme appears to have a positive effect when enabling those non-RD&I active firms into RD&I performers following their grant award. Figure 33, below, sets out the share of awardees with no previous R&D activity before receipt of an award from the RD&I Programme (left) and then each year up to five years after receipt of a grant. This analysis highlights a year-on-year and average reduction of the proportion of previously non-RD&I active firms.

This is further substantiated by survey data. While this is a small sample, some indication of initial RD&I activity is evident. When comparing the reported post-award levels of RD&I expenditure of those previously non-active firms, 70% (21 respondents) reported an increase in spending on R&D. While RD&I expenditure levels remained relatively modest among this group post-award, one firm reported expenditure of approximately €200,000.

*Figure 33 Share of awardees with no previous R&D in total awardees before and five years after the first approved awards*
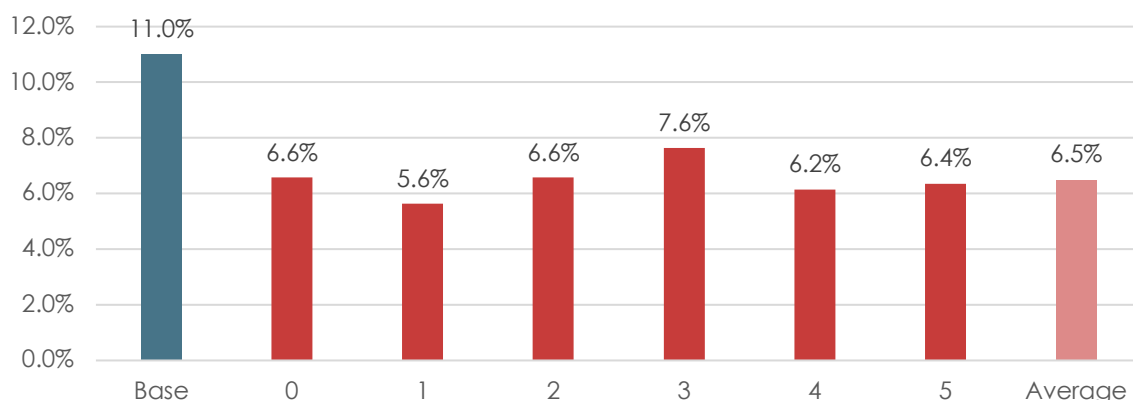


Bar chart showing share of awardees with no previous R&D before and after first approved awards:
Base: 11.0%, 0: 6.6%, 1: 5.6%, 2: 6.6%, 3: 7.6%, 4: 6.2%, 5: 6.4%, Average: 6.5%

Source: ESRI estimates based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland

When asked in interviews, two of the four international comparator programme representatives consulted, stated that they actively try to reach these types of firms, tailoring call descriptions

and attempting improved communication with the subset of firms, in terms of setting out the potential benefits of RD&I. One programme in Denmark exists to help firms hire individuals to help them to scope RD&I prospects in the future. This was regarded as an effective approach.

## 4.3   Added value of the RD&I Programme

In order to understand the extent to which firms believe the RD&I Programme support to be important to their RD&I activity and experienced benefits, awardees were asked via survey to reflect on i) what would have happened in the absence of their grant, and ii) the degree of contribution their specific grant had made to their experienced results.

Figure 34 shows that the RD&I Programme is regarded as having allowed the awardees to pursue their plans. Only 7% of respondents declared that they would have continued with their efforts at the same scale and time frame, while 81% declared that they would have had to scale down or delay (or both) their project. Finally, 10% would not have undertaken the project at all.

*Figure 34  What would have happened in the absence of the grant*



- We would have continued with our efforts or project at a later time
- We would have continued with our efforts or project at a reduced scale
- We would have continued with our efforts or project at a reduced scale and at a later time
- We would not have undertaken the project
- We would have continued with our efforts or project at the same scale and in the same timeframe
- We would have continued our with our efforts or project at an alternative location (outside Ireland)

Source: Technopolis, based on survey data. Base: 190

When asked about the level of contribution of each grant to their overall results, survey responses demonstrate a variation among the different grants within the programme. 95% of recipients of the Agile Innovation Fund reported that the grant has contributed 'to a medium extent' and 'to a large extent' to their achieved results. However, this represents a small number of respondents. 91% of recipients of the RD&I Fund reported that the grant had contributed 'to a medium extent' and 'to a large extent' to their achieved results. These findings are currently tentative and require further analysis. Examining the raw data showed that the number of respondents who answered the question for some grants exceeded in the number of respondents that earlier reported themselves as recipients of that specific grant. The study team thus repeated the analysis drawing on only the answers from confirmed grant recipients included. This is summarised in Figure 35, below.

*Figure 35 Extent to which each grant has contributed to results*
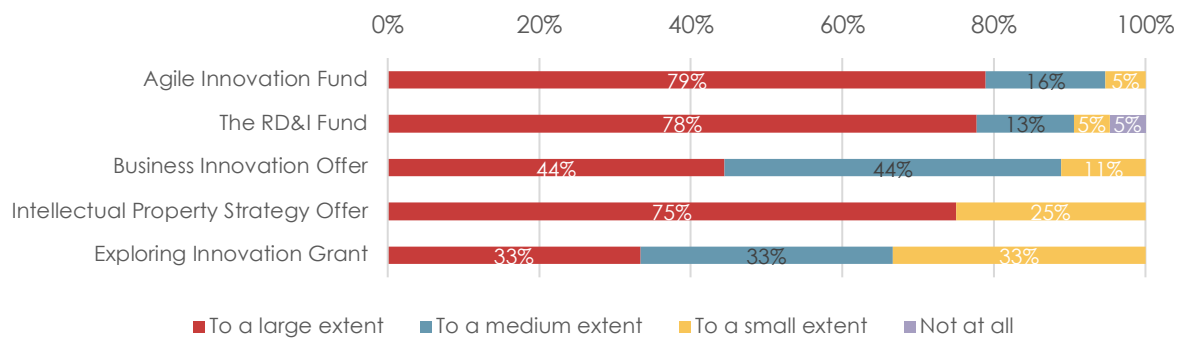


Source: Technopolis, based on survey data. Base for 'The RD&I Fund' = 148, for all others base = 4 – 19

## 4.4 Interaction of direct and indirect supports for RD&I

### 4.4.1 *The role and performance of indirect RD&I supports*

*Evaluation requirement: Compare the role and performance of the direct to firm financial supports of the EI RD&I Programme in terms of achieving increased BERD to the roles and performances of: The Knowledge Development Box; The R&D Tax Credit; European Space Agency Funding; and Small Business Innovation Research. (Objective 2a)*

Due to data limitations,[44] it has been difficult to quantitatively examine the performance of the suite of indirect supports in terms of increasing business expenditure in R&D, and the performance of combined direct and indirect supports. A descriptive analysis of the participation in ESA funding is available in Appendix A.3.[45]

In order to mitigate this, the study team consulted stakeholders and awardees via interview, as well as with representatives of comparator programmes in other countries. Through this approach, it was possible to reach a high-level view of the value of indirect supports in addition to direct supports through programmes such as the RD&I Programme.

Emerging from these conversations was a view that indirect supports for RD&I such as the R&D Tax Credit, ESA funding and SBIR funding are important components in increasing R&D expenditure within the firm base. Firms that had accessed the R&D Tax Credit, for example, were positive about its utility, but stressed that it is a complementary support to their grants that performs a different function for their business. In particular, firms that had used both suggested in interview that the R&D Tax Credit is less restrictive than grants and allows them to maximise the return of their RD&I activity with relatively little effort, and often helped firms to further invest in their R&D functions.

Similarly, consultation revealed that ESA funding and SBIR funding are, overall, well-regarded by firms that have the ability to operate in those priority areas. There are a small number of examples of firms that have accessed the RD&I Programme to explore other application areas

---

[44] Inclusive of access issues to R&D Tax Credit data

[45] The included assessment of the ESA Programme does not include MNCs and non-EI Client firms

for the products developed through ESA contracts.[46] During the analysis, the study team attempted to identify firms that had benefited from both ESA funding and the RD&I Programme, but the number of observations was too small for analysis. The limited number of observations for firms accessing ESA[47] and SBIR funding, within the datasets used in this study, reinforces the view that these indirect supports have most relevance for a smaller number of firms operating in specific areas. It should be noted that SBIR is a rather new programme at the time of this study.

National stakeholders supported the view that funding both direct and indirect supports was the optimal approach to reaching the goal of increasing R&D expenditure.

### 4.4.2  Synergies between available RD&I support

*Evaluation requirement: Explore the synergies with the above RD&I supports to the EI RD&I Programme (Objective 2b)*

This section examines the degree of interaction and complementarity that exists between the supports available for RD&I in Ireland. To do so, we draw on i) survey data, which indicate a high degree of synergy, ii) interview data, within which interviewees suggest that the holistic approach is most impactful, as different supports address different needs in different ways and often work well for different sub-sets of firms, and iii) and examination of the objectives of each scheme within the RD&I Programme and suite of indirect supports, found in section 2.2.

Taking the examination of individual objectives first, an evident complementarity is seen among the RD&I Programme schemes and the suite of indirect supports. This examination of individual scheme objectives highlights that there are a number of ways in which firms are encouraged or supported to invest in RD&I (e.g. RD&I Fund, R&D Tax Credit) that use different, complementary mechanisms. The Exploring Innovation Grant is an important addition to these mechanisms to help firms to understand the role that RD&I could play for them, and to encourage better planning. The relationship between the Knowledge Box and Intellectual Property Strategy Offer may be seen similarly in their individual approaches to encouraging firms to better manage and leverage intellectual assets. There are then a series of schemes across the direct and indirect supports that target more specific cases, from the Agile Innovation Fund (for firms in sectors such as ICT or with short product cycles) and the Business Innovation Offer (for non-technological innovations), to the more 'specialised' or thematically-focused ESA and SBIR programmes. There are also a small number of firms -revealed in consultation – that had received ESA funding and subsequently accessed the RD&I Programme in order to explore further areas of application for the innovations developed.

Turning to the survey of awardees of the RD&I Programme, respondents were asked about their use of alternative support programmes. The responses revealed that the 'R&D Tax Credit' is the only instrument that is used by a large share on a regular basis (59%, 104 respondents). All other schemes have been used by less than a third of respondents. Awareness of the schemes can also be seen to vary. In the case of the European Space Agency, less than a third (30%) of the respondents were aware of the programme – see Figure 36.

---

[46] It should be noted that the performance of ESA beneficiaries measured here is only a sub-section of the overall performance of ESA beneficiaries

[47] A separate exercise will evaluate the European Space Programmes and provide baseline figures to 2019, against which it is intended that progress can be measured on realising the ambition expressed in the National Space Strategy for Enterprise

When asking the same question of clients that have not received support through the RD&I Programme, the R&D Tax Credit was by far the most commonly reported indirect support accessed, followed by collaborative R&D supports such as the Innovation Voucher and Innovation Partnerships grant (not shown in the Figure).

*Figure 36 Level of engagement with alternative supports for RD&I*
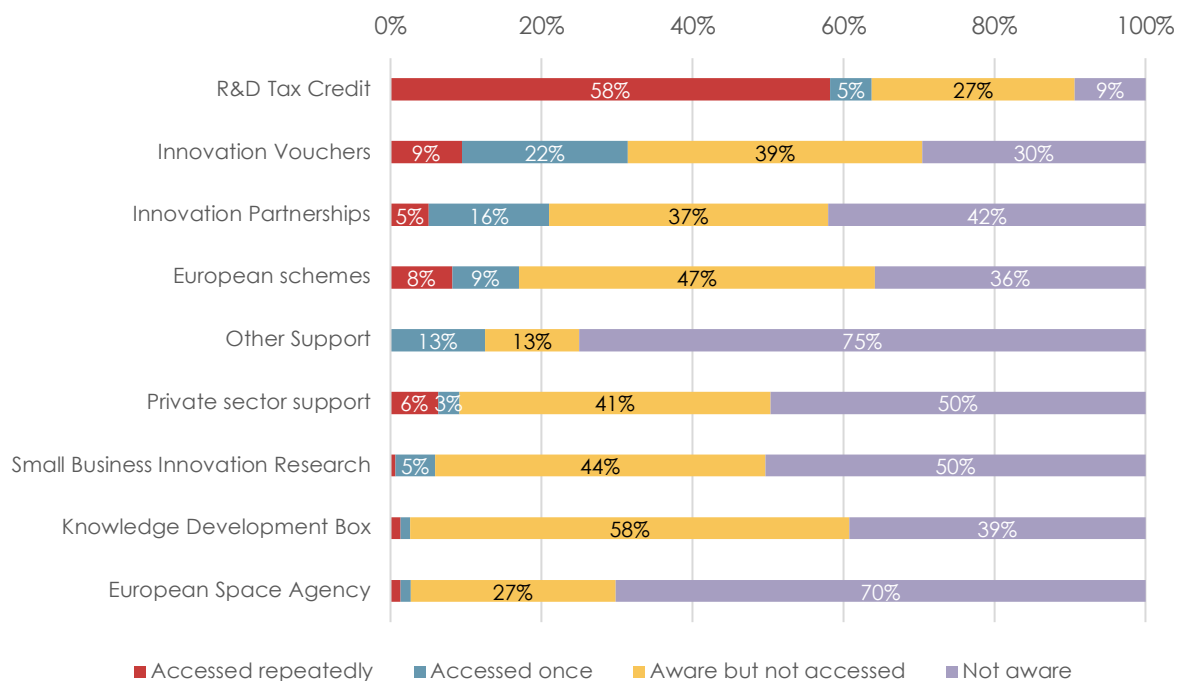


Source: Technopolis, based on survey data. Base = 140 - 182, base for 'Other Support' = 8

The above findings are also reflected in the results for the perceived compatibility between the support provided by Enterprise Ireland and alternative support schemes. When asked about the possible interaction of different support measures, 107 out of 138 awardees that responded to the survey considered the R&D Tax Credit as complementary to the Enterprise Ireland RD&I Programme. By comparison, only four out of the 23 respondents felt so for the European Space Agency, though this is understandably a more 'niche' support programme – see Figure 37.

*Figure 37 Complementarity between RD&I programme and alternative support measures*
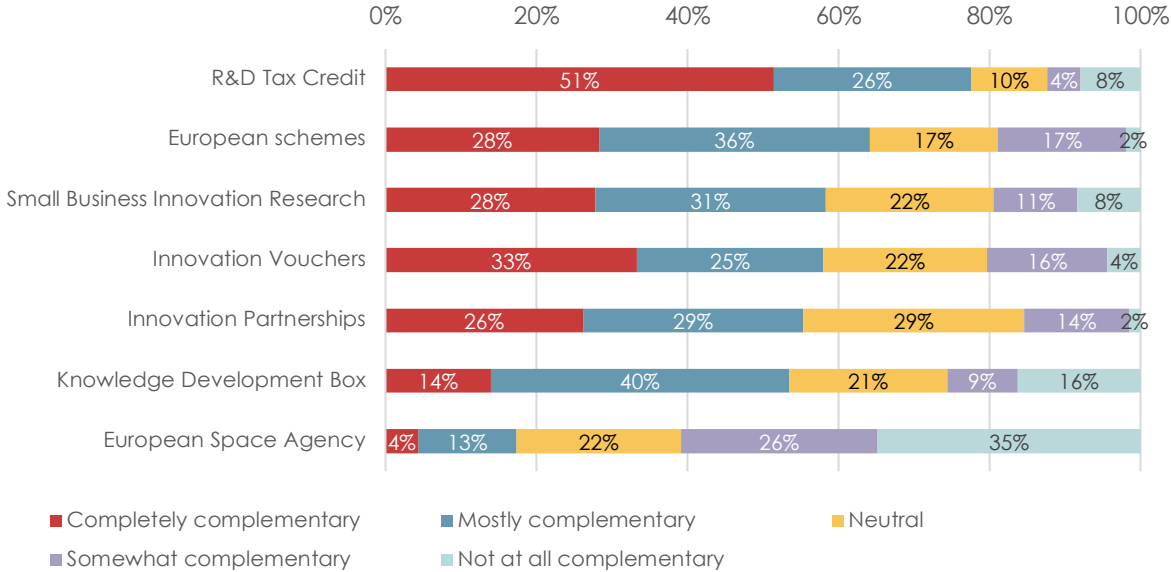
Source: Technopolis, based on survey data. Base for 'R&D Tax Credit' = 138, for others base = 26 – 69

# 5 Assessment of efficiency

*Evaluation requirement: Determine whether the Programme can be delivered more efficiently (Objective 1d)*

To address this evaluation requirement, the study team has examined three dimensions of efficiency as related to the delivery of a support programme:

i) The processes and procedures related to the implementation of the programme, through the lens of awardee satisfaction,

ii) The extent to which awardees experienced barriers to accessing support and maximising the benefits or impact of that support

iii) The main routes through which firms learn about and access the support available through the programme

Each of these aspects were explored through the survey of awardees, and the analysis is presented in turn, below.[48] Taken together, these aspects present a positive picture of the RD&I Programme.

## 5.1 Firm satisfaction with procedures

The survey results show a largely positive picture regarding the procedures involved in accessing support, and the nature of the support received. The analysis of survey responses reveals a positive picture. Only 15% reported that they were either 'Not satisfied' (12%, 21 respondents) or 'Not satisfied at all' (3%, 5 respondents) with the 'Administrative requirements following the approval of the application'. For all other services, the share of respondents who were either 'Satisfied' or 'Very satisfied' was 69% or higher. In the case of 'Support provided by the Enterprise Ireland Development Advisor' the according approval rate was 83%.

*Figure 38 Satisfaction with procedures and received support*
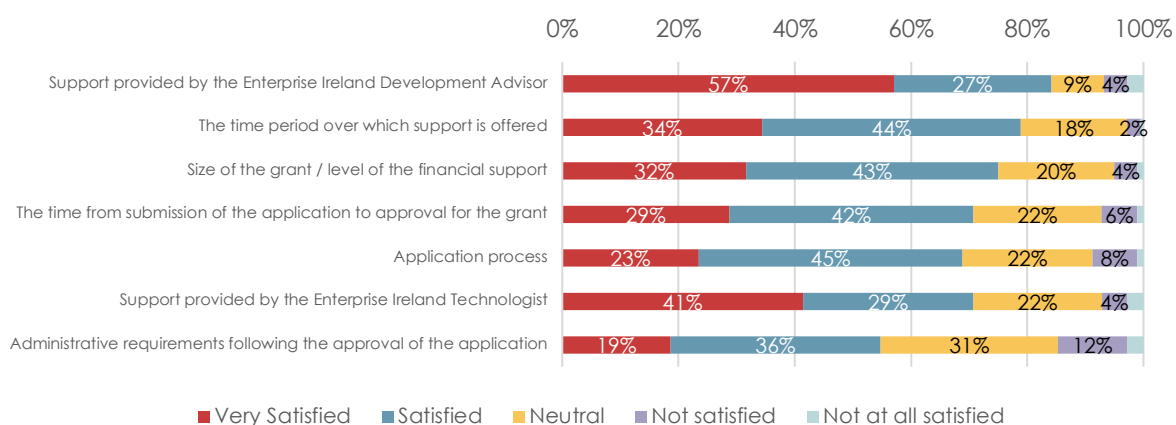


Source: Technopolis, based on survey data. Base = 140 - 183

---

[48] The study team also considered the possibility of examining cost-effectiveness, though full cost data were not available

## 5.2 Barriers experienced

In order to understand both general satisfaction and the presence of any issues in a) accessing support and b) maximising the benefits of that support, our survey of awardees asked a range of questions related to what barriers, if any, had been experienced during and following the application process.

Figure 39 shows the different types of barriers perceived. Overall, the results show relatively consistent patterns among the different grants. 'The work required to prepare and submit the application', for instance, is the most frequently perceived barrier among all respondents. On the other hand, 'Securing co-financing for the grant' and 'Securing internal resourcing to continue the work after the grant finished' are not a common barrier among any of the grant recipients.

Further analysis of the results reveals a connection between the size of the company and the perception of barriers before, during or after the application process. Comparing the results for the eight different types of possible barriers, large companies (250 or more FTEs) least often reported experiencing issues, whereas micro (1 – 9 FTEs) and small (10 – 49 FTEs) firms consistently reported the highest share.

The segmentation in different regions does not reveal any distinct correlations with the perception or experience of barriers. Examining perceived barriers across industry segments reveals some points of difference. Respondents within the chemical and pharmaceuticals industry consistently reported the lowest level of barriers perceived (except for 'Securing internal resourcing to continue the work after the grant finished').

Enterprise Ireland clients that had not accessed the RD&I Programme primarily reported their barriers to access related to a lack of alignment from the Programme with their own business needs or plans (e.g. 17% or 8 respondents are not R&D active and do not plan to be in the near future), difficulty obtaining match funding (again 17%, 8 respondents), the complexity of the application process (11%, 5 respondents), a lack of awareness of available support (a further 17%, 8 respondents).

*Figure 39 Perceived barriers experienced in accessing mechanisms*



- ■ The work required to prepare and submit the application
- ■ The work required during the assessment process
- ■ Securing internal resourcing to implement the work
- ■ Unable to hire people with the skills to undertake the project
- ■ Securing financing to continue the work after the grant finished
- ■ Other Barriers Experienced
- ■ Securing co-financing for the grant
- ■ Securing internal resourcing to continue the work after the grant finished

Source: Technopolis, based on survey data. Base = 4 – 21, base for 'RD&I Fund' = 163. NB: The chart shows that no respondent reported perceived barriers related to the Intellectual Property Strategy Offer

The appraisal process has been consciously improved over time in terms of turnaround time, and the introduction of the Agile Innovation Fund was noted in interviews as being a positive move for businesses in sectors such as ICT or those with short product lifecycles. In conversation with Development Advisors, there was a sense that the new streamlined approvals processes were not always used to the fullest extent. For example, the Management Approval Committee, which meets weekly and approves Agile Innovation Fund grants that are too large to be approved online (and where a firm has had no prior support) reportedly lacks technological expertise in its process. This has sometimes meant that proposals that are on an agile track have been taken through the R&D Committee, which meets less frequently, meaning that the agile process that should take three weeks might eventually take up to 12 weeks. This appears to be a disincentive to make use of the committee processes that are designed to minimise turnaround times. Due to requirements of funding, the agile process also excludes firms that have previously received support. This can create problems for repeat innovators that operate in sectors where the Agile Innovation Fund would be most beneficial.

The general view among awardees is that some administration is required and expected when accessing public funds, and that some learning curve is expected when accessing a scheme for the first time. This is well understood and is often a calculated decision for firms when accessing the Programme, and, once this learning has occurred, most found the process manageable. This appears to especially be the case among firms that access the Programme repeatedly. However, in interviews, some firms explained that they had experienced difficulties fulfilling monitoring procedures. Two examples of this include completing timesheets where firms have different established project management systems (leading to duplicated effort) and the requirement for external auditors to sign off claims (with cost implications for firms). Another barrier explained was the non-eligibility of overseas labour or services, especially in areas where firms experience a fairly limited pool of appropriate talent. Firms in some sectors stated that they face difficulty securing required expertise in Ireland, while others suggested that they had experienced difficulty while attempting to run market testing overseas. Two firms mentioned difficulties from experiencing draw down delays, which impacted the progress of their supported projects. There was limited discussion about the application process. Several firms reflected the complexity of the application process, and a number of Development Advisors suggested that they have had to provide additional guidance over and above what is available in written form, or to compensate for a perceived non-intuitive online process (e.g. a confusing or out-dated user interface, and the need for applicant firms to reply to an automated email with documentation).

## 5.3   Access routes to support

Our survey of awardees asked respondents to indicate via which route they had been introduced to the RD&I Programme. The results show that the 'internal' communication channels of Enterprise Ireland is most common, as the vast majority (71%, 147 respondents) first heard about the available grants by their Enterprise Ireland Development Advisor while another 19% found the information directly on the Enterprise Ireland website – see Figure 40. 'Other' sources include outside consultants, word of mouth and past experience among others.

*Figure 40 Source of Information*



Legend:
- Your Enterprise Ireland Development Advisor
- Directly via the Enterprise Ireland Website
- Other
- Enterprise Ireland events
- Local Enterprise Offices (LEO)
- Media advertisements

Pie chart values: 71%, 15%, 6%, 4%, 2%, 2%
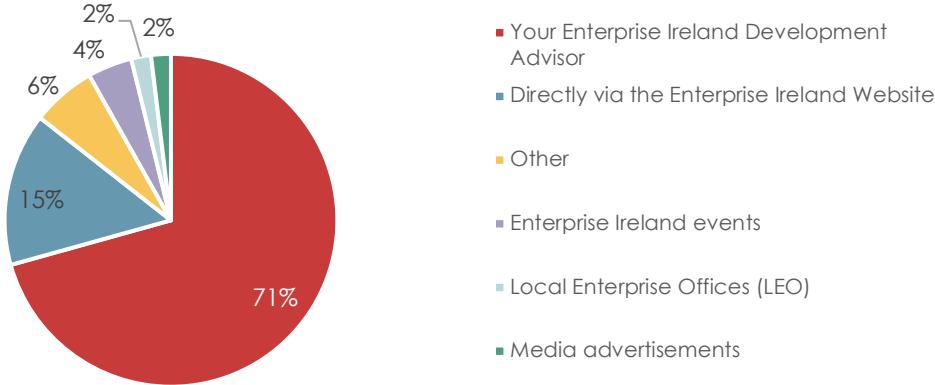
Source: Technopolis, based on survey data. Base = 212

# 6    Comparative view of select RD&I supports

*Evaluation requirement: Assess the performance of the Programme relative to similar programmes available in other comparator countries (Objective 1e)*

## 6.1    Introduction to the international comparators

The following chapter sets out a comparison of the RD&I Programme with a number of similar programmes delivered in other countries, focusing on the role and performance of support for RD&I. The list of comparator countries was selected based on several criteria. First, the schemes operate in countries that are either members of the Small Advanced Economies Initiative of which Ireland is also a member,[49] or rank well in the latest Global Innovation Index (2019) published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO).[50] In this analysis, the study team has excluded policy systems are qualitatively different to Ireland, such as federal states (i.e. the US, Germany) or where instrumentation is significantly dissimilar to Ireland (e.g. Japan, the Republic of Korea, Singapore). In addition, programmes were selected that cover broad in-house RD&I activities (rather than collaborative RD&I programmes) that are instrumented in an open way (rather than in targeted thematic areas). There is some commonality between the selected programme countries and the countries focused on in the 2017 Indecon report, though the approach taken to the current evaluation focuses specifically at the programme level rather than a system perspective.

Most schemes among these comparators are similar in terms of structure and eligibility. Most of the programmes are aimed towards, and actively target, small and medium-sized enterprises (SMEs), and most offer support via a grant mode similar to the RD&I Programme.[51]

*Table 11   Overview of international comparator programmes*

| Country | Organising body | Programme |
|---|---|---|
| Austria | Austrian Research Promotion Agency (FFG) | Frontrunner |
| Denmark | Innovationsfonden | InnoBooster |
| Finland | Business Finland | Research, development and piloting for SMEs & midcaps |
| Israel | Innovation Israel Authority | R&D Fund |
| Netherlands | Netherlands Enterprise Agency (RVO) | SME+ Innovation Fund (Innovatiefonds MKB+) |
| New Zealand | Callaghan Innovation | R&D Project Grant |
| Sweden | Vinnova | Innovation projects in small and medium-sized companies |
| Switzerland | Innosuisse | Innovation projects (without innovation partner) |

---

[49] See: https://smalladvancedeconomies.org/

[50] The Global Innovation Index (GII) is an annual ranking of economies by innovation performance. See: https://www.globalinnovationindex.org/home

[51] The Finnish programme is based on loans which have the potential to be converted into grants and is therefore also included

| United Kingdom | Innovate UK | Smart Grants |
|---|---|---|

## 6.2 Budgets and eligibility

While the nine comparator programmes are broadly similar in terms of their mode of funding, eligibility criteria and funding levels, some differences are evident in the grant size and intervention rate. These range from 33% (Denmark) to 70% (Finland, UK) of total project costs. Most schemes offer different intervention rates based on the size of the applicant firm. The maximum rate is summarised in the table below.

*Table 12   Comparator programme budgets and intervention rates*

| Programme | Latest annual budgets (EUR) | Max. project costs (SMEs) |
|---|---|---|
| Frontrunner (Austria) | €20m (2019) | 50% |
| InnoBooster (Denmark) | €40m (approx., 2019)[52] | 33% |
| Research, development and piloting for SMEs and midcaps (Finland) | Not found | 70% |
| R&D Fund (Israel) | €110m (approx., 2018)[53] | 50% |
| SME+ Innovation Fund (Innovatiefonds MKB+) (Netherlands) | €70m (Innovation Credit, 2019)[54] | Not found |
| R&D Project Grant (New Zealand) | €15m (approx., 2017/18)[55] | 40% |
| Innovation projects in small and medium-sized companies (Sweden) | Not found | 50% |
| Smart grants (United Kingdom) | Not found | 70% |

Source: Technopolis, based on reviews of agency websites

## 6.3 Range of available support

The Enterprise Ireland RD&I Programme is among the most comprehensive support available to firms for RD&I within this set of comparators. This is largely due to the features of the international comparator programmes, which in general focus more narrowly on technological innovations. The RD&I Programme is made up of more components and supports a broader range of activities, from specific IP support to support for business innovations. The addition of the Agile Innovation Fund for firms in sectors with short product cycles also stands out among the comparators, as does the explicit eligibility of commercialisation costs. While it is clear in the examples from Finland, the Netherlands, New Zealand, Switzerland and UK that additional, linked business/product development support is also made available, the support available through Enterprise Ireland appears to be more holistic in nature, due to the presence of

---

[52] See: https://www.teknologiudvikling.dk/innobooster

[53] See: https://innovationisrael.org.il/en/reportchapter/innovation-authority

[54] See: https://www.rvo.nl/subsidies-regelingen/innovatiekrediet

[55] See: https://www.callaghaninnovation.govt.nz/sites/all/files/callaghan-innovation-annual-report-2018.pdf

dedicated Development Advisors that work with firms to identify and signpost additional support attached to their funding.

*Table 13  Standalone or holistic support available via comparator programmes*

| Programme | Nature of support |
|---|---|
| Frontrunner (Austria) | Appears to be relatively standalone in nature |
| InnoBooster (Denmark) | Appears to be relatively standalone in nature |
| Research, development and piloting for SMEs and midcaps (Finland) | Clearly linked advisory services, access to networks, peer support, etc. |
| SME+ Innovation Fund (Innovatiefonds MKB+) (Netherlands) | Grants and repayable credits with linked expertise in areas such as support for digital communication, smart organisation, and finding business partners |
| R&D Project Grant (New Zealand) | Clearly linked access to experts and innovation skills development |
| Innovation projects in small and medium-sized companies (Sweden) | Appears to be relatively standalone in nature |
| Innovation projects (without innovation partner) (Switzerland) | Clearly linked access to coaching, training, mentoring, peer networks |
| Smart grants (United Kingdom) | Clearly linked access to networking, collaboration, attracting investors, market access support, etc. |

Source: Technopolis, based on reviews of agency websites

## 6.4  Documented impacts and lessons learned

The study team has reviewed the available evaluative material to reach a view of the achievements, benefits and impacts of the selected comparator schemes. Four of the nine selected comparator schemes have been evaluated in the last three years, with others addressed via – for example – annual reports. An evaluation is in progress for the Innovate UK Smart Grants Programme. In order to gain further insight, the study team sought to interview representatives of the programmes. In total, four interviews were conducted, with representatives of the programmes in Austria, Denmark, the Netherlands and Sweden.

While it is not possible to compare the performance of these comparators with the RD&I Programme,[56] the study team has summarised the key achievements and impacts, key success factors and lessons learned of the four programmes where documentation allowed and/or consultation was possible. The selection of key success factors and lessons learned appear to be broadly in line with the approach taken to evolving the RD&I Programme.

*Table 14  Impacts and lessons learned among international comparators*

| Programme | Achievements and impacts | Key success factors | Lessons learned |
|---|---|---|---|
| Frontrunner (Austria) [57] | Allowed projects to be technologically more demanding and/or generally more extensive than without support | Programme signals belief in the firm to international actors – helping SMEs access international markets | More focus needed on target groups of mainly SMEs and midcaps to maximise impact |

---

[56] Due to, in part, methodological differences and elsewhere a lack of appropriate data

[57] Available at: https://repository.fteval.at/389/1/EB_ohne_Kommentare_TC_FFG_BMVIT_barrierefrei.pdf (in German)

| | Helped support established frontrunner companies to build new market segments | The simplicity of the support was deemed to be a reason for signalling success | Future iterations could be geared toward promoting diversification among strong companies in new segments<br><br>Improvements needed to project monitoring in order to enable necessary changes |
|---|---|---|---|
| InnoBooster (Denmark) [58] | Encourages firms of varying stages of readiness to develop RD&I capability and activity<br><br>Helps firms to crowd in funding from other sources<br><br>There has been a positive effect on start-ups, which while not intentional now makes up a significant proportion of awards | Broad range of available grant sizes and the lack of thematic restrictions<br><br>Support is capped low (33% of costs) to ensures firms apply with a concrete and well-backed project | Some funding criteria changed<br><br>Flexibility is important – consideration is being given to allowing the support to extend to collaborative projects in future<br><br>Effectively addresses the demand side, though mid-sized companies are underrepresented |
| SME+ Innovation Fund (Innovatiefonds MKB+) (Netherlands) | The creation of an ecosystem of venture capital investments<br><br>The attraction of projects related to 'higher government goals', encouraging private investment in public missions | Making the market responsible for investment decisions (based on deep and relevant experience) | Ensuring market readiness before launching a new scheme<br><br>Ensuring a mixture of industry and government representatives in the process, to maximise the perspective of the market |
| Innovation projects in small and medium-sized companies (Sweden) | Financing a broad spectrum of SMEs<br><br>A number of the companies funded through the scheme have become success stories (e.g. listed among the most successful SMEs in Sweden) | Producing non-thematic, open calls allows a high variety of firms to apply and broadens the impact<br><br>Flexibility to evolve with time and as the ecosystem changes (e.g. moving to a sustainability focus)<br><br>Having a diverse programme team, with a broad pool of skills and backgrounds (especially industry experience) | A change of focus from purely R&D potential to commercial potential as well was necessary<br><br>Change to the structure of the programme: separating start-ups and SMEs to offer fairer conditions and criteria<br><br>Allowing the programme to evolve in response to both 'push' and 'pull' factors |

Source: Technopolis, based on available evaluations

## 6.5   Lessons for Ireland from the group of comparator programmes

As set out above, comparator programmes were selected based on two main criteria: i) the country of operation was either a member of the Small Advanced Economies Initiative of which Ireland is also a member, or ranks well in the 2019 Global Innovation Index, and has a similar policy system to Ireland, and ii) the programmes cover in-house RD&I activities that are instrumented in an open way (rather than in targeted thematic areas).

---

[58] Available at: https://ufm.dk/publikationer/2019/filer/evalueringsrapporten.pdf

Ireland's support is already among the most comprehensive within this group in that it covers a broad range of RD&I (technological and non-technological), caters explicitly to several kinds of industries (including those with short cycles), and is open to both established and new performers. The main lessons for Ireland drawn from the examination of this group of comparator programmes can be summarised as follows:

- A continued focus on agile innovation and non-technological innovation (i.e. business innovations) should be maintained to continue the support for a broad range of firms

- Ireland appears to also be somewhat a front-runner in supporting a broad range of firms, including new and less-experienced performers, and so current approaches could be continued

- Where some programmes – such as in in the Netherlands and Sweden have pushed hard on examining and emphasising commercial aspects, it is clear that Ireland has already instituted examinations of commercial and technological aspects at the appraisal stage, which is a direction also taken by some programmes within this group

- The Netherlands has sought to build a network of private investors around their programme – this could be a useful augmentation to the RD&I Programme

- Some programmes include a challenge-based perspective. Where this could usefully be covered by SBIR in Ireland, it is possible that some orientation of grants under the RD&I Programme could encourage a broader range of firms to participate in this type of mechanism. However, it is not clear what the appetite among firms would be for this

# 7 Conclusions and recommendations

Evaluation requirement: Develop findings, conclusions and recommendations from the evaluation of the RD&I Programme and the comparison of the role and performance of enterprise RD&I supports (Objective 3)

## 7.1 Conclusions

**An assessment of appropriateness**

The EI RD&I Programme is well-aligned with both national policy and firms' needs. The Programme has been consciously developed over its lifetime, in response to both client feedback, including the introduction of the Agile Innovation Fund and the Business Innovation Offer in 2016/17. These two new strands of the Programme address support requirements for shorter lifecycle projects and non-technical, business innovations. This – and the support available from Development Advisors – makes the RD&I Programme among the most comprehensive support schemes available when compared to similar schemes in other countries.

**An assessment of effectiveness**

While the Programme evidently has a positive impact on a number of innovation and economic performance indicators, there are some areas where the impact of the Programme is less distinct.

When compared to similar, matched firms that had not received support through the Programme, awardees of grants show a significant boost to their R&D performance in the five years after receiving their grant(s). In particular, these include:

- Net R&D expenditures (including as a proportion of turnover, as a proportion of number of employees)
- R&D employment (and R&D employment as a proportion of number of employees)

Over the five years since awarding of their grant(s), the economic performance of awardees is significantly better than that of matched non-awardees in four areas: i) turnover, ii) total value added, iii) employment, and iv) export sales.

However, there is no evidence that productivity performance (as measured by Total value added per employee and Turnover per employee) is significantly better among awardees. Literature suggests that this may be related to the timeframe under examination. Productivity effects may also vary across sectors. For example, sectors such as ICT and services tend to be in constant cycles of innovation, meaning almost-perpetual reinvestment, which may mask measures of productivity.

The Programme is also attracting non-RD&I performers, and appears to help a proportion of them to become RD&I-active post-award.

Where firms experienced positive effects, they were affirmative about the contribution of the Programme to those effects. The majority of firms also suggested that the Programme had allowed them to undertake their RD&I projects at a larger scale and sooner than if the support had not been available. The RD&I Fund in particular was regarded positively for its contribution to experienced benefits.

There is evidence of synergy and positive interaction between the direct financial support available through the RD&I Programme and the indirect support for RD&I available particularly

through the R&D Tax Credit. Firms and stakeholders believe that a holistic approach – i.e. the presence of both types of support – is the optimal way to achieve an uplift in RD&I expenditure.

**An assessment of efficiency**

Awardees are predominantly satisfied with the processes and procedures associated with accessing support. Where concerns were raised in consultation, these were largely seen as being a reasonable cost for accessing the support, though some consultees noted that the turnaround times of agile-track applications, where committees are not effectively used. The main concern raised in terms of procedures related to the recently-introduced Business Innovation Offer, whose criteria some firms felt were difficult to grasp. Firms' Development Advisors were the most common routes to access support from the RD&I Programme. Among client firms that had not accessed the Programme, the main barrier to doing so was a lack of relevance or low awareness.

## 7.2   Recommendations

Drawing on the analysis above, the report concludes with nine recommendations.

**Appropriateness**

1. Our examination of the support available for RD&I in light of both policy objectives and firm needs suggests that the holistic approach to RD&I support (a mix of both direct and indirect supports) is optimal and appropriate. It is clear that the individual supports address different objectives and are used differently by firms. Similarly, Ireland appears to be a frontrunner among comparators in the ways in which a broad range of firms are addressed via its RD&I support. Ireland should continue to invest in both direct and indirect support for RD&I, rather than focusing solely on directional grants or indirect supports

**Effectiveness**

2. Our econometric analysis and consultation with firms has revealed the RD&I Programme to be effective when considering the economic and innovation performance of beneficiaries as compared to firms that have not accessed the programme. While the effect of the programme on firms' productivity is less visible, this is likely related to the time period of data examined in this study. Therefore, the current constitution of the Programme should be maintained, with sensitivity to the productivity issue – some consideration may need to be given to how productivity is addressed in some sectors

3. While our analysis shows that the RD&I Programme performs well in attracting and supporting new performers, a recent OECD review suggested that there is untapped entrepreneurial potential within the firm base. The review suggests a further role for the Local Enterprise Offices across Ireland in order to better tap into this potential for innovation among firms. We would mirror this and suggest a review of the role or the Local Enterprise Offices to attract firms in the regions, or firms that have not yet applied for RD&I support

**Efficiency**

4. It is clear that continual efforts are being made to improve turnaround times for the approval of grant applications, some issues were revealed in consultation regarding the use of the R&D Committee for agile-track applications. We recommend that these efforts are maintained, and that some  consideration should be given to procedures to ensure no barriers exist to accessing appropriate funding along optimal timescales (e.g. in scenarios where serial innovators apply for Agile Innovation Fund grants)

5. Furthermore, we would suggest that efforts are continued to simplify the application process to encourage greater up-take among less-experienced firms. It is clear that firms expect a learning curve in applying for (and managing) public grants, but consultation

revealed that some Development Advisors believe that application systems could be improved, including the online system

6. Consultation with firms revealed a high degree of connectedness and trust in Development Advisors, who were the most-commonly reported route to finding out about and applying for support through the RD&I Programme. In order to further broaden the base of firms accessing the Programme, more active communication about the Programme and its benefits could be instrumented via Development Advisors

**Future monitoring and evaluation**

7. Like the expected learning curve in applying to public grants (see above), consulted firms also largely reported an expectation to participate in monitoring activities as part of accessing public money. Many found this to be manageable once learned, though some found difficulties in fulfilling the requirements to complete project timesheets in addition to their own systems (leading to duplication), while others found the requirement for an external audit of claims to be financially challenging. Some consideration could be given to simplifying these requirements in some cases

8. Linked to the second recommendation, above, we believe that there is merit in seeking to further understand the link between RD&I and productivity across sectors within the economy. This research project would ideally feed into the ways in which data are collected through applications and monitoring, as well as broader on-going data collection exercises. We would also recommend further monitoring with sensitivity at the sectoral level, in order to better assess impact across the programme in future

9. Finally, in order to gain a better view of the effects of the RD&I Programme on firm productivity, we recommend that this evaluation exercise is repeated in two or three years. This would enable the evaluation to examine data across a larger time period, ideally seven or nine years after grant award, which literature suggests is a more appropriate window to observe productivity effects for such activities. The repeated evaluation would also be in a position to take in additional monitoring at the sectoral level, as set out in the preceding bullet point

# Appendix A    Additional statistical data

## A.1    Composition analysis: Direct financial supports

*Figure 41  Average EI RD&I direct financial supports per each grants, 2007-2018*
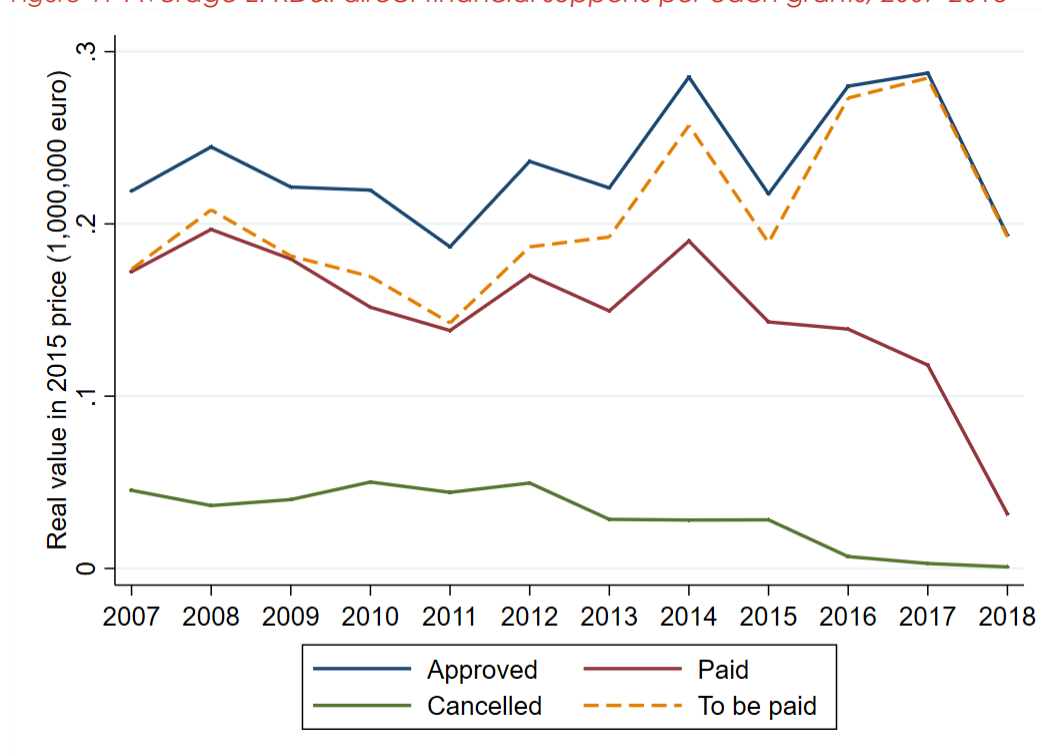


*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.
Note: Figures are in constant 2015 prices in 1,000,000 euros.

*Table 15  Number of grants, number of awardees of EI RD&I direct financial supports, and total amount of approved and paid funds by year*

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # grants | 223 | 224 | 215 | 165 | 148 | 167 | 179 | 168 | 129 | 107 | 111 | 169 | **2,005** |
| # awardees | 134 | 143 | 176 | 124 | 128 | 148 | 142 | 132 | 105 | 92 | 91 | 147 | **1,562** |
| Value approved | 48.9 | 54.8 | 47.6 | 36.2 | 27.6 | 39.5 | 39.5 | 47.9 | 28.0 | 30.0 | 31.9 | 32.7 | **464.7** |
| Paid | 38.4 | 44.1 | 38.6 | 25.0 | 20.4 | 28.4 | 26.8 | 31.9 | 18.5 | 14.9 | 13.1 | 5.3 | **305.5** |
| (%) | 79% | 80% | 81% | 69% | 74% | 72% | 68% | 67% | 66% | 50% | 41% | 16% | **66%** |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland. Notes: Different projects of the same grant type and approved on the same date are aggregated to one grant. Approved and paid grants are in constant 2015 prices in million euros.

*Table 16  EI RD&I direct financial supports by equity or non-equity*

| | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Non-equity** | # grants | 211 | 215 | 201 | 155 | 138 | 153 | 175 | 167 | 129 | 103 | 97 | 154 |
| | # awardees | 127 | 135 | 163 | 115 | 118 | 135 | 140 | 131 | 105 | 88 | 78 | 134 |
| | Approved | 43.9 | 48.9 | 41.1 | 31.5 | 24.2 | 35.3 | 38.9 | 47.8 | 28.0 | 29.1 | 26.3 | 28.9 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Paid | 33.5 | 39.7 | 32.8 | 20.8 | 17.3 | 24.2 | 26.2 | 31.8 | 18.5 | 14.0 | 8.1 | 2.9 |
| **Equity** | # grants | 12 | 9 | 14 | 10 | 10 | 14 | 4 | 1 | | 4 | 14 | 15 |
| | # awardees | 12 | 9 | 13 | 10 | 10 | 14 | 4 | 1 | | 4 | 13 | 15 |
| | Approved | 4.9 | 5.9 | 6.5 | 4.7 | 3.4 | 4.2 | 0.6 | 0.2 | 0.0 | 0.9 | 5.6 | 3.8 |
| | Paid | 4.9 | 4.4 | 5.9 | 4.2 | 3.2 | 4.2 | 0.6 | 0.2 | 0.0 | 0.9 | 5.0 | 2.4 |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland. Note: Different projects of the same grants type and approved on the same date are aggregated to one grant. One awardee may get more than one grant that may belong to the same or different categories in a year. Approved and paid grants are in constant 2015 prices in 1,000,000 euros.

*Table 17  EI RD&I direct financial supports by package or standalone*

| | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Package** | # grants | 36 | 26 | 31 | 27 | 23 | 31 | 33 | 34 | 13 | 13 | 14 | 16 |
| | # awardees | 24 | 17 | 27 | 21 | 22 | 27 | 27 | 25 | 11 | 9 | 12 | 12 |
| | Approved | 12.2 | 14.1 | 16.2 | 9.8 | 7.4 | 17.0 | 12.0 | 24.9 | 7.9 | 11.3 | 5.9 | 5.2 |
| | Paid | 10.8 | 10.9 | 14.0 | 8.2 | 5.3 | 10.2 | 5.7 | 14.9 | 2.4 | 2.9 | 0.8 | 0.0 |
| **Standalone** | # grants | 187 | 198 | 184 | 138 | 125 | 136 | 146 | 134 | 116 | 94 | 97 | 153 |
| | # awardees | 113 | 126 | 149 | 104 | 106 | 121 | 117 | 107 | 94 | 83 | 79 | 136 |
| | Approved | 36.7 | 40.7 | 31.4 | 26.5 | 20.2 | 22.5 | 27.6 | 23.0 | 20.1 | 18.7 | 26.1 | 27.5 |
| | Paid | 27.6 | 33.2 | 24.6 | 16.8 | 15.2 | 18.2 | 21.0 | 17.1 | 16.1 | 12.0 | 12.3 | 5.3 |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland. Note: Different projects of the same grants type and approved on the same date are aggregated to one grants. One awardee may get more than one grants that may belong to the same or different categories in a year. Approved and paid grants are in constant 2015 prices in 1,000,000 euros.

*Table 18  EI RD&I direct financial supports by offer bundle (main offer bundles)*

| Offer bundle | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Company Expansions** | # grants | 36 | 26 | 26 | 26 | 21 | 30 | 32 | 5 | | | | |
| | # awardees | 24 | 17 | 23 | 20 | 20 | 26 | 26 | 4 | | | | |
| | Approved | 12.2 | 14.1 | 14.3 | 9.0 | 6.8 | 16.9 | 11.8 | 2.4 | | | | |
| | Paid | 10.8 | 10.9 | 12.2 | 7.7 | 4.7 | 10.1 | 5.5 | 2.1 | | | | |
| **R&D Fund** | # grants | | 119 | 170 | 136 | 116 | 129 | 146 | 134 | 102 | 79 | 91 | 84 |
| | # awardees | | 70 | 136 | 102 | 97 | 114 | 117 | 107 | 82 | 69 | 75 | 71 |
| | Approved | | 25.4 | 31.0 | 26.5 | 20.0 | 22.0 | 27.6 | 23.0 | 18.4 | 16.7 | 25.2 | 22.6 |
| | Paid | | 20.3 | 24.4 | 16.7 | 15.0 | 17.7 | 21.0 | 17.1 | 14.8 | 10.6 | 11.8 | 4.1 |
| **R & D Stimulation** | # grants | | 16 | 13 | 2 | 9 | 4 | | | | | | |
| | # awardees | | 16 | 13 | 2 | 9 | 4 | | | | | | |
| | Approved | | 0.5 | 0.3 | 0.0 | 0.2 | 0.1 | | | | | | |
| | Paid | | 0.3 | 0.2 | 0.0 | 0.1 | 0.1 | | | | | | |
| **Scaling including R&D** | # grants | | 5 | 1 | 2 | 1 | 1 | | | | | | |
| | # awardees | | 4 | 1 | 2 | 1 | 1 | | | | | | |
| | Approved | | 2.0 | 0.8 | 0.7 | 0.1 | 0.2 | | | | | | |
| | Paid | | 1.8 | 0.5 | 0.6 | 0.1 | 0.2 | | | | | | |
| | # grants | | | | | | | | 28 | 13 | 13 | 14 | 16 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Company Development** | # awardees | | 20 | 11 | 9 | 12 | 12 |
| | Approved | | 21.3 | 7.9 | 11.3 | 5.9 | 5.2 |
| | Paid | | 12.8 | 2.4 | 2.9 | 0.8 | 0.0 |
| **Business Innovation Initiative** | # grants | | | 14 | 15 | 6 | 1 |
| | # awardees | | | 14 | 15 | 6 | 1 |
| | Approved | | | 1.7 | 2.0 | 0.8 | 0.1 |
| | Paid | | | 1.3 | 1.4 | 0.5 | 0.1 |
| **Strategic R&D** | # grants | 20 | 10 | 1 | | | |
| | # awardees | 13 | 4 | 1 | | | |
| | Approved | 14.9 | 8.4 | 0.1 | | | |
| | Paid | 11.0 | 7.3 | 0.1 | | | |
| **RTI Fund** | # grants | 163 | 53 | | | | |
| | # awardees | 96 | 37 | | | | |
| | Approved | 21.7 | 6.4 | | | | |
| | Paid | 16.6 | 5.3 | | | | |

*Source:* ESRI elaboration based on the data provided by Enterprise Ireland.
Notes: Different projects of the same grants type and approved on the same date are aggregated to one grants. One awardee may get more than one grants that may belong to the same or different categories in a year. Approved and paid grants are in constant 2015 prices in million euros.

*Table 19   EI RD&I direct financial supports by offer bundle (additional offer bundles)*

| Offer bundle name | Small Industry (Pre 2005) GSS | Market Research for SMEs (Pre 2005) GSS | Sustaining Jobs Equity Fund | Scaling Projects | Agile Innovation | Exploring Innovation | Operational Excellence | IP Strategy |
|---|---|---|---|---|---|---|---|---|
| **Year** | 2007 | 2007 | 2012 | 2014 | 2018 | 2018 | 2018 | 2018 |
| **# grants** | 3 | 1 | 3 | 1 | 39 | 16 | 4 | 9 |
| **# awardees** | 3 | 1 | 3 | 1 | 39 | 16 | 4 | 8 |
| **Approved** | 0.1 | 0.0 | 0.4 | 1.2 | 3.3 | 0.6 | 0.6 | 0.2 |
| **Paid** | 0.0 | 0.0 | 0.4 | 0.0 | 0.9 | 0.1 | 0.0 | 0.0 |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.
Notes: Different projects of the same grants type and approved on the same date are aggregated to one grants. One awardee may get more than one grants that may belong to the same or different categories in a year. Approved and paid grants are in constant 2015 prices in 1,000,000 euros.

Table 20  EI RD&I direct financial supports by grants type

| Grants type | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **R&D Facility** | # grants | 81 | 75 | 31 | 37 | 19 | 15 | 31 | 33 | 21 | 13 | 14 | 15 |
| | # awardees | 81 | 73 | 31 | 37 | 19 | 15 | 31 | 32 | 21 | 13 | 14 | 15 |
| | Approved | 4.2 | 4.7 | 0.9 | 0.7 | 0.5 | 0.2 | 1.3 | 3.0 | 0.4 | 0.4 | 0.8 | 0.4 |
| | Paid | 2.0 | 2.7 | 0.6 | 0.3 | 0.2 | 0.0 | 0.5 | 2.4 | 0.1 | 0.0 | 0.0 | 0.0 |
| **R&D Revenue** | # grants | 123 | 123 | 152 | 113 | 110 | 133 | 141 | 131 | 107 | 90 | 82 | 113 |
| | # awardees | 122 | 118 | 150 | 112 | 109 | 131 | 140 | 130 | 105 | 88 | 78 | 112 |
| | Approved | 39.4 | 43.7 | 39.7 | 30.7 | 23.6 | 34.9 | 37.6 | 44.6 | 27.6 | 28.6 | 25.4 | 27.6 |
| | Paid | 31.3 | 36.7 | 31.9 | 20.4 | 16.9 | 24.1 | 25.6 | 29.3 | 18.3 | 14.0 | 8.1 | 2.8 |
| **Preference Equity** | # grants | 11 | 9 | 8 | 9 | 10 | 12 | 4 | 1 | | 2 | 10 | 11 |
| | # awardees | 11 | 9 | 8 | 9 | 10 | 12 | 4 | 1 | | 2 | 10 | 11 |
| | Approved | 4.7 | 5.9 | 3.3 | 4.5 | 3.4 | 3.4 | 0.6 | 0.2 | | 0.3 | 3.8 | 3.0 |
| | Paid | 4.7 | 4.4 | 2.7 | 4.0 | 3.2 | 3.4 | 0.6 | 0.2 | | 0.3 | 3.2 | 2.3 |
| **Ordinary Equity** | # grants | 1 | | 6 | 1 | | 2 | | | | 2 | 4 | 4 |
| | # awardees | 1 | | 6 | 1 | | 2 | | | | 2 | 4 | 4 |
| | Approved | 0.2 | | 3.2 | 0.2 | | 0.8 | | | | 0.6 | 1.8 | 0.8 |
| | Paid | 0.2 | | 3.2 | 0.2 | | 0.8 | | | | 0.6 | 1.8 | 0.2 |
| **Feasibility** | # grants | | 16 | 13 | 2 | 9 | 4 | | | | | | 16 |
| | # awardees | | 16 | 13 | 2 | 9 | 4 | | | | | | 16 |
| | Approved | | 0.5 | 0.3 | 0.0 | 0.2 | 0.1 | | | | | | 0.6 |
| | Paid | | 0.3 | 0.2 | 0.0 | 0.1 | 0.1 | | | | | | 0.1 |
| **Key Manager** | # grants | | | | | | 1 | 2 | 2 | 1 | | 1 | 1 |
| | # awardees | | | | | | 1 | 3 | 3 | 1 | | 1 | 1 |
| | Approved | | | | | | 0.0 | 0.1 | 0.1 | 0.0 | | 0.0 | 0.0 |
| | Paid | | | | | | 0.0 | 0.0 | 0.1 | 0.0 | | 0.0 | 0.0 |
| **Capital** | # grants | | 1 | 5 | 3 | | | 1 | | | | | |
| | # awardees | | 1 | 5 | 3 | | | 1 | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Approved | | 0.0 | 0.2 | 0.0 | 0.1 | |
| | Paid | | 0.0 | 0.1 | 0.0 | 0.0 | |
| **[Grants type not known]** | # grants | 7 | | | | 1 | 9 |
| | # awardees | 7 | | | | 1 | 8 |
| | Approved | 0.3 | | | | 0.0 | 0.2 |
| | Paid | 0.2 | | | | 0.0 | 0.0 |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.

Notes: Different projects of the same grants type and approved on the same date are aggregated to one grants. One awardee may get more than one grants that may belong to the same or different categories in a year. Approved and paid grants are in constant 2015 prices in 1,000,000 euros.

The table below shows the number of awardees as well as approved and paid EI RD&I financial supports by sector. This analysis uses the sector classification provided by the DBEI.

*Table 21   Awardees of EI RD&I direct financial supports by sector*

| Sector | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Food, Drink and Primary Production** | # grants | 46 | 19 | 29 | 25 | 16 | 36 | 31 | 38 | 20 | 22 | 22 | 26 |
| | # awardees | 26 | 13 | 25 | 18 | 14 | 31 | 24 | 27 | 18 | 17 | 16 | 23 |
| | Approved | 13.8 | 6.7 | 8.6 | 4.3 | 1.8 | 12.2 | 11.9 | 16.3 | 6.5 | 11.3 | 5.5 | 5.2 |
| | Paid | 9.0 | 5.4 | 7.2 | 3.2 | 1.1 | 4.4 | 5.6 | 10.3 | 3.6 | 2.9 | 2.0 | 0.2 |
| **Traditional Manufacturing** | # grants | 69 | 73 | 74 | 37 | 55 | 44 | 58 | 49 | 36 | 22 | 38 | 43 |
| | # awardees | 45 | 49 | 57 | 31 | 49 | 38 | 41 | 40 | 28 | 19 | 33 | 35 |
| | Approved | 12.2 | 13.5 | 12.5 | 6.1 | 8.5 | 8.2 | 10.3 | 8.6 | 6.5 | 3.0 | 11.1 | 9.0 |
| | Paid | 10.2 | 10.0 | 9.2 | 5.0 | 6.7 | 6.8 | 8.6 | 6.7 | 5.0 | 1.4 | 3.1 | 0.5 |
| **Chemicals and pharmaceuticals** | # grants | 8 | 15 | 12 | 7 | 7 | 5 | 4 | 11 | 5 | 3 | 1 | 5 |
| | # awardees | 4 | 8 | 9 | 6 | 7 | 5 | 2 | 8 | 4 | 3 | 1 | 4 |
| | Approved | 0.4 | 2.1 | 2.5 | 1.4 | 1.8 | 1.6 | 0.2 | 3.7 | 0.7 | 0.3 | 0.2 | 1.0 |
| | Paid | 0.2 | 1.3 | 1.4 | 0.6 | 1.1 | 1.4 | 0.2 | 2.0 | 0.4 | 0.0 | 0.2 | 0.4 |
| **Computer, electronic and optical** | # grants | 15 | 6 | 10 | 20 | 9 | 10 | 11 | 7 | 7 | 8 | 5 | 11 |
| | # awardees | 9 | 4 | 8 | 12 | 8 | 8 | 10 | 5 | 5 | 8 | 4 | 8 |
| | Approved | 2.9 | 1.7 | 4.0 | 3.2 | 2.3 | 2.5 | 3.1 | 0.8 | 1.5 | 2.5 | 3.1 | 2.7 |
| | Paid | 1.9 | 1.4 | 3.3 | 1.5 | 1.5 | 2.3 | 1.6 | 0.6 | 0.9 | 2.3 | 0.4 | 0.5 |
| **Med Devices** | # grants | | 2 | 2 | 3 | 3 | 2 | 1 | 1 | | 2 | | 3 |
| | # awardees | | 1 | 2 | 2 | 2 | 2 | 1 | 1 | | 1 | | 2 |
| | Approved | | 0.2 | 0.5 | 0.5 | 0.6 | 0.1 | 0.1 | 0.2 | | 0.8 | | 0.2 |
| | Paid | | 0.2 | 0.5 | 0.3 | 0.2 | 0.0 | 0.0 | 0.2 | | 0.0 | | 0.0 |
| **Energy, Water, Waste** | # grants | 4 | 5 | 4 | 3 | 5 | 5 | 6 | 8 | 1 | 3 | 2 | 4 |
| | # awardees | 2 | 3 | 3 | 2 | 4 | 4 | 4 | 4 | 1 | 2 | 2 | 3 |
| | Approved | 0.6 | 0.9 | 0.7 | 0.3 | 0.5 | 0.5 | 0.7 | 0.8 | 0.1 | 0.2 | 0.2 | 0.4 |
| | Paid | 0.6 | 0.7 | 0.6 | 0.2 | 0.1 | 0.5 | 0.5 | 0.4 | 0.1 | 0.1 | 0.1 | 0.0 |
| **Construction** | # grants | 2 | 1 | 5 | | 2 | 1 | | 1 | | | 1 | 2 |
| | # awardees | 1 | 1 | 4 | | 1 | 1 | | 1 | | | 1 | 2 |
| | Approved | 0.3 | 0.4 | 0.8 | | 0.4 | 0.2 | | 0.1 | | | 0.2 | 0.2 |
| | Paid | 0.3 | 0.4 | 0.4 | | 0.4 | 0.2 | | 0.1 | | | 0.1 | 0.0 |
| **Information and Communication and other internationally Traded Services** | # grants | 74 | 63 | 66 | 45 | 30 | 48 | 48 | 33 | 45 | 37 | 35 | 47 |
| | # awardees | 44 | 40 | 55 | 34 | 25 | 44 | 44 | 28 | 36 | 34 | 28 | 45 |
| | Approved | 18.1 | 20.9 | 15.3 | 11.7 | 7.2 | 10.2 | 9.6 | 8.7 | 10.5 | 9.8 | 8.7 | 9.7 |
| | Paid | 16.1 | 17.8 | 14.1 | 8.1 | 6.2 | 9.5 | 8.1 | 6.1 | 6.6 | 7.7 | 5.7 | 2.5 |
| **Business, Financial and Other Services** | # grants | 5 | 37 | 12 | 25 | 18 | 12 | 19 | 19 | 13 | 10 | 7 | 28 |
| | # awardees | 3 | 22 | 12 | 19 | 15 | 11 | 15 | 17 | 11 | 8 | 6 | 25 |
| | Approved | 0.4 | 7.3 | 2.8 | 8.7 | 3.7 | 2.5 | 3.4 | 8.5 | 1.9 | 2.0 | 2.8 | 4.3 |
| | Paid | 0.1 | 5.8 | 2.0 | 6.1 | 2.4 | 2.0 | 2.2 | 5.4 | 1.6 | 0.5 | 1.6 | 1.2 |
| **Semi-conductors** | # grants | | 3 | 1 | | 3 | 4 | 1 | 1 | 2 | | | |
| | # awardees | | 2 | 1 | | 3 | 4 | 1 | 1 | 2 | | | |

| | 1.2 | 0.0 | | 0.8 | 1.4 | 0.2 | 0.2 | 0.3 |
|---|---|---|---|---|---|---|---|---|
| Approved | 1.2 | 0.0 | | 0.8 | 1.4 | 0.2 | 0.2 | 0.3 |
| Paid | 1.0 | 0.0 | | 0.7 | 1.4 | 0.1 | 0.1 | 0.2 |

*Source*: ESRI elaboration based on the RD&I data provided by Enterprise Ireland. Notes: Different projects of the same grant type and approved on the same date are aggregated to one grant. One awardee may get more than one grant that may belong to the same or different categories in a year. Approved and paid grants are in constant 2015 prices in million euros.

*Table 22   Awardees of EI RD&I direct financial supports by sector (additional sub-sectors)*

| Sub-sector | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Architectural consultants** | # grants | | 2 | | 2 | | | | 2 | | | | |
| | # awardees | | 1 | | 1 | | | | 1 | | | | |
| | Approved | | 0.3 | | 0.3 | | | | 0.3 | | | | |
| | Paid | | 0.3 | | 0.3 | | | | 0.3 | | | | |
| **Engineering - project management** | # grants | 3 | 1 | 1 | 1 | 5 | 1 | 1 | 1 | | 1 | | 5 |
| | # awardees | 2 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | | 1 | | 3 |
| | Approved | 0.1 | 0.0 | 0.3 | 0.1 | 0.6 | 0.1 | 0.2 | 0.1 | | 0.1 | | 0.9 |
| | Paid | 0.1 | 0.0 | 0.0 | 0.0 | 0.2 | 0.1 | 0.2 | 0.1 | | 0.0 | | 0.0 |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland. Note: Different projects of the same grant type and approved on the same date are aggregated to one grant. One awardee may get more than one grant that may belong to the same or different categories in a year. Approved and paid grants are in constant 2015 prices in million euros.

Table 16 below compares the distributions of the numbers of awardees and of EI clients by sector and by year. A few sizeable differences between the two distributions stand out. Relative to the sectoral profile of EI clients, a few sectors appear to be over-represented in the distribution of the number of awardees: the Food, Drink and Primary Production sector by 10.2 percentage points in 2012; the Information and Communication and other Internationally Traded Services sector by 13.7 percentage points, 14.0 percentage points and 10.6 percentage points in 2007, 2009, and 2010, respectively; the Traditional Manufacturing sector by 9.4 percentage points in 2017. The Business, Financial and Other Services sector was under-represented in the total number of awardees by 11.4 percentage points, 11.7 percentage points and 12.4 percentage points in 2009, 2012, and 2016 respectively. The Traditional Manufacturing sector was under-represented by 10.7 percentage points in 2010.

*Table 23  The distributions of the numbers of awardees and of EI clients  by sector, 2007-2018*

| Sector | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Food, Drink and Primary Production | Awardees | 18.0% | 9.8% | 16.4% | 13.5% | 11.1% | 22.4% | 18.2% | 16.8% | 16.1% | 16.9% | 16.0% | 17.8% |
| | EI clients | 16.4% | 14.7% | 13.7% | 13.0% | 12.6% | 12.2% | 12.7% | 13.2% | 12.6% | 12.3% | 12.6% | 12.6% |
| | Difference | 1.6 | -4.9 | 2.7 | 0.5 | -1.5 | 10.2 | 5.4 | 3.6 | 3.5 | 4.6 | 3.5 | 5.2 |
| Traditional Manufacturing | Awardees | 38.2% | 33.3% | 29.9% | 22.5% | 37.4% | 25.9% | 27.3% | 32.7% | 28.0% | 23.4% | 37.0% | 23.7% |
| | EI clients | 39.8% | 37.2% | 34.6% | 33.1% | 32.0% | 31.9% | 30.5% | 28.3% | 29.2% | 28.0% | 27.6% | 27.8% |
| | Difference | -1.6 | -3.8 | -4.8 | -10.7 | 5.4 | -6.0 | -3.2 | 4.4 | -1.2 | -4.7 | 9.4 | -4.1 |
| Chemicals and Pharmaceuticals | Awardees | 2.2% | 6.9% | 4.5% | 4.5% | 6.1% | 4.3% | 1.7% | 7.1% | 4.3% | 3.9% | 1.2% | 3.4% |
| | EI clients | 3.0% | 2.8% | 2.7% | 2.6% | 2.9% | 2.9% | 2.7% | 2.9% | 2.9% | 2.6% | 2.6% | 2.6% |
| | Difference | -0.7 | 4.1 | 1.8 | 1.9 | 3.2 | 1.4 | -1.0 | 4.2 | 1.4 | 1.3 | -1.3 | 0.7 |
| Computer, Electronic and Optical Products | Awardees | 3.4% | 2.9% | 3.7% | 7.9% | 6.1% | 6.9% | 6.6% | 4.4% | 4.3% | 9.1% | 4.9% | 5.9% |
| | EI clients | 3.4% | 3.2% | 3.5% | 3.6% | 3.4% | 3.2% | 3.0% | 2.9% | 2.9% | 2.7% | 2.5% | 2.6% |
| | Difference | 0.0 | -0.3 | 0.2 | 4.3 | 2.6 | 3.7 | 3.6 | 1.5 | 1.4 | 6.4 | 2.4 | 3.4 |
| Medical Devices | Awardees | 0.0% | 1.0% | 0.7% | 2.2% | 2.0% | 0.9% | 0.8% | 0.9% | 0.0% | 1.3% | 0.0% | 1.7% |
| | EI clients | 0.3% | 0.4% | 0.4% | 0.5% | 0.4% | 0.5% | 0.6% | 0.7% | 0.8% | 0.8% | 0.9% | 0.9% |
| | Difference | -0.3 | 0.6 | 0.3 | 1.8 | 1.6 | 0.4 | 0.3 | 0.2 | -0.8 | 0.5 | -0.9 | 0.8 |
| Energy, Water, Waste | Awardees | 0.0% | 1.0% | 1.5% | 2.2% | 2.0% | 0.9% | 3.3% | 3.5% | 1.1% | 1.3% | 1.2% | 1.7% |
| | EI clients | 1.3% | 2.6% | 3.2% | 3.1% | 3.3% | 3.2% | 2.9% | 3.4% | 3.6% | 3.7% | 3.6% | 3.6% |
| | Difference | -1.3 | -1.6 | -1.7 | -0.8 | -1.3 | -2.3 | 0.4 | 0.1 | -2.5 | -2.4 | -2.4 | -1.9 |
| Construction | Awardees | 0.0% | 0.0% | 1.5% | 0.0% | 1.0% | 0.9% | 0.0% | 0.9% | 0.0% | 0.0% | 1.2% | 1.7% |
| | EI clients | 1.7% | 1.9% | 2.1% | 2.0% | 1.8% | 1.9% | 1.8% | 1.7% | 1.8% | 2.1% | 2.1% | 2.1% |
| | Difference | -1.7 | -1.9 | -0.6 | -2.0 | -0.8 | -1.1 | -1.8 | -0.8 | -1.8 | -2.1 | -0.8 | -0.4 |
| Information and Communication and other Internationally Traded Services | Awardees | 36.0% | 25.5% | 35.8% | 33.7% | 23.2% | 28.4% | 30.6% | 21.2% | 35.5% | 37.7% | 30.9% | 30.5% |
| | EI clients | 22.2% | 21.4% | 21.8% | 23.1% | 24.6% | 25.6% | 26.3% | 27.4% | 27.2% | 28.2% | 29.4% | 29.0% |
| | Difference | 13.7 | 4.1 | 14.0 | 10.6 | -1.4 | 2.9 | 4.3 | -6.2 | 8.3 | 9.4 | 1.4 | 1.5 |
| Business, Financial and Other Services | Awardees | 2.2% | 17.6% | 6.0% | 13.5% | 8.1% | 6.0% | 10.7% | 11.5% | 9.7% | 6.5% | 7.4% | 13.6% |
| | EI clients | 11.3% | 15.4% | 17.3% | 18.3% | 18.1% | 17.8% | 18.8% | 18.7% | 18.3% | 18.9% | 18.2% | 18.3% |
| | Difference | -9.0 | 2.3 | -11.4 | -4.9 | -10.1 | -11.7 | -8.1 | -7.2 | -8.6 | -12.4 | -10.7 | -4.7 |

| Semi-conductors | Awardees | 0.0% | 2.0% | 0.0% | 0.0% | 3.0% | 3.4% | 0.8% | 0.9% | 1.1% | 0.0% | 0.0% | 0.0% |
| | EI clients | 0.6% | 0.6% | 0.6% | 0.7% | 0.8% | 0.9% | 0.6% | 0.7% | 0.7% | 0.6% | 0.5% | 0.6% |
| | Difference | -0.6 | 1.4 | -0.6 | -0.7 | 2.2 | 2.6 | 0.2 | 0.2 | 0.4 | -0.6 | -0.5 | -0.6 |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.

The table below summarises information on the EI RD&I direct financial supports by region. This analysis uses the region classification provided by Enterprise Ireland.

*Table 24  Awardees of EI RD&I direct financial supports by region (EI classification)*

| | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dublin** | # grants | 61 | 77 | 75 | 73 | 50 | 56 | 57 | 43 | 49 | 33 | 40 | 61 |
| | # awardees | 37 | 48 | 60 | 53 | 43 | 52 | 51 | 38 | 39 | 30 | 32 | 58 |
| | Approved | 17.2 | 25.9 | 16.7 | 15.9 | 10.4 | 12.5 | 10.8 | 15.0 | 10.6 | 8.4 | 11.3 | 12.4 |
| | Paid | 14.5 | 21.2 | 15.3 | 10.1 | 8.2 | 11.8 | 9.1 | 9.7 | 6.6 | 6.2 | 6.3 | 3.4 |
| **Mid-West** | # grants | 35 | 23 | 23 | 17 | 9 | 14 | 22 | 18 | 14 | 8 | 12 | 17 |
| | # awardees | 22 | 15 | 18 | 12 | 8 | 14 | 16 | 14 | 11 | 7 | 11 | 15 |
| | Approved | 3.9 | 7.1 | 8.4 | 2.1 | 1.0 | 8.9 | 4.9 | 5.9 | 2.4 | 6.5 | 2.3 | 3.4 |
| | Paid | 3.4 | 4.8 | 7.0 | 1.8 | 0.8 | 3.3 | 3.2 | 5.2 | 1.8 | 2.2 | 0.4 | 0.1 |
| **Midlands /Mid-East** | # grants | 25 | 34 | 24 | 20 | 27 | 35 | 21 | 32 | 22 | 15 | 11 | 32 |
| | # awardees | 18 | 22 | 20 | 16 | 23 | 30 | 16 | 26 | 17 | 12 | 10 | 24 |
| | Approved | 5.7 | 5.0 | 5.1 | 6.9 | 3.7 | 4.6 | 4.7 | 12.1 | 6.2 | 5.7 | 2.0 | 5.9 |
| | Paid | 4.0 | 4.4 | 4.1 | 3.9 | 2.4 | 3.3 | 3.8 | 6.3 | 3.2 | 2.7 | 1.0 | 0.4 |
| **North East /North West** | # grants | 27 | 14 | 24 | 14 | 18 | 19 | 31 | 31 | 15 | 15 | 16 | 24 |
| | # awardees | 16 | 10 | 19 | 12 | 16 | 16 | 25 | 21 | 13 | 13 | 14 | 18 |
| | Approved | 2.9 | 2.5 | 4.7 | 1.8 | 3.5 | 3.8 | 8.3 | 6.1 | 2.5 | 3.0 | 6.3 | 5.8 |
| | Paid | 2.2 | 1.7 | 3.5 | 1.2 | 2.2 | 2.6 | 4.4 | 4.9 | 1.9 | 0.8 | 2.8 | 0.3 |
| **South /South East** | # grants | 57 | 60 | 47 | 31 | 32 | 34 | 35 | 30 | 20 | 28 | 23 | 24 |
| | # awardees | 30 | 37 | 40 | 23 | 27 | 28 | 25 | 22 | 17 | 23 | 16 | 22 |
| | Approved | 15.7 | 11.9 | 8.4 | 5.4 | 6.8 | 6.7 | 7.2 | 6.4 | 4.3 | 5.3 | 7.7 | 3.7 |
| | Paid | 11.1 | 10.1 | 6.3 | 4.5 | 5.3 | 4.9 | 4.5 | 4.3 | 3.3 | 2.3 | 1.6 | 0.9 |
| **West** | # grants | 18 | 16 | 22 | 10 | 11 | 9 | 13 | 13 | 9 | 8 | 8 | 10 |
| | # awardees | 11 | 11 | 19 | 8 | 10 | 8 | 9 | 10 | 8 | 7 | 7 | 9 |
| | Approved | 3.4 | 2.4 | 4.3 | 4.0 | 1.9 | 2.9 | 3.6 | 2.5 | 2.0 | 1.1 | 1.9 | 1.4 |
| | Paid | 3.1 | 1.8 | 2.4 | 3.5 | 1.3 | 2.4 | 1.8 | 1.6 | 1.7 | 0.6 | 0.6 | 0.1 |
| **Overseas** | # grants | | | | | 1 | | | 1 | | | 1 | 1 |
| | # awardees | | | | | 1 | | | 1 | | | 1 | 1 |
| | Approved | | | | | 0.3 | | | 0.1 | | | 0.5 | 0.1 |
| | Paid | | | | | 0.2 | | | 0.0 | | | 0.5 | 0.1 |

*Source*: ESRI elaboration based on the RD&I data provided by Enterprise Ireland. Note: Different projects of the same grant type and approved on the same date are aggregated to one grant. One awardee may get more than one grant that may belong to the same or different categories in a year. Approved and paid grants are in constant 2015 prices in 1,000,000 euros.

Table 18 below compares the distributions of the numbers of awardees and of EI clients by region and by year. There are only a few sizeable differences between the two distributions. Relative to the profile of the EI clients, the share of the Border region in the number of awardees was lower by 5 percentage points in 2008 and higher by 9 and 7 percentage points in 2013 and 2014, respectively.  The share of the Dublin region in the number of awardees was lower by 11 and 8 percentage points in 2014 and 2016, respectively.  The share of the Mid-West region in the number of awardees was lower by 7 percentage points in 2011.

*Table 25  The distributions of the numbers of awardees and of EI clients  by region, 2007-2018*

| Region | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Border | Awardees | 12.4% | 6.9% | 11.2% | 7.9% | 14.1% | 13.8% | 19.0% | 17.7% | 14.0% | 10.4% | 13.6% | 10.2% |
| | EI clients | 12.6% | 12.0% | 11.7% | 11.5% | 11.4% | 10.7% | 10.5% | 10.5% | 10.8% | 10.6% | 10.5% | 10.6% |
| | Difference | -0.2 | -5.2 | -0.5 | -3.6 | 2.8 | 3.1 | 8.5 | 7.2 | 3.2 | -0.3 | 3.1 | -0.4 |
| Dublin | Awardees | 28.1% | 34.3% | 37.3% | 44.9% | 34.3% | 31.0% | 35.5% | 28.3% | 37.6% | 32.5% | 37.0% | 39.8% |
| | EI clients | 33.6% | 36.0% | 37.3% | 38.6% | 38.8% | 38.3% | 38.4% | 39.1% | 39.4% | 40.5% | 40.3% | 40.2% |
| | Difference | -5.5 | -1.7 | 0.0 | 6.3 | -4.5 | -7.2 | -2.9 | -10.7 | -1.8 | -8.0 | -3.3 | -0.4 |
| Mid-East | Awardees | 9.0% | 8.8% | 6.0% | 10.1% | 9.1% | 15.5% | 7.4% | 14.2% | 10.8% | 7.8% | 4.9% | 11.0% |
| | EI clients | 8.8% | 8.4% | 8.2% | 8.1% | 7.6% | 8.3% | 8.8% | 8.7% | 9.1% | 8.8% | 8.9% | 8.8% |
| | Difference | 0.2 | 0.4 | -2.3 | 2.1 | 1.5 | 7.2 | -1.4 | 5.5 | 1.7 | -1.0 | -4.0 | 2.2 |
| Mid-West | Awardees | 10.1% | 4.9% | 9.7% | 5.6% | 2.0% | 8.6% | 9.1% | 8.8% | 6.5% | 7.8% | 11.1% | 7.6% |
| | EI clients | 9.7% | 9.0% | 8.6% | 8.8% | 9.0% | 8.7% | 8.1% | 7.7% | 7.5% | 7.8% | 7.9% | 7.8% |
| | Difference | 0.4 | -4.1 | 1.1 | -3.1 | -7.0 | -0.1 | 1.0 | 1.2 | -1.0 | 0.0 | 3.2 | -0.2 |
| Midlands | Awardees | 7.9% | 7.8% | 3.7% | 4.5% | 5.1% | 3.4% | 4.1% | 3.5% | 5.4% | 5.2% | 7.4% | 5.9% |
| | EI clients | 5.3% | 5.1% | 4.7% | 4.5% | 4.5% | 4.8% | 4.8% | 5.1% | 5.2% | 4.9% | 5.0% | 5.0% |
| | Difference | 2.5 | 2.8 | -1.0 | 0.0 | 0.5 | -1.4 | -0.7 | -1.6 | 0.2 | 0.3 | 2.5 | 0.9 |
| South-East | Awardees | 9.0% | 10.8% | 6.7% | 7.9% | 8.1% | 8.6% | 7.4% | 5.3% | 4.3% | 11.7% | 8.6% | 5.1% |
| | EI clients | 9.5% | 9.2% | 9.1% | 8.6% | 8.2% | 8.7% | 8.7% | 8.4% | 7.8% | 7.7% | 7.8% | 7.8% |
| | Difference | -0.5 | 1.6 | -2.4 | -0.7 | -0.1 | 0.0 | -1.3 | -3.1 | -3.5 | 4.0 | 0.9 | -2.8 |
| South-West | Awardees | 15.7% | 16.7% | 15.7% | 12.4% | 17.2% | 13.8% | 10.7% | 14.2% | 15.1% | 16.9% | 11.1% | 13.6% |
| | EI clients | 13.3% | 12.8% | 12.6% | 12.2% | 12.9% | 13.2% | 13.2% | 13.1% | 12.9% | 12.6% | 12.7% | 12.6% |
| | Difference | 2.4 | 3.9 | 3.1 | 0.2 | 4.3 | 0.6 | -2.4 | 1.1 | 2.1 | 4.3 | -1.5 | 0.9 |
| West | Awardees | 7.9% | 9.8% | 9.7% | 6.7% | 10.1% | 5.2% | 6.6% | 8.0% | 6.5% | 7.8% | 6.2% | 6.8% |
| | EI clients | 7.2% | 7.5% | 7.7% | 7.9% | 7.7% | 7.3% | 7.5% | 7.5% | 7.3% | 7.1% | 7.0% | 7.1% |

| Differenc e | 0.7 | 2.3 | 2.0 | -1.1 | 2.4 | -2.2 | -0.9 | 0.4 | -0.8 | 0.7 | -0.8 | -0.3 |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.

As shown in Table 26, the uptake of EI RD&I direct financial supports among Irish-owned EI client companies ranges from 6.8% in 2009 to 3.2% in 2016. The number of awardees has been the largest in 2009 (128) and the smallest in 2016 (78). In terms of the value of the approved awards, the largest amounts have been awarded in 2014 (42.2 million euros) and the smallest in 2015 (26.0 million euros).

*Table 26   Uptake of EI RD&I direct financial supports by ownership*

| | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Irish** | # awardees | 94 | 98 | 128 | 90 | 101 | 110 | 121 | 112 | 95 | 78 | 83 | 121 |
| | # EI clients (%) | 1642 | 1805 | 1896 | 1887 | 1961 | 2034 | 2243 | 2204 | 2264 | 2419 | 2308 | 2261 |
| | | 5.7% | 5.4% | 6.8% | 4.8% | 5.2% | 5.4% | 5.4% | 5.1% | 4.2% | 3.2% | 3.6% | 5.4% |
| | Approved | 31.6 | 33.5 | 36.9 | 23.1 | 23.8 | 35.0 | 32.2 | 42.2 | 26.0 | 26.6 | 29.1 | 29.4 |
| | Paid | 26.5 | 26.7 | 31.0 | 18.4 | 18.3 | 25.0 | 24.3 | 27.5 | 17.0 | 14.1 | 11.6 | 4.0 |
| **Non-Irish** | # awardees | 1 | 6 | 4 | 2 | 1 | 3 | 4 | 3 | 0 | 1 | 1 | 1 |
| | # EI clients (%) | 17 | 17 | 17 | 16 | 16 | 16 | 12 | 12 | 12 | 12 | 12 | 12 |
| | | 5.9% | 35.3% | 23.5% | 12.5% | 6.3% | 18.8% | 33.3% | 25.0% | 0.0% | 8.3% | 8.3% | 8.3% |
| | Approved | 0.1 | 4.0 | 4.7 | 1.3 | 0.4 | 0.9 | 4.4 | 2.6 | 0.0 | 0.5 | 0.5 | 0.2 |
| | Paid | 0.1 | 3.4 | 3.7 | 1.2 | 0.0 | 0.7 | 1.3 | 2.5 | 0.0 | 0.0 | 0.0 | 0.0 |

*Source*: ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same enterprise group. An awardee-group is classified as Irish if at least one awardee within the group is Irish-owned. Approved and paid grants are in constant 2015 prices in million euros.

Table 27 shows that the largest number of awardees are small-sized companies. However, in relative terms, the uptake rates of EI RD&I financial supports are the greatest for large companies followed by medium-sized companies. This pattern reflects the distribution of firms by size with small size companies being the most numerous. The uptake rate among EI client companies ranges in the case of small companies from 5.7% in 2009 to 2.8% in 2016; for medium sized companies from 9.3% in 2009 to 4.2% in 2016; and for large companies from 14.3% in 2009 to 5.3% in 2016.

*Table 27   Uptake of EI RD&I direct financial supports by size*

| | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Small** | # awardees | 55 | 62 | 82 | 58 | 64 | 72 | 77 | 64 | 55 | 47 | 46 | 69 |
| | # EI clients (%) | 1147 | 1293 | 1433 | 1408 | 1460 | 1502 | 1670 | 1591 | 1596 | 1707 | 1588 | 1479 |
| | | 4.8% | 4.8% | 5.7% | 4.1% | 4.4% | 4.8% | 4.6% | 4.0% | 3.4% | 2.8% | 2.9% | 4.7% |
| | Approved | 12.5 | 15.6 | 18.2 | 11.7 | 12.8 | 14.5 | 15.1 | 12.4 | 11.4 | 10.1 | 12.7 | 13.4 |
| | Paid | 10.4 | 12.7 | 16.5 | 9.8 | 10.3 | 13.1 | 12.7 | 10.5 | 9.0 | 8.2 | 8.3 | 3.2 |
| **Medium** | # awardees | 26 | 30 | 35 | 27 | 27 | 30 | 34 | 34 | 32 | 24 | 28 | 35 |
| | # EI clients (%) | 409 | 414 | 375 | 397 | 411 | 430 | 453 | 484 | 533 | 572 | 574 | 625 |
| | | 6.4% | 7.2% | 9.3% | 6.8% | 6.6% | 7.0% | 7.5% | 7.0% | 6.0% | 4.2% | 4.9% | 5.6% |
| | Approved | 11.1 | 11.9 | 11.9 | 8.8 | 7.9 | 8.4 | 9.8 | 8.7 | 9.4 | 6.1 | 10.8 | 8.1 |
| | Paid | 9.0 | 9.6 | 8.7 | 6.5 | 6.1 | 6.5 | 7.2 | 5.3 | 5.7 | 3.6 | 2.8 | 0.4 |
| **Large** | # awardees | 14 | 12 | 15 | 7 | 11 | 11 | 14 | 17 | 8 | 8 | 10 | 18 |
| | # EI clients (%) | 103 | 115 | 105 | 98 | 106 | 118 | 132 | 141 | 147 | 152 | 158 | 169 |
| | | 13.6% | 10.4% | 14.3% | 7.1% | 10.4% | 9.3% | 10.6% | 12.1% | 5.4% | 5.3% | 6.3% | 10.7% |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approved | 8.1 | 10.0 | 11.5 | 3.9 | 3.5 | 13.0 | 11.7 | 23.7 | 5.2 | 11.0 | 6.2 | 8.0 |
| Paid | 7.2 | 7.8 | 9.5 | 3.4 | 1.9 | 6.1 | 5.7 | 14.2 | 2.2 | 2.4 | 0.5 | 0.4 |

*Source*: ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same group. A "Small Enterprise" is defined as an enterprise that has fewer than 50 employees and has an annual turnover of less than €10m; a "Large Enterprise" is defined as an enterprise that has more than 249 employees or an annual turnover of more than €50m; The remainder are classified as "Medium-sized Enterprises". Approved and paid grants are in constant 2015 prices in million euros.

The uptake rates of EI RD&I direct financial supports are higher for companies with export activity. Among EI client companies, the uptake rates for exporters range from 8.1% in 2009 to 3.7% in 2016. In comparison, the highest uptake rate for companies serving only the Irish market was in 2008 (2.5%) and the lowest in 2018 (0.5%). No awards were made to this category of companies in 2012 and 2016.

*Table 28  Uptake of EI RD&I direct financial supports by export participation*

| | Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Exporter** | # awardees | 91 | 95 | 124 | 88 | 99 | 113 | 119 | 112 | 94 | 79 | 82 | 121 |
| | # EI clients (%) | 1340 | 1466 | 1536 | 1597 | 1687 | 1770 | 1921 | 1950 | 2008 | 2133 | 2053 | 2074 |
| | | 6.8% | 6.5% | 8.1% | 5.5% | 5.9% | 6.4% | 6.2% | 5.7% | 4.7% | 3.7% | 4.0% | 5.8% |
| | Approved | 31.5 | 35.3 | 41.1 | 24.0 | 23.7 | 36.0 | 35.2 | 44.5 | 25.9 | 27.1 | 29.3 | 29.4 |
| | Paid | 26.5 | 28.2 | 34.4 | 19.3 | 17.8 | 25.7 | 24.4 | 29.8 | 16.9 | 14.1 | 11.3 | 4.0 |
| **Non-exporter** | # awardees | 4 | 9 | 8 | 4 | 3 | 0 | 6 | 3 | 1 | 0 | 2 | 1 |
| | # EI clients (%) | 319 | 356 | 377 | 306 | 290 | 280 | 334 | 266 | 268 | 298 | 267 | 199 |
| | | 1.3% | 2.5% | 2.1% | 1.3% | 1.0% | 0.0% | 1.8% | 1.1% | 0.4% | 0.0% | 0.7% | 0.5% |
| | Approved | 0.2 | 2.2 | 0.4 | 0.4 | 0.6 | 0.0 | 1.4 | 0.3 | 0.1 | 0.0 | 0.4 | 0.2 |
| | Paid | 0.0 | 1.8 | 0.3 | 0.3 | 0.5 | 0.0 | 1.2 | 0.2 | 0.1 | 0.0 | 0.3 | 0.0 |

*Source*: ESRI elaboration based on the linked ABSEI and RD&I data sets  provided by the DBEI and Enterprise Ireland. Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same enterprise group. An awardee-group is classified as an exporter if it has exporting activities. Approved and paid grants are in constant 2015 prices in million euros.

Looking at the innovation profile of awardees,[59] the uptake rates are higher for companies with product innovation, ranging from 8.8% in 2013 to 4.9% in 2016. The annual uptake rates for firms without product innovation range from 3.6% in 2018 to 1.5% in 2017.

*Table 29  Uptake of EI RD&I direct financial supports by product innovation*

| | Year | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|
| **Product innovators** | # awardees | 86 | 99 | 88 | 75 | 56 | 68 | 85 |
| | # EI clients (%) | 1159 | 1128 | 1150 | 1239 | 1135 | 1262 | 1251 |
| | | 7.4% | 8.8% | 7.7% | 6.1% | 4.9% | 5.4% | 6.8% |
| | Approved | 30.9 | 29.0 | 34.4 | 21.4 | 21.4 | 24.8 | 19.4 |
| | Paid | 21.8 | 21.8 | 23.1 | 13.3 | 10.2 | 8.7 | 2.5 |
| | # awardees | 27 | 26 | 27 | 20 | 23 | 16 | 37 |

---

[59] This analysis is based on data on sales of new products available from the ABSEI data set since 2012.

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Without product innovation** | # EI clients | 891 | 1127 | 1066 | 1037 | 1296 | 1058 | 1022 |
| | (%) | 3.0% | 2.3% | 2.5% | 1.9% | 1.8% | 1.5% | 3.6% |
| | Approved | 5.1 | 7.6 | 10.3 | 4.6 | 5.8 | 4.8 | 10.2 |
| | Paid | 3.9 | 3.7 | 7.0 | 3.7 | 3.9 | 2.9 | 1.5 |

*Source*: ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same enterprise -group. An awardee-group is classified as a new product innovator if it has sales of "new product" based on data available in the ABSEI data set (since 2012). Approved and paid grants are in constant 2015 prices in million euros.

As shown in the table below, the uptake of EI RD&I direct financial supports among EI clients (aggregated at enterprise group level) ranges from 6.9% in 2009 to 3.2% in 2016. In terms of value, the largest amount was approved in 2014 (44.8 million euros) and the smallest in 2011 (24.3 million euros). 83.9% of the approved awards in 2007 have been paid.

*Table 30  Uptake of EI RD&I direct financial supports by EI clients*

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **# awardees** | 95 | 104 | 132 | 92 | 102 | 113 | 125 | 115 | 95 | 79 | 84 | 122 |
| **# EI clients** | 1659 | 1822 | 1913 | 1903 | 1977 | 2050 | 2255 | 2216 | 2276 | 2431 | 2320 | 2273 |
| **(%)** | 5.7% | 5.7% | 6.9% | 4.8% | 5.2% | 5.5% | 5.5% | 5.2% | 4.2% | 3.2% | 3.6% | 5.4% |
| **Approved** | 31.7 | 37.5 | 41.5 | 24.4 | 24.3 | 36.0 | 36.6 | 44.8 | 26.0 | 27.1 | 29.6 | 29.6 |
| **Paid** | 26.6 | 30.0 | 34.7 | 19.6 | 18.3 | 25.7 | 25.6 | 30.0 | 17.0 | 14.1 | 11.6 | 4.0 |
| **(%)** | 83.9% | 80.1% | 83.5% | 80.5% | 75.6% | 71.4% | 69.8% | 67.1% | 65.4% | 52.0% | 39.3% | 13.5% |

*Source*: ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Note: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. Approved and paid grants are in constant 2015 prices in million euros.

*Table 31  Intensity of EI RD&I direct financial supports by awardee-group size (approved grants over turnover)*

| Year | Small | | Medium | | Large | |
|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median |
| **2007** | 19.5% | 7.4% | 3.8% | 2.4% | 0.4% | 0.3% |
| **2008** | 16.3% | 7.7% | 4.4% | 2.9% | 1.1% | 0.6% |
| **2009** | 12.4% | 8.2% | 2.6% | 1.8% | 0.6% | 0.5% |
| **2010** | 9.9% | 6.8% | 2.9% | 2.1% | 0.9% | 0.1% |
| **2011** | 12.8% | 7.2% | 2.8% | 1.6% | 0.5% | 0.4% |
| **2012** | 9.9% | 6.2% | 2.0% | 1.9% | 0.7% | 0.3% |
| **2013** | 10.0% | 7.5% | 2.3% | 1.8% | 0.5% | 0.3% |
| **2014** | 11.1% | 6.1% | 2.4% | 1.2% | 0.8% | 0.6% |
| **2015** | 9.2% | 6.5% | 2.4% | 1.4% | 0.6% | 0.6% |
| **2016** | 9.3% | 7.2% | 1.9% | 1.0% | 1.1% | 0.9% |
| **2017** | 16.7% | 6.4% | 2.6% | 1.8% | 0.7% | 0.5% |
| **2018** | 8.7% | 5.4% | 2.2% | 1.7% | 0.3% | 0.2% |

*Source*: ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. A "Small Enterprise" is defined as an enterprise that has fewer than 50 employees and has an annual turnover of less than €10m; a "Large Enterprise" is defined as an enterprise that has more than 249 employees or an annual turnover of more than €50m; the remaining enterprises are classified as "Medium Enterprises." Approved grants and turnover are in constant 2015 price.

*Table 32  Grants intensity of EI RD&I direct financial supports by export participation (approved grants over turnover)*

| Year | Exporter | | Non-exporter | |
|------|------|--------|------|--------|
| | Mean | Median | Mean | Median |
| **2007** | 12.5% | 4.7% | 9.7% | 2.2% |
| **2008** | 11.5% | 4.4% | 6.7% | 5.1% |
| **2009** | 8.7% | 4.6% | 4.4% | 3.1% |
| **2010** | 7.2% | 4.5% | 5.5% | 4.8% |
| **2011** | 8.8% | 3.4% | 11.2% | 11.6% |
| **2012** | 6.9% | 3.8% | | |
| **2013** | 6.3% | 3.2% | 16.0% | 8.9% |
| **2014** | 6.6% | 2.7% | 21.2% | 5.7% |
| **2015** | 6.3% | 3.2% | 0.4% | 0.4% |
| **2016** | 6.2% | 4.2% | | |
| **2017** | 10.1% | 3.5% | 7.9% | 7.9% |
| **2018** | 5.6% | 2.7% | 3.7% | 3.7% |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. An awardee-group is classified as an exporter if it has exporting activities. Approved grants and turnover are in constant 2015 prices.

*Table 33  Grants intensity of EI RD&I direct financial supports by product innovation (approved grants over turnover)*

| Year | Product innovators | | Without product innovation | |
|------|------|--------|------|--------|
| | Mean | Median | Mean | Median |
| **2012** | 5.4% | 3.5% | 11.5% | 4.8% |
| **2013** | 6.4% | 3.1% | 8.5% | 3.9% |
| **2014** | 6.3% | 2.2% | 9.2% | 6.4% |
| **2015** | 5.4% | 2.2% | 9.1% | 4.6% |
| **2016** | 6.2% | 4.2% | 6.3% | 4.3% |
| **2017** | 10.8% | 3.5% | 6.4% | 3.9% |
| **2018** | 4.6% | 2.6% | 7.8% | 3.1% |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. An awardee-group is classified as a new product innovator if it has sales of "new product" based on ABSEI survey (since 2012). An awardee-group is classified as an exporter if it has exporting activities. Approved grants and turnover are in constant 2015 prices.

*Table 34  Grants intensity of EI RD&I direct financial supports by engagement in R&D (approved grants over turnover)*

| Year | With R&D expenditure | | Without R&D expenditure | |
|------|------|--------|------|--------|
| | Mean | Median | Mean | Median |
| **2007** | 12.3% | 3.9% | 14.7% | 12.0% |
| **2008** | 11.4% | 4.4% | 4.2% | 3.7% |
| **2009** | 8.5% | 4.3% | 7.4% | 7.4% |
| **2010** | 7.3% | 4.6% | 2.5% | 3.2% |

| | | | | | |
|---|---|---|---|---|---|
| **2011** | 9.0% | 3.6% | | 3.6% | 3.9% |
| **2012** | 6.9% | 3.6% | | 6.8% | 5.5% |
| **2013** | 6.7% | 3.3% | | 12.0% | 3.7% |
| **2014** | 7.1% | 2.8% | | 0.6% | 0.6% |
| **2015** | 6.3% | 3.2% | | 3.6% | 1.4% |
| **2016** | 6.4% | 4.3% | | 1.9% | 1.9% |
| **2017** | 10.5% | 3.6% | | 2.6% | 2.2% |
| **2018** | 5.8% | 2.8% | | 3.3% | 1.8% |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. An awardee-group is classified as "with R&D" if it has any R&D expenditure in that year. Approved and paid grants are in constant 2015 prices.

*Table 35  Grants intensity of EI RD&I direct financial supports by with or without in-house R&D expenditure (approved grants over turnover).*

| Year | With in-house R&D | | | Without in-house R&D | |
|---|---|---|---|---|---|
| | Mean | Median | | Mean | Median |
| **2007** | 12.3% | 3.9% | | 14.7% | 12.0% |
| **2008** | 11.4% | 4.5% | | 4.2% | 4.4% |
| **2009** | 8.5% | 4.3% | | 7.2% | 6.8% |
| **2010** | 7.3% | 4.6% | | 2.5% | 3.2% |
| **2011** | 9.0% | 3.6% | | 3.6% | 3.9% |
| **2012** | 6.9% | 3.6% | | 6.8% | 5.5% |
| **2013** | 6.7% | 3.4% | | 9.0% | 2.4% |
| **2014** | 7.2% | 2.8% | | 0.5% | 0.4% |
| **2015** | 6.3% | 3.2% | | 3.7% | 2.8% |
| **2016** | 6.4% | 4.3% | | 1.9% | 1.9% |
| **2017** | 10.6% | 3.7% | | 2.3% | 1.7% |
| **2018** | 5.9% | 2.8% | | 3.2% | 1.8% |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. An awardee-group is classified as "with in-house R&D" if it has any in-house R&D expenditure in that year. Approved and paid grants are in constant price (2015 price).

*Table 36  Grants intensity of EI RD&I direct financial supports by awardee-group size (approved grants over employment).*

| Year | Small | | | Medium | | | Large | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Medium | | Mean | Medium | | Mean | Medium |
| **2007** | 13.5 | 8.9 | | 5.9 | 5.0 | | 1.6 | 1.0 |
| **2008** | 17.6 | 10.4 | | 6.9 | 4.8 | | 2.2 | 1.6 |
| **2009** | 14.7 | 11.2 | | 3.7 | 3.2 | | 2.0 | 1.4 |
| **2010** | 10.7 | 8.9 | | 5.0 | 5.1 | | 1.1 | 0.9 |
| **2011** | 13.1 | 9.9 | | 3.6 | 3.4 | | 1.7 | 0.9 |
| **2012** | 11.9 | 9.5 | | 3.6 | 2.5 | | 2.2 | 1.0 |
| **2013** | 11.9 | 9.0 | | 4.2 | 3.2 | | 2.4 | 0.9 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **2014** | 12.4 | 9.7 | 3.7 | 2.9 | 2.8 | 2.3 |
| **2015** | 9.4 | 7.5 | 4.1 | 2.9 | 1.5 | 1.4 |
| **2016** | 10.7 | 9.8 | 3.2 | 2.2 | 1.4 | 0.8 |
| **2017** | 11.9 | 8.2 | 7.3 | 4.0 | 2.1 | 1.8 |
| **2018** | 9.2 | 7.2 | 3.3 | 1.9 | 1.4 | 0.8 |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. A "Small Enterprise" is defined as an enterprise that has fewer than 50 employees and has an annual turnover of less than €10m; a "Large Enterprise" is defined as an enterprise that has more than 249 employees or an annual turnover of more than €50m; a "Medium Enterprise" is the rest. Approved grants are in constant 2015 prices in 1,000 euros.

*Table 37  Grants intensity of EI RD&I direct financial supports by exporter or non-exporter (approved grants over employment)*

| Year | Exporter | | Non-exporter | |
|---|---|---|---|---|
| | Mean | Median | Mean | Median |
| **2007** | 9.5 | 6.9 | 13.5 | 2.0 |
| **2008** | 12.6 | 7.3 | 14.4 | 7.1 |
| **2009** | 10.7 | 6.6 | 4.6 | 3.3 |
| **2010** | 8.3 | 6.0 | 8.6 | 6.1 |
| **2011** | 9.3 | 4.9 | 12.1 | 8.2 |
| **2012** | 8.8 | 5.6 | | |
| **2013** | 8.7 | 6.2 | 10.3 | 5.4 |
| **2014** | 8.3 | 5.0 | 10.5 | 10.8 |
| **2015** | 7.0 | 5.4 | 1.1 | 1.1 |
| **2016** | 7.5 | 5.1 | | |
| **2017** | 9.3 | 5.7 | 6.1 | 6.1 |
| **2018** | 6.4 | 3.5 | 4.7 | 4.7 |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Note: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. An awardee-group is classified as an exporter if it has exporting activities. Approved grants are in constant 2015 prices in 1,000 euros.

*Table 38  Grants intensity of EI RD&I direct financial supports by product innovation (approved grants over employment)*

| Year | New-product innovator | | Without product innovation | |
|---|---|---|---|---|
| | Mean | Median | Mean | Median |
| **2012** | 7.9 | 5.4 | 11.6 | 6.2 |
| **2013** | 8.9 | 6.3 | 8.2 | 5.0 |
| **2014** | 7.7 | 4.6 | 10.6 | 7.3 |
| **2015** | 6.2 | 4.9 | 9.6 | 6.1 |
| **2016** | 7.8 | 5.0 | 6.8 | 5.5 |
| **2017** | 9.2 | 5.3 | 9.4 | 6.7 |
| **2018** | 5.7 | 3.0 | 7.9 | 6.5 |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Note: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. An awardee-group is classified as a new product innovator if it has sales

of "new product" based on ABSEI survey (since 2012). An awardee-group is classified as an exporter if it has exporting activities. Approved grants are in constant 2015 prices in 1,000 euros.

*Table 39  Grants intensity of EI RD&I direct financial supports by engagement in R&D expenditure (approved grants over employment)*

| Year | With R&D expenditure | | Without R&D expenditure | |
|------|------|--------|------|--------|
| | Mean | Median | Mean | Median |
| **2007** | 9.3 | 6.8 | 15.8 | 6.4 |
| **2008** | 13.0 | 7.3 | 6.5 | 6.5 |
| **2009** | 10.4 | 6.4 | 7.8 | 7.8 |
| **2010** | 8.4 | 6.1 | 5.5 | 4.0 |
| **2011** | 9.5 | 5.4 | 3.1 | 3.9 |
| **2012** | 8.8 | 5.6 | 7.9 | 5.7 |
| **2013** | 8.7 | 6.2 | 10.5 | 5.3 |
| **2014** | 8.5 | 5.1 | 0.7 | 0.7 |
| **2015** | 7.1 | 5.4 | 3.7 | 4.1 |
| **2016** | 7.6 | 5.5 | 1.4 | 1.4 |
| **2017** | 9.5 | 6.1 | 4.2 | 3.2 |
| **2018** | 6.6 | 4.1 | 4.4 | 3.4 |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Note: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. An awardee-group is classified as "with R&D" if it has any R&D expenditure in that year. Approved grants are in constant 2015 prices in 1,000 euros.

*Table 40  Grants intensity of EI RD&I direct financial supports by with or without in-house R&D expenditure (approved grants over employment)*

| Year | With in-house R&D | | Without in-house R&D | |
|------|------|--------|------|--------|
| | Mean | Median | Mean | Median |
| **2007** | 9.3 | 6.8 | 15.8 | 6.4 |
| **2008** | 13.0 | 7.3 | 7.2 | 6.8 |
| **2009** | 10.4 | 6.4 | 8.5 | 9.6 |
| **2010** | 8.4 | 6.1 | 5.5 | 4.0 |
| **2011** | 9.5 | 5.4 | 3.1 | 3.9 |
| **2012** | 8.8 | 5.6 | 7.9 | 5.7 |
| **2013** | 8.8 | 6.2 | 8.1 | 3.1 |
| **2014** | 8.6 | 5.3 | 1.0 | 0.8 |
| **2015** | 7.1 | 5.5 | 4.0 | 4.4 |
| **2016** | 7.6 | 5.5 | 1.4 | 1.4 |
| **2017** | 9.5 | 6.1 | 5.9 | 4.3 |
| **2018** | 6.7 | 4.3 | 4.1 | 3.2 |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Notes: Different grants received by an awardee in the same year are aggregated. Individual awardees are integrated if they belong to the same awardees-group. An awardee-group is classified as "with in-house R&D" if it has any in-house R&D expenditure in that year. Approved grants are in constant 2015 prices in 1,000 euros.

*Table 41  Total amount of approved and cancelled funds by year*

| Year | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Approved | 48.9 | 54.8 | 47.6 | 36.2 | 27.6 | 39.5 | 39.5 | 47.9 | 28.0 | 30.0 | 31.9 | 32.7 | 464.7 |
| Cancelled (%) | 10.1 | 8.2 | 8.6 | 8.3 | 6.5 | 8.3 | 5.1 | 4.7 | 3.6 | 0.7 | 0.3 | 0.2 | 64.7 |
| | 21% | 15% | 18% | 23% | 24% | 21% | 13% | 10% | 13% | 2% | 1% | 0% | 14% |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.
Note: Grants cancellation normally happen two to three years after approval, therefore, cancellation information may not complete in recent year. Approved and paid grants are in constant 2015 prices in 1,000,000 euros.

*Table 42  Number of cancelled grants by cancellation category*

| Year | # grants | Percentage of cancelled grants | | | |
|---|---|---|---|---|---|
| | | >0% | <10% | [10-90%] | >90% |
| **2007** | 223 | 170 | 56 | 74 | 40 |
| | | 76% | 25% | 33% | 18% |
| **2008** | 224 | 167 | 55 | 78 | 34 |
| | | 75% | 25% | 35% | 15% |
| **2009** | 215 | 149 | 58 | 58 | 33 |
| | | 69% | 27% | 27% | 15% |
| **2010** | 165 | 123 | 39 | 52 | 32 |
| | | 75% | 24% | 32% | 19% |
| **2011** | 148 | 117 | 45 | 55 | 17 |
| | | 79% | 30% | 37% | 11% |
| **2012** | 167 | 118 | 52 | 41 | 25 |
| | | 71% | 31% | 25% | 15% |
| **2013** | 179 | 115 | 49 | 44 | 22 |
| | | 64% | 27% | 25% | 12% |
| **2014** | 168 | 93 | 38 | 42 | 13 |
| | | 55% | 23% | 25% | 8% |
| **2015** | 129 | 70 | 29 | 30 | 11 |
| | | 54% | 22% | 23% | 9% |
| **2016** | 107 | 17 | 9 | 6 | 2 |
| | | 16% | 8% | 6% | 2% |
| **2017** | 111 | 12 | 9 | 2 | 1 |
| | | 11% | 8% | 2% | 1% |
| **2018** | 169 | 5 | 2 | 2 | 1 |
| | | 3% | 1% | 1% | 1% |
| **Overall** | 2005 | 1156 | 441 | 484 | 231 |
| | | 58% | 22% | 24% | 12% |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.
Notes: Grants cancellation normally happen two to three years after approval, therefore, cancellation information may not complete in recent year. Percentage figures show the percent of cancellation over total number of approved grants in the same year.

*Table 43  Number of awardees that have grants being cancelled by cancellation category*

| Year | # awardees | Percentage of total grants being cancelled | | | |
|---|---|---|---|---|---|
| | | >0% | < 10% | [10%, 90%] | >90% |
| **2007** | 134 | 113 | 49 | 54 | 10 |
| | | 84% | 37% | 40% | 7% |
| **2008** | 143 | 115 | 53 | 50 | 12 |
| | | 80% | 37% | 35% | 8% |
| **2009** | 176 | 125 | 52 | 56 | 17 |
| | | 71% | 30% | 32% | 10% |
| **2010** | 124 | 96 | 37 | 43 | 16 |
| | | 77% | 30% | 35% | 13% |
| **2011** | 128 | 104 | 44 | 49 | 11 |
| | | 81% | 34% | 38% | 9% |
| **2012** | 148 | 107 | 51 | 38 | 18 |
| | | 72% | 34% | 26% | 12% |
| **2013** | 142 | 97 | 49 | 38 | 10 |
| | | 68% | 35% | 27% | 7% |
| **2014** | 132 | 80 | 40 | 34 | 6 |
| | | 61% | 30% | 26% | 5% |
| **2015** | 105 | 60 | 30 | 24 | 6 |
| | | 57% | 29% | 23% | 6% |
| **2016** | 92 | 17 | 10 | 5 | 2 |
| | | 18% | 11% | 5% | 2% |
| **2017** | 91 | 12 | 9 | 2 | 1 |
| | | 13% | 10% | 2% | 1% |
| **2018** | 147 | 5 | 2 | 2 | 1 |
| | | 3% | 1% | 1% | 1% |
| **Overall** | 1562 | 931 | 426 | 395 | 110 |
| | | 60% | 27% | 25% | 7% |

*Source*: ESRI elaboration based on the data provided by Enterprise Ireland.
Note: Grants cancellation normally happen two to three years after approval, therefore, cancellation information may not complete in recent year. Percentage figures show the percent of awardees that had grants cancellation over total number of awardees with grants Approval in the same year.

## A.2 Econometric analysis: Direct financial supports

Figure 42 shows the estimated propensity score for the awardees of EI RD&I direct financial supports and unmatched and matched control groups. The left panel shows that the distribution of the estimated propensity scores for the awardees and for the other firms differ significantly. The right panel shows that the distribution of the estimated propensity scores for the awardees and for their matched control group are very similar indicating that we have achieved a successful matching. The impact of the RD&I intervention can consequently be calculated as the performance differential between these two enterprise groups.

*Figure 42 Estimated propensity score for unmatched and matched data for the EI RD&I Programme*
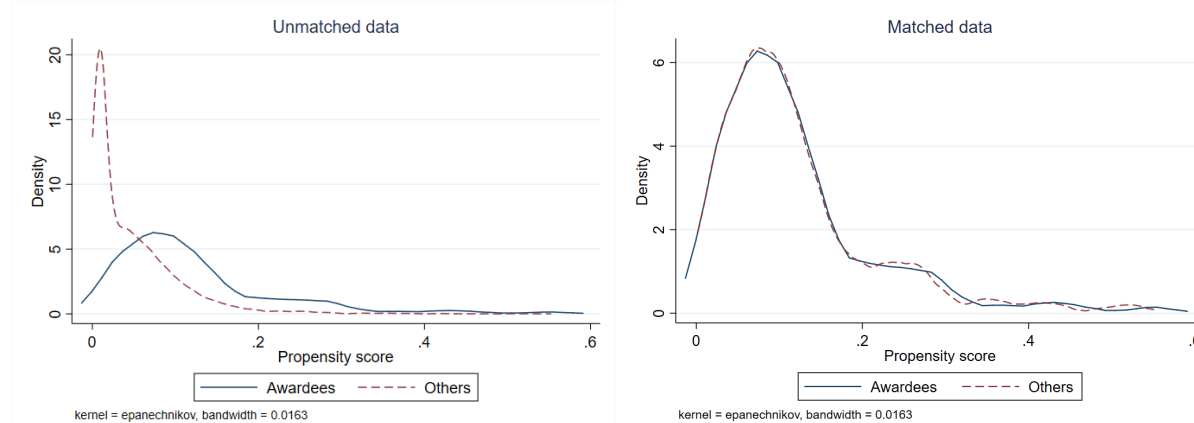


Source: ESRI elaboration based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland.

*Table 44   Summary statistics of outcome performance variables, all firms*

| Variables | All firms | | | |
| --- | --- | --- | --- | --- |
| | Mean | SD | Min | Max |
| **Turnover (thousands euro, 2015 prices)** | 13885.9 | 48267.3 | 4.0 | 661062.0 |
| **Total value added (thousands euro, 2015 prices)** | 4889.9 | 14013.8 | 0.0 | 225745.5 |
| **Employment** | 53.7 | 126.0 | 1.0 | 1517.0 |
| **Export sales (thousands euro, 2015 prices)** | 6842.9 | 30213.7 | 0.0 | 415066.0 |
| **Turnover / employment (thousands euro/employee, 2015 prices)** | 195.2 | 240.0 | 1.3 | 2213.4 |
| **Total value added / employment (thousands euro/employee, 2015 prices)** | 91.0 | 140.6 | 0.0 | 1522.0 |
| **Export / turnover** | 0.4 | 0.4 | 0.0 | 1.0 |
| **Net R&D (thousands euro, 2015 prices)** | 258.3 | 674.2 | 0.0 | 7028.6 |
| **Net R&D / turnover** | 0.3 | 1.6 | 0.0 | 24.0 |
| **Net R&D / employment (thousands euro/employee, 2015 prices)** | 11.0 | 22.6 | 0.0 | 198.5 |
| **R&D employment** | 3.1 | 6.6 | 0.0 | 58.0 |
| **R&D employment / employment** | 0.15 | 0.25 | 0.0 | 1.0 |
| **New product sales* (thousands euro, 2015 prices)** | 779.9 | 2402.3 | 0.0 | 23704.2 |
| **New product sales / turnover*** | 0.1 | 0.3 | 0.0 | 1.0 |
| **Wages per employee (thousands euro/employee, 2015 prices)** | 47.5 | 27.1 | 0.0 | 241.9 |
| **No. of observations** | | | 20,502 | |

*Source*: ESRI calculations based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland.
Notes: SD denotes the standard deviation statistics measuring the amount of variation of the performance outcomes across firms. * Data on new product sales is available since 2012. 11,228 observations are avaialble for the corresponding variables.

*Table 45  Summary statistics for awardees and non-awardees*

| Variables | Non-awardees (a) | | | | Awardees (b) | | | | t-test |
|---|---|---|---|---|---|---|---|---|---|
| | Mean | SD | Min | Max | Mean | SD | Min | Max | (b)>(a) |
| Log turnover | 7.58 | 1.9 | 1.4 | 13.4 | 8.50 | 1.6 | 1.4 | 13.4 | 1.00 |
| Log total value added | 5.83 | 4.2 | -6.9 | 12.3 | 7.13 | 3.3 | -6.9 | 12.3 | 1.00 |
| Log employment | 2.83 | 1.3 | 0.0 | 7.3 | 3.52 | 1.2 | 0.0 | 7.3 | 1.00 |
| Log export sales | 3.64 | 5.6 | -6.9 | 12.9 | 6.84 | 3.7 | -6.9 | 12.9 | 1.00 |
| Log turnover / employment | 4.75 | 1.1 | 0.3 | 7.7 | 4.98 | 0.8 | 0.3 | 7.6 | 1.00 |
| Log total value added / employment | 3.01 | 3.8 | -10.9 | 7.3 | 3.61 | 2.9 | -10.9 | 7.3 | 1.00 |
| Log export / turnover | -3.93 | 5.2 | -17.9 | 0.0 | -1.66 | 3.1 | -17.4 | 0.0 | 1.00 |
| Log net R&D | -0.76 | 5.8 | -6.9 | 8.9 | 4.23 | 4.0 | -6.9 | 8.9 | 1.00 |
| Log net R&D / turnover | -8.34 | 6.2 | -19.1 | 3.2 | -4.27 | 4.0 | -19.1 | 3.2 | 1.00 |
| Log net R&D / employment | -3.59 | 5.9 | -13.2 | 5.3 | 0.71 | 3.9 | -13.2 | 5.3 | 1.00 |
| Log R&D employment | 0.56 | 0.7 | 0.0 | 4.1 | 1.50 | 1.0 | 0.0 | 4.1 | 1.00 |
| Log R&D employment / employment | -2.26 | 1.4 | -6.4 | 0.7 | -2.02 | 1.3 | -6.4 | 0.7 | 1.00 |
| Log new product sales* | -1.45 | 6.3 | -6.9 | 10.1 | 2.55 | 6.4 | -6.9 | 10.1 | 1.00 |
| Log new product sales / turnover* | -8.95 | 6.4 | -19.0 | 0.1 | -6.00 | 6.2 | -19.0 | 0.1 | 1.00 |
| Log wages per employee | 3.22 | 2.5 | -11.1 | 5.5 | 3.78 | 0.9 | -11.1 | 5.5 | 1.00 |
| Exporter (=1) | 0.80 | 0.40 | 0 | 1 | 0.95 | 0.22 | 0 | 1 | 1.00 |
| Positive profit (=1) | 0.60 | 0.49 | 0 | 1 | 0.64 | 0.48 | 0 | 1 | 1.00 |
| R&D activity (=1) | 0.54 | 0.50 | 0 | 1 | 0.91 | 0.29 | 0 | 1 | 1.00 |
| Patent holder (=1) | 0.07 | 0.26 | 0 | 1 | 0.26 | 0.44 | 0 | 1 | 1.00 |
| University link (=1) | 0.08 | 0.28 | 0 | 1 | 0.23 | 0.42 | 0 | 1 | 1.00 |
| No. of observations | 14,182 | | | | 6,320 | | | | |

*Source*: ESRI calculations based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Notes: SD denotes the standard deviation statistics measuring the amount of variation of the performance outcomes across firms. *Data on new product sales is available since 2012. For the corresponding variable, 7,765 observations are available for non-awardees and 3,463 observations for awardees.

Table 46 shows summary statistics of the variables as used in the econometric analysis. It shows that a number of performance outcomes are unevenly distributed across firms, in particular total sales, export sales, sales of new products, total value added, and net R&D expenditures (the standard deviation statistics, are very high indicating a variation across a wide range of values). The distributions of the intensity of inputs and outputs (accounting for group size measured as turnover or employment) are less skewed (the standard deviation statistics for these performance outcomes are lower). Among all firms, 85% are exporters and 65% have reported R&D activity. In terms of innovation activities, 13% of all firms hold patents and 13% of all firms have links with universities.

*Table 46  Summary statistics of outcome performance, all firms (2007-2016)*

| Variables | All firms | | | |
|---|---|---|---|---|
| | Mean | SD | Min | Max |
| Log turnover | 7.86 | 1.84 | 1.39 | 13.40 |
| Log total value added | 6.23 | 4.01 | -6.91 | 12.33 |
| Log employment | 3.04 | 1.29 | 0.00 | 7.32 |

| | | | | |
|---|---|---|---|---|
| **Log export sales** | 4.63 | 5.27 | -6.91 | 12.94 |
| **Log turnover / employment** | 4.82 | 0.99 | 0.29 | 7.70 |
| **Log total value added / employment** | 3.19 | 3.52 | -10.88 | 7.33 |
| **Log export / turnover** | -3.23 | 4.78 | -17.88 | 0.00 |
| **Log net R&D** | 0.78 | 5.77 | -6.91 | 8.86 |
| **Log net R&D / turnover** | -7.08 | 5.90 | -19.06 | 3.18 |
| **Log net R&D / employment** | -2.26 | 5.73 | -13.24 | 5.29 |
| **Log R&D employment** | 0.85 | 0.93 | 0.00 | 4.08 |
| **Log R&D employment / employment** | -2.19 | 1.37 | -6.35 | 0.69 |
| **Log new product sales*** | -0.22 | 6.58 | -6.91 | 10.07 |
| **Log new product sales / turnover*** | -8.04 | 6.47 | -18.96 | 0.12 |
| **Log wages per employee** | 3.40 | 2.18 | -11.10 | 5.49 |
| **Exporter (=1) (share of companies that export)** | 0.85 | 0.36 | 0 | 1 |
| **Positive profit (=1) (share of companies with positive profit)** | 0.61 | 0.49 | 0 | 1 |
| **R&D activity (=1) (share of companies that are R&D active)** | 0.65 | 0.48 | 0 | 1 |
| **Patent holder (=1) (share of companies that hold a patent)** | 0.13 | 0.34 | 0 | 1 |
| **University link (=1) ) (share of companies that have links with universities)** | 0.13 | 0.33 | 0 | 1 |
| **No. of observations** | | | 20,502 | |

*Source*: ESRI calculations based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Notes: SD denotes the standard deviation statistics measuring the amount of variation of the performance outcomes across firms. * Data on new product sales is available since 2012. 11,228 observations are available for the corresponding variables. SD = Standard Deviation

*Table 47   Statistics of covariates for control and treated groups before matching for RD&I program*

| Before matching | Means | | Variances | |
|---|---|---|---|---|
| | **Control** | **Treated** | **Control** | **Treated** |
| **Labour productivity (log)** | 3.041 | 3.485 | 12.378 | 8.147 |
| **Employment (log)** | 2.888 | 3.405 | 1.568 | 1.550 |
| **Wage (log)** | 3.217 | 3.765 | 6.103 | 0.773 |
| **Exporter (=1)** | 0.819 | 0.957 | 0.148 | 0.041 |
| **Positive profit (=1)** | 0.692 | 0.755 | 0.213 | 0.185 |
| **R&D activity (=1)** | 0.571 | 0.920 | 0.245 | 0.073 |
| **Patent holder (=1)** | 0.074 | 0.240 | 0.068 | 0.183 |
| **University link (=1)** | 0.078 | 0.197 | 0.072 | 0.159 |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Note: labour productivity is measured by total value added / employment.

*Table 48   Balancing test of covariates before and after matching for RD&I program – difference in means and variance ratios*

| Before/after matching | Standardized differences | | Variance ratio | |
|---|---|---|---|---|
| | **Raw** | **Matched** | **Raw** | **Matched** |
| **Labour productivity (log)** | 0.139 | 0.009 | 0.658 | 1.052 |
| **Employment (log)** | 0.414 | 0.023 | 0.988 | 1.068 |
| **Wage (log)** | 0.296 | 0.001 | 0.127 | 0.962 |
| **Exporter (=1)** | 0.450 | -0.008 | 0.277 | 1.035 |

| | | | | |
|---|---|---|---|---|
| **Positive profit (=1)** | 0.141 | 0.004 | 0.869 | 0.996 |
| **R&D activity (=1)** | 0.876 | 0.006 | 0.299 | 0.983 |
| **Patent holder (=1)** | 0.469 | 0.000 | 2.674 | 1.000 |
| **University link (=1)** | 0.350 | 0.000 | 2.197 | 1.000 |

*Source*: ESRI elaboration based on the linked ABSEI data and data provided by Enterprise Ireland.
Note: Labour productivity is measured by total value added / employment.

*Table 49  Statistics of covariates for control and treated groups before matching for ESA program*

| **Before matching** | **Means** | | **Variances** | |
|---|---|---|---|---|
| | **Control** | **Treated** | **Control** | **Treated** |
| **Labour productivity (log)** | 3.254 | 1.550 | 10.386 | 24.930 |
| **Employment (log)** | 3.068 | 2.939 | 1.592 | 2.297 |
| **Wage (log)** | 3.369 | 3.732 | 4.706 | 1.698 |
| **Exporter (=1)** | 0.861 | 0.940 | 0.120 | 0.057 |
| **Positive profit (=1)** | 0.712 | 0.564 | 0.205 | 0.248 |
| **R&D activity (=1)** | 0.671 | 0.902 | 0.221 | 0.089 |
| **Patent holder (=1)** | 0.127 | 0.286 | 0.111 | 0.206 |
| **University link (=1)** | 0.114 | 0.361 | 0.101 | 0.232 |

*Source*: ESRI estimates based on the linked ABSEI data and ESA data provided by Enterprise Ireland.
Note: Labour productivity is measured by total value added / employment.

*Table 50  Balancing test of covariates before and after matching for ESA program*

| **Before/after matching** | **Standardized mean differences** | | **Variance ratio** | |
|---|---|---|---|---|
| | **Raw** | **Matched** | **Raw** | **Matched** |
| **Labour productivity (log)** | -0.406 | -0.011 | 2.400 | 1.046 |
| **Employment (log)** | -0.093 | -0.035 | 1.443 | 1.005 |
| **Wage (log)** | 0.203 | 0.009 | 0.361 | 0.975 |
| **Exporter (=1)** | 0.265 | 0.000 | 0.476 | 1.000 |
| **Positive profit (=1)** | -0.312 | 0.000 | 1.209 | 1.000 |
| **R&D activity (=1)** | 0.587 | 0.000 | 0.403 | 1.000 |
| **Patent holder (=1)** | 0.398 | 0.000 | 1.852 | 1.000 |
| **University link (=1)** | 0.606 | 0.000 | 2.305 | 1.000 |

*Source*: ESRI elaboration based on the linked ABSEI data and ESA data provided by Enterprise Ireland.
Note: Labour productivity is measured by total value added / employment.

*Table 51  Statistics of covariates for control and treated groups before matching for combined funding from the EI RD&I and ESA Programmes*

| **Before matching** | **Means** | | **Variances** | |
|---|---|---|---|---|
| | **Control** | **Treated** | **Control** | **Treated** |
| **Labour productivity (log)** | 3.067 | 3.314 | 12.239 | 9.060 |
| **Employment (log)** | 2.887 | 3.316 | 1.573 | 2.189 |
| **Wage (log)** | 3.189 | 3.759 | 6.520 | 0.237 |
| **Exporter (=1)** | 0.814 | 1.000 | 0.152 | 0.000 |
| **Positive profit (=1)** | 0.695 | 0.761 | 0.212 | 0.186 |
| **R&D activity (=1)** | 0.565 | 0.978 | 0.246 | 0.022 |

| | | | |
|---|---|---|---|
| **Patent holder (=1)** | 0.072 | 0.348 | 0.067 | 0.232 |
| **University link (=1)** | 0.074 | 0.457 | 0.069 | 0.254 |

*Source*: ESRI elaboration based on the linked ABSEI, RD&I and ESA data provided by Enterprise Ireland.  Note: labour productivity is measured by total value added / employment.

*Table 52  Balancing test of covariates before and after matching for combined funding from the EI RD&I and ESA Programmes*

| Before/after matching | Standardized means differences | | Variance ratio | |
|---|---|---|---|---|
| | **Raw** | **Matched** | **Raw** | **Matched** |
| **Labour productivity (log)** | 0.076 | 0.017 | 0.740 | 0.981 |
| **Employment (log)** | 0.313 | 0.012 | 1.392 | 1.148 |
| **Wage (log)** | 0.310 | -0.215 | 0.036 | 3.457 |
| **Exporter (=1)** | 0.677 | | 0.000 | |
| **Positive profit (=1)** | 0.147 | 0.000 | 0.878 | 1.000 |
| **R&D activity (=1)** | 1.130 | 0.000 | 0.088 | 1.000 |
| **Patent holder (=1)** | 0.715 | 0.000 | 3.481 | 1.000 |
| **University link (=1)** | 0.951 | 0.000 | 3.679 | 1.000 |

*Source*: ESRI elaboration based on the linked ABSEI, RD&I and ESA data sets provided by the DBEI and Enterprise Ireland. Note: Labour productivity is measured as total value added / employment.

In the table below, the row "beta" shows the value of the impact, for a given number of years after approval of EI RD&I direct funding. The row 'p-value' indicates whether or not beta is statistically significant, with values above 0.010 indicating that the 'beta' (i.e. effect) is **not** statistically significant.

*Table 53  Estimated impacts of the EI RD&I direct financial supports on the performance of awardees*

| Outcome variables | | Years after approval of EI RD&I direct funding | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | 5 | Average effect |
| ***R&D performance outcomes*** | | | | | | | | |
| **Net R&D expenditures** | beta | 0.997 | 1.425 | 1.517 | 1.757 | 1.975 | 2.295 | 1.569 |
| | s.e. | 0.172 | 0.194 | 0.214 | 0.250 | 0.268 | 0.288 | 0.168 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Net R&D expenditures/ turnover** | beta | 0.877 | 1.250 | 1.362 | 1.555 | 1.777 | 2.013 | 1.378 |
| | s.e. | 0.172 | 0.194 | 0.214 | 0.245 | 0.265 | 0.285 | 0.167 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Net R&D expenditures/ employee** | beta | 0.864 | 1.277 | 1.348 | 1.567 | 1.776 | 2.077 | 1.380 |
| | s.e. | 0.171 | 0.193 | 0.212 | 0.246 | 0.264 | 0.286 | 0.166 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **R&D employees** | beta | 0.267 | 0.351 | 0.358 | 0.388 | 0.436 | 0.427 | 0.360 |
| | s.e. | 0.025 | 0.031 | 0.036 | 0.043 | 0.050 | 0.056 | 0.031 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **R&D employees / total employees** | beta | 0.136 | 0.203 | 0.187 | 0.194 | 0.232 | 0.205 | 0.170 |
| | s.e. | 0.027 | 0.031 | 0.036 | 0.042 | 0.049 | 0.059 | 0.032 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| ***Economic and innovation performance outcomes*** | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Turnover** | beta | 0.121 | 0.182 | 0.161 | 0.203 | 0.196 | 0.281 | 0.195 |
| | s.e. | 0.025 | 0.033 | 0.039 | 0.042 | 0.050 | 0.057 | 0.032 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Total value added** | beta | 0.189 | 0.499 | 0.239 | 0.287 | 0.217 | 0.424 | 0.352 |
| | s.e. | 0.128 | 0.143 | 0.146 | 0.165 | 0.168 | 0.167 | 0.111 |
| | p-value | 0.140 | 0.000 | 0.101 | 0.083 | 0.197 | 0.011 | 0.001 |
| **Employment** | beta | 0.131 | 0.148 | 0.170 | 0.190 | 0.201 | 0.220 | 0.189 |
| | s.e. | 0.019 | 0.023 | 0.028 | 0.033 | 0.040 | 0.043 | 0.025 |
| | p-value | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Export sales** | beta | 0.510 | 0.448 | 0.701 | 0.687 | 0.435 | 0.630 | 0.693 |
| | s.e. | 0.114 | 0.145 | 0.171 | 0.180 | 0.192 | 0.226 | 0.131 |
| | p-value | 0.000 | 0.002 | 0.000 | 0.000 | 0.024 | 0.005 | 0.000 |
| **Turnover / employee** | beta | -0.010 | 0.030 | -0.011 | 0.013 | 0.003 | 0.061 | 0.004 |
| | s.e. | 0.021 | 0.026 | 0.030 | 0.031 | 0.037 | 0.040 | 0.023 |
| | p-value | 0.624 | 0.253 | 0.710 | 0.678 | 0.925 | 0.133 | 0.859 |
| **Total value added / employee** | beta | 0.062 | 0.346 | 0.075 | 0.100 | 0.027 | 0.219 | 0.165 |
| | s.e. | 0.124 | 0.140 | 0.143 | 0.157 | 0.155 | 0.154 | 0.105 |
| | p-value | 0.620 | 0.013 | 0.597 | 0.524 | 0.862 | 0.154 | 0.116 |
| **Export / turnover** | beta | 0.389 | 0.265 | 0.536 | 0.478 | 0.234 | 0.345 | 0.496 |
| | s.e. | 0.108 | 0.138 | 0.162 | 0.169 | 0.181 | 0.210 | 0.122 |
| | p-value | 0.000 | 0.055 | 0.001 | 0.005 | 0.196 | 0.100 | 0.000 |
| **New product sales** | beta | 1.752 | 0.494 | 0.862 | 2.608 | 2.234 | 1.477 | 0.894 |
| | s.e. | 0.709 | 0.737 | 0.745 | 0.869 | 0.974 | 1.343 | 0.647 |
| | p-value | 0.013 | 0.502 | 0.247 | 0.003 | 0.022 | 0.271 | 0.167 |
| **New product sales / turnover** | beta | 1.721 | 0.447 | 0.873 | 2.642 | 2.212 | 1.513 | 0.851 |
| | s.e. | 0.713 | 0.735 | 0.744 | 0.861 | 0.959 | 1.341 | 0.644 |
| | p-value | 0.016 | 0.543 | 0.241 | 0.002 | 0.021 | 0.259 | 0.186 |

*Source*: ESRI estimates based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland.
Note: Standard errors (s.e) are clustered at enterprise group level.

## A.3   Composition analysis: Indirect financial supports

*Table 54   Awardees of ESA funding by exporter status*

| | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Exporter** | ESA Awardees | 0 | 3 | 2 | 2 | 4 | 5 | 7 | 6 | 9 | 2 | 10 |
| | EI clients | 1466 | 1536 | 1597 | 1687 | 1770 | 1921 | 1950 | 2008 | 2133 | 2053 | 2074 |
| | % | | 0.20% | 0.13% | 0.12% | 0.23% | 0.26% | 0.36% | 0.30% | 0.42% | 0.10% | 0.48% |
| | Total grants | | 0.54 | 0.29 | 1.53 | 1.46 | 1.64 | 3.35 | 1.80 | 4.34 | 2.22 | 11.81 |
| **Non exporter** | ESA Awardees | 4 | 3 | 6 | 3 | 1 | 2 | 2 | 2 | 2 | 3 | 3 |
| | EI clients | 356 | 377 | 306 | 290 | 280 | 334 | 266 | 268 | 298 | 267 | 199 |
| | % | 1.12% | 0.80% | 1.96% | 1.03% | 0.36% | 0.60% | 0.75% | 0.75% | 0.67% | 1.12% | 1.51% |
| | Total grants | 2.48 | 1.79 | 1.54 | 0.82 | 0.71 | 1.00 | 0.64 | 2.01 | 1.22 | 0.70 | 1.07 |

*Source*: DBEI elaboration based on the RD&I data provided by Enterprise Ireland

*Table 55   Awardees of ESA funding by product innovator status*

| | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Product innovator** | ESA Awardees | | | | | 3 | 5 | 3 | 5 | 5 | 4 | |
| | EI Clients | | | | | 1159 | 1128 | 1150 | 1239 | 1135 | 1262 | |
| | % | | | | | 0.26% | 0.44% | 0.26% | 0.40% | 0.44% | 0.32% | |
| | Total grant | | | | | 1.34 | 1.64 | 2.24 | 1.57 | 2.45 | 2.22 | |
| **Without product innovator** | ESA Awardees | | | | | 2 | 2 | 5 | 3 | 8 | 3 | |
| | EI Clients | | | | | 891 | 1127 | 1066 | 1037 | 1296 | 1058 | |
| | % | | | | | 0.22% | 0.18% | 0.47% | 0.29% | 0.62% | 0.28% | |
| | Total grant | | | | | 0.83 | 1.00 | 1.32 | 1.57 | 3.63 | 0.70 | |

*Source*: DBEI elaboration based on the RD&I data provided by Enterprise Ireland

*Table 56   Awardees of ESA funding by R&D status*

| | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **With R&D** | ESA awardees | 0 | 3 | 3 | 5 | 4 | 5 | 7 | 6 | 9 | 4 | |
| | EI client | 1137 | 1202 | 1233 | 1278 | 1347 | 1467 | 1505 | 1538 | 1609 | 1549 | |
| | % | | 0.25% | 0.24% | 0.39% | 0.30% | 0.34% | 0.47% | 0.39% | 0.56% | 0.26% | |
| | Total grant | | 0.54 | 0.59 | 0.82 | 1.46 | 1.64 | 3.35 | 1.80 | 4.34 | 2.22 | |
| **Without R&D** | ESA awardees | 2 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | |
| | EI client | 685 | 711 | 670 | 699 | 703 | 788 | 711 | 738 | 822 | 771 | |
| | % | 0.29% | 0.28% | 0.45% | 0.29% | 0.14% | 0.25% | 0.14% | 0.27% | 0.24% | 0.39% | |
| | Total grant | 1.89 | 1.56 | 0.51 | 1.53 | 0.71 | 1.00 | 0.21 | 2.01 | 1.22 | 0.70 | |

*Source*: DBEI elaboration based on the RD&I data provided by Enterprise Ireland

*Table 57  Awardees of ESA funding by R&D function*

| | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **With in house R&D** | **ESA Awardees** | 0 | 3 | 3 | 3 | 4 | 7 | 7 | 6 | 9 | 4 | |
| | **EI clients** | 1105 | 1162 | 1184 | 1246 | 1303 | 1412 | 1448 | 1480 | 1545 | 1480 | |
| | **%** | | 0.26% | 0.25% | 0.24% | 0.31% | 0.50% | 0.48% | 0.41% | 0.58% | 0.27% | |
| | **Total grant** | | 0.54 | 0.59 | 0.82 | 1.46 | 1.64 | 3.35 | 1.80 | 4.36 | 2.22 | |
| **No in house R&D** | **ESA Awardees** | 2 | 2 | 3 | 2 | 1 | 2 | 1 | 2 | 2 | 3 | |
| | **EI clients** | 717 | 751 | 719 | 731 | 747 | 843 | 768 | 796 | 886 | 840 | |
| | **%** | 0.28% | 0.27% | 0.42% | 0.27% | 0.13% | 0.24% | 0.13% | 0.25% | 0.23% | 0.36% | |
| | **Total grant** | 1.89 | 1.56 | 0.51 | 1.53 | 1.05 | 1.00 | 0.21 | 2.01 | 1.22 | 0.70 | |

*Source*: DBEI elaboration based on the RD&I data provided by Enterprise Ireland

*Table 58  Awardees of ESA funding by region*

| | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Border** | ESA Awardees | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | EI Clients | 227 | 233 | 227 | 233 | 227 | 245 | 242 | 254 | 268 | 252 | 248 |
| | % | | | | | | | | | | | |
| | Total grants | | | | | | | | | | | |
| **Dublin** | ESA Awardees | 3 | 5 | 7 | 4 | 4 | 6 | 4 | 7 | 8 | 8 | 10 |
| | EI Clients | 680 | 743 | 762 | 796 | 814 | 900 | 897 | 928 | 1019 | 969 | 944 |
| | % | 0.44% | 0.67% | 0.92% | 0.50% | 0.49% | 0.67% | 0.45% | 0.75% | 0.79% | 0.83% | 1.06% |
| | Total grants | 2.34 | 2.10 | 1.39 | 1.87 | 1.80 | 2.28 | 2.38 | 3.61 | 3.68 | 3.16 | 9.88 |
| **Mid-East** | ESA Awardees | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 |
| | EI Clients | 159 | 164 | 159 | 156 | 177 | 206 | 199 | 214 | 221 | 214 | 206 |
| | % | | | | | | 0.49% | | | | | 0.49% |
| | Total grants | | | | | | 0.35 | | | | | 0.50 |
| **Mid-West** | ESA Awardees | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 1 |
| | EI Clients | 170 | 171 | 173 | 184 | 185 | 189 | 176 | 176 | 197 | 189 | 184 |
| | % | | | | | | | 0.57% | 1.14% | 0.51% | | 0.54% |
| | Total grants | | | | | | | 0.19 | 0.30 | 0.49 | | 2.00 |
| **Midland** | ESA Awardees | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | EI Clients | 96 | 94 | 88 | 93 | 103 | 113 | 117 | 123 | 124 | 119 | 118 |
| | % | | | | | | | | | | | |
| | Total grants | | | | | | | | | | | |
| **South East** | ESA Awardees | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 2 |
| | EI Clients | 174 | 181 | 170 | 168 | 184 | 204 | 192 | 184 | 193 | 187 | 184 |
| | % | | | | | | | 0.52% | | 0.52% | | 1.09% |
| | Total grants | | | | | | | 0.43 | | 0.20 | | 0.51 |
| **South West** | ESA Awardees | 1 | 1 | 1 | 2 | 2 | 1 | 4 | 1 | 3 | 1 | 3 |
| | EI Clients | 242 | 251 | 240 | 264 | 281 | 308 | 300 | 305 | 318 | 304 | 296 |
| | % | 0.41% | 0.40% | 0.42% | 0.76% | 0.71% | 0.32% | 1.33% | 0.33% | 0.94% | 0.33% | 1.01% |
| | Total grants | 0.15 | 0.22 | 0.44 | 0.80 | 0.52 | 0.20 | 1.11 | 0.04 | 1.72 | 0.19 | 0.89 |
| **West** | ESA Awardees | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| | EI Clients | 141 | 153 | 155 | 157 | 156 | 176 | 173 | 172 | 178 | 168 | 166 |
| | % | 0.71% | | | | | | | | | | 0.60% |
| | Total grants | 0.15 | | | | | | | | | | 0.60 |

*Source*: DBEI elaboration based on the RD&I data provided by Enterprise Ireland

*Table 59  Awardees of ESA funding by sector*

| | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Food, Drink and Primary Production** | **ESA Awardees** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **EI Clients** | 277 | 272 | 257 | 259 | 260 | 298 | 304 | 297 | 310 | 302 | 296 |
| | **%** | | | | | | | | | | | |
| | **Total grants** | | | | | | | | | | | |
| **ICT and Internationally Traded Services** | **ESA Awardees** | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 6 | 5 | 5 |
| | **EI Clients** | 404 | 434 | 456 | 505 | 544 | 615 | 629 | 640 | 711 | 707 | 680 |
| | **Percentage** | 0.99% | 0.92% | 0.88% | 0.59% | 0.74% | 0.65% | 0.64% | 0.63% | 0.84% | 0.71% | 0.74% |
| | **Total grants** | 2.49 | 1.86 | 0.76 | 1.83 | 1.39 | 1.55 | 0.77 | 2.12 | 2.58 | 1.14 | 2.10 |
| **Computer, electronic and optical** | **ESA Awardees** | 0 | 1 | 1 | 1 | 1 | 3 | 2 | 3 | 2 | 1 | 5 |
| | **EI Clients** | 61 | 70 | 71 | 70 | 68 | 71 | 67 | 69 | 68 | 61 | 60 |
| | **Percentage** | | 1.43% | 1.41% | 1.43% | 1.47% | 4.23% | 2.99% | 4.35% | 2.94% | 1.64% | 8.33% |
| | **Total grants** | | 0.24 | 0.34 | 0.02 | 0.78 | 1.09 | 2.28 | 1.49 | 0.62 | 1.19 | 4.64 |
| **Med devices** | **ESA Awardees** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **EI Clients** | 7 | 8 | 9 | 9 | 10 | 13 | 16 | 19 | 20 | 21 | 21 |
| | **%** | | | | | | | | | | | |
| | **Total grants** | | | | | | | | | | | |
| **Energy, Water and Waste** | **ESA Awardees** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **EI Clients** | 49 | 64 | 61 | 68 | 67 | 69 | 78 | 85 | 94 | 87 | 84 |
| | **%** | | | | | | | | | | | |
| | **Total grants** | | | | | | | | | | | |
| **Construction** | **ESA Awardees** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **EI Clients** | 35 | 42 | 39 | 37 | 41 | 42 | 38 | 43 | 52 | 50 | 49 |
| | **%** | | | | | | | | | | | |
| | **Total grants** | | | | | | | | | | | |
| **Chemical and pharmaceuticals** | **ESA Awardees** | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 |
| | **EI Clients** | 52 | 53 | 51 | 59 | 61 | 63 | 67 | 68 | 65 | 62 | 62 |
| | **Percentage** | | | | 1.69% | | | 1.49% | | 1.54% | | 1.61% |
| | **Total grants** | | | | 0.50 | | | 0.70 | | 1.20 | | 0.30 |
| **Traditional Manufacturing** | **ESA Awardees** | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 2 |
| | **EI Clients** | 702 | 689 | 654 | 655 | 678 | 713 | 650 | 687 | 706 | 663 | 652 |
| | **Percentage** | 0.14% | 0.15% | 0.15% | | | | 0.15% | 0 | 0.14% | 0.15% | 0.31% |
| | **Total grants** | 0.15 | 0.22 | 0.44 | | | | 0.06 | | 0.49 | 0.48 | 4.24 |
| **Business, Financial and other services** | **ESA Awardees** | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 1 |
| | **EI Clients** | 290 | 345 | 362 | 372 | 378 | 441 | 430 | 431 | 475 | 436 | 429 |
| | **Percentage** | | | 0.28% | 0.27% | 0.26% | 0.23% | 0.47% | 0.23% | 0.21% | 0 | 0.23% |
| | **Total grants** | | | 0.29 | 0.32 | 0.15 | 0.20 | 0.30 | 0.44 | 0.49 | | 2.00 |
| **Semi-conductors** | **ESA Awardees** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | **EI Clients** | 11 | 12 | 13 | 16 | 19 | 15 | 16 | 16 | 16 | 13 | 13 |
| | **Percentage** | | | | | | | | | | | |
| | **Total grants** | | | | | | | | | | | |

*Source*: DBEI elaboration based on the RD&I data provided by Enterprise Ireland

## A.4  Data tables for the survey of awardees

**Profile of respondents**

In total, 220 responded to the survey of awardees. The data describing the company characteristics are described in Table 60, Table 61, Table 62 and Table 63. The relative share of the sample group across these characteristics is broadly consistent with their respective proportion of the whole population described in chapter 2.3, though those firms within the 'Business and Financial Services' sector account for 17% of the awardees within the data population, but have lower representation in the survey sample (5%). One tenth of survey respondents remain unclassified ('Other') despite re-defining a large share of them according to existing categories.

*Table 60   Data sample – Industry sectors (awardees)*

| Industry Sector | Number | Percentage |
|---|---|---|
| Information, communication and computing | 56 | 25.9% |
| Traditional manufacturing | 45 | 20.8% |
| Food, drink and primary production | 33 | 15.3% |
| Others[60] | 21 | 9.7% |
| Computers, electronics and optical | 18 | 8.3% |
| Business and financial services | 10 | 4.6% |
| Chemicals and pharmaceuticals | 10 | 4.6% |
| Medical devices | 10 | 4.6% |
| Construction | 8 | 3.7% |
| Energy, waste, and water | 5 | 2.3% |
| Total | 216 | 100% |

Source: Technopolis, based on survey data

*Table 61   Data sample – Number of full-time equivalent employees (awardees)*

| Firm size (full-time equivalent) | Number | Percentage |
|---|---|---|
| 0-9 FTEs | 19 | 8.8% |
| 10 – 49 FTEs | 108 | 49.8% |
| 50 – 249 FTEs | 69 | 31.8% |
| 250+ FTEs | 21 | 9.7% |
| Total | 217 | 100% |

Source: Technopolis, based on survey data

*Table 62   Data sample – Region (awardees)*

| Location (region) | Number | Percentage |
|---|---|---|
| Dublin | 76 | 34.9% |
| South-East | 29 | 13.3% |
| Border | 23 | 10.6% |

---

[60] 32 respondents marked as 'Others' have been allocated to existing categories based on the description of their industry

| | | |
|---|---|---|
| Mid-West | 23 | 10.6% |
| South-West | 23 | 10.6% |
| West | 17 | 7.8% |
| Midlands | 15 | 6.9% |
| Mid-East | 12 | 5.5% |
| Total | 21 8 | 100% |

Source: Technopolis, based on survey data

*Table 63   Data sample – Trade experience (awardees)*

| Years of trading experience | Number | Percentage |
|---|---|---|
| 1 – 10 years | 32 | 14.5% |
| 11 – 20 years | 68 | 30.9% |
| 21 – 30 years | 48 | 21.8% |
| 31 – 40 years | 36 | 16.4% |
| More than 40 years | 36 | 16.4% |
| Total | 220 | 100% |

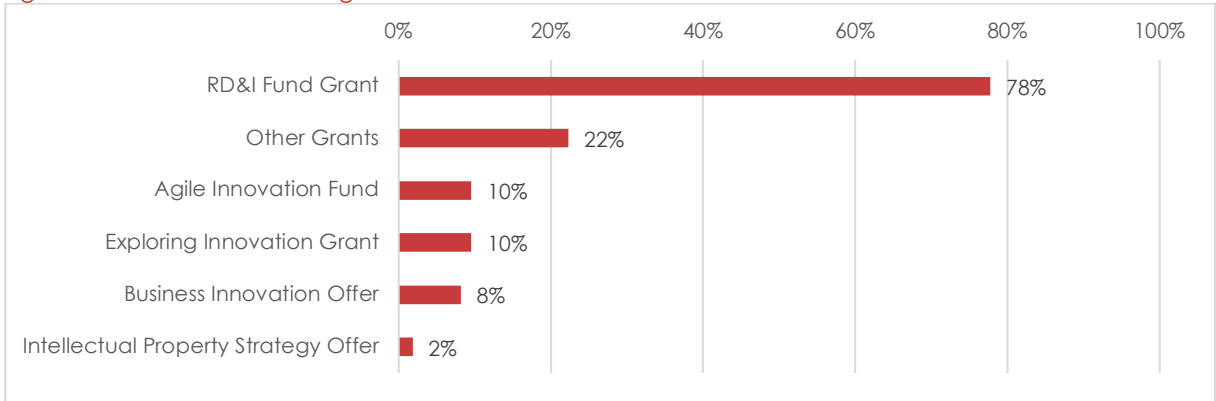Source: Technopolis, based on survey data

**Grants received**

The number of received grants are summarised in Figure 43. The RD&I Fund is the most commonly-reported grant received, reported as accessed by almost 80% of respondents. The 'Agile Innovation Fund', 'Exploring Innovation Grant' and the 'Business Innovation Offer' show similar frequency as one another while only a minority reported accessing the 'Intellectual Property Strategy Offer'. Among the 'Other'[61] supports reported by respondents 'Lean support' grants were most common, having been received by approximately 15% of respondents. Other popular schemes classified under 'Other' include grants for employment, grants for market access, the Innovation Partnership grant and capital grants.

The analysis shows that it is not uncommon for firms to engage in multiple support schemes with 25% of the respondents having received at least 2 different grants. A small minority (11 respondents, 5%) reported to have received up to three different grants. The analysis further revealed that the median grant duration lasted four years[62].

---

[61] Various grants reported under 'Others' have been re-classified under the pre-defined categories as part of the analysis

[62] Values that appeared incorrect or implausible have been removed from the data sample

*Figure 43       Received EI grants*



Source: Technopolis, based on survey data. Base = 220

## A.5 Data tables for the survey of Enterprise Ireland clients that have not accessed the programme

**Profile of respondents**

*Table 64   Data sample – Industry sectors (clients that have not accessed the programme)*

| Industry Sector | Count of respondents | % of respondents |
|---|---|---|
| Business and financial services | 4 | 8% |
| Computers, electronics and optical (including semi-conductors) | 2 | 4% |
| Construction | 5 | 10% |
| Energy, waste, and water | 1 | 2% |
| Food, drink and primary production | 5 | 10% |
| Information, communication, and computing | 12 | 24% |
| Medical devices | 3 | 6% |
| Traditional manufacturing | 17 | 35% |
| Total | 49 | 100% |

Source: Technopolis, based on survey data

*Table 65   Data sample – Number of full-time equivalent employees (clients that have not accessed the programme)*

| Firm size (FTE) | Count of respondents | % of respondents |
|---|---|---|
| 0-9 FTEs | 7 | 13% |
| 10-49 FTEs | 26 | 49% |
| 250+ FTEs | 1 | 2% |
| 50-249 FTEs | 19 | 36% |
| Total | 53 | 100% |

Source: Technopolis, based on survey data

*Table 66   Data sample – Region (clients that have not accessed the programme)*

| Base region | Count of respondents | % of respondents |
|---|---|---|
| Border | 7 | 13% |
| Dublin | 20 | 38% |
| Mid-East | 1 | 2% |
| Midlands | 2 | 4% |
| South-East | 8 | 15% |
| South-West | 9 | 17% |
| West | 6 | 11% |
| Total | 53 | 100% |

Source: Technopolis, based on survey data

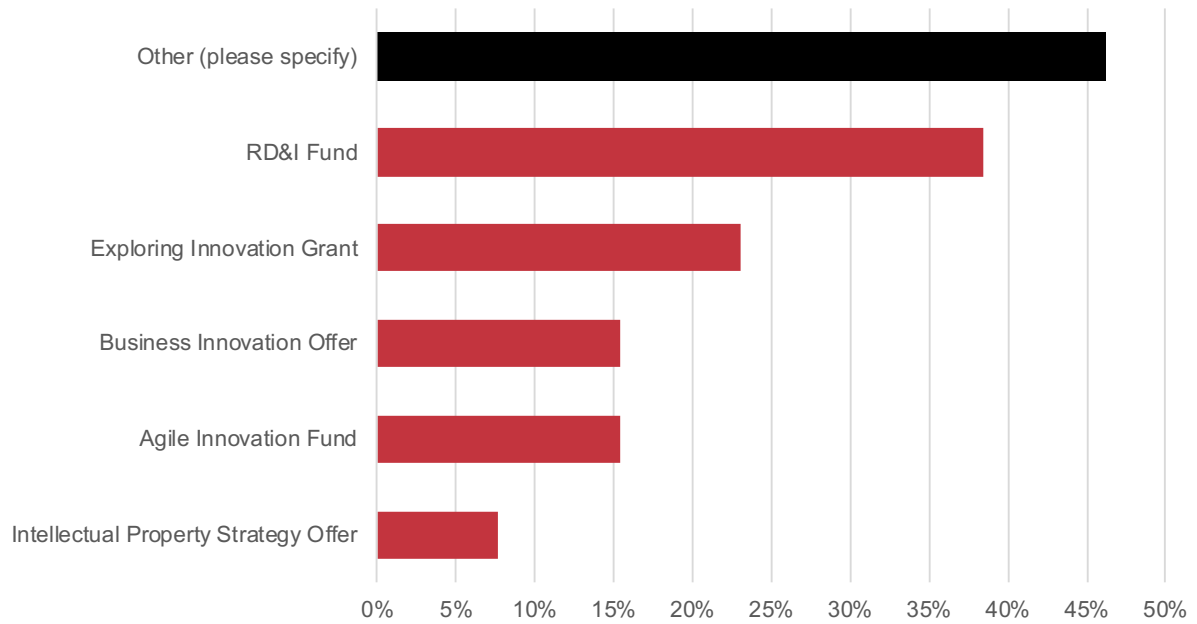*Table 67   Data sample – Trade experience (clients that have not accessed the programme)*

| Number of years trading | Count of respondents | % of respondents |
|---|---|---|
| 1-10 | 6 | 11% |
| 11-20 | 12 | 22% |
| 21-30 | 9 | 17% |

| | | |
|---|---:|---:|
| 31-40 | 9 | 17% |
| More than 40 years | 18 | 33% |
| Total | 54 | 100% |

**Grants applied for**

*Figure 44  Grants applied for by client firms that have not accessed the programme*

# Appendix B Methodological information

## B.1   Econometric analysis – data treatment

**Propensity score matching**

This technique allows us to compare the performance outcomes of awardees with the performance of a group of non-awardees with similar characteristics (control group).  The control group of firms would have the same chance to be awarded RD&I direct financial supports conditional on their characteristics. These characteristics are shown in Table 68.

Table 68 also shows the estimates from an econometric model which identifies the importance of a range of enterprise characteristics which influence the chance to be awarded EI RD&I direct financial supports. The table shows that on average, the probability to be awarded RD&I direct financial supports is positively associated with a range of firm-specific characteristics including labour productivity, firm size, high skills, export participation, engagement in R&D activity, innovation activity, profitability, and links with universities. The year-specific effects indicate that relative to 2007 the probability to be awarded EI RD&I financial supports has declined significantly from 2010 until 2018, which is important to capture for the 'matching' process but does not have a wider implication for the programme and the evaluation.

The estimates of the probabilities to be awarded EI RD&I direct financial supports are then used to match the group of awardees with a control group of non-awardees having similar characteristics with the awardees (and the same probability to be awarded EI RD&I direct financial supports).[63] Using the propensity score estimates, 654 enterprise group awardees identified in the data set are matched using information from a control group of 12,094 observations. The matching is carried out using the nearest neighbour method.

*Table 68          Determinants of the probability of approved EI RD&I awards*

|  | beta | s.e. | p-value | Marginal effects |
|---|---|---|---|---|
| **Labour productivity (log)** | 0.034 | 0.019 | 0.07 | 0.0009 |
| **Employment (log)** | 0.207 | 0.043 | 0.00 | 0.0053 |
| **Wage per employee (log)** | 0.148 | 0.069 | 0.03 | 0.0038 |
| **Exporter (=1)** | 1.049 | 0.207 | 0.00 | 0.0270 |
| **Positive profit (=1)** | 0.252 | 0.123 | 0.04 | 0.0065 |
| **R&D activity (=1)** | 1.853 | 0.158 | 0.00 | 0.0477 |
| **Patent holder (=1)** | 0.832 | 0.159 | 0.00 | 0.0214 |
| **University link (=1)** | 0.588 | 0.168 | 0.00 | 0.0151 |
| **Constant** | -6.589 | 0.365 | 0.00 | |
| **Year fixed effects** | | | | |
| **2008** | 0.055 | 0.155 | 0.72 | 0.0022 |
| **2009** | 0.136 | 0.151 | 0.37 | 0.0057 |
| **2010** | -0.390 | 0.172 | 0.02 | -0.0129 |
| **2011** | -0.391 | 0.175 | 0.03 | -0.0129 |

---

[63] The matching has been done using the nearest neighbour with replacement method.

|  | beta | s.e. | p-value | Marginal effects |
|---|---|---|---|---|
| **2012** | -0.765 | 0.193 | 0.00 | -0.0215 |
| **2013** | -0.346 | 0.168 | 0.04 | -0.0117 |
| **2014** | -0.543 | 0.173 | 0.00 | -0.0168 |
| **2015** | -0.921 | 0.190 | 0.00 | -0.0243 |
| **2016** | -1.070 | 0.191 | 0.00 | -0.0266 |
| **No. of observations** | 12,748 | | | |
| **Pseudo R²** | 0.143 | | | |
| **Wald chi² (17)** | 370.880 | | | |

*Source*: ESRI estimates based on the linked ABSEI and RD&I data sets provided by the DBEI and Enterprise Ireland. Note: Labour productivity is measured as total value added / employment. Covariates are averages over two years before the approval (treatment) year. The probabilities are estimated on the basis of the first approved EI RD&I direct financial support. Standard errors are clustered at enterprise-group level, using a probit model. S.E. = Standard Error ***Significant at 1% level, ** Significant at 5% level, *Significant at 10% level

## B.2   Interviews undertaken

**Interviews with firms**

| Firm group | Invited | Completed |
|---|---|---|
| Awardees | 70 | 34 |
| EI clients that had not accessed the Programme | 18 | 6 |
| Total | 88 | 40 |

**Interviews with Development Advisors**

| Name | Sector of focus |
|---|---|
| James Croke | Services |
| Helen McAuliffe | HPSU and ICT |
| Michael Browne | Financial services |
| Alan Dunne | Electronics |
| Ray Walsh | ICT (software) |
| Michelle O'Grady | ICT (cybersecurity) |
| TJ Hughes | Medical devices & HPSU |
| David O'Sullivan | Life Sciences and Pharma |

**Interviews with representatives of international comparator programmes**

| Country | Programme | Name |
|---|---|---|
| Austria | Frontrunner | Martin Wilfling |
| Denmark | Innobooster | Johan Lervang |
| Netherlands | SME+ Innovation Fund | Natascha Szilágyi, Rein van Erp |
| Sweden | Innovation projects in small and medium-sized companies | Anna Chiara Brunetti |

# Appendix C    Data collection tools

## C.1   Survey questionnaire for awardees of the RD&I programme

**Introduction**

Thank you for taking the time to reply to this survey. The Department of Business, Enterprise & Innovation (DBEI) has commissioned Technopolis Group to evaluate the direct financial support available for research and development (R&D) provided by Enterprise Ireland. This comprises a suite of supports, including: the Exploring Innovation Grant [LINK], the R&D Fund [LINK], the Agile Innovation Fund [LINK], the Business Innovation Projects grant [LINK], and the Intellectual Property Strategy Offer [LINK]. These grant schemes are collectively referred to as the RD&I Programme throughout this survey.

You have received this survey as a client of Enterprise Ireland that has received support through the RD&I Programme. The objective of this survey is to gather feedback from recipients of the RD&I fund. The collection information will be used to evaluate the appropriateness and the effectiveness of the business support scheme as well as to identify needs for improvement. A letter of introduction, providing further information about the evaluation can be found at this [LINK].

All responses will be treated in strict confidence, and only reported at the highest possible level of aggregation.

*Confidentiality and data*

Your participation in this survey is voluntary you are able to withdraw at any time. Indeed, you are free to request the withdrawal and deletion of your submission and data at any point during the course of the study. Technopolis Group provides independent, evidence-based research to support policy makers across the world. Technopolis operates in compliance with GDPR and take all steps to ensure the protection and confidentiality of your personal information.

For further information on your rights and how to contact Technopolis, please refer to their Privacy Notice: http://www.technopolis-group.com/privacy-policy. For any queries please contact Martin Wain at martin.wain@technopolis-group.com.

**About your company**

Q1: Can you please confirm:

- Your sector of operation

[Drop down menu with sectors]

- The size of your firm (full time equivalents)

[List of options: 0-9 FTEs, 10-49, 50-249, 250+]

- The region you are based in

[Drop down menu with regions]

- Number of years trading

[Number]

- Which grant(s) you received (please select all that apply)

- When was the first and last year you received a grant? Type year or type don't know

**Your involvement with the RD&I programme**

Q2: How did you learn about the EI RD&I Programme? Please select one option.

- Directly via the Enterprise Ireland website
- Your Enterprise Ireland Development Advisor
- Local Enterprise Offices (LEO)
- Media advertisements
- Enterprise Ireland Events
- Other (please specify)

**Your motivations to access the RD&I programme**

Q3. On a scale of 1 to 5 (where one is 'not at all important' and 5 is 'very important') how important were the following motivations for applying for the RD&I programme?:

- Learn more about how RD&I could benefit your company
- Increase your company's capacity and capability to undertake RD&I activities
- Undertake a new RD&I project in your company's core business area
- Undertake a new RD&I project in a new business area (e.g. new application, new sector)
- Consolidate or increase your company's current market position
- Expand to new markets outside Ireland
- Protect intellectual property emerging from your company's RD&I activity
- Secure further private investments or financing (e.g. new investors, stronger commitment from existing investors)
- Secure further public investments or financing (e.g. research funds, grants, loans, equity investment, R&D tax credits, other public programmes)
- Increase profitability
- Reduce the financial risk associated with carrying out a new R&D project
- Other (please specify)

**Benefits emerging from your participation in RD&I programme**

Q4. To what extent have you experienced the following benefits from the support you received from the RD&I programme?:

- Improved knowledge on the benefits of RD&I for our company
- Higher capacity to undertake RD&I activities
- Higher capability to undertake RD&I activities
- Development of new or enhanced products, processes or services
- Development of new or enhanced business innovations (e.g. organisational)
- Development of new or enhanced IP strategy
- Other (please specify)

Q5. We want to understand how your level of **R&D investment** has changed since you received the support. What was the level of your annual R&D expenditure in the year before receiving the support and what is your current level of annual R&D expenditure?

Please provide your best estimate in EUR or bands.

[List of options: Before, Currently]

Q6. To what extent have you experienced the following impacts on your business from the support you received?

[Matrix. Columns: Yes, to a large extent; Yes, to some extent; No, but this is expected in the future; No, and this is not expected in the future, Not applicable]

- Increased or safeguarded turnover
- Created or safeguarded jobs
- Won new customers
- Won new business with existing customers
- Expanded to other sectors / product ranges
- Expanded to other markets outside Ireland
- Increased profitability
- Other (please specify)

Q7. Have you experienced any other benefits from the RD&I programme (not captured in the prior questions)? Please describe:

[Open text]

Q8: Thinking about the ambition or project that motivated you to take part in the programme, what would have happened in the absence of support from the RD&I programme?

- We would have continued with our efforts or project at the same scale and in the same timeframe
- We would have continued with our efforts or project at a reduced scale
- We would have continued with our efforts or project at a later time
- We would have continued with our efforts or project at a reduced scale and at a later time
- We would have continued our with our efforts or project at an alternative location (outside Ireland)
- We would not have undertaken the project

Q9: Thinking about the benefits described in the prior questions, to what extent have each of the grant offers you received contributed to achieving those results?  .

[Matrix. Columns:  Not applicable / Not at all / To a small extent / To a medium extent / To a large extent]

- Exploring Innovation Grant
- Research and Development (R&D) Fund
- Intellectual Property Strategy Offer (either IP Start of IP Plus)
- Agile Innovation Fund
- Business Innovation Projects

Please describe your answer: [Open text]


**Your satisfaction with the RD&I programme**

Q10. Did you experience any of the following barriers during your application for or use of the support you received? Please tick all that apply, against each of the supports you received.

Only tick the boxes for those schemes in which you were involved.

[Matrix. Columns of tick boxes per grant scheme / support]

- The work required to prepare and submit the application
- The work required during the assessment process
- Securing co-financing for the grant
- Securing internal resourcing to implement the work
- Securing financing to continue the work after the grant finished
- Securing internal resourcing to continue the work after the grant finished
- Unable to hire people with the skills to undertake the project
- None
- Other (please specify)


Q11. On a scale from 1 to 5 (where 1 is 'not satisfied at all', and 5 is 'very satisfied'), how satisfied are you with the following aspects of the RD&I programme. Please respond to each of the supports you have received

[Matrix. Drop-down boxes:  1-5, Do not know]

- Application process (e.g. clarity of the purpose of the grant, eligibility, level of detail required in the application process)
- The time from submission of the application to approval for the grant
- Administrative requirements following the approval of the application (e.g. reporting, monitoring)
- Size of the grant / level of the financial support
- The time period over which support is offered
- Support provided by the Enterprise Ireland Development Advisor

- Support provided by the Enterprise Ireland Technologist

**Comparison with other RD&I support schemes**

Q12. Please indicate your level of engagement other R&D support measures available in Ireland:

[Matrix. Columns: Not aware / Aware but not accessed / Accessed once / Accessed repeatedly]

- R&D Tax Credit
- Knowledge Development Box
- Small Business Innovation Research
- European Space Agency
- Innovation Partnerships
- Innovation Vouchers
- European schemes (e.g. Enterprise Europe Network, Horizon 2020)
- Private sector support
- Others (Please specify)

Q13. We are interested in understanding how various R&D support mechanisms interact and help businesses to achieve their goals. On a scale from 1 to 5 (where 1 is 'not at all complementary', and 5 is 'completely complementary'), to what extent do you believe the RD&I Programme is complementary to the other listed RD&I support schemes?

[Matrix. Columns: 1-5, Do not know, Not applicable/Not used]

- R&D Tax Credit
- Knowledge Development Box
- Small Business Innovation Research
- European Space Agency
- Innovation Partnerships
- Innovation Vouchers
- Horizon 2020

Please explain your answer [open text]

**Future challenges**

Q14. What are the main challenges your business will face in the next 5-10 years?

- Recruitment issues (e.g. finding and retaining employees with appropriate skills)
- Technological advancements (e.g. integration, automation, etc.)
- Data management (e.g. information security, integrity, etc.)
- Supply chain issues (e.g. changing commodity prices, increasing competition, etc.)
- Maintaining profit margins

- Increased market uncertainty (e.g. changing global conditions)
-  Access to finance
- Changes in consumer demand
- Productivity (e.g. resource management)
- Other (please describe)

Q15. On a scale of 1 to 5 (where one is 'very appropriate' and 5 is 'not appropriate at all'), how appropriate is the RD&I programme (in its current configuration) in helping your organisation to address those future challenges?

[Options: 1-5, Do not know]

Please explain your answer [open text]

Q16. What one thing would you recommend to Enterprise Ireland for improving the RD&I programme in future?

[Open text]

*Closing*

Q17. We would welcome the opportunity for a 15-20 minute telephone conversation discuss your answers and views in more detail. If you are willing to participate then please provide your details below.

- Name
- Email

## C.2   Survey questionnaire for EI clients that have not accessed the RD&I programme

**Introduction**

Thank you for taking the time to reply to this survey. The Department of Business, Enterprise & Innovation (DBEI) has commissioned Technopolis Group to evaluate the direct financial support available for research and development (R&D) provided by Enterprise Ireland. This comprises a suite of supports, including: the Exploring Innovation Grant [LINK], the R&D Fund [LINK], the Agile Innovation Fund [LINK], the Business Innovation Projects grant [LINK], and the Intellectual Property Strategy Offer [LINK].

You have received this survey as a client of Enterprise Ireland that has not yet received support through the RD&I Programme. As part of the evaluation of this fund, we are keen to understand what barriers might exist to firms undertaking this support. This will ensure that future iterations of the programme can be designed to best cater to the needs of Irish businesses. A letter of introduction, providing further information about the evaluation can be found at this [LINK].

All responses will be treated in strict confidence, and only reported at the highest possible level of aggregation.

*Confidentiality and data*

Your participation in this survey is voluntary you are able to withdraw at any time. Indeed, you are free to request the withdrawal and deletion of your submission and data at any point during the course of the study. Technopolis Group provides independent, evidence-based research to support policy makers across the world. Technopolis operates in compliance with GDPR and take all steps to ensure the protection and confidentiality of your personal information.

For further information on your rights and how to contact Technopolis, please refer to their Privacy Notice: http://www.technopolis-group.com/privacy-policy. For any queries please contact Martin Wain at martin.wain@technopolis-group.com.

**About your company**

Q1. Can you please confirm:

- Your sector of operation

[Drop down menu with sectors]

- The size of your firm (full time equivalents)

[List of options: 0-9 FTEs, 10-49, 50-249, 250+]

- The region you are based in

[Drop down menu with regions]

- Number of years trading

[Number]

- Please indicate if you have applied for the following grants under the EI RD&I programme

[Drop down menu with name of grants, and option other]

**Reasons for not accessing the RD&I programme**

Q2. Which of the following statements best explain why you have not accessed the RD&I programme? Tick all that apply.

- We are not R&D active and do not plan to be in the near future

- We applied for Enterprise Ireland support but our application was not successful

- We were not aware of the available schemes

- We were not eligible for the programmes

- The application process was complex

- The process for drawing down other EI grants was complex

- We could not get matched funding for an RD&I grant

- Other schemes were more appropriate for our business

- Other, please describe

Q3. What one change could be made to make you more likely to take up Enterprise Ireland support?

[Open text]

**Future challenges**

Q4. What are the main challenges your business will face in the next 5-10 years?

- Recruitment issues (e.g. finding and retaining employees with appropriate skills)
- Technological advancements (e.g. integration, automation, etc.)
- Data management (e.g. information security, integrity, etc.)
- Supply chain issues (e.g. changing commodity prices, increasing competition, etc.)
- Maintaining profit margins
- Increased market uncertainty (e.g. changing global conditions)
-  Access to finance
- Changes in consumer demand
- Productivity (e.g. resource management)
- Other (please describe)


Q5. If you are planning future investment in R&D, on a scale of 1 to 5 (where one is 'very appropriate' and 5 is 'not appropriate at all'), how appropriate do you believe the RD&I programme would be to address those future challenges?:

[Options: 1-5, Do not know, Not Applicable]

Please explain your answer [open text]


**Other schemes**

Q6. Have you received any other support from Enterprise Ireland?

- No, we have not received other support from Enterprise Ireland
- Yes, Capital support
- Yes, Employment support
- Yes, Market diversification support
- Other (Please specify)


Q7. Have you used any alternative business support schemes for R&D? Tick all that apply

- R&D Tax Credit
- Knowledge Development Box
- Small Business Innovation Research
- European Space Agency
- Innovation Partnerships
- Innovation Vouchers
- European schemes (e.g. Enterprise Europe Network, Horizon 2020)
- Private sector support

- Others (Please specify)

Q8. We would welcome the opportunity for a 10-minute telephone conversation discuss your answers and views in more detail. If you are willing to participate then please provide your details below.

- Name
- Email

## C.3   Interview topic guide for RD&I programme awardees

1. Please tell us a little bit about your business
2. Could you briefly summarise your interactions with the Enterprise Ireland Development Advisor when applying to the RD&I programme?
    i) Why did you / you and your DA decide to approach the RD&I programme?
    ii) What was the process of application?
3. To what extent were your business needs met through the RD&I programme?
4. Were any of your business needs un-met?
    i) Is this due to missing provision or specific barriers
5. What do you regard as the most significant benefit or impact that the RD&I programme support has had on your business?
    i) Do you expect any further benefits or impacts to be realised in the future?
6. Did you experience any barriers to maximising the benefits of the RD&I support?
7. Have you gone on to use any other RD&I-focused business support since using the RD&I programme?
    i) Do you see any overlaps between the RD&I programme support you received and other support for RD&I in Ireland?
8. Do you have any other comments or remarks?


## C.4   Interview topic guide for EI clients that have not accessed the RD&I programme

8 Please tell us a little bit about your business
9 Have you held any conversations with your Enterprise Ireland Development Advisor about receiving RD&I programme support?
    i) Do you have any emergent business needs that might be served by the RD&I programme?
10 Could you please summarise the reasons for not applying to the RD&I programme?
    ii) Were there any specific barriers that deterred you?
11 Have you considered using any other RD&I-focused business support since using the RD&I programme?
    iii) If yes, what would make these suitable for your business?
12 Do you have any other comments or remarks?

## C.5   Interview topic guide for EI Development Advisors

- How many client firms do you have in your current portfolio?
  - Has this changed (increased/decreased) in the last 5-10 years?
- Which sector do you cover?
- What do you regard as the key achievements or impacts of the RD&I Programme (or its constituent parts)?
- Our econometric analysis shows that productivity effects have been limited among beneficiaries of the programme. Does this resonate with the evidence / feedback you get from client companies?
  - If yes, what is precluding them from achieving those benefits?
  - If not, do you have any examples on how participating in the programme has led to productivity effects?
- Our econometric analysis also shows that R&D expenditure has increased disproportionally more than R&D employment. Do you have a view of why that could be case?
  - Do you have a sense of how the grants accessed through the programme affect RD&I employment in beneficiary firms?
- Going forward, what changes would you make to the RD&I Programme to improve its effectiveness (e.g. orientation in terms of target groups/thematic vs open calls, etc.)?
  - Are there any special features or requirements of certain sectors that necessitate any changes in approach?
- In our prior consultations, we have heard some sense that the eligibility of the Business Innovation Offer has been confusing – does this resonate with you?
- Do you have any other comments you would like to make?


## C.6   Interview topic guide for representatives of international comparator programmes

- What do you regard as the key achievements or impacts of [insert programme name]?
  - Have you noticed any productivity effects on beneficiaries of the programme?
- What would you say are the key success factors of [insert programme name]?
- Could you tell us about the key lessons learnt over the period of implementation?
  - Have any changes to the programme (e.g. orientation in terms of target groups/thematic vs open calls, etc.)?
- What is your approach to supporting new R&D performers (i.e. those firms that have not been R&D active before)?
  - How do you identify such firms?
  - How do you attract such firms?
  - How do you track the developments of these firms?
- Are there any differences in how R&D support is addressed nationally and regionally in [country]?
- [Only if the country offers an R&D tax credit or similar] Do you have any sense of how your beneficiary firms access/combine the support offered by [insert programme name] with [country's] tax credit or similar incentives?

- Do you have a sense of which is more impactful for businesses?
- Do you have any other comments you would like to make?

## C.7 Template for international comparator data collection

*Descriptive information:*

- Name of Initiative:
- Start date/End date:
- Funding agency:

*Contacts for further information:*

- Name:
- Email:
- Bio:

*Description:*

- Support available (type, duration)
- Maximum and minimum funding levels
- Basic details (format, budget, how long it has been running)

*Objectives:*

- What does it aim to achieve?
- Rationale behind the programme, was it designed to help countries achieve certain targets?

*Eligibility criteria:*

- Who can apply?
- What conditions exist for them to become beneficiaries?

*Achievements to date:*

- What has the programme achieved? Over what time frame?
- How many have interacted with the programme?
- Were there any unintended benefits?

*Examples of success stories:*

- Short case study vignettes of success stories seen through the programme (if available)

*Lessons learnt:*

- Commentary on the key barriers and enablers to the programme

*How the case study programme compares to the EI RD&I programme:*

- How does the programme's performance compare to that of the EI RD&I?
- What lessons could be applied to the EI RD&I?