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# SME INSTRUMENT – SO FAR SO GOOD?

## *Expectations, Reality and Lessons to Learn*

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*Executive Summary*

The SME Instrument (SMEI) is a new consolidated funding scheme within Horizon 2020. It was introduced in 2014 as a dedicated tool to support high potential innovation, ultimately as a way to consolidate EU policy efforts to foster European competitiveness in advanced technologies in order to match its excellence in science. The expectations were pinned on small firms – the drivers of knowledge economy. There was never previously a tool dedicated exclusively to supporting the technological entrepreneurship of small and medium-sized companies in the European policy landscape. Therefore, the introduction of the SME Instrument was eagerly expected and widely welcomed by both policymakers and European small companies.

However, both practitioners and experts have been growing increasingly frustrated with the pace and the rates of implementation of the Instrument. With the extraordinary rate of response from European SMEs that the Instrument received, it has so far been financially constrained in satisfying the demand, which has eventually led to some losses of investment and the neglect of talent.

In this report, we provide the description and initial analysis of the SME Instrument, as well as first lessons that can be extracted from the ongoing stream of applications. We first note that Europe has long been experiencing a paradoxical disbalance between its strength in scientific research and its low capacity in innovation. We illustrate how the need for a dedicated tool of technological innovation support within the European policy landscape has been growing, becoming increasingly recognised throughout the successive framework programmes.

In essence, the design of the SME Instrument mimics that of the U.S. Small Business Innovation Research Program in its 3-phase structure, amounts of the awards and focus on technology commercialisation. We analyse evaluation reports and academic literature of SBIR and provide initial comparison between the two programmes. What we note is that SBIR had multiple unexpected non-financial positive externalities, such as the facilitation of entrepreneurship culture, and we make multiple propositions about the likelihood of these effects occurring as a result of the SME Instrument funding.

The report identifies three main policy implications based on first years of implementation of the SMEI: while it is extremely popular, it is way too competitive. The low probability of funding may discourage future applications once the hype for the new tool fades. Second, the variety of firms applying for the SMEI support discloses the variety of strategies and ways of coping with early stage lack of financing that exist in Europe. Many lessons can be extracted from the narratives of applicant firms and their business models. Third, there is still a lot of ambiguity about the 3rd phase of the SMEI and the ways in which SMEI awardees can access further sources of European finance.

Finally, the report profiles the proposals in terms of their technological area, country where the proposals submitted from, countries with the highest rates of funded proposals, size and age of applicant and successful SMEs, the amount of funding allocated. Eventually, we open up discontinuities in funding between phase 1 and phase 2 of the SMEI, calling them 'Wasted Talent'. This data can be a source for ongoing research in innovation management. Among others, the paper provides initial insights into how the SMEI awardee data can be used for the analysis of fast growing firms across sectors, how the applicant and awardee data can be used in the evaluation of the SMEI as a policy tool, a comparative dimension with the US SBIR and how it is possible to study synergies with other entrepreneurship policies on the European and national levels.

## *1 Introduction*

This work provides an introduction and an overview of the SME Instrument (SMEI) – currently the most popular and innovative part of the EU funding landscape. To date, over a quarter of Horizon 2020 applications have been submitted for the SME Instrument. The SMEI provides financial rewards to innovative small firms that demonstrate high growth potential. With its scale and scope, SME Instrument is a type of action new to Europe and was introduced in Horizon 2020 (H2020), the Eighth European Framework Programme for Research and Innovation. SME Instrument was to a large extent modeled after one of the most successful existing programmes that support small firms: SBIR, the U.S. Small Business Innovation Research Program (EC, 2011).

Small and Medium Enterprises (SMEs) [1] constitute the vast majority of companies in any country, and are the backbone of European economy. According to the Annual Report on European SMEs 2014/15 (Muller *et al.*, 2015), in 2014, SMEs represented 99.8% of businesses and weighed for 67% of total employment (2/3 of private sector workforce, about 90 mln people) in the 28 European Member States, generating 58% of gross value added. In the same year, SMEs created the 71.4% of new jobs in the non-financial business sector.

The SME Instrument financially supports, provides coaching and network support in order to foster high-growth firms and commercialise highly innovative research across the priorities of H2020. It empowers innovative potential of participating firms and smoothers their transition to other the EU funding schemes. Launched in 2014, the SME Instrument already received more than 20,000 proposals and was able to finance 1,879 projects, allocating almost € 700 mln.

This paper overviews the history, design and early stages of implementation of the SME Instrument, as well as provides initial analyses and sketches of future research agendas. To do this, we collected and analysed the data on SMEs that either were awarded SMEI grants, or received a 'Seal of Excellence' from the European Commission. The aggregate data that we present in this study are our elaborations based on the publicly available data published on the website of EASME – Executive Agency of SMEs of the European Commission.

The paper is structured as follows: the next section positions the SME Instrument among relevant academic theories, in the European landscape and among similar policies. In Sections 3 and 4, we provide preliminary analysis of design and implementation of SME Instrument, its strong points as well as some issues that emerged along the way. Section 5 provides an agenda for future research. Section 6 concludes the paper.

## *2 Positioning the SME Instrument: from Theory to Practice*

SME Instrument is an important landmark development of European policy. Analysing the design and implementation of the SME Instrument is of great interest to a variety of academic communities, as well as to policymakers and practitioners. In this section, we identify three research contexts for the analysis of the SME Instrument: (i) government support of small firms in the context of SME growth theories; (ii) EU research and innovation policy, with prospects of evaluation; and (iii) a comparative view of small business support programmes (taking the US SBIR as a benchmark).

### 2.1 SME Instrument and SME Growth in Europe

SME growth has been one of the most widely debated topics of innovation management

[1] The European Commission identifies SMEs companies with less than 250 employees and with no more than € 50 mln of annual turnover and/or an annual balance sheet not higher than € 43 mln.

in the past 2 decades. Accordingly, governments worldwide have re-evaluated the role of small firms in economic growth (Wennekers and Thurik, 1999). We identify two areas where the discussion of the SME Instrument can contribute to the development of theory of small business growth: the 'leverage effect' of bridging the equity gap, and the impact of direct public support on the growth of 'gazelles'.

There is currently a very positive view of the role of SMEs in economic development. Small firms are seen as sources of employment, innovation and local impact and empowerment (Acs et al., 1999; Drilhon and Estime, 1993). Yet, SMEs have constrained financial resources, which prompt them to keep seeking for extra capital. However, private investors are usually cautious and prefer to invest in companies that already demonstrate high growth rates instead of in newly founded firms with promising inventions. This part of SME growth trajectory – from the establishment to recognition and first major private investment – has been described by in the literature as the **'equity gap'** (Hyytinen and Toivanen, 2005). As venture capital funds and other private investors tend to be averse to such kind of investment, public support carries small firms through this market failure to the point where they can be investable for private funds (Colombo et al., 2016a; Lim and Kim, 2015).

Bridging the 'equity gap' is the reason why public investment in small business exists. Public investment is seen as one of the few effective tools to help young small firms to make the journey from the inception to attracting their first venture funding (Buckley, 2016), not only due to direct effects of finance, but also due to the publicity effect this type of funding has for private venture capitalists. This **"leverage effect**" has been one of the most eagerly expected results of the SME Instrument. Evaluation of the SMEI awardees' performance will necessarily need to trace whether or not they manage to attract private equity after the SMEI award and the share of this equity in contrast with the award itself. The combination of these various funding sources and the impact of timing of the investment are debated (Alperovych et al., 2015; David et al., 2000; Grilli and Murtinu, 2015) and could be probed further using SMEI award data.

The leverage effect exists alongside other entrepreneurship and small business support initiatives (Shapira, 2010). Credit guarantees so far remain the most widely employed type of support tool in OECD countries (OECD, 2016). In terms of innovation policies and programmes, research so far has mostly focused on the effects of fiscal incentives for small firms, subsidies, and government venture funding (Brander et al., 2015; Czarnitzki et al., 2011; Guo et al., 2016).

SME Instrument is a subsidy-type public investment: the awardees have no obligation to repay the investment they receive from the EU. This type of public support is usually more selective than credit guarantees or fiscal incentives, as the public body handpicks the successful companies. Yet, the companies usually receive sums that are larger per company than the ones awarded by any other public SME finance tools. A subsidy

instrument can also serve in addition to other measures: the same innovative SME can get both tax credits and subsidies. Studies provide a mixed response when they evaluate such instruments. The main criticism is that public subsidies generally cannot aid all companies that deserve it (Becchetti and Trovato, 2002). The latter is particularly relevant in relation to the SME Instrument, considering its low application success rates.

Subsidy-type instruments tend to target high-growth innovative SMEs in science- and technology-intensive sectors, or support entrepreneurship in the innovation ecosystem, such as academic entrepreneurship (Bertoni and Tykvova, 2015; Bronzini and Piselli, 2016; Hottenrott and Lopes-Bento, 2014; Zúñiga-Vicente et al., 2014). In these cases, the instruments were generally found to be effective in helping the companies bridge the equity gap and continue growing.

However, no particular effect has so far been identified in relation to all fast growing companies. These companies – 'gazelles' – are found to constitute a small minority of SMEs, but give big promise in terms of innovation, job creation and overall impact (Birch et al., 1998; Feindta et al., 2002; Skuras et al., 2005; Wong et al., 2005). Gazelles are found in all sectors of the economy and across all technologies. By identifying European gazelles and making them visible, the H2020 policymakers aim to provide a subsequent investment pipeline for these valuable firms.

Studies stress certain sets of characteristics of gazelles, which distinguishes them from low-growth companies, such as location and technology environment, experienced founders, creative business practices and careful human resource management (Barringer et al., 2005). Financing conditions and opportunities were found to be especially important for gazelles (Mason and Brown, 2013), yet no direct links have so far been established between government subsidies and the propensity of subsequent high growth (Koski and Pajarinen, 2013).

The question remains open whether the SME Instrument provides the best type of support to the prospective European SME champions. The visibility boost and the financial support that young firms receive from the award have not yet been studied in detail. On the contrary, enacting a more targeted SME support mechanism (for example, supporting only academic entrepreneurship) with broader coverage (such as innovation vouchers) could be more effective than funding a very small number of firms. Therefore, the exact link between the funding the SME Instrument provides and its impact on SME growth in the European context is yet to be established.

### 2.2 SME Instrument in the Context of European Policy

SME Instrument is the latest attempt to provide a solution to the EU's underperformance in terms of exploitation of new technologies. Compared with Europe's strength in producing new research, this discrepancy has been named a 'European Paradox' (Lundvall and Borràs, 2005). This issue was not paid much attention to in the first four

iterations, EU Framework Programmes, which tended to focus on strengthening the science base. Yet, when the innovation caveat was thought to undermine the eventual economic gain (Barker and Cameron, 2004), increasingly more changes were made to address it, starting from FP5 onwards. However, while SME and entrepreneurship policies improved significantly, up until the launch of Horizon 2020, there was not one funding stream to which European SMEs could apply for support alone and not as a part of consortia.

At the time of writing, the H2020 mid-term assessment is due to start in late 2016. The evaluation will focus on the effectiveness of the program, the relevance of the measures it includes and their coherence, the efficiency and use of resources, and the EU added value of the actions (EC, 2016a). In this context, we analyse how H2020, with its innovation entrepreneurship agenda, fared against its predecessors. We first overview how European entrepreneurship policies developed throughout framework programmes. We then outline the contemporary EU funding landscape and opportunities it gives to the SMEs. Finally, we present some considerations on SME Instrument evaluation.

#### *2.2.1 R&I in the European Union: from the Framework Programmes to Horizon 2020*

Since the inception of its first structured policy for science and technology in the early 1980s, Europe has fared remarkably in the development of a unified research and innovation landscape across its member states. Over the past 40 years, EU Strategic and Framework Programmes assisted to the reduction of research and innovation divide across European countries and regions (Barker and Cameron, 2004), and in boosting Europe's competitiveness against global leaders in science, mainly, the USA and Japan (Colombo et al., 2016b; Young, 2015).

EU programmes for science and technology were initially research-driven. Innovation and commercialisation aspects were introduced gradually as the 'European Paradox' caveat became apparent to policy makers. We identify four periods in the development of EU research and innovation programmes: experimentation, consolidation, innovation shift, and integration.

The **experimentation period** covers the first attempts to develop truly European research agenda. It includes the launch of the European Strategic Programme for Research and Development in Information Technology in 1982 and collecting all ongoing programmes under the single umbrella of the First Framework Programme (FP1, 1984-1987). These two initiatives focused on few research areas (such as industrial, information and biotechnologies), identified strategic European priorities, and developed a system whereby funds were allocated based on submitted proposals (Roediger-Schluga and Barber, 2006). However, these initial attempts faced significant burdens, such as delays, abandons, and the stonewalling attitude of some Member States (Guzzetti, 1995).

The FP1 provided a set of projects for technological innovation that included European

companies, in order to involve them in sharing their costs. The programme also supported industrial collaboration and facilitated academia-government-industry links. Some changes made during the FP1 indicate the rising importance of industrial participation throughout the programme: for example, the budget allocated on energy research decreased, with a symmetrical increase of budget dedicated to the research for industrial competitiveness.

The **consolidation period** spans the Second and the Third Framework Programmes (FP2, 1988-1991 and FP3, 1990-1994) and witnesses the emergence of the scope, duration and structure of FPs, which has been carried over to the present day. The legal basis of the FPs was established in the Single European Act (1987) and the Maastricht Treaty (1992). EU Framework Programmes formalised the *technology push* approach as a driver of European knowledge-based economy, were to last for 5 years, and encompassed projects related to basic and applied research, technology development and demonstration.

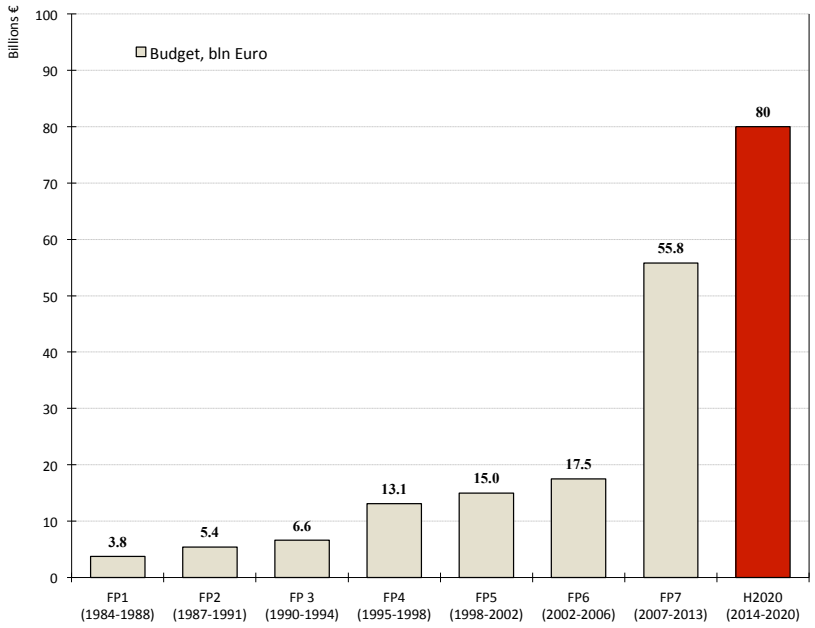
The role of industrial collaboration was also envisioned to become more active in FP3 and FP4. In fact, FP3 was the first program to include SMEs among its targets through the Co-operative research programme (Roediger-Schluga and Barber, 2006). The FP4, in its turn, promoted international collaboration and integration, along with the diffusion of new technologies, allocating budget on researchers' mobility and training-related measures.

A milestone in this development was the Green Paper on Innovation (EC, 1995), published between the third and the fourth Framework Programmes. The Green Paper stipulated that the EU at that point was not investing enough in innovation, both in terms of human resources and funds, especially if compared with global competitors. EU member states not only showed huge differences in their regulations and bureaucracy, but also high cultural and linguistic barriers. Furthermore, the EU lacked coordination and concentrated efforts to reduce challenges and restrictions to innovation.

The Green Paper had great impact on how Framework Programmes were since then perceived, and prompted **an innovation shift** in European funding. Exploitation of research results, in order to transform them into real innovations, became one of the key priorities, and, starting from FP4 (1995-1998), the budgets allocated to managing innovative outputs significantly increased.

In terms of the overall budget allocation, the increase was also significant. From an average of € 5.25 bln for the first three FPs, the budget grew to € 13.215 bln in the FP4. The FP5 (1998-2002) had a budget of € 14.96 bln, with a strong user-oriented approach and a goal to tackle socio-economic challenges through the development of breakthrough innovations. The budget of FP7 was 219% of FP6 budget, which is the highest hike in FP budget allocation so far (see Figure 1).

**Figure 1 European Framework Programmes Budgets**




Source: European Commission

Nonetheless, the assessment of the FP5 brought forth concerns about the impact of EU research and innovation policy on European competitiveness and economic growth. The stress was placed on the lack of interaction – be it between research disciplines, or innovation actors (Bruce et al., 2004). In response, the European Commission shifted its focus towards the development of opportunities of broader communication and interactions among actors involved in research and innovation. The three latest Framework Programmes have strived to **integrate** European resources, to develop complementarities and synergies between initiatives, and to provide incentives for participating actors' interaction.

In research, the FP6 (2002-2006) was designed with a purpose to contribute to the development of the European research Area (ERA), which systematised previously fragmented European scientific resources (European Commission, 2000). Strengthening the ERA was also included in the goals of the FP7. The EC substantially increased the budget of the FP7 (2007-2013), allocating more than € 55 bln to improve European research excellence and build a knowledge economy, supporting basic research and improving transnational collaboration to boost EU competitiveness, growth and employment.

In innovation, the SMEs became crucial: looking at the role played by the US small business in the rise of the Silicon Valley industries, the EC started pursuing scale economies and the diffusion of technologies through the collaboration among SMEs, and between SMEs and other actors of the innovation system (Barker and Cameron, 2004). Furthermore, FP7 recognised the crucial role of SMEs in European economic recovery,

and promoted strategic involvement of small firms in European funding landscape, allocating the total of 16.9% of the budget to support them.

The increase in FP7 funding was a trustable opportunity that EU never had before. Universities, research organisations, private companies and public organisations (though in lower numbers) participated in the FP7, submitting more than 139,000 research proposals. SMEs were heavily involved in these partnership projects. About 19,300 SMEs participated in the 106,000 projects registered to the FP7, receiving almost €5 bln of EU contribution (Fresco et al., 2015). FP7 also successfully stimulated public-private partnerships in research initiatives, promoting cross-border and cross-sector cooperation.

#### *2.2.2 Horizon 2020: a change of pace in the FPs*

Horizon 2020 (2014-2020), the Eighth Framework Programme, continues with the effort of integrating European resources and capabilities to assist research and innovation efforts. However, it changes pace from 5 to 7 years, it is broader, and it demonstrates much higher embeddedness with other projects that constitute EU innovation strategy.

First, H2020 is designed to propel Europe to achieve its 2020 goals as defined in the Innovation Union. In 2010, the European Commission launched Europe 2020 (European Commission, 2010), a ten-year jobs and growth strategy aimed at creating appropriate conditions towards smart, sustainable and inclusive growth. These priorities are tackled through seven flagship initiatives, one of which is the Innovation Union (see Table 1).

**Table 1 Flagship Initiatives of Europe 2020**

| | |
|---|---|
| Smart Growth | Digital Agenda for Europe |
| | **Innovation Union** |
| | Youth on the move |
| Sustainable Growth | Resource efficient Europe |
| | An industrial policy for the globalisation era |
| Inclusive Growth | An agenda for new skills and jobs |
| | European platform against poverty |

Source: European Commission

The Innovation Union includes over thirty action points aiming at (re)making Europe a world-class science performer, removing the obstacles to innovation that prevent ideas going quickly to market, and changing the modes through which the public and private sector cooperate. H2020 represents the *financial tool* for implementing the Innovation Union, the engine propelling Europe toward 2020 goals. Overall, it allocates nearly € 80 bln of funding (€ 70.2 bln in constant prices).

At the same time, according with the priorities of ERA, H2020 continues to structure the research environment to foster the creation of knowledge that is necessary to promote innovation. H2020 is strictly interrelated with the implementation of the ERA and

incorporates diversified policy tools[2]. In this sense, H2020 is much broader in terms of its scope than FP7. In addition to the initiatives prioritised in FP7, it includes some funding mechanisms that previously were a part of the Competitiveness and Innovation Programme, and some initiatives promoted by the European Institute for Innovation and Technology.

Furthermore, H2020 is characterised by a strong connection with European Structural Funds, which now consider research and innovation as their key priority. Most recent legislation provides for the combination of EU-level financial instruments, such as H2020, and European Structural and Investment Funds (ESIF) allocated in joint instruments and pursuing the same policy goals, implementing the same requirements and delivery mechanisms, even though the instruments differ on eligibility criteria and final beneficiaries.

H2020 is the world largest cross-border research programme. It couples research and innovation with three mutually reinforcing and complementary priorities: Excellent Science, Industrial Leadership, and Societal Challenges (see Table 3). It integrates and simplifies the support throughout the innovation cycle by focusing on innovation and providing ongoing R&D support. The stimulation of innovation in small and medium-sized European firms becomes one of its key targets.

H2020 adopts a bottom-up challenge-based approach. While H2020 has certain technological areas of special interest, the Programme leaves industry applicants considerably free to propose innovative solutions, while the emphasis is on the expected impact of innovative solutions proposed. Proposals submitted to H2020 funding projects ideally relate to one of the goals of the 'Societal Challenges' Pillar, and correspond to the ongoing renewing agenda of two-year work programmes. The work programmes are based on strategic planning jointly conducted by EC and Member States representatives in multiple thematic committees, with the purpose to maximise the impact of European funding and provide more integrated approach to the programme.

Horizon 2020 provides support to activities that are closer to users and markets (i.e. piloting, demonstration, prototyping) than previous FPs, and for demand side activities, which highly involve industry through the deployment of key enabling technologies and PPPs (both institutional and contractual).

[2] E.g. the Societal Challenges, the European Research Council, the European Institute of Technology, ERA-NETS, the Marie Curie actions, etc.

**Table 2 Key Pillars of Horizon 2020**

| Excellent Science | Industrial Leadership | Societal Challenges |
|---|---|---|
| • European Research Council | • Leadership in Enabling and Industrial Technologies (LEIT) | • Health, Demographic Change and Wellbeing |
| • Future and Emerging Technologies | • Access to risk finance | • Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy |
| • Marie Skłodowska-Curie actions | • **Innovation in SMEs** | • Secure, Clean and Efficient Energy |
| • Research Infrastructures, including e-Infrastructures | | • Smart, Green and Integrated Transport |
| | | • Climate Action, Environment, Resource Efficiency and Raw Materials |
| | | • Europe in a changing world - Inclusive, innovative and reflective societies |
| | | • Secure societies – Protecting freedom and security of Europe and its citizens |

Source: European Commission

### *2.2.3 SME Support in H2020*

On the European level, first policies related to providing small firms with financial guarantees that increase their lending and leasing were launched in 1998. They focused on supporting highly innovative and fast-growing SMEs. Almost 600,000 SMEs received guarantees support from the EU up to date, and more than € 4 bln was invested so far through equity instruments, Structural Funds and other financial instruments. Among these are the Competitiveness and Innovation Framework Programme; the European Progress Microfinance Facility; and, during 2007-2013, Risk Sharing instrument for Innovative Research oriented SMEs & Small Mid-Caps.

With regard to Framework Programmes, the involvement of the SMEs has been increasing since the FP1. However, some scholars and practitioners still considered their participation in the FP7 as not satisfactory (Colombo et al., 2016b). SME projects need short-term commercial return and that jeopardised their participation in European projects that require heavy commitment of funding and time resources (Luukkonen, 1998; Luukkonen and Hälikkä, 2000). However, SMEs participating in EU consortia show strong market-oriented purposes and propensity to collaborate, even more than large companies, interest in R&D funds and potential new markets (Luukkonen, 2002). The benefits of SME participation in FPs and the need for 'special treatment' of SME needs necessitated positioning SMEs as specific targets of FPs, staring from FP3.

The economic crises and the rise of new actors in the globalised economy created new

challenges for EU performance on the global market. In order to face these challenges, the European Commission decided to strongly invest in the R&D activities conducted by European SMEs considering them essential actors in implementing innovation strategies, restoring EU competitiveness and creating new job and growth opportunities (Di Minin & De Marco, *in press*; Fresco *et al.*, 2015).

H2020 extends the support of small and medium-sized firms in comparison with the previous FPs[3], both in terms of budget and diversification of support tools. The centrality of the SMEs in H2020 can in fact be considered its main distinguishing feature. In December 2013, the European Commission established the Executive Agency for Small and Medium-Sized Enterprises (EASME) to provide wide support for SMEs participating in H2020 programmes, from networking and matching them with partners, to help with intellectual property management (EASME, 2016).

H2020 adopts an integrated approach towards SME support. The programme allocates, overall, over € 17 bln for the SMEs. 80% of this budget (€ 13.56 mln) is allocated through the Leadership Enabling Industrial Technologies (LEIT) Programme; 17% (€ 2.84 mln) is allocated through the Access to risk finance scheme; and the remaining 3% (€ 616 mln) is allocated through the funding scheme Innovation in SMEs. Furthermore, the 20% of the budget of LEITs and Societal Challenges is reserved to SMEs: 13% for collaborative projects and 7% for the SME Instrument managed by EASME. The following paragraph will overview the SME Instrument and the next section will discuss its initial results.

#### *2.2.4 The SME Instrument*

The SME Instrument is dedicated to support highly innovative SMEs oriented toward internationalisation and growth, committed to implement high-risk ideas with highly innovative potential. The SME Instrument provides support to projects with European relevance, potentially able to introduce disruptive innovations and change the business world. It provides funds to bridge the early-stage 'equity gap' and aims to identify the next generation of European business champions (see Section 2.1). It also aims at boosting SMEs' potential of expanding their activities and markets in Europe and beyond the EU.

SMEI integrates all the previous programmes and initiative for SMEs in a single funding scheme. It incorporates old support programmes overseen by the FP7 and the Competitiveness and Innovation Framework Programme. A key difference is that in all prior SME support policies, SMEs could only enter competitions in partnerships with other private or public sector organisations. Within SME Instrument, an SME can

[3] Due to volume limitations, we limit the focus of this paper to the description of the SME Instrument, being fully aware that the European scenario of support for small and medium-sized business goes far beyond the SMEI and includes many programmes managed both within and outside the H2020 framework, such as COSME, Eureka-Eurostar scheme and others.

participate in a European call alone. Yet, partnering is advisable to increase the chances of success, especially with universities and other research-performing organisations.

The SMEI is structured in three main phases (with addition of the coaching tool), articulated as follows: concept and feasibility assessment; demonstration and market replication R&D; Commercialisation. The emphasis of the SMEI is on speeding up the innovation process, for fast assessment and application of innovation.

The SMEI is an *open call*, meaning that companies can apply whenever they prefer and be included in the quarterly rankings awarding the funds. Each phase specifies fundable activities for winning proposals. Depending on the stage of development of the project to be proposed, SMEs can apply directly to the second phase of funding if they want to bypass the first one.

We review each of the phases in detail below.

1- **Concept and Feasibility assessment**. In Phase 1 (Ph1) the SMEs are called to transform a business idea into a business concept by developing the idea and evaluating its viability, considering technological and commercial risks, and the potential of the idea, its feasibility. In a preliminary business plan, the proposing companies explore possibilities of commercialising a breakthrough innovation. SMEs apply to Ph1 with a short business plan (about 10 pages long). They describe the innovativeness and excellence of their business idea, its potential impact and the proposed implementation strategy. 10% of the total SMEI budget is allocated in this phase, and each winning project is awarded with a lump sum of € 50,000. Funds are employed for a proof of concept, technical feasibility assessment and commercial potential assessment of an innovation that the SME wants to develop and bring to the market. Fundable activities include risk assessment, market analysis and design, exploring intellectual property (IP) regimes and strategies, developing pilot applications. The project should aim at bringing a new service, product or process to the market, through innovative application of technologies, methodologies or extant business processes. The project is supposed to align with the business strategy of the SME, as a tool to pursue internal growth or aiming at new transnational business opportunities. Ph1 covers a maximum of 6 months per project and its main output is a feasibility study including an elaborated business plan.

2- **Demonstration and Market Replication R&D**. Phase 2 (Ph2) includes activities, such as R&D, demonstration and replication on the market. By going through these steps, companies develop a business concept up to the market-maturity and make it ready to attract further investment. The SMEs apply with a 30-page proposal that should include a business plan and a description of proposed activities. Almost 88% of the SMEI budget is allocated in this phase, and funds are employed for innovative projects with strong strategic business

plans. Since companies have to demonstrate commercial potential of their concepts, fundable activities include prototyping (on small or large scale), testing, design, performance evaluation, monitoring, demonstration, piloting, validation for market duplication, scaling-up and application development. The amount of the award ranges between a minimum of € 500,000 and a maximum of € 2.5 mln (up to € 5 mln for healthcare projects[4]), and can cover up to 70% of eligible costs (up to 100% in healthcare projects). Ph2 projects last between 12 months and 2 years, but in case of fully justified situations, a longer duration of the project activities and additional funding can be claimed. The result of Ph2 is a product, a process or a service that is ready to compete on the market. Awardees are also required to prepare an elaborated "investor-ready business plan", which includes detailed commercialisation strategy, and a funding plan for the potential launch on the market.

3- **Commercialisation**. Phase 3 (Ph3) promotes the SMEI as a *quality label* for successful projects easing the shift of innovation from market-mature status to the market launch. There are no direct funds awarded for this phase and only 2% of the budget is allocated to run it. In Ph3 the European Commission provides support in the commercial exploitation of innovations resulting from Phases 1 and 2 of the SMEI, eases access to private finance, and leverages potential synergies with other European tools. The support can include the creation of linkages among private investors and clients, brokerage activities, support in the access to risk finance trough other European programmes, and other activities aimed at making SMEI projects ready to receive and/or attract investments. The launch of Ph3 is expected in 2016, but did not start at the point of writing.

During Phases 1 and 2, the SMEI also provides coaching support along with the financial subsidies. The coaches are international business experts selected from a Community created under the auspices of the same H2020, which funded the CoachCom2020 project[5] to develop a coaching methodology and build a community of coaches registered on a European database. Under the SMEI, the coaches offer their experience to the awardees in 3 coaching days during Ph1 and 12 coaching days in Ph2. During these days, senior managers of SMEs work hand in hand with coaches to develop strategies that would stimulate performance of their companies. The coaches aim to enhance commercial potential of companies and the impact of their participation in the SMEI. Ultimately, this is to make the H2020 contribution a milestone of a sustainable high growth of the company.

#### *2.2.5 Award Criteria and Procedures*

Proposals submitted to the SME Instrument are screened against three defined criteria

[4] The Societal Challenge "Clinical validation of biomarker and/or diagnostic medical devices".
[5] cordis.europa.eu/project/rcn/193334_it.html

that recur in all the calls of H2020. These criteria are excellence, impact, and quality and efficiency of implementation.

***Excellence*** refers to robustness of the proposed concept against the topics included in the related work programmes. Successful projects need to be sound and rational, ambitious and with strong potential of innovativeness that overcomes the state of the art with new concepts and approaches.

***Impact*** criteria concern the extent to which the project can have valuable outputs for the European and/or international level. The impact is evaluated according to the innovative capacity of the project and the integration of new knowledge fostering companies' growth. Furthermore, dissemination and exploitation of project results, including communication and IPR management, are among the criteria.

***Quality and efficiency of the implementation*** criteria concern the coherence and effectiveness of the work plans. They consider such aspects, as adequate allocation of resources for the tasks included in the milestones of projects, and the relevance of project participants.

At least, four independent and highly skilled experts with experience and knowledge in the areas of the topics of the SMEI, including project management, innovation, exploitation, dissemination and communication, evaluate the submitted projects. The experts come from both technical and financial backgrounds and are selected with the aim of achieving a balanced composition in terms of skills, experience, knowledge, geographical diversity and gender. The experts evaluate proposals by preparing 'individual evaluation reports' in which they provide comments and scores from 0 to 5 for each of the three criteria.

In Phase 1, the threshold to achieve per criterion is 4 points and, applying the sum of these points, the overall threshold is 13 points. In Phase 2, the threshold is 4 points only for the *Impact* criterion, and 3 points for the other two criteria, and the overall threshold is 12 points. In both Phase 1 and 2, the *Impact* criterion has a weight of 1.5 in determining the outcome. The final score is calculated based on the median of scores provided by the individual experts. This evaluation identifies projects below quality thresholds that are not mature enough to be funded, and projects above thresholds, which deserve funding. Depending on the availability of the budget allocated for each call, only the best ranking proposals receive the EU contribution.

What distinguishes the SME Instrument is that it is not a zero sum game for participating SMEs: submitting a proposal but not winning the funds does not result in net loss. Projects that achieve scores above the thresholds but do not get funded are not discarded. In 2015, the European Commission launched the '**Seal of Excellence'** scheme in order to allow the recognition of promising projects. The scheme was launched as a pilot only for the proposals applying to the SME Instrument and is under consideration to be extended

to other H2020 programmes in the future.

The Seal is awarded to project proposals that were submitted to the SMEI, scored sufficiently to be funded, but were not funded due to budget constraints. As a quality label, the Seal holder firms will be able to apply to other H2020, European and National funds to obtain funding without having to undergo other rounds of competition. The initiative is designed to facilitate synergies between European and national funds, private or public, and to empower companies with highly innovative projects.

Local authorities that decide to award projects coming from SME Seal of Excellence companies established in their territories can avoid high costs of holding public competitions and evaluations. Being a 'sealed' company means that the quality of its project is guaranteed on the European level and no further proving is needed, guaranteeing the quality of the assessment procedures.

#### *2.2.6 SMEI Evaluation*

SME Instrument is a young policy without a considerable results portfolio. This makes full evaluation of SMEI a premature task at the time of writing. However, it is already possible to assess some of the emerging benefits and caveats of this tool.

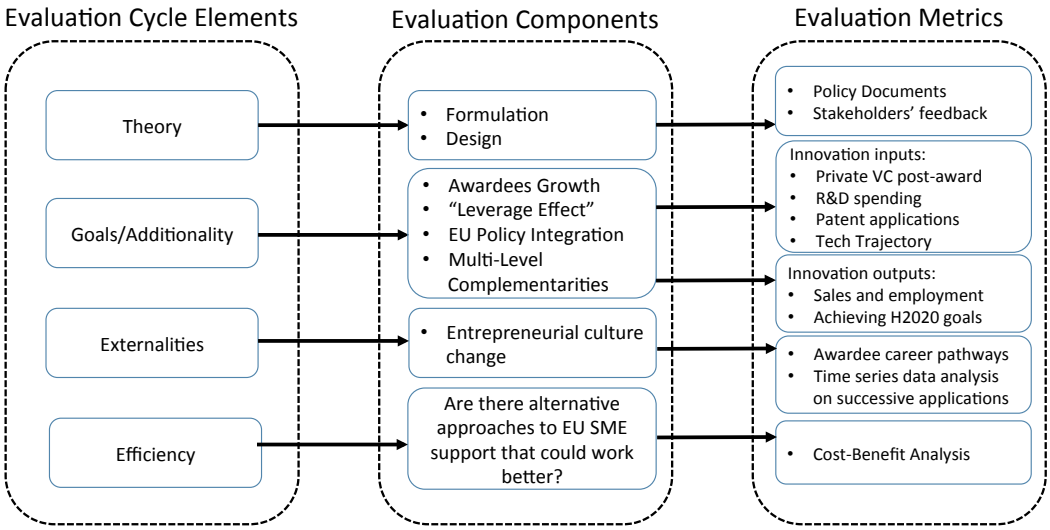
The key question in policy evaluation is whether the policy is a good intervention (Edler et al., 2012). In the case of the SME Instrument, the policy not only aims to address the 'equity gap', but also has the ambition to select and 'highlight' European fast-growing firms, and to ensure synergies with other policies at multiple levels of governance.

The demonstrable interest from small European firms in SMEI gives encouraging signals. The evaluation of this newly launched and experimental tool with the purpose of its inclusion (in a modified form) in the next Framework Programme can take up multiple directions in the evaluative cycle (Vega and Chiasson, 2015). In this section, we focus on four of them: the policy theory (design); the way it achieves its main goals and provides additionality; its externalities, and its efficiency.

The **policy theory** justifies the way a policy is formulated, the amount of funding allocated for the support, the types of support the policy provides, and the overall design of the policy. Part of evaluation is to understand whether the policy as it exists now fits in with other support measures, and how its design could be improved in the next iterations. With regard of the SMEI, the design of the policy is likely to be improved. As of now, the SMEI goals are extremely broad (to fund high potential innovation), and therefore the modest amount of funding is thinly spread across countries and sectors. Furthermore, in Section 4 of the current paper, we suggest that due to this, the issue of 'neglected talent' emerges, and the available resources could be distributed in a more flexible way. Finally, we note that the feedback provided to applicants is concise and does not contain the necessary information of how to improve their subsequent applications for next rounds of European funding calls.

The extent to which the SMEI **achieves its goals** should be the main item of evaluation. Funding high potential innovation can take two forms: to enhance participating companies' innovation capabilities – and thus it will assess *innovation inputs* of awardees: R&D spending, patent applications, overall company strategy and technological trajectory. The other evaluation avenue is the assessment of *innovation outputs* – in terms of company survival and growth rates, sales and employment, delivering new innovative products, services or processes. From the analysis of policy documents, briefings and articles in press, we identify three more important expected outcomes of the SMEI: 'leverage effect', EU Policy Integration and achieving multi-level complementarities (Figure 2).

**Figure 2 SME Instrument Evaluation Framework**




Source: authors' interpretation of Vega and Chiasson (2015); Gok and Edler (2012); Lanahan (2016); Edwards et al. (2007)

The "leverage effect" was extensively discussed earlier in this paper. It reflects the expectation of the European Commission that the dedicated SMEI funding will only be a first step in the financing pipeline that will help European innovative SMEs develop and produce excellent outputs. Accessing private venture capital, as a result of the EU support is the main indicator of the achieving this goal.

The financing pipeline does not only cover access to private capital, but also different types of access to ongoing funds. It is expected that SMEI awardees will continue to receive some kind of support from Europe and their national governments post-award. SMEI in this sense is a part of a 'policy mix', where the emphasis is placed on communication and interactions of different policies across various dimensions (Flanagan et al., 2011).

Horizontally, the European Commission places high importance on synergies and

complementarities between H2020 programmes and the activities of European Structural and Investment Funds, as well as other EU programmes (European Commission, 2016b, 2014a). Vertically, the Seal of Excellence Initiative was designed to streamline the process by which the Member States select and award SMEs nationally. We may even expect the emergence of direct complementarities between the European and national support tools (see Lanahan, 2016 for the US experience). Yet, the analysis of these multi-level funding systems may uncover unexpected hurdles of which policy makers should be aware.

Evaluation of SMEI goals has significant methodological implications. Studies note that the impact of policy is very hard to identify, mainly due to the issue of its *additionality*. Additionality is defined as the 'added effect' of policy, which would *not* have occurred in the absence of policy intervention (Georghiou, 2002; Gök and Edler, 2012). In terms of SME support, additionality is assessed in terms of whether companies would have failed without the support, whether the beneficial effect of the policy is additional (not substitutive or overlapping) to other support these companies may be getting, and whether the policy effects are captured by the measurements (Edwards et al., 2007; Tsai and Kuo, 2011). In the case of the SME Instrument, the evaluation task is to determine whether the success of awardees is independent from SMEI award or not.

As a way of **positive externalities**, SME Instrument is expected to produce a change in Europe's entrepreneurial culture, as one of the ways to overcome the 'European Paradox'. The externalities will reflect culture change, in terms of orientations of SMEI awardees, as well as in attracting new applicants to the Instrument funding. Another part of culture change can be an orientation towards riskier, more unconventional innovation strategy by awardee firms.

Additionally, we expect the SME Instrument to have diverging impact in various EU regions. As demonstrated in Section 3 of this work, SMEI awards tend to be distributed disproportionately among EU member countries and technology areas. A more detailed analysis should reveal regional clusters that tend to receive the awards. The subsequent research should trace academic research concentration in these areas, the availability of private venture capital and the overall productivity of regional clusters in which SMEI awardees are located.

Finally, the **efficiency** of the policy needs to be estimated. Policy efficiency in evaluation research suggests a purely financial cost-benefit analysis, looking to answer the question of whether there are alternative options that would work better. SME Instrument definitely requires such an assessment. In a recent grey paper, Simonelli (2016) makes an estimation that in terms of the overall SME support, H2020 sets the target of providing only €1 bln funding to SMEs more than the FP7, thus calling to temper the enthusiasm for the SME Instrument. Indeed, form of support that the H2020 provides is more focused than the FP7, but does it make this tool more efficient?

### 2.3 SME Instrument and SBIR: Transatlantic Cousins

Comparative analysis of policies that target similar market failures and have similar structure is useful for understanding moderating factors of design and implementation. In the following paragraphs, we overview the U.S. Small Business Innovation Research (SBIR) program, after which the SME Instrument was modeled. After that, we provide the initial comparison of SBIR and SMEI design.

#### *2.3.1 Introducing SBIR*

Established in 1982, SBIR has been regarded as one of the most successful public SME support tools (Audretsch, 2003; Audretsch et al., 2002a, 2002b; Cooper, 2003; Lerner, 1999). Reports that studied SBIR indicate that when a company receives SBIR funding, it significantly increases the chances of its commercial success, both in terms of innovative product sales, and in terms of employment. Additionally, SBIR funding has positive non-financial impact on awardee companies, the states they are located in, and on research-performing organisations. For example, Audretsch et al. (2002b) find that SBIR funding incentivises scientists and engineers to become entrepreneurs, to change their career paths and implement projects they would otherwise had not considered doing.

Table 4 juxtaposes the main elements of design of SBIR and SME Instrument, listing similarities as well as differences. SMEI is similar to SBIR in its 3-phase structure, the purpose and the amounts of the awards, and in its general purpose. The awards of each of the phases of the two policy tools are comparable, but the SMEI is a much smaller programme overall. Its funds are allocated as a fixed amount within the H2020 budget, while the SBIR programme is a long-running success, and its budget is defined as a share of R&D budgets of 11 Federal Agencies. These Agencies tend to define the scope of the projects they are interested in, and indicate specific topics and calls for applications (Cooper, 2003). The Department of Defense is to date the biggest funder of the SBIR programme, with the total allocation of $1.07 bln in 2015 (SBIR.gov, 2016a), which matches the total allocation for the SME Instrument for the same year.

Since its establishment, SBIR was reworked multiple times, and has expanded significantly. For example, in the 1992 redesign, commercialisation was moved up in the list of its strategic priorities. In 2012, SMEs were allowed to apply for Phase 2 funding without having previously applied to Phase 1 funding. In 1992, a related program Small Business Technology Transfer (STTR) was opened to expand joint research opportunities between SMEs and research-performing organisations[6]. Applications to these programme are only accepted by 5 Federal Agencies and require formal collaboration between an SME and a non-profit organisation (usually a university) to be eligible (SBIR.gov, 2016b).

[6] While STTR is a relevant tool, we limit its description in this paper, as the focus is on SBIR and SMEI.

**Table 3 SBIR and the SME Instrument Compared**

| | SBIR | SME Instrument |
|---|---|---|
| **Purpose** | Clearly Listed Targets:<br>• Technological innovation;<br>• Meeting Federal R&D needs;<br>• Increase of private-public commercialisation and innovation;<br>• Encouraging diversity of entrepreneurship. | Funds high-potential innovation. Expected impact:<br>• Enhance profitability and growth of SMEs;<br>• Market uptake by addressing specific challenges;<br>• Increase of private investment in innovations. |
| **Recipients** | SMEs only (up to 1/3 of research can be subcontracted) | SMEs (alone or with partners) |
| **Design** | 3-phase (from Concept to Commercialisation) | 3-phase (from Concept to Commercialisation) |
| **Award Amount** | $150.000 in Phase 1; up to $1 mln in Phase 2 | € 50.000 in Phase 1; up to EUR 2.5 mln in Phase 2 |
| **Total Funding Amount** | $1.5 bln in 2015 | € 0.3 bln in 2015 |
| **Funding Allocation** | Federal Agencies with R&D over $100 mln allocates 2.8% of budget | 7% of the total H2020 budget |
| **Application Process** | Strictly to Phase 1 until 2012; since 2012 to Ph1 or Ph2 | Project to any of the phases, then selection |
| **Success rate** | 17% for Ph1, 40% go on to Ph2 | 8.2% for Ph1 and 5.9% for Ph2[7] |
| **Types of Projects** | Defined by departments | Bottom-up with note of H2020 goals |

Sources: European Commission, 2014; SBIR.gov, 2016a

### *2.3.2 SBIR and the SME Instrument*

SME Instrument seems to account for the changes made within SBIR. Small firms applying for funding may do so alone or jointly with other organisations; receiving funding in Phase 1 is not a prerequisite for applying to Phase 2 funding; and trackable commercial impact is seen as the highest of anticipated result of the SMEI award. Yet, while SBIR funding is directed more at academic entrepreneurship and includes broader goals to incentivise entrepreneurial behavior, including that of minority groups, the SMEI is much more focused on delivering commercialisable innovations. A new product or service is not a prerequisite of SBIR, where the Phase 2 funding needs to be spent on R&D. In contrast, the SME Instrument specifies exactly what types of activities its Phase 2 are fundable. Potentially, this should improve the results of the programme in terms of innovations that actually make it to the market, which is where some parts of SBIR are reported to be weak (Archibald and Finifter, 2003).

The design of the SME Instrument includes and builds on non-commercial benefits that analysts identified for the SBIR programme over the course of its running. These are

[7] This data is based on calculations presented in Section 2.3 and thus may differ from other reported results.

*certification effect, demonstration effect and strategy effect*. Additionally, we argue, the design of the SME Instrument expands on these envisioned effects to include the *open innovation effect*.

Lerner (1999) found that despite SBIR awardees demonstrated significantly higher growth over 10 years than matched firms, the size of the award had no effect on the rates of growth. From this finding, he suggested a certification effect of SBIR award: being recognised as a potential high growth firm by SBIR was a signal of credibility for private investors. In the circumstances where there is uncertainty regarding innovative SMEs, SBIR awards reduced this uncertainty by marking investable companies to private venture capitalists. Similarly, the recognition of companies with high growth potential has been one of the main goals of the SME Instrument.

Other studies (Audretsch et al., 2002b; Cooper, 2003) report that scientists and engineers who were awarded by SBIR to start develop their innovative technology projects tended to inspire others in their environment to apply for SBIR funding. This demonstration effect results in high clustering of successful SBIR awardees in certain regions and organisations.

Finally, SBIR awards tended to alter subsequent strategies of awardee firms. For instance, Cooper (2003) reports that SBIR awardees tend to engage in more radical projects or move to emerging technological areas.

The SME Instrument is not explicitly targeting the latter two effects to occur in Europe, although they would definitely be beneficial externalities. What the SMEI design is making emphasis on is the value of collaboration, communication and networking through its coaching programme and the work of national contact points that organise events and provide support for all SMEs that applied for funding, not just successful applicants. This emphasis bodes well with the broader European policy goals towards greater cohesion and collaboration. However, the precise scale of the effect remains to be investigated.

Yet, the changes in the SBIR programme, such as the introduction of STTR and the opportunity to apply for Phase 2 funding without having previously received Phase 1 funding, have not addressed some of the criticisms that researchers expressed over it, and the SME Instrument may suffer from the same ailments. Primarily, these are the weakness of the Phase 3 and the regional inequality (Link and Scott, 2010).

The main reason of why SBIR-awarded projects drop out after Phase 2 is the lack of funding allocated, and the discontinuation of funding in Phase 3. After advanced stages of piloting and testing, companies have to rely to a large extent on the certification effect that the status of an awardee provides. The scope of activities and support offered in Phase 3 of SBIR varies greatly depending on the Federal Agency executing the project, and is a subject of ongoing criticism. Yet, it still seems to be stronger and better defined

than Phase 3 of the SME Instrument, which only contains the general guidance for the awardees to seek further European financing options, but offers little practical guidance.

In addition, there are certain regional disparities in terms of regional distribution of SBIR awards and subsequent trajectories of awardee firms. SBIR project evaluation does not consider the location of the applicant company, which is why the distribution of awardees spans all US states. It provides beneficial effects (demonstration effect) in regions with weak venture capital infrastructure, as other sources of funding for SMEs are limited (Cooper, 2003). Yet, the awardees that demonstrate the highest subsequent growth are mostly located in clusters with highly developed venture capital infrastructure that can provide next stage investment for SBIR-marked firms (Lerner, 1999).

This heterogeneous impact on different regions will most likely be replicated in return on investment in the SME Instrument. In Section 3 of this article, we identify countries like Italy and Spain among the sources of applications for the SME Instrument funding. This may be likely due to the lack of national and regional support tools than in richer European countries. However, learning from SBIR results, the impact of SME Instrument may be vastly different on SME growth in these countries than on growth trajectories of awardees from Germany or France.

*3 SME Instrument: Initial Results and descriptive statistics of proposals' success rate*

In this section, we will provide descriptive statistics of the first results achieved by the SME Instrument since 2014, presenting aggregated calculations that are our elaborations from EASME data website[8]. This study includes all the data since the launch of the SME Instrument. The second part of the section presents some initial considerations on funding inefficiencies within SMEI.

**3.1 SMEI Descriptive Statistics**

As cited above, the calls for the SME Instrument are open continuously, and every three months, following the so-called *cut-off dates*, rankings are published. In 2014 there were three cut-offs of Phase 1, and two of Phase 2. The year 2015 counts 4 cut-offs per each phase, and 2016 counts two cut-offs for each phase up to the moment of writing.

Since the first launch of Horizon 2020, the SME Instrument has been extremely popular with small and medium companies. At the end of May 2016, SMEs counted for the 27.41% of all projects submitted to H2020 and received 23.76% of the EU budget contribution. 24,631 proposals have been submitted for the SME Instrument, respectively 18,372 proposals by 19,895 companies to Phase 1 and 6,259 proposals by 8,209 companies to Phase 2.

Only a small fraction of these applicants was awarded SMEI funding (see Table 4). Out of all the winners of the 3-years period (2014-2016), 99 companies were awarded both a

[8] See https://ec.europa.eu/easme/en

Phase 1 and a Phase 2 grants of, respectively, € 4.95 mln and € 161.12 mln, meaning a total EU contribution of € 166.07 mln invested in these European SME champions.

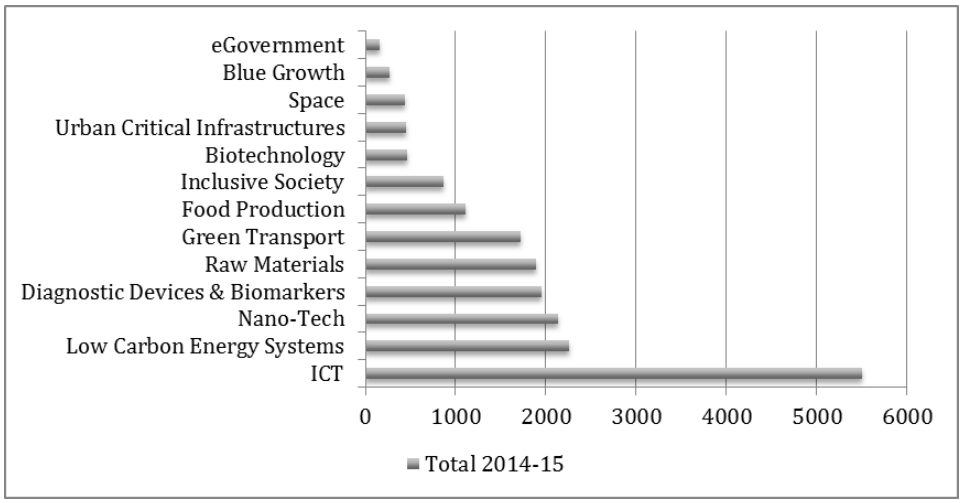
**Table 4 SMEI Awards, 2014-16**

| | Projects | Companies | Total Award |
|---|---|---|---|
| **Phase 1** | 1,506 | 1,632 | € 75.3 mln |
| **Phase 2** | 372 | 466 | € 619.6 mln |

Source: authors' calculations based on EASME data

Figure 3 depicts the breakdown of proposals submitted to the SMEI according to their theme. The most popular topic receiving the majority of proposals is ICT under the call "*Open Disruptive Innovation Scheme (implemented through the SME instrument)*": in 2014-2015, it received 29% (5,504) of the total number of proposals to the SME Instrument. The Energy topic is in the second place: the call "*Stimulating the innovation potential of SMEs for a low carbon and efficient energy system*" received 12% (2,252) of proposals submitted. Nanotechnologies and advanced materials gained the third place with the call "*Accelerating the uptake of nanotechnologies, advanced materials or advanced manufacturing and processing technologies by SMEs*", which received 11% (2,133) proposals. These topics correspond with technology areas with some of the most eagerly anticipated results, which can help tackle H2020 Societal Challenges.

**Figure 3 Submitted Proposals per Topic (2014-2015)**

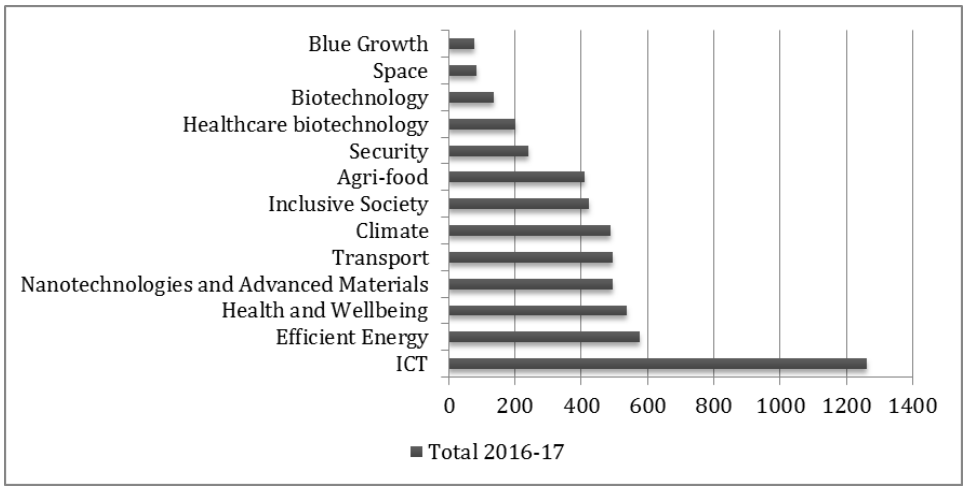



Source: authors' calculations based on EASME data

The labels and the themes of the call for applications of the SMEI shifted in the work programmes 2016-2017, but the contents of the calls and the ranking of the most popular topics changed only slightly (see Figure 4). ICT remained in the first place, counting 23% (1,261) of the total of 5,428 proposals submitted in 2016. The same can be said for Energy and low carbon issues, ranking again second place with 11% (577) submitted proposals. The third place of the ranking is held by the Health and Wellbeing topic, with the call "*Accelerating market introduction of ICT solutions for Health, Well-Being and*

*Ageing Well*", with 10% (538) submitted proposals.

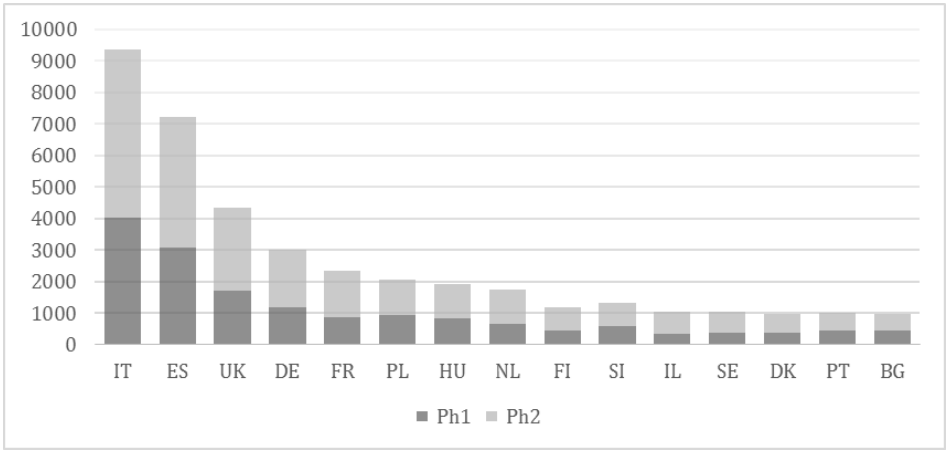
**Figure 4 Submitted Proposals per Topic (2016)**




Source: authors' calculations based on EASME data

We now turn to geographical distribution of SMEI applicants and awardees. Italy is the most generous Member State in term of *number of proposals* (see Figure 5): it ranks the first place with a total of 5,336 proposals, 4,036 in Phase 1 and 1,300 in Phase 2. Italy is followed by Spain and UK, respectively with 4,124 and 2,651 proposals (3.089 and 1.714 in Phase 1; 1.035 and 937 in Phase 2).

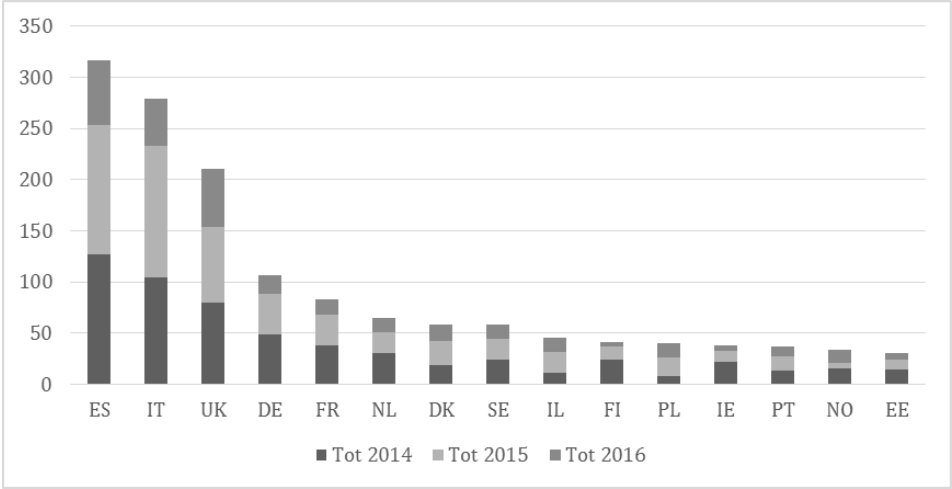
**Figure 5 Top 15 Countries with the Highest Number of Submitted Proposals (2014-2016)**




Source: authors' calculations based on EASME data

The three countries keep the podium even considering the *participation in winning proposals*, but with a different ranking. In Phase 1 (see Figure 6), Spain achieved the first place with 319 companies participating in funded proposals, followed by Italy with 280 companies, and UK with 213 companies. Germany ranks fourth place with a significant drop, counting only 109 SMEs participating in funded proposals.

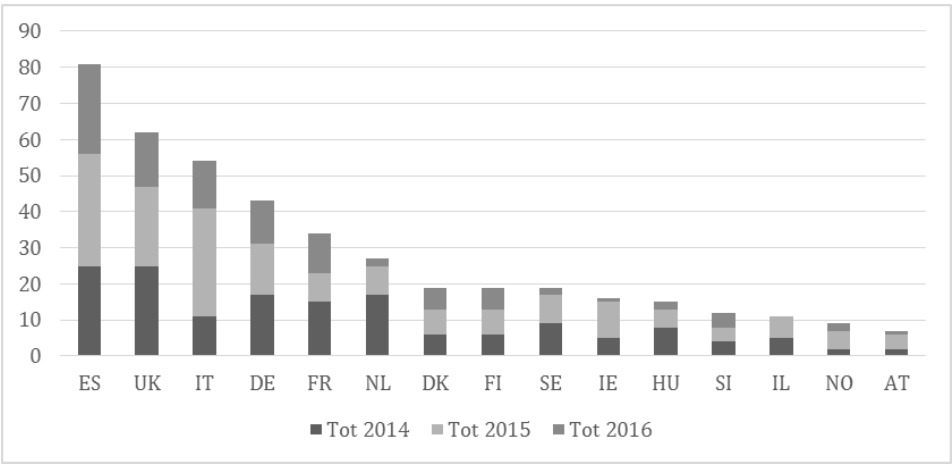
**Figure 6 Participation in Funded Proposals per Country, Phase 1 (2014-2016)**




Source: authors' calculations based on EASME data

In Phase 2 (see Figure 7) Spain keeps the first place with 81 winning companies, followed by Italy with 62 companies and the UK with 54 companies. The gap between the top three countries and the follow-up group is smaller than in Phase 1, and Germany ranks the fourth place with 43 SMEs participating in funded proposals.

**Figure 7 Participation in Funded Proposals per Country, Phase 2 (2014-2016)**

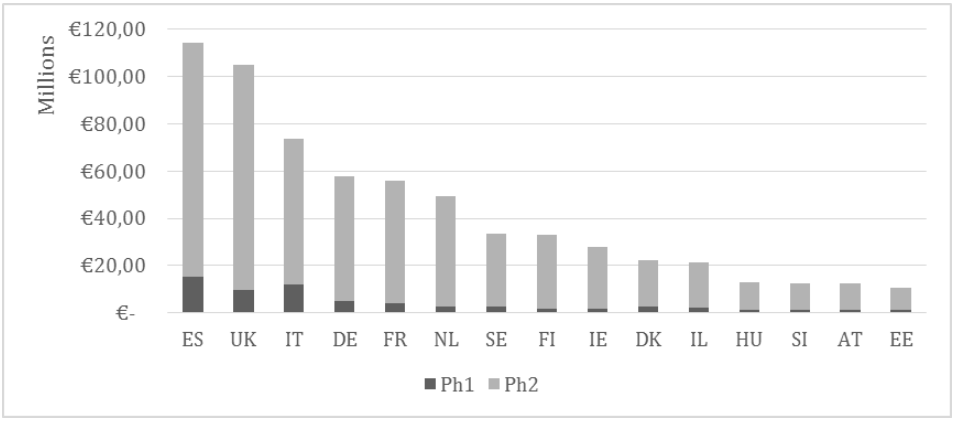



Source: authors' calculations based on EASME data

Comparing the position of the member states in the rankings based on the number of SMEs participating in submitted proposals and the number of companies participating in funded proposals, we notice that there are many countries with low proposal submission rate, but high proposal success rate. For example, Ireland counts 410 companies submitting proposals (266 in Phase 1 and 144 in Phase 2). In terms of succeeding proposals, Ireland counts 38 funded SMEs in Phase 1 and 16 in Phase 2, for 38 projects in Phase 1 and 13 in Phase 2. This means that, in 2014/2016, Ireland received € 1.9 mln of EU Contribution in the Phase 1 and € 25.8 mln in Phase 2 (see Figure 8). Irish results in term of budget gained under the SMEI program are significant if compared with other

countries.

**Figure 8 Top 15 Countries per EU Contribution per Phase (2014-2016)**

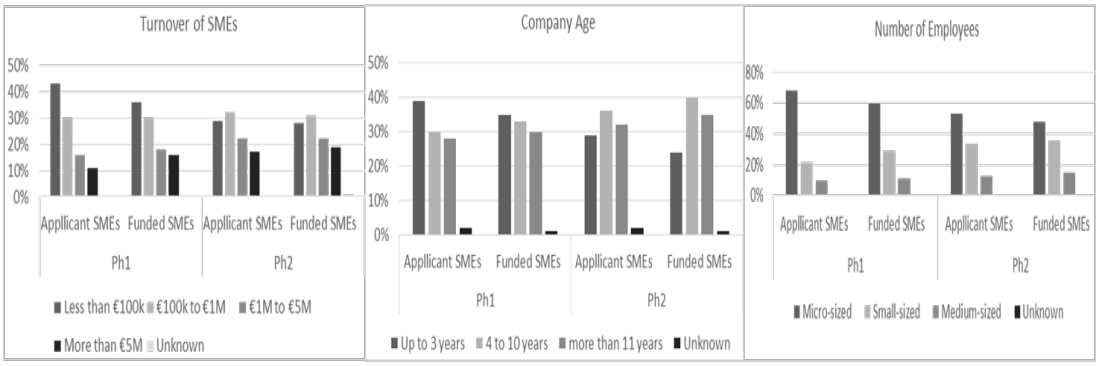



Source: authors' calculations based on EASME data

In 2014-2015, the SMEI budget allocated, combining the budgets of Societal Challenges and LEITs, accounted for 5.30% (€ 519.9 mln) of the total H2020 annual budget, and it is due to increase up to 7.53% (€ 790.9 mln) in 2016-2017.

The best performer country in terms of budget gained from the SMEI is Spain, which received € 114.33 mln in total, respectively € 15.25 mln in Phase 1 and € 99.08 mln in Phase 2. The United Kingdom ranks second, with a total EU contribution of € 104.93 mln (€ 9.85 mln in Phase 1; € 95.08 mln in Phase 2). The third is Italy, with € 73.81 mln of EU contribution (€ 11.85 mln in Phase 1; € 61.96 mln in Phase 2).

**Figure 9 Dimensions of Applicant and Funded SMEs (2014-2015)**




Source: EASME 2016

We also compare characteristics of applicant and funded SMEs in 2014-2015 (see Figure 9). While there are no strong differences in the demographic, turnover or age of companies that tend to receive the award from the overall applicant population, there are certain groups that stand out. For instance, successful companies tend to be micro-sized (1-3 employees), representing more than half of the sample both in Phase 1 and Phase 2, and at least 4 years old, as are the companies with a turnover range of € 100,000 - € 1 mln.

### 3.2 High numbers of promising proposals: the European neglected talents

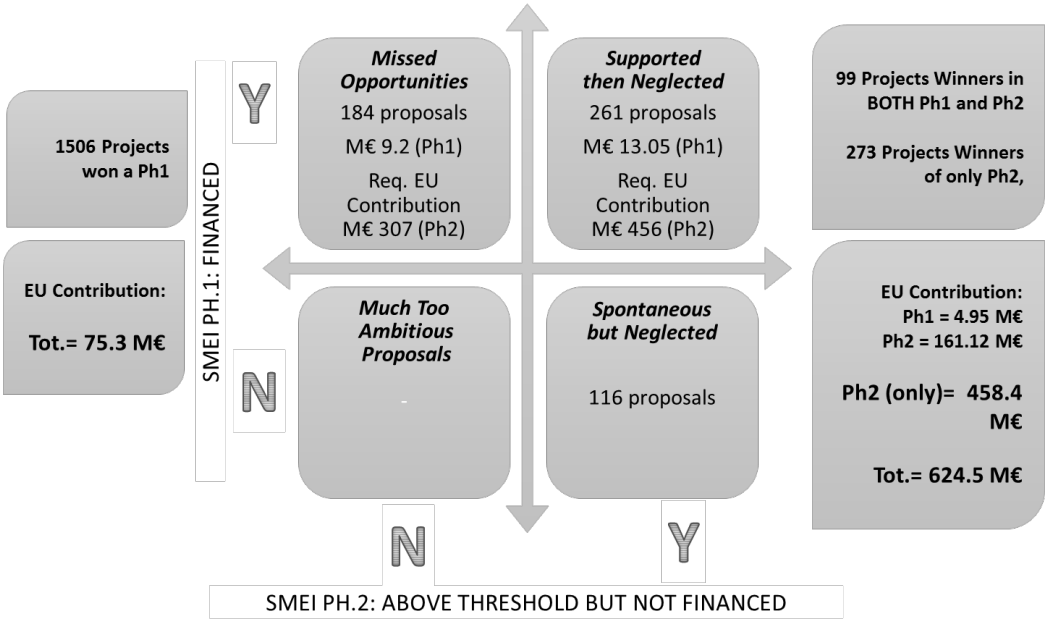
Finally, we examine proposals submitted to Phase 2 of the SMEI that did not succeed in receiving contributions from the European Commission more closely. A two dimensional matrix is proposed (see Figure 10). The first dimension considers whether the proposal was awarded funding in the Phase 1 of the SMEI; the second dimension considers whether the proposal applying in Phase 2 was or not judged above threshold but not funded for lack of available funds.

The shares of proposals that transitioned from SMEI Phase 1 to Phase 2, and the share of proposals funded in Phase 2, have multiple implications.

Most importantly, we identify the European 'neglected talent': the 377 proposals that scored above threshold in Phase 2 applications, but did not receive funding. Using the criterion of whether these proposals were supported in Phase 1, we classify them as 'spontaneous, but neglected talent' (not funded in Ph1, 116 proposals), and as 'at first supported, and then neglected talent' (funded in Ph1, 261 proposals).

The common characteristic of both groups is that these proposals scored highly in the assessment and were judged as potentially highly innovative. The neglected talent represents potential growth and investments for proposing SMEs, innovation and new job opportunities that should not be discarded solely due to the lack of funds. Not supporting these projects is the SME Instrument's main shortcoming. We stress that the 'neglected talent' issue, as much as it is tackled now with the 'Seal of Excellence' initiative, should be tackled much more.

**Figure 10 European Wasted Talent Matrix (2014-2016)**



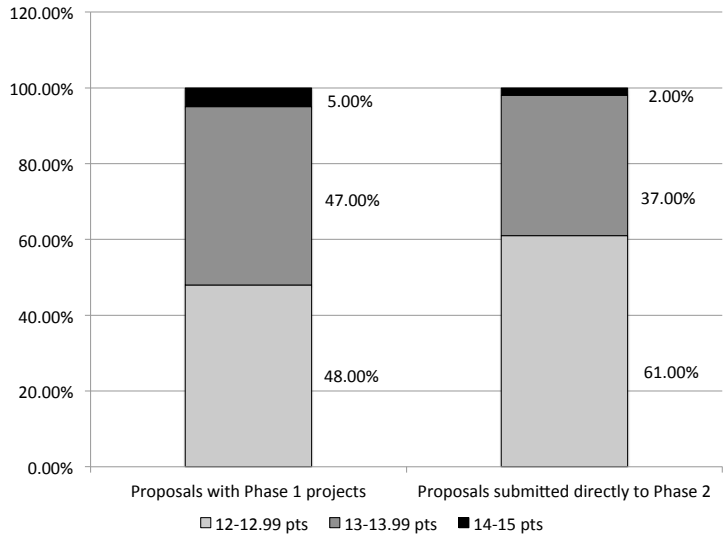

Source: authors' calculations based on EASME data

The ‘at first supported’ neglected talent is a case that has more tangible financial implications. These proposals already received a total of € 13.05 mln of European contribution in Phase 1 and were judged positively during evaluation in Phase 2. These proposals requested a total of € 456 mln from the European commission.

The budget requested represents more than 65% of the total budget allocated through the SMEI, in both Phase 1 and 2 (€ 695 mln, 2014/2015). This category of projects received the Seal of Excellence since they were judged above the threshold needed for receiving funding, being of high quality, but below the budget available for funds.

SMEs awarded a Phase 1 have a triple chance of being awarded a Phase 2 and, in general, achieve better results in Phase 2 evaluation than SMEs that submit a proposal directly to Phase 2 (see fig. 11). Only 10% of companies that participate in Phase 2 can boast a Phase 1 award. The majority of these ongoing applicants (76%) receive a positive evaluation in Phase 2, being judged above threshold, and 14% are funded with a Phase 2 grant.

**Fig. 11 Does starting from Phase 1 help in Phase 2? (2014-2015)**




Source: Lai (2015), The SME Instrument H2020, EASME (2015)

An issue of a different nature is represented by proposals that received Phase 1 SMEI funding, but failed to score sufficiently to be funded in Phase 2. These 184 proposals are identified as ‘missed opportunities’. A total of € 9.2 mln was invested in these proposals in Phase 1 funding stage. The participating companies therefore missed the opportunity to receive further EU investment by submitting inadequate Phase 2 proposals.

We might suggest multiple reasons for that, ranging from the mismanagement of EU

funds by awardees or the development of inappropriate business models and/or strategy, to the emergence of unforeseen hurdles in technology. While any policy can expect some share of failed investment, further research is required in order to investigate whether Phase 1 selection process could identify the selection failure and avoid failed funding. An investigation into reasons of this failed Phase 2 applications would benefit the appraisal of the Instrument as well.

Finally, the bottom left box identifies proposals that without obtaining any funds in Ph1 applied to Ph2 and were judged below threshold. Most probably, companies in this category should apply to Phase 1 before trying again with submitting a proposal directly to Phase 2.

*4 Policy Implications*

Based on these first few years of application of SMEI we can identify three main policy implications.

**Popular but too competitive**. The first implication is a direct consequence of the numbers discussed above. The number of applicants for the Instrument has been beyond expectations. Many of the companies applying for SMEI were approaching EU funding for the first time. This reflects the fact that some of the characteristics of the tool are extremely appreciated by SMEs. Bottom-up funding scheme, simple application process, time to grant (both for Phase 1 and Phase 2), the lump sum contribution and other friendly features of the SMEI make it appealing for small firms. In addition, the general availability of contribution and the broad criteria used by the European Commission for the calls of the SMEI are among the elements attracting many companies.

The bottom up approach leaves SMEs lot of freedom in determining the scope of their projects and wide possibilities in designing their budget. All these elements made SMEI one of the most popular innovation support tools across Framework Programmes.

Still, given the fact that the amount of budget had been set in advance, such popularity made SMEI extremely competitive. The competition is so high that it might discourage some of the prospective applicants from spending time preparing applications with little chance of success. Due to lack of funding, way too many good applications, after receiving initial funding in Phase 1, did not receive funding in Phase 2.

Could SMEI be a larger programme? Balancing resource allocation within framework programmes is not an easy task and increasing the budget of a programme leads to cuts elsewhere. Still, the staggering number of solid applications should be something legislators keep in mind when designing new policy interventions. In addition, the level of popularity of SMEI should lead to more concrete attempts of creating synergies with national and regional levels of intervention. The kick off of the Seal of Excellence is a starting point. However, more courageous and direct steps to connect the SMEI pipeline of applications to national and regional innovation support scheme could be attempted.

**SMEI Storytelling**. As we observe SMEI awardees develop their business plans, we encounter various examples of technology transfer, business model innovation, open innovation, and diversification. We need to closely monitor these cases, and learn from successes and failures.

Early anecdotal evidence seems to suggest that EU SMEs are crossing the "valley of death" in many different ways. There is not one model, i.e. exponential growth and IPO, but many forms of growth. SMEI allows, for example, academic spin-off companies to disenfranchise from purely research-oriented environment. At the same time, larger SMEs use SMEI to differentiate and explore areas of business that might lead to future sources of competitive advantage. Alternatively, we see start-ups developing new business models from scratch hoping to become the next unicorns.

In all these cases, the pathways of growth are very different. While it is likely that for some companies access to risk finance will be fundamental for future growth, others might rely on internal support, through reinvestment of early profits. Policy makers should monitor how these groups of companies evolve as they might indeed reveal unique way to markets that had been previously ignored or belittled.

**Phase 3: one last shot**. SMEI was designed as a 3 phases support mechanism. Still, Phase 3 remains not very clearly defined and not directly funded. "Synergies with other programs" are often cited as the expected dynamics that will take place in Phase 3. We suggest that as results and success stories emerge, the Commission as well as other policy makers could take a bolder approach towards Phase 3, and indicate new forms of support to companies that successfully proved to have innovative projects, and that are wisely spending EU money.

Legislators could indeed support with new mechanisms what often been cited as the EU Innovator's Champions League. Access to risk finance, but also demand side innovation policy, smart procurement and more could be tools for direct support of these companies. These companies should be the ones that will lay the foundations for the new competitive advantage of Europe.

*5 Future Research*

This paper lists multiple possible avenues for further research. In the context of theory, companies that won SME Instrument awards present a unique cross-European sample of potentially fast-growing firms. This sample can be regarded as a 'treated sample' and be matched with other firms for analysis. As the number of SMEI recipients continues to increase, their growth trajectories will diverge. Analysing these growth trajectories and their factors will highlight conditions of growth opportunities in Europe.

In the context of policy evaluation, SME Instrument is an experiment in the European policy landscape, and its successes are yet to be assessed. In this work, we suggest some of the conceptual policy lessons that can already be derived from the initial analysis of

results of the SME Instrument: the award is very thinly spread. It attracts unequal numbers of applications from the member states, and the projects are funded unequally as well. Finally, there is inefficiency in funding, which causes the 'neglect' of talent.

In addition, SMEI as a 'treated sample' present an opportunity for the study of additionality. Usually, evaluating the additionality effect of policy requires having a matching sample of companies. However, in the absence of a randomised group, the matching sample always contains bias that is hard to overcome (Bakhshi et al., 2015; Bronzini and Piselli, 2016; Van Cauwenberge et al., 2013). The projects in the SME Instrument are selected based on their merit, but the merit of a project is defined by a capability of a firm that designs it. SMEI awardees may simply be better than other SMEs and would have fared better than matching firms anyway. In the case of the SME Instrument, this can be addressed by using the Seal of Excellence awardees – companies that scored enough points to be funded but were not due to the lack of funds – as a matching group of companies. These companies constitute the possible sample of matching companies, which can help to evaluate the impact of the SME Instrument.

To sum up, as a way of the future research agenda, we suggest exploration of the following questions:

- What are the policy learning options between SBIR and SME Instrument?
- What are the certification, demonstration and strategy effects of the SME Instrument? Does it have open innovation effect?
- A comparative analysis of growth rates, technological trajectories, and commercial success of firms that became SBIR and SMEI awardees to highlight favouring and inhibiting factors that could inform innovation policy in both the USA and the EU.
- What are the survival rates and growth trajectories of SMEI awardees?
- Do the companies that are recognised by SMEI funding and the Seal of Excellence demonstrate gazelles growth rates, i.e. does the SMEI identify European Champions?
- Does the SMEI achieve its main stated goals? Does the SMEI have additionality effect?
- How can the design of the SMEI be improved?
- What are the externalities of SME in terms of environmental and social impact, regional development, and entrepreneurial culture?
- What are the horizontal and vertical synergies that the SMEI demonstrates with (i) other European policies; and (ii) with national and regional entrepreneurship and innovation policies?
- How efficient is the SME Instrument as a separate policy instrument in comparison with alternative options of EU Framework Programme funding allocation options?

## *6 Conclusions*

This article, to the knowledge of its authors, is the first contribution that focuses on the SME Instrument and research prospects it offers. As a unique policy, first of its kind ever adopted in Europe, the SME Instrument was eagerly expected in European business research and policy communities. In this work, we demonstrated that indeed it received extraordinary rate of response from European small firms. However, in reality, the surge of applications for the SMEI support could not be met within the H2020 budgets, which has led to issues, such as neglected talent, and the loss of investment.

These observations entail multiple lessons that the European Commission and other policymakers should learn in the future iterations of their programmes, as well as tangible research agendas that need to be captured by academic researchers. Ultimately, European decision makers need to recognise that in a heterogeneous environment they operate in, there are different avenues for growth, and adopted policies need to be flexible enough to accommodate these variations.

At this point, including the SME Instrument as a permanent part of the European Commission's portfolio in its current form would be questionable. With the global shift of policy support from established industries to small and medium enterprises, we suggest that Europe should keep looking for optimal ways to support its SMEs, positioning them as the main drivers of growth, but also should allocate financial support in a smarter way within a better working model than the current SME Instrument.

We place significant expectations on the academic community to take up the task of appraisal and evaluation of results of the SME Instrument. In this work, we briefly overviewed its most successful counterpart, the US SBIR programme. Yet, there is evidence worldwide on ineffective and cost-inefficient measures of SME support tools, which demonstrate unsuccessful or unimpactful interventions (Buckley, 2016; Parker, 2000). We believe that ultimately, the effectiveness of the SME Instrument will be decisive in the ways it is gradually improved.

Subsequent Framework Programmes will undoubtedly keep experimenting with new tools that offer support to European innovative small and medium enterprises. At the time of writing, H2020 is starting its mid-term evaluation, and preparations are underway for the development of the EU Innovation Council. With all its shortcomings listed in this paper, the general frame of the SME Instrument may become a suitable playground for piloting these tools. The lessons learned from the SME Instrument will also be accounted for in the 9$^{th}$ Framework Programme.

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*References*

Acs, Z.J., Carlsson, B., Karlsson, C., 1999. Entrepreneurship, Small and Medium-Sized Enterprises and the Macroeconomy. Cambridge University Press.

Alperovych, Y., Huebner, G., Lobet, F., 2015. How does governmental versus private venture capital backing affect a firm's efficiency? Evidence from Belgium. Journal of Business Venturing 30, 508–525.

APRE, *in press*. PMI e Ingegneria Finanzaria in Horizon 2020. Rome.

Archibald, R.B., Finifter, D.H., 2003. Evaluating the NASA small business innovation research program: preliminary evidence of a trade-off between commercialization and basic research. Research Policy 32, 605–619.

Audretsch, D.B., 2003. Standing on the shoulders of midgets: The US Small Business Innovation Research program (SBIR). Small Business Economics Group 20, 129–135.

Audretsch, D.B., 1995. Innovation and Industry Evolution. MIT Press.

Audretsch, D.B., Link, A.N., Scott, J.T., 2002a. Public/private technology partnerships: evaluating SBIR-supported research. Res. Policy 31, 145–158.

Audretsch, D.B., Weigand, J., Weigand, C., 2002b. The impact of the SBIR on creating entrepreneurial behavior. Economic Development Quarterly 16, 32–38.

Bakhshi, H., Edwards, J.S., Roper, S., Scully, J., Shaw, D., Morley, L., Rathbone, N., 2015. Assessing an experimental approach to industrial policy evaluation: Applying RCT plus to the case of Creative Credits. Research Policy 44, 1462–1472.

Barker, K., Cameron, H., 2004. European Union science and technology policy, RJV collaboration and competition policy, in: Caloghirou, Y., Vonortas, N.S., Ioannides, S. (Eds.), European Collaboration in Research and Development. Edward Elgar Publishing Limited, Cheltenham, UK and Northampton, MA, US, pp. 154–186.

Barringer, B.R., Jones, F.F., Neubaum, D.O., 2005. A quantitative content analysis of the characteristics of rapid-growth firms and their founders. Journal of Business Venturing 20, 663–687.

Becchetti, L., Trovato, G., 2002. The determinants of growth for small and medium sized firms. The role of the availability of external finance. Small Business Economics Group 19, 291–306.

Bertoni, F., Tykvova, T., 2015. Does governmental venture capital spur invention and innovation? Evidence from young European biotech companies. Research Policy 44, 925–935.

Birch, D.L., Haggerty, A., Parsons, W., 1998. Who's creating jobs? Cognetics, Cambridge, MA.

Brander, J.A., Du, Q., Hellmann, T., 2015. The Effects of Government-Sponsored Venture Capital: International Evidence. Review of Finance 19, 571–618.

Bronzini, R., Piselli, P., 2016. The impact of R&D subsidies on firm innovation. Research Policy 45, 442–457.

Bruce, A., Lyall, C., Tait, J., Williams, R., 2004. Interdisciplinary integration in Europe: The case of the Fifth Framework programme. Futures 36, 457–470.

Buckley, A.P., 2016. Using Contribution Analysis to evaluate small & medium enterprise support policy. Evaluation 22, 129–148.

Colombo, M.G., Cumming, D.J., Vismara, S., 2016a. Governmental venture capital for innovative young firms. Journal of Technology Transfer 41, 10–24.

Colombo, M.G., D'Adda, D., Pirelli, L.H., 2016b. The participation of new technology-based firms in EU-funded R&D partnerships: The role of venture capital. Research Policy 45, 361–375.
Cooper, R.S., 2003. Purpose and performance of the Small Business Innovation Research (SBIR) program. Small Business Economics Group 20, 137–151.
Czarnitzki, D., Hanel, P., Rosa, J.M., 2011. Evaluating the impact of R&D tax credits on innovation: A microeconometric study on Canadian firms. Research Policy 40, 217–229.
David, P.A., Hall, B.H., Toole, A.A., 2000. Is public R&D a complement or substitute for private R&D? A review of the econometric evidence. Research Policy 29, 497–529.
Di Minin, A., De Marco, C.E., *in press*. Introduzione. In APRE (Ed.), PMI e Ingegneria Finanziaria in Horizon 2020. APRE – Agenzia per la Promozione della Ricerca Europea.
Drilhon, G., Estime, M.-F., 1993. Technology Watch and the Small Firm. The OECD Observer 182, 31.
EASME, 2016. EASME - Executive Agency for SMEs. URL https://ec.europa.eu/easme/en (accessed 12.8.16).
Edler, J., Berger, M., Dinges, M., Gök, A., 2012. The practice of evaluation in innovation policy in Europe. Research Evaluation 21, 167–182.
Edwards, T., Delbridge, R., Munday, M., 2007. A critical assessment of the evaluation of EU interventions for innovation in the SME sector in wales. Urban Studies 44, 2429–2447.
European Commission, 2016a. Evaluation and Fitness Check (fc) Roadmap. Brussels
European Commission, 2016b. EU Funds Working Together for Jobs and Growth: Synergies between the R&I Framework Programmes and the European Structural & Investment Funds. Publications Office of the European Union, Luxembourg.
European Commission, 2014a. Enabling synergies between European Structural and Investment Funds, Horizon 2020 and other research, innovation and competitiveness-related Union programmes: Guidance for policy-makers and implementing bodies. Publications Office of the European Union, Luxembourg.
European Commission, 2014b. Dedicated SME Instrument Work Programme 2014-2015, Horizon 2020.
European Commission, 2011. Communication from the Commission to the European Economic and Social Committee and the Committee of the Regions. Brussels
European Commission, 2010. Europe 2020: A Strategy for Smart, Sustainable and Inclusive Growth: Communication from the Commission. Publications Office of the European Union.
European Commission, 2000. Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions - Towards a European Research Area.
European Commission, 1995. Green Paper on Innovation. Office for Official Publications of the European Communities.
Feindta, S., Jeffcoate, J., Chappell, C., 2002. Identifying success factors for rapid growth in SME E-commerce. Small Business Economics Group 19, 51–62.
Filos, E., 2013. *Manufacturing Innovation and Horizon 2020* in S. B. Heidelberg (Ed.) *Addressing the Challenges of Europe ' s Manufacturing*..
Flanagan, K., Uyarra, E., Laranja, M., 2011. Reconceptualising the "policy mix" for innovation. Research Policy 40, 702–713.
Fresco, L.O., Martinuzzi, A., Wiman, A., 2015. COMMITMENT and COHERENCE essential ingredients for success in science and innovation. Ex□Post□Evaluation of the 7th EU Framework Programme (2007□2013). URL: https://ec.europa.eu/research/evaluations/pdf/fp7_final_evaluation_expert_group_report.pdf (Accessed 5.8.2016)

Georghiou, L., 2002. Impact and Additionality of Innovation Policy, in: Boekholt, P. (Ed.), Innovation Policy and Sustainable Development: Can Public Innovation Incentives Make a Difference? Presented at the SIX COUNTRIES PROGRAMME ON INNOVATION, IWT Observatory, Brussels.

Gök, A., Edler, J., 2012. The use of behavioural additionality evaluation in innovation policy making. Research Evaluation 21, 306–318.

Grilli, L., Murtinu, S., 2015. New technology-based firms in Europe: market penetration, public venture capital, and timing of investment. Industrial and Corporate Change 24, 1109–1148.

Guo, D., Guo, Y., Jiang, K., 2016. Government-subsidized R&D and firm innovation: Evidence from China. Research Policy 45, 1129–1144.

Guzzetti, L., 1995. A brief history of european union research policy. European Commission, DG Science Research and Development, Brussels.

Hottenrott, H., Lopes-Bento, C., 2014. (International) R&D collaboration and SMEs: The effectiveness of targeted public R&D support schemes. Research Policy 43, 1055–1066.

Hyytinen, A., Toivanen, O., 2005. Do financial. constraints hold back innovation and growth? Evidence on the role of public policy. Research Policy 34, 1385–1403.

Koski, H., Pajarinen, M., 2013. The role of business subsidies in job creation of start-ups, gazelles and incumbents. Small Business Economics Group 41, 195–214.

Lanahan, L., 2016. Multilevel public funding for small business innovation: a review of US state SBIR match programs. Journal of Technology Transfer 41, 220–249.

Lerner, J., 1999. The government as venture capitalist: The long-run impact of the SBIR program. Journal of Business 72, 285–318.

Lim, S., Kim, Y., 2015. How to Design Public Venture Capital Funds: Empirical Evidence from South Korea. Journal of Small Business Management 53, 843–867.

Link, A.N., Scott, J.T., 2010. Government as entrepreneur: Evaluating the commercialization success of SBIR projects. Research Policy 39, 589–601.

Lundvall, B.-A., Borràs, S., 2005. Science, Technology, and Innovation policy, in: Fagerberg, J., Mowery, D.C., Nelson, R.R. (Eds.), The Oxford Handbook of Innovation. Oxford University Press, Oxford, pp. 599–631.

Luukkonen, T., 2002. Technology and market orientation in company participation in the EU framework programme. Research Policy 31, 437–455.

Luukkonen, T., 1998. The difficulties in assessing the impact of EU framework programmes. Research Policy 27, 599–610.

Luukkonen, T., Hälikkä, S., 2000. Knowledge creation and knowledge diffusion networks.pdf. Publications of the Finnish Secretariat for EU R&D 1/2000, Helsinki.

Mason, C., Brown, R., 2013. Creating good public policy to support high-growth firms. Small Business Economics Group 40, 211–225.

Muller, P., Caliandro, C., Gagliardi, D., & Marzocchi, C., 2015. Annual Report on European SMEs 2014/2015.

OECD, 2016. Financing SMEs and Entrepreneurs 2016: An OECD Scoreboard. OECD Publishing, Paris.

OECD, 2004. Promoting Entrepreneurship and Innovative SMEs in a Global Economy: Towards a more responsible and inclusive globalisation, 2nd OECD Conference of Ministers Responsible for Smalle and Medium-Sized Enterprises (SMEs). Istanbul, Turkey.

Parker, R., 2000. Small is not necessarily beautiful: An evaluation of policy support for small and medium-sized enterprises in Australia. Aust. Journal of Political Science 35, 239–253.

Roediger-Schluga, T., Barber, M.J., 2006. The structure of R&D collaboration networks in the European Framework Programmes. Maastricht, The Netherlands.

SBIR.gov, 2016a. What is the Purpose of SBIR and STTR Programs? URL: https://www.sbir.gov/sites/all/themes/sbir/dawnbreaker/img/documents/Course1-Tutorial1.pdf (accessed 11.8.16).

SBIR.gov, 2016b. About STTR. URL: https://www.sbir.gov/about/about-sttr (accessed 11.8.16).

Shapira, P., 2010. Innovation and Small and Midsize Enterprises: Innovation Dynamics and Policy Strategies, in: Smits, R., Kuhlmann, S., Shapira, P. (Eds.), The Theory and Practice of Innovation Policy: An International Research Handbook. Edward Elgar, Cheltenham, UK.

Simonelli, F., 2016. Is Horizon 2020 really more SME-friendly? A look at the figures. CEPS Commentary, 17 February 2016. URL https://www.ceps.eu/publications/horizon-2020-really-more-sme-friendly-look-figures (accessed 8.8.16).

Skuras, D., Meccheri, N., Moreira, M.B., Rosell, J., Stathopoulou, S., 2005. Business growth and development trajectories in lagging and remote areas of Southern Europe. European Urban Regional Studies 12, 335–351.

Stevenson, H.H., Jarillo, J.C., 2007. A Paradigm of Entrepreneurship: Entrepreneurial Management, in: Cuervo, P.Á., Ribeiro, P.D., Roig, P.S. (Eds.), *Entrepreneurship.* Springer Berlin Heidelberg, pp. 155–170.

Tsai, W.-H., Kuo, H.-C., 2011. Entrepreneurship policy evaluation and decision analysis for SMEs. Expert Systems Applications 38, 8343–8351.

Van Cauwenberge, P., Vander Bauwhede, H., Schoonjans, B., 2013. An evaluation of public spending: the effectiveness of a government-supported networking program in Flanders. Environment and Planning C-Government and Policy 31, 24–38.

Vega, A., Chiasson, M., 2015. Towards a comprehensive framework for the evaluation of small and medium enterprise policy. Evaluation 21, 359–375.

Wagenvoort, R., 2003. Are finance constraints hindering the growth of SMEs in Europe? (EIB Paper No. 7/2003). European Investment Bank, Economics Department.

Wennekers, S., Thurik, R., 1999. Linking Entrepreneurship and Economic Growth. Small Business Economics 13, 27–56.

Wong, P.K., Ho, Y.P., Autio, E., 2005. Entrepreneurship, Innovation and Economic Growth: Evidence from GEM data. Small Business Economics 24, 335–350.

Young, M., 2015. Shifting policy narratives in Horizon 2020. Journal of Contemporary European Research 11, 16–30.

Zúñiga-Vicente, J.Á., Alonso-Borrego, C., Forcadell, F.J., Galán, J.I., 2014. Assessing the Effect of Public Subsidies on Firm R&d Investment: A Survey. Journal of Economic Surveys 28, 36–67.