Support to SMEs - Increasing Research and Innovation in SMEs and SME Development

Work Package 2

First Intermediate Report

Volume I: Synthesis Report

Ex post evaluation of Cohesion Policy programmes 2007-2013, focusing on the European Regional Development Fund (ERDF) and the Cohesion Fund (CF)

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First Intermediate Report

Volume I: Synthesis Report

July – 2015
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Quotation is authorised as long as the source is acknowledged.
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<tr>
<td>AT</td>
<td>Austria</td>
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<tr>
<td>BE</td>
<td>Belgium</td>
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<td>BERD</td>
<td>Business Expenditure in Research and Development</td>
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<td>BG</td>
<td>Bulgaria</td>
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<td>BN</td>
<td>Bayesian Network</td>
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<td>CF</td>
<td>Cohesion Fund</td>
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<td>CMO</td>
<td>Context-Mechanism-Outcome</td>
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<td>CONV</td>
<td>Convergence (Cohesion Policy objective)</td>
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<td>COMP</td>
<td>Competitiveness and Employment (Cohesion Policy objective)</td>
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<td>CZ</td>
<td>Czech Republic</td>
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<td>DE</td>
<td>Germany</td>
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<td>DG REGIO</td>
<td>Directorate-General for Regional and Urban Policy</td>
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<td>DK</td>
<td>Denmark</td>
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<tr>
<td>EBIT</td>
<td>Earnings Before Interest and Tax</td>
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<td>EBITDA</td>
<td>Earnings Before Interest, Taxes, Depreciation and Amortization</td>
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<tr>
<td>EC</td>
<td>European Commission</td>
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<td>EE</td>
<td>Estonia</td>
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<td>European Patent Office</td>
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<td>ERDF</td>
<td>European Regional Development Fund</td>
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<td>ES</td>
<td>Spain</td>
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<td>ESPON</td>
<td>European Observation Network, Territorial Development and Cohesion</td>
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<td>EU</td>
<td>European Union</td>
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<td>EUR</td>
<td>Euro</td>
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<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>France</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GERD</td>
<td>Gross Expenditure in Research and Development</td>
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<td>GRCF</td>
<td>Gross Fixed Capital Formation</td>
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<td>Greece</td>
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<td>GVA</td>
<td>Gross Value Added</td>
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<td>HEIs</td>
<td>High Education Institutes</td>
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<td>HU</td>
<td>Hungary</td>
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<td>ICT</td>
<td>Information and Communication Technology</td>
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<td>IPR</td>
<td>Intellectual Property Right</td>
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<td>M EUR</td>
<td>Million Euro</td>
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<td>MA</td>
<td>Managing Authority</td>
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<td>MS</td>
<td>Member State</td>
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<td>MULTIREG</td>
<td>Multiregional</td>
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<tr>
<td>NACE</td>
<td>Nomenclature statistique des activités économiques (Statistical classification for economic activities)</td>
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<td>NAT</td>
<td>National</td>
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<td>NL</td>
<td>Netherland</td>
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<td>NUTS</td>
<td>Nomenclature of territorial units for statistics</td>
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<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>OP</td>
<td>Operational Programme</td>
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<td>PCT</td>
<td>Patent Cooperation Treaty</td>
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<td>PT</td>
<td>Portugal</td>
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<td>R&amp;D</td>
<td>Research and Development</td>
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<td>R&amp;TD</td>
<td>Research and technological development</td>
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<td>REG</td>
<td>Regional</td>
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<td>RO</td>
<td>Romania</td>
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<td>RTDI</td>
<td>Research, technological development and innovation</td>
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<td>SE</td>
<td>Sweden</td>
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<td>SF</td>
<td>Structural Fund</td>
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<td>Slovakia</td>
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<td>SME</td>
<td>Small and medium enterprise</td>
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<td>TBIE</td>
<td>Theory-based impact evaluation</td>
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<td>ToR</td>
<td>Terms of Reference</td>
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<td>UK</td>
<td>United Kingdom</td>
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<td>WP</td>
<td>Work package</td>
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1 EXECUTIVE SUMMARY

This is the First Intermediate Report of the ex-post evaluation of Support to Small and Medium Enterprises (SMEs) – Increasing Research and Innovation in SMEs and SME development. The objective of the evaluation is to assess the effectiveness and the impact of the European Regional Development Fund (ERDF) with regards to support for innovation and the development of SMEs in the European Union over the 2007-2013 programming period.

This report presents the results of Tasks 1 and 2, i.e., a literature review on SME support and an analysis of policy instruments mobilised in 50 Operational Programmes (OPs) selected for their importance to SMEs. The objective of the report is to account for the form taken by ERDF support to SMEs and collect initial evidence on the effectiveness of the policy instruments mobilised in this context. It is organised in two volumes: a main report and 50 “fiches” prepared on each OP.

The findings of the work carried out so far have enabled the evaluation team to identify a number of features of both the context and the implemented programmes themselves that, with the support of the literature review, suggest a number of research questions that will be further explored in the forthcoming analytical activities, namely the case studies and theory based evaluation. We present here the key findings identified.

1.1 The context and its recent development influences the perspective of analysis

Carrying out the ex post evaluation of the effects of ERDF support to SMEs requires the complex background to be taken into account in which European SMEs have operated in the programming period under consideration. As a matter of fact, the programming period investigated in the study was characterised by an unparalleled economic recession, which deeply affected European economies and enterprises: the total number of SMEs dropped significantly, as well as their level of employment and their value added.

Sectors, regions and specific categories of SMEs showed different degree of resilience to the crisis, especially when taking into account the structural factors that were already in place before 2008 that have consistently impaired the competitiveness of European SMEs. In particular, while the capacity to innovate and go global are recognised as the two main drivers for growth, SMEs generally exhibit weaknesses in respect of both. At the same time, when looking at different size classes and sectors, a slightly more promising picture emerges, when considering small firms, for example, which recovered more positively in 2012 in terms of employment, and SMEs in innovative service sectors, where innovation performances are much better than those in manufacturing sectors.

Assessing the effectiveness of Cohesion Policy programmes under such circumstances requires the perspective of the analysis to be adapted: to what extent were programmes designed and implemented in order to address long-term objectives to cope with structural barriers affecting target SMEs or rather to respond to the contingent pressures arising from the high cost of access to credit, the fall in fixed capital formation and in employment? While the first strategy could have been more ambitious but exposed to a higher risk of failure, the second strategy could have been more effective in the short term but perhaps missed the opportunity to effectively bring about structural change.
1.2 Supporting SMEs under different angles

Evidence collected from empirical literature shows how knowledge content of production is an increasingly important competitive advantage. This further deepens the heterogeneity of SMEs and heightens a discrimination between high growth SMEs and other SMEs whose development path is hampered by obstacles traditionally linked to their small size. **Two main rationales underpin the logic of intervention supporting SMEs: either addressing some market or system failures which hinders their capacity to compete and grow, or to support their start-up and growth in the sectors which are deemed to be the most promising and relevant for the territorial competitive system and most resilient to global pressures.**

The strategic choice of policy instruments that can be mobilised by policy makers to support SMEs is not neutral since it requires choosing between different trade-offs in terms of performance and effectiveness. Possible alternatives include: direct (grants) vs indirect (business services, incubators) support, aid vs repayable support (loans, equity finance), individual vs collective (e.g. collaborative R&D projects, clusters), and single instrument vs an integrated package of instruments. Besides specific success factors, different broad conditions of effectiveness of these policy instruments can be identified, covering: firms’ capacity (including entrepreneurship), institutional setting and implementation arrangements (in particular the role of intermediaries) and the wider policy mix within which specific policy instruments are embedded.

Among other specific lessons drawn from the literature, it is worth mentioning that **the recent policy debate is putting greater emphasis on the need to move from more traditional direct non repayable aid to individual firms for generic access to finance to more innovative instruments addressing group of firms or actors in order to stimulate in a selective manner more promising investments promoting excellence in innovation, including by demand-driven innovation.** Such instruments, however, require a certain amount of planning and financing capacities from the side of the firms and good governance and administrative capacity from the side of the public agencies.

Hence, the choice of policy mix can be influenced by considerations about the knowledge and experience (including path dependence patterns) of regional administrations and may reflect different bargaining powers of local interest groups. In order to assess the effectiveness of Cohesion Policy programmes, it is crucial to understand the interplay of knowledge bases, competences and interests which played a role in the design and implementation of the selected policy mix.

1.3 Policy mix in the target OPs

The 50 OPs under review represent 62% of the total amount of all OPs in the categories of expenditure concerning support to SMEs. This sample offers a privileged perspective given its variegated features ranging from large country to small region, with different socio-economic and industrial performances, as well as large differences in the number of SMEs and their distribution by size class. While on the one hand this broad range of territories limits the possibility to highlight specific patterns and trajectories, as confirmed by the analysis of policy instruments (see below), it nonetheless allows the analysis to investigate the rich variety of policy mixes that the different territories have selected.

Another characteristic worth mentioning is the difference in terms of absolute and relative importance of ERDF funds dedicated to SMEs within the OPs, and in terms of the role of ERDF in the wider national / regional policy mix. These are all relevant aspects in
the analysis of the possible strategies adopted by the OPs concerned. More specifically, depending on the amount of the absolute value of ERDF resources in a given OP and the relative share addressed to SMEs support, as well as the weight of ERDF measures for SMEs as compared to other regional and national measures, the role of ERDF may vary from constituting a crucial tool for industrial policy to being a mere laboratory for experimenting with tools and practices. The assessment of effectiveness is obviously affected by the understanding of such circumstances.

1.4 Key findings

- **The comprehensive review of a total of 670 policy instruments identified across the 50 OPs** provides a very detailed picture of the key features of policy instruments implemented during the programming period. More than three quarters of the policy instruments identified can be classified in the following five categories: support for business creation and development (26%), support for R&D projects (23%), provision of infrastructure and related services (12%), support for technological and non-technological innovation (8%) and support to internationalisation (7%). The other categories are: access and diffusion of ICT (6%), support for improving capacities (4%), knowledge and technology transfer (3%), generic access to finance (3%), eco-innovation (3%), creation of innovative companies (3%) and networking (2%).

- Policy instruments are predominantly geared to objectives in terms of SME innovation (around half of all instruments and of the disbursed public contribution) whereas 21% of contribution paid so far refers exclusively to SME growth and development. Another quarter of policy instruments do not make clear cut distinctions and refer to innovation as a way to promote SME development.

- **Grants are the preferred mode of delivery** for slightly less than half of the policy instruments identified, followed by packages defined as a combination of modes of delivery (22%). Indirect support in the form of consulting, advice and technical assistance represent 14% of total policy instruments, followed by repayable financial support (9%).

- **Policy instruments are by and large addressed to individual SMEs (including single entrepreneurs) or to individual enterprises without a size distinction.** In 15% of the cases, policy instruments support partnerships (among enterprises / SMEs or between enterprises and research organisations).

- **Policy instruments generally do not target specific sectors.** A minority of policy instruments (12% of the total number of identified policy instruments, 7% of the total public contribution already paid) are addressed to SMEs operating in particular sectors, the most common of which is tourism and, in some cases, various high-tech sectors.

- In a large majority of cases the support is directly provided to SMEs, in general through grants. **Intermediaries** (defined as the direct beneficiaries of ERDF funding, which in turn use the resources to provide support to enterprises or SMEs in particular) are resorted to by 37% of the policy instruments, (i.e., 28% of public contribution already paid). The intermediaries most frequently mobilised are financial institutions and fund managers and universities and research organisations are the second most important type of intermediary, generally serving SMEs through consulting services and advice.
- **Micro-enterprises** represent the large majority of beneficiaries for which the size class is available. A rough estimation provides the following proportions: 54% of beneficiaries are micro-enterprises, 30% small enterprises and 16% medium enterprises.

- On average, policy instruments with the **largest number of beneficiaries** are those that involve the promotion of business creation and development, and **generic access to finance**. Indeed, grants and repayable financial support (especially those involving guarantees to credit) are associated with the highest average number of beneficiaries.

- While in the EU the share of SMEs operating in the manufacturing sectors are 10% of all SMEs in terms of numbers and slightly more than 20%, in terms of employment, **around 44% of beneficiary SMEs are in the manufacturing sector**. This figure suggests that beneficiary SMEs are concentrated in manufacturing to a significantly greater extent than in the overall SME population. **As to the remaining beneficiary SMEs, 16% are in the wholesale and retail trade, repair of motor vehicles and motorcycles; 10% in Information and communication; 6% in the accommodation and food service activities.**

- **Beneficiary SMEs are generally characterised by low technological intensity**, although variability across policy instruments is large.

- Some **differentiation between countries** can be detected in the choice of policy instruments. The patterns tend to **reflect institutional differences**. For example, Polish OPs rely to a greater extent on intermediaries (as compared with other Convergence areas) and municipalities are the most common type of intermediary mobilised. Municipalities and local public authorities channel a large number of instruments also in the two Swedish OPs and in Piedmont (Italy). In Spain, Chambers of Commerce have a predominant intermediary role, much larger than in any other OP of the sample. Conversely, projects carried out by SMEs in Portugal are more often supported by the universities and research centres, which are the direct recipients of ERDF support.

- A slight difference characterises the OPs in Convergence regions (CONV) and those in Competitiveness and Employment regions (COMP). For example, in CONV regions, a larger use is made of grants than in COMP regions (46% vs. 33% of paid amount). Conversely, the combination of different modes of delivery are more common in COMP regions (42% vs. only 23% in CONV regions). Likewise, CONV regions make a comparatively greater use of policy instruments addressed to individual SMEs (**the share of public contribution paid to individual SMEs is 34% in CONV regions against 24% of in COMP regions**), while CONV regions show a higher preference for instruments targeted to a mix of diverse types of beneficiaries (27% of paid amount against only 4% in COMP regions). Finally, **Convergence objective regions make a more limited use of intermediaries** (27% of all occurred paid amount) as compared with Competitiveness and Employment objective regions (42% of all paid amount). These patterns reinforce the idea that the more complex instruments require a stronger design and implementation capacity which COMP regions are more likely to have.

- This picture of the form of ERDF in support of SMEs must be **assessed in the light of the deep economic crisis**, which erupted during the programming period. The economic crisis had a notable impact on the OPs reviewed. A **shift of resources is observed away from innovation to more generic growth**
objectives, with the aim of strengthening efforts to safeguard jobs. Aggregate data shows that only 6 out of the 50 OPs made no change to their programme, seven OPs did not change the overall allocation but were subject to internal reshuffling between priority axes, and all the remaining 37 OPs were affected in one way or another (change in co-financing rate, changes in total allocation). The economic crisis has negatively affected the performance of some instruments too: for example, a number of instruments introduced by the Greek OPs failed to reach the desired outcomes due to the difficulties SMEs had in accessing the co-financing credit.

- Only a small share of ERDF support has already generated documented effects. According to the information available from the monitoring system and additional sources (e.g. ad hoc evaluation), only 12% of all policy instruments have robust evidence of positive achievements. Policy instruments which can be assessed as ineffective represent to 5% of the total.

- For the remaining policy instruments, no conclusive assessment on achievements can be provided, either because there is a lack of any sort of evidence about the possible effectiveness of the instruments, but mostly because it is still too early to provide a conclusive assessment.

- The largest number of instruments for which evidence of positive achievement is available is those supporting SME R&D projects and business creation and development. These are also the types of instrument where the largest share of public financing has been allocated and already paid. Among the most successful instruments are also those promoting networking among companies, usually through the establishment of clusters, even if their number is marginal within the whole set of instruments. Eco-innovation instruments record the most negative achievements in terms of SME performance.

- Overall, out of the 50 OPs reviewed, the monitoring system is considered good enough to assess the instruments’ achievements only in 7 cases. The monitoring system of 11 OPs is considered poor in accounting for the effectiveness of specific policy instruments, either because some output and result indicators are available only at priority axis level, or because no pertinent result indicators are set. The monitoring system of 30 OPs is scored as modest as evidence is available for some instruments, but not for all of them.

Overall, some of the findings emerging from the comparative analysis of policy instruments mobilised in the 50 OPs under examination may appear to be counterintuitive against expectations arising from the policy debate and the literature. Among these, the distinct preference for grants to enterprises seems to contrast with the growing emphasis in the policy debate on equity finance, repayable support and indirect support. Partnerships between enterprises and research centres and recourse to intermediary actors to provide assistance to SMEs, also appear to be less developed than anticipated, despite the great attention these themes attract. It is argued that this mismatch could in part be explained by the crisis. In a context of economic recession, policy makers could have preferred more ‘traditional’ policy instruments to sustain local economies at a critical time. Other reasons for the less-use of Financial Instruments are the difficulties of implementing them and the lack of control over which companies ultimately receive support.

In these circumstances, it is even more necessary to uncover real trends and behaviours behind the headlines and aggregate figures. The current exercise indeed represents an
unparalleled effort to identify and characterise the policy instruments commonly used in the 2007-13 programming period in a comparative perspective, but it will also be necessary, in forthcoming steps, to refine our understanding of the real as opposed to the declared intervention logics and to assess the effectiveness of the policy instruments that are examined.
Chapter 2: Context Analysis: Some Stylized Facts

This Chapter aims to provide an overview of the environment in which the ERDF operates and supports the growth and innovation processes of Small and Medium Enterprises (hereafter SMEs). This Chapter is, therefore, an introductory step for the micro-level analysis presented in Chapter 4. It provides descriptive evidence on some macro-level stylized facts influencing growth of firms in general and, where possible, of SMEs, uncovering at the same time the heterogeneity in which ERDF beneficiaries operate, both from a sectoral and a geographical point of view.

The focus is on the identification of the aggregate economic trends that characterize the programming period 2007-2013, highlighting structural issues (with data prior to 2007) both at the sectoral and at the regional level, which influence the performance of SMEs and may influence the impact of European policies aimed at them.

Accordingly, the first section is focused on the sectoral dimension. After a brief overview on the importance, characteristics and the role of SMEs in the EU, we analyse the dynamics of SME performance with respect to the three inputs of interest, during the period covered by our evaluation and, where possible, also for the period going from 1997 to 2007 to unveil structural trends. In the second section we move the analysis to the regional (NUTS 2) level, exploring the relationship between inputs and output from a geographical point of view, and highlight specific spatial and temporal dynamics in terms of innovation and technology levels of SMEs.

2.1 Characteristics of SMEs across the EU

2.1.1 Distribution and performance by sector

The European Commission (2003i) defines SMEs as firms employing less than 250 employees and having an annual turnover of not more than EUR 50 million and/or a balance sheet total of not more than EUR 43 million. SMEs are further classified in three categories: micro, small and medium-size firms, depending on the number of people employed and turnover.1 Additional conditions also apply, implying that an SME cannot be effectively owned and controlled by larger enterprises or public organisations.2 In 2013 more than 20.7 million SMEs were counted throughout the EU, with a higher share of SMEs over the total number of enterprises in the Southern countries of the EU (Figure 1.).

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1 Micro firms have less than 10 employees, a turnover of less than EUR 2 million and/or total assets below EUR 2 million. Small firms have more than 10 and less than 50 employees, a turnover of less than EUR 10 million and/or total assets below EUR 10 million. Medium firms have more than 50 and less than 250 employees, a turnover of less than EUR 50 million and/or total assets below EUR 43 million.

2 The main statistical sources do not provide data on enterprises defined as SMEs, according to a strict application of the above reported SME definition. Available data are based on the employment size criterion. Accordingly, the statistics reported in this chapter are based on this definition. It must be noted that, while including the turnover and/or total assets criteria should not change the statistics very much, applying the rules concerning the autonomy of enterprises could have a substantial impact on the results; in a study conducted in Germany, the application of this rule reduced the total number of 'SMEs' by 9% (CSES, 2012)
SMEs play an important role in the EU’s non-financial sectors economy. As illustrated in Figure 2, as of 2013, not only do SMEs represent more than 99% of the total number of enterprises in the EU, but they also employ almost 70% of the total number of people employed and generate almost 60% of the total value added. When looking at the distribution of these three variables of interest among SMEs classes of size, micro firms, including one-person firms, are by far the most represented in terms of number of firms, while in terms of employment they share the podium with large firms, employing more than 30% of the whole number of people employed in the EU. Only in terms of value added are micro firms almost comparable to small and medium firms, although they are still slightly more predominant than in the other two classes.

Figure 3 shows the dynamics of SME demography, employment and value added between 2008 and 2013. SMEs clearly suffered in the aftermath of the economic crisis, with an important drop in growth in 2009, when total value added fell by nearly 15%. This recession was followed by a recovery in terms of number of enterprises and value added, while employment continued to show a decline throughout the years. In 2012, another downturn was recorded for all the considered variables. In 2013, value added finally rose almost to the level of 2008.

It should be noted that the insight provided by aggregate data at the EU level (as provided in Figures 2 and 3) is hiding significant differences across countries. Some countries have been hit harder by the crisis while others have recovered faster, and this will be reflected on SME activities and performance as well.

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With respect to the number of firms, the number of employees and the level of value added, we are relying throughout this section, on data provided by the European Commission in the framework of its SMEs Performance Review (European Commission, 2014), which is in turn based on data extracted from the Eurostat Structural Business Statistics. The analysis focused on the following 1 digit NACE non-financial sectors: ‘mining and quarrying’, ‘manufacturing’, ‘electricity, gas, steam and air condition supply’, ‘water supply, sewerage, waste management and remediation activities’, ‘construction’, ‘wholesale and retail trade, repair of motor vehicles and motorcycles’, ‘transportation and storage’, ‘accommodation and food services’, ‘information and communication’, ‘real estate activities’, ‘professional, scientific and technical activities’ and ‘administrative and support services’.
Figure 2. Number of enterprises, employment and value added by size – EU28 (2013)

Note: Large enterprises are represented in red, while SMEs are represented in shades of blue.
Source: CSIL elaboration based on EC SME Performance Review Dataset.

Figure 3. Percentage change in number of firms (SMEs), employment and value added (in real terms) – EU28 (2008 base year)

Note: Slovakia is excluded due to a break in the series.

Using data from another source on the same variables allows us to better gauge the dynamics for different classes of SMEs, classified based on the number of their employees. Using data from the Structural and Demographic for Business Statistics (SDBS) between 2007 and 2012, annual changes in value added, employment and number of firms in volumes can be plotted for firms in different size classes. The OECD classifies firms according to their employment in the following manner: class 1 corresponds to firms with less than 10 people employed, class 2 to firms with 10-19 people employed, class 3 to firms with 20-49 people employed, class 4 to firms with 50-249 people employed, class 5 to firms with more than 250 people employed.

Starting from value added, there is a general trend, irrespective of size, that suggests that firms have experienced a drop in value added in 2009 and that there has been, since then a recovering trend. However, differences emerge suggesting, for example that small firms (those belonging to size class 2) are the only category that present, in 2012, a positive growth rate of value added. All other categories are assessed around a null growth rate. With respect to employment, after the plunge in 2009, all categories have experienced a slight recovery with a non-negative growth rate for all but SME firms in
size class 4, thus the larger in terms of size in the SME category. The trend here appears to be negative. Finally, in terms of demography, smaller SMES (i.e. those in the first two size classes) seem to have recovered better since 2009, with slightly positive growth rate of total number of firms.

**Figure 4. Percentage change in number of firms, employment and value added by size class– EU28 (2008-2012)**

Note: Average of values for Austria; Belgium; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Luxembourg; Netherlands; Poland; Portugal; Slovak Republic; Slovenia; Spain; Sweden; United Kingdom; Bulgaria; Croatia; Cyprus; Former Yugoslav Republic of Macedonia; Latvia; Lithuania; Malta; Romania.

Source: CSIL elaboration on OECD SDBS data.

Taken together these figures suggest a set of considerations. First, the 2008 crisis has caused a significant drop in the growth rates of value added, employment and number of firms for all firms. Second, there has been a modest recovery between 2009 and 2010, which however has been hampered by the ongoing crisis, leading to null or even slightly negative growth rates for all variables across all size classes. However, **among SMES, the smaller firms (those with less than 20 people employed) are showing some signs of potential recovery in 2012, while larger SMES seem to be still suffering from the crisis.** This latter result seems to mimic the negative trend recorded for larger firms, i.e. those with more than 250 people employed.
Shifting the focus from aggregate figures to an industrial disaggregation, a certain variability in the share of SMEs over employment across sectors can be pointed out (Figure 5.). The share of SMEs is especially high in services, such as accommodation and food services, real estate, wholesale and retail, professional and scientific activities, and, in industry, in construction.

**Figure 5. Percentage of SMEs over total Employment by industrial sector – EU28 (NACE rev.2 1 digits disaggregation, 2013)**

In the following part of this section we restrict our analysis to the five macro-sectors where most of ERDF beneficiaries operate. According to the analysis of a sample of Operational Programmes (see Chapter 4), the main sectors of beneficiary SMEs are: manufacturing, wholesale and retail, accommodation and food provision, information and communication, and professional, scientific and technical activities. Indeed, we can observe from Figure 6., which shows the relative share of each non-financial sector with respect to the number of SMEs, to the employment and to the value added that SMEs created in 2013, that these sectors are also among the most significant non-financial sectors, for SMEs. The largest sector along all dimensions is wholesale and retail. Professional, scientific and technological activities follow in terms of number of enterprises, while, in terms of employment and value added, manufacturing has the second largest share. This reflects the predominance of micro firms (which include one-person firms) in the professional sector with respect to manufacturing, where the share of medium and small firms is larger.
Figure 6. Share of number of SMEs, SME employment and SME value added (in real terms) by industrial sector over the total number of SMEs – EU28 (NACE rev.2 1 digit disaggregation, 2013)


Figure 7. Average annual growth rate in value added of SMEs by sector (NACE rev.2, 2 digits disaggregation) – EU28 (2008-2013)

Source: Own elaboration based on EC SME Performance Review dataset.

Figure 7. illustrates the dynamics of value added of SMEs, expressed in terms of average annual growth rates, between 2008 and 2013\(^4\) for finely disaggregated sectors (NACE Rev. 2, 2 digits disaggregation). The first thing that can be noticed by the observation of this histogram is that while all services sectors show a positive growth in the period, manufacturing sectors are mostly lagging behind. In particular, the value added of most traditional manufacturing sectors, with the notable exceptions of food, beverages and tobacco and paper products, has decreased. Among the worst performers we find the whole apparel and textiles industry, manufacturing of printing and

\(^{4}\) The choice of the period of analysis is driven by data availability.
reproduction of recorded media, coke and refined petroleum, the metals production chain and glass and ceramics, together with furniture production. Chemicals and related sectors such as pharmaceuticals and rubber are keeping up with the motor vehicles industry. It is interesting to note that among the manufacturing sectors, the best performers are basic pharmaceuticals and other transport equipment (which also includes the aeronautical sector), i.e. the most technologically intense sectors. A somewhat similar trend is recognisable in the services industry, where the performances of scientific research and development, telecommunications and information service activities and computer consultancy stand out with respect to other sectors.

Figure 8. Let us look from another perspective at the dynamics of SMEs growth, showing the relationship between percentage changes in value added (on the vertical axis) and percentage changes in the number of firms (on the horizontal axis) between 2008 and 2013 by sectors of activity, thus unveiling sectoral dynamic trends. Although on average, consistently with the tendencies reported in Figure 3, all sectors show signs of recovery with respect to the levels of 2008, they show large variability in their performance. Not surprisingly, we can observe a positive relationship between the two variables, with most of the sectors are located either in the first or in the third quadrant of the graph, where the axes represent the average values of the two variables.

Sectors located in the first quadrant (North-East) performed better than the average both in terms of percentage change in value added and in terms of percentage change in number of firms, while sectors located in the third quadrant (South-West) performed worse than the average in terms of both variables. Table 1 helps us in interpreting this graph by classifying sectors in the four quadrants.

Among the firms that performed above the average both in terms of value added and in terms of number of enterprises (first quadrant, top right), we find mostly service sectors (information and communication and most of the professional activities, together with accommodation and food provision). Among the manufacturing sectors, only ‘other manufacturing’ shows slightly above average growth in terms of both value added and number of firms.

In the second quadrant (upper left) we sectors with increasing value added (or decreasing at a slower pace than the average), while number of firms decreased. It must be noted that, although we are here generally interpreting a growing number of enterprises as a sign of positive performance, in the presence of previously unexploited scale economies, a reduction in the number of firms could be due to a process of convergence to the optimal scale, which should translate in a growth in value added. The process undergone by the sectors included in this quadrant could, therefore, can be read as an improvement in terms of efficiency.

Among the worst performers (third quadrant, lower left-hand corner) there are mostly traditional manufacturing sectors. Among non-manufacturing sectors, only publishing activities are included in this quadrant, but their performance is still positive in terms of both variables and is very close to the economy averages.

Finally, the fourth (lower right) quadrant includes sectors that presented an above average growth in the number of firms, while their value added grew below the average. These include some professional activities, among which are advertising and market

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5 See Chapter 4 for a classification of sectors by their technological intensity.
research and architectural and engineering activities, wholesale and media. Basic metals production is the only sector in this quadrant to show a negative trend in terms of value added.

Table 1. Classification of sectors in terms of their growth in value added and in number. of enterprises – EU28, 2008-2013.

<table>
<thead>
<tr>
<th>1st quadrant (North-East)</th>
<th>2nd quadrant (North-West)</th>
<th>3rd quadrant (South-West)</th>
<th>4th quadrant (South-East)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C32: Other manufacturing; I55: Accommodation; I56: Food and beverage service activities; J61: Telecommunications; J62: Computer programming, consultancy and related activities; J63: Information service activities; G45: Wholesale and retail trade and repair of motor vehicles and motorcycles; M69: Legal and accounting activities; M70: Activities of head offices; management consultancy activities; M72: Scientific research and development: technical testing and analysis; M75: Veterinary activities.</td>
<td>C10: Food products; C11: Beverages; C12: Tobacco; C21: Basic pharmaceutical products and pharmaceutical preparations; C17: Paper and paper products; C30: Other transport equipment; G47: Retail trade, except of motor vehicles and motorcycles. J60: Programming and broadcasting activities.</td>
<td>C13: Textiles; C14: Wearing apparel; C15: Leather and related products; C16: Wood and products of wood and cork, except furniture; articles of straw and plaiting materials; C18: Printing and reproduction of recorded media; C19: Coke and refined petroleum products; C20: Chemicals and chemical products; C22: Rubber and plastic products; C23: Other non-metallic mineral products; C25: Fabricated metal products, except machinery and equipment; C26: Computer, electronic and optical products; C27: Electrical equipment; C28: Machinery and equipment n.e.c.; C29: Motor vehicles, trailers and semi-trailers; C31: Furniture; J58: Publishing activities.</td>
<td>C24: Basic metals; C33: Repair and installation of machinery and equipment; G46: Wholesale trade, except of motor vehicles and motorcycles; J59: Motion picture, video and television programme production, sound recording and music publishing activities; M71: Architectural and engineering activities; M73: Advertising and market research; M74: Other professional, scientific and technical activities.</td>
</tr>
</tbody>
</table>

Source: CSIL elaboration based on EC SME Performance Review dataset.
Figure 8. Relationship between % change in number of SMEs and % change in SMEs’ value added from 2008 to 2013 in EU 28 (NACE rev. 2, 1 digit classification)

Legend of NACE codes: C10: Food products; C11: Beverages; C12: Tobacco products; C13: Textiles; C14: Wearing apparel; C15: Leather and related products; C16: Wood and products of wood and cork, except furniture; articles of straw and plaiting materials; C17: Paper and paper products; C18: Printing and reproduction of recorded media; C19: Coke and refined petroleum products; C20: Chemicals and chemical products; C21: Basic pharmaceutical products and pharmaceutical preparations; C22: Rubber and plastic products; C23: Other non-metallic mineral products; C24: Basic metals; C25: Fabricated metal products, except machinery and equipment; C26: Computer, electronic and optical products; C27: Electrical equipment; C28: Machinery and equipment n.e.c.; C29: Motor vehicles, trailers and semi-trailers; C30: Other transport equipment; C31: Furniture; C32: Other manufacturing; C33: Repair and installation of machinery and equipment; G45: Wholesale and retail trade and repair of motor vehicles and motorcycles; G46: Wholesale trade, except of motor vehicles and motorcycles; G47: Retail trade, except of motor vehicles and motorcycles; I55: Accommodation; I56: Food and beverage service activities; J58: Publishing activities; J59: Motion picture, video and television programme production, sound recording and music publishing activities; J60: Programming and broadcasting activities; J61: Telecommunications; J62: Computer programming, consultancy and related activities; J63: Information service activities; M69: Legal and accounting activities; M70: Activities of head offices; management consultancy activities; M71: Architectural and engineering activities; technical testing and analysis; M72: Scientific research and development; M73: Advertising and market research; M74: Other professional, scientific and technical activities; M75: Veterinary activities.

Note: Slovakia is excluded due to a break in the series.

Source: Own elaboration based on EC SME Performance Review dataset.
Two further important aspects are related to the internationalisation processes of SMEs, specifically related to their export behaviour and their challenges in having access to finance. Starting from the former, the most recent data available linking exports (as a percentage of turnover) by size class is for 2008 and is taken from European Commission (2010iv), based on the results of a survey of 9,480 SMEs in 33 European countries, carried out in 2009. Micro firms are those with less than 10 employed persons, small firms have between 10 and 49 employed persons while medium firms have between 50 and 259 employed persons.

A higher percentage of exports to total turnover is reported by larger firms, and the actual figure is increasing in SME size. While a clearer picture could be gained with data for a longer period of time, this result suggests that small SMEs are still lagging behind in terms of the advancement of their internationalization process, hinting towards the existence of a size-specific issue. It should be noted that this result could be linked to the higher percentage of SMEs in non-traded sectors and to the fact that SMEs might be partners with larger firms which deal directly with the exporting activities. Firm-specific data on the sector, position in the value chain, and export activities and revenues would be needed to disentangle the different drivers of this finding.

Table 2. Exports as a % of turnover for SMEs by size class (2009).

<table>
<thead>
<tr>
<th>Size class</th>
<th>0%</th>
<th>1% - 10%</th>
<th>11% - 25%</th>
<th>26% - 50%</th>
<th>50% - 75%</th>
<th>76% - 100%</th>
<th>Don't know / no answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro</td>
<td>76%</td>
<td>10%</td>
<td>4%</td>
<td>3%</td>
<td>1%</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>Small</td>
<td>63%</td>
<td>14%</td>
<td>6%</td>
<td>7%</td>
<td>3%</td>
<td>3%</td>
<td>5%</td>
</tr>
<tr>
<td>Medium</td>
<td>47%</td>
<td>15%</td>
<td>8%</td>
<td>9%</td>
<td>7%</td>
<td>7%</td>
<td>8%</td>
</tr>
<tr>
<td>Total</td>
<td>75%</td>
<td>10%</td>
<td>4%</td>
<td>4%</td>
<td>1%</td>
<td>2%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Notes: Weighted results. Processing: EIM 5/22/2009
Source: Survey 2009, Internationalisation or European SMEs EIM/GDCC (N=9480).

With respect to financing issues, some insights on the difficulties faced by SMEs can be inferred by analysing the results of the Survey on Access to Finance (SAFE), administered by the European Central Bank and the European Commission twice a year from 2009 to 2014. In a static perspective, the percentage of firms declaring the access to finance as a pressing problem is clearly inversely related to firm size, with higher percentages of small firms considering this a major hurdle, although the percentage of firms reporting this as a major hurdle is relatively small (around 14% of the total for all years and firm sizes). This suggests that the issue of financing may particularly severe for SMEs, in all years considered. In a dynamic perspective, while the share of firms considering external financing a problem has decreased since 2014 for all firm sizes, some differences in terms of size still emerge. First, all categories of SMEs (thus micro, small and medium enterprises) exhibit an average annual decrease over the period considered which is higher than that of large enterprises (with more than 250 persons employed). This might suggest that the financing problem for SMEs is gradually becoming less relevant, possibly suggesting better financing avenues have emerged for SMEs in recent years. Second, within the category of SMEs size once again matters with the decrease in the percentage of firms reporting access to finance as a problems decreasing more as size increases. All in all the results of this survey highlight how

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access to finance is a problem for SMEs and that, while the situation has improved since 2009, the smaller firms are still facing difficulties and improvements are slower for them than for larger enterprises. It should be stressed once again that the percentage of firms reporting financing as a major problem is relatively small.

Table 3. Percentage of firms declaring Access to Finance as a pressing problem- EU average by size class (2009-2014)

<table>
<thead>
<tr>
<th></th>
<th>Micro</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009 (1)</td>
<td>17.6</td>
<td>17.2</td>
<td>17.3</td>
<td></td>
</tr>
<tr>
<td>2009 (2)</td>
<td>21.0</td>
<td>19.3</td>
<td>16.9</td>
<td>12.8</td>
</tr>
<tr>
<td>2010 (1)</td>
<td>17.2</td>
<td>16.1</td>
<td>11.0</td>
<td>10.9</td>
</tr>
<tr>
<td>2010 (2)</td>
<td>17.2</td>
<td>17.1</td>
<td>13.0</td>
<td>9.9</td>
</tr>
<tr>
<td>2011 (1)</td>
<td>17.0</td>
<td>16.1</td>
<td>14.4</td>
<td>10.4</td>
</tr>
<tr>
<td>2011 (2)</td>
<td>19.8</td>
<td>16.7</td>
<td>15.1</td>
<td>12.9</td>
</tr>
<tr>
<td>2012 (1)</td>
<td>18.0</td>
<td>16.5</td>
<td>13.6</td>
<td>13.1</td>
</tr>
<tr>
<td>2012 (2)</td>
<td>16.4</td>
<td>14.3</td>
<td>13.3</td>
<td>10.8</td>
</tr>
<tr>
<td>2013 (1)</td>
<td>17.5</td>
<td>13.2</td>
<td>12.0</td>
<td>9.3</td>
</tr>
<tr>
<td>2013 (2)</td>
<td>15.7</td>
<td>12.0</td>
<td>10.7</td>
<td>7.9</td>
</tr>
<tr>
<td>2014 (1)</td>
<td>14.7</td>
<td>12.6</td>
<td>11.0</td>
<td>10.9</td>
</tr>
</tbody>
</table>

*average annual % change -1.13 -2.66 -3.32 -0.27

Notes: % of firms declaring access to finance as a pressing problem, EU average.
Micro-less than 9 persons employed. Small-from 10 to 49 persons employed. Medium- from 50 to 250 persons employed. Large- more than 250 persons employed.
Source: CSIL elaboration on results from SAFE survey.

A more in depth analysis of SMEs characteristics in EU would be out of the scope of this work; for further information refer to EC (2014i).

2.1.2 Drivers of performance

In the previous section we have analysed how SMEs distribute themselves across sectors and looked at the dynamics of their performance over a relevant period. Here we analyse the drivers contributing to SME production and in particular capital, labour and the technological level.

To this end we adopt the theoretical framework of a classical production function, of the form $Y = AF(K, L)$. This function suggests that a firm’s, thus including SME, production output ($Y$) results from the combination of three main factors, or inputs: capital ($K$), labour ($L$) and total factor productivity ($A$), a measure of the economy’s technological level.\(^8\)

\(^7\) We continue to focus on the five macro-sector listed in the previous section: manufacturing, wholesale and retail, accommodation and food provision, information and communication, and professional, scientific and technical activities

\(^8\) We can express this production function explicitly e.g. in a Cobb-Douglas form, such as $Y_t = A_tK_tL_t^{-\alpha}$. Taking natural logs of both sides of this function we get: $\ln Y_t = \ln A_t + \alpha \ln K_t + (1 - \alpha) \ln L_t$, where subscript $t$ stands for the period of reference. Subtracting to this the same expression for year $t-1$ leads to the following expression for output growth: $\frac{\ln Y_t - \ln Y_{t-1}}{\ln Y_{t-1}} = g_Y = \alpha g_K + (1 - \alpha) g_L$, where we use the fact that $\frac{\ln(1+a) - \ln(1+a)}{\ln(1+a)_{t-1}} = g_a$. We can thus see clearly that $\alpha$ and $1-\alpha$ indicate here the elasticity of the output to a change in the levels of either capital or labour. $g_K$ represents the change in growth that cannot be
While this chapter will look at the production function at an aggregate level, with the purpose of identifying the macro-drivers of growth, this will only be the starting point in order to introduce and frame the analysis which will be taken out in Chapter 4. There, we will go into detail, identifying and classifying the drivers of SME performance into much finer categories. Therefore, for instance, the aggregate input of labour, which is going to be one of the analysed drivers in this chapter, will be exploded into several drivers in Chapter 4, such as job creation, job safe guarding, increase in skill and capabilities. With respect to capital investment, this driver will be analysed, for example, in the form of increase fixed capital. Finally, the technological level will be analysed through the lens of R&D activity and expenditure, innovation levels and ICT.

Without the ambition of estimating a production function, a task that would require the availability of micro-data, possibly at the firm-level, and a longer time-span, we would like here to simply look at the relationship between the above mentioned inputs and the output, measured as the aggregate SME value added for different sectors and for different size classes of SMEs. We look at the relationship between value added growth and changes in one input at a time, thus ideally holding the other factors of production constant, to highlight both the impacts of the crisis and, where possible, some structural trends, at the sectoral level, that characterize the production process of SMEs in Europe.

We measure labour as the number of persons employed in SMEs. We first take percentage changes by industrial sector in EU28 between 2009 and 2011 and plot these against percentage changes in value added (generated by SMEs) in the same period. Results are shown in Figure 9. Changes in employment and in value added appear as expected to be correlated in the period. Again the axes indicate the average values of the variables. We see that, consistently with the results shown in Figure 3, the value added grew substantially on average in the period, showing the recovery undergone by most of the EU economy after the dip of 2009, at the peak of the economic crisis. Conversely, the employment level decreased between 2009 and 2011, reflecting the more sluggish reaction of this input to both the crisis and the prospective recovery. This opposite trend is probably at the root of the weak relationship between the two variables shown in this graph, also due to the short period that we are taking into consideration.

Nonetheless, we can still trace some common trends between sectors. In particular, among those sectors whose value added grew substantially in the period, while their employment level stayed constant (first quadrant, top right), we identify groups of manufacturing sectors belonging to the same production chain. At the same time, more
traditional manufacturing sectors, grew below the average in terms of value added and mostly decreased in terms of number of people employed in the period. Information and communication sectors all grew with respect to value added, although at a slower pace than the previously mentioned high-performing manufacturing sectors. Information and computer services stands out, presenting an important increase in the level of employment. In this time-frame, the only receding sectors in terms of value added appear to be scientific research and development, the pharmaceuticals manufacture (which nonetheless apparently increased in terms of number of people employed) and wholesale and retail. It must be noted that these latter sectors did not undergo the same deep recession in 2009 as most of the above mentioned sectors.

Going ahead with our exploration of the production function inputs, we proxy variations in capital with changes in gross fixed capital formation,\(^\text{11}\) which is a measure of investment in capital. Since data on gross fixed capital formation for SMEs are not available for this time period, we must look at the aggregate variable for all firms. Figure 10. illustrates the relationship between value added and capital formation. Again, the percentage change in value added is reported on the vertical axis, while the percentage change in gross fixed capital formation is reported on the horizontal axis. Due to lack of data for gross fixed capital formation for some European countries,\(^\text{12}\) the results in terms of value added are not always consistent with those reported in Figure 9. , which are based on the whole EU28 sample. On average, similarly to SME value added, the aggregate gross fixed capital formation increased in the period considered. Nonetheless, the relationship between variations in the SME value added and in the aggregate industrial gross fixed capital formation is positive but quite weak, suggesting that the increase in fixed capital does not systematically and immediately translate in an increase in value added for SMEs.

In terms of sectoral analysis the transport vehicles sector (which includes the automotive industry) appears to have invested considerably in the period while also increasing its value added above the European average.\(^\text{13}\) By contrast, most services sectors, for which, typically, fixed investments are relatively less important than for the manufacturing sectors, were quite constant in their level of investment during the period, while growing on average in terms of value added.

\(^\text{11}\) Eurostat defines the Gross fixed capital formation (GFCF) as the resident producers’ acquisitions, less disposals, of fixed assets during a given period plus certain additions to the value of non-produced assets realised by the productive activity of producer or institutional units. Fixed assets are tangible or intangible assets produced as outputs from processes of production that are themselves used repeatedly, or continuously, in processes of production for more than one year. Disposals of fixed assets are treated as negative acquisitions.

\(^\text{12}\) Croatia, Latvia, France, Spain.

\(^\text{13}\) A stronger comovement of the two variables in manufacturing sectors could also be driven by the presence of stronger connections between small and large firms in the same 2 digits manufacturing sector, where small firms could be highly dependent on larger firms, producing intermediate products. The transport vehicles sector, which is mostly taken up by the automotive sector, is a good example of this kind of relationships and, indeed, shows a stronger comovement with respect to other sectors and notably to services sector (on the effect of this kind of production chain relationships in the automotive sector see Castelli et al., 2008; Bacchiocchi et al., 2012 and Bacchiocchi et al. 2014).
Figure 9. Relationship between changes in value added and employment—EU28 SMEs (2009-2011)

Legend of NACE codes: C10: Food products; C11: Beverages; C12: Tobacco products; C13: Textiles; C14: Wearing apparel; C15: Leather and related products; C16: Wood and products of wood and cork, except furniture; articles of straw and plaiting materials; C17: Paper and paper products; C18: Printing and reproduction of recorded media; C19: Coke and refined petroleum products; C20: Chemicals and chemical products; C21: Basic pharmaceutical products and pharmaceutical preparations; C22: Rubber and plastic products; C23: Other non-metallic mineral products; C24: Basic metals; C25: Fabricated metal products, except machinery and equipment; C26: Computer, electronic and optical products; C27: Electrical equipment; C28: Machinery and equipment n.e.c.; C29: Motor vehicles, trailers and semi-trailers; C30: Other transport equipment; C31: Furniture; C32: Other manufacturing; C33: Repair and installation of machinery and equipment; G45: Wholesale and retail trade and repair of motor vehicles and motorcycles; G46: Wholesale trade, except of motor vehicles and motorcycles; G47: Retail trade, except of motor vehicles and motorcycles; J55: Accommodation; J56: Food and beverage service activities; J58: Publishing activities; J59: Motion picture, video and television programme production, sound recording and music publishing activities; J60: Programming and broadcasting activities; J61: Telecommunications; J62: Computer programming, consultancy and related activities; J63: Information service activities; M69: Legal and accounting activities; M70: Activities of head offices; management consultancy activities; M71: Architectural and engineering activities; technical testing and analysis; M72: Scientific research and development; M73: Advertising and market research; M74: Other professional, scientific and technical activities; M75: Veterinary activities.

Source: Own elaborations based on Eurostat and EC SME Performance Reviews data.
Figure 10. Relationship between changes in SME value added and in gross fixed capital formation – EU28 (2008-2011)

Legend of NACE codes: C10: Food products; C11: Beverages; C12: Tobacco products; C13: Textiles; C14: Wearing apparel; C15: Leather and related products; C16: Wood and products of wood and cork, except furniture; articles of straw and plaiting materials; C17: Paper and paper products; C18: Printing and reproduction of recorded media; C19: Coke and refined petroleum products; C20: Chemicals and chemical products; C21: Basic pharmaceutical products and pharmaceutical preparations; C22: Rubber and plastic products; C23: Other non-metallic mineral products; C24: Basic metals; C25: Fabricated metal products, except machinery and equipment; C26: Computer, electronic and optical products; C27: Electrical equipment; C28: Machinery and equipment n.e.c.; C29: Motor vehicles, trailers and semi-trailers; C30: Other transport equipment; C31: Furniture; C32: Other manufacturing; C33: Repair and installation of machinery and equipment; G45: Wholesale and retail trade and repair of motor vehicles and motorcycles; G46: Wholesale trade, except of motor vehicles and motorcycles; G47: Retail trade, except of motor vehicles and motorcycles; I55: Accommodation; I56: Food and beverage service activities; J58: Publishing activities; J59: Motion picture, video and television programme production, sound recording and music publishing activities; J60: Programming and broadcasting activities; J61: Telecommunications; J62: Computer programming, consultancy and related activities; J63: Information service activities; M69: Legal and accounting activities; M70: Activities of head offices; management consultancy activities; M71: Architectural and engineering activities; technical testing and analysis; M72: Scientific research and development; M73: Advertising and market research; M74: Other professional, scientific and technical activities; M75: Veterinary activities.

Source: Own elaborations based on Eurostat and EC SME Performance Reviews data.
To better understand the structural dynamics of the main inputs of production across different sectors for SMEs, additional data from the OECD has been considered, as this allows expanding the time horizon, thus hinting towards structural trends and analysing the differences across SMEs belonging to different size classes. Using data from the Structural and Demographic for Business Statistics (SDBS) between 1997 through 2007, annual changes in value added in volumes can be plotted against changes in total employment and changes in gross investment in volume for firms in different size classes, thus replicating Figure 9 for SMEs for previous years and providing additional insight on Figure 10 by explicitly focusing on SMEs. The sectoral disaggregation from the OECD data for SMEs is not exactly comparable with the one adopted by Eurostat and SME performance data used previously, although it is very similar. The five main sectors considered before are: manufacturing, wholesale and retail, accommodation and food provision, information and communication, and professional, scientific and technical activities. With the OECD classification, the following sectors can be considered as comparable: manufacturing (D), wholesale and retail trade, repair of motor vehicles/cycles, personal and household goods (G), Hotels and restaurants (H), transport, storage and communication (I), Real estate, renting and business activities (K). Additional information on mining and quarrying (B) and construction (C) is added to provide a clearer picture of the situation of SMEs in the longer term.

Focusing first on value added, for all size classes the trend between 1997 and 2007, thus prior to the crisis, was one of positive growth, with an average value, across sectors and classes, of around 20%. Employment growth was also positive, albeit with much smaller values, on average higher for SMEs in size class 2 (i.e. with 10 to 19 people employed). Gross investment growth is also positive, with the lowest average value for medium sized SMEs (i.e. those belonging to size class 3, with 20 to 49 people employed). What emerges from inspection of Figure 11 is that the sectoral dimension matters and that the strength and weaknesses of sectors vary across size classes.

**SMEs in service sectors** (mainly I - transport, storage and communication and, to a lesser extent, K - real estate, renting and business activities) seem to have been characterized, between 1997 and 2007, by positive growth rates in both output (value added) and inputs (employment and gross investment). SMEs in G - wholesale and retail trade, repair of motor vehicles/cycles, personal and household goods, on the other hand, did not fare as well in terms of value added and gross investment, while recording positive employment growth rates. SMEs in B - mining and quarrying presented positive value added growth, while facing some issues in terms of production inputs. Large firms (i.e. those in size class 5, or with more than 250 people employed) in the same sector, on the contrary, suffered lower than average growth for both inputs and value added. Similar patterns are detected for D - manufacturing. SMEs in F - construction experience below the average growth in value added and in gross investment, while generally above the average employment growth. Overall, these results suggest a positive structural trend for SMEs some services, albeit with some qualifications in terms of size classes, and a negative trend for more traditional sectors, such as D, manufacturing and B, mining and quarrying, for SMEs and larger firms alike.

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14 As mentioned earlier, the OECD classifies firms according to their employment in the following manner: class 1 corresponds to firms with less than 10 people employed, class 2 to firms with 10-19 people employed, class 3 20-49 people employed, class 4 50-249 people employed, class 5 for firms with more than 250 people employed. The figures are represented by the average of EU countries at the ISIC Rev. 3 industrial classification, re-labelled according to the NACE 1-digit classification.
Figure 11. Relationship between changes in SME value added and in employment and gross fixed capital formation – SMEs by size class-EU28 (1997-2007)

Size class 1 (0-9)

Size class 2 (10-19)

Size class 3 (20-49)
We now check the relationship between changes in SME value added and in technology level. Technology is here proxied by the level of R&D expenditure of the business sector (BERD), consistently with the measure of technological intensity that will be used throughout this work. R&D expenditure of the business sector is not available at SME specific level, but only as the aggregate for all firms. Still, a mildly positive relationship between changes in SME value added and in technological level in manufacturing and service sectors\textsuperscript{15} is found, as presented in Figure 12. Again, the weakness of this result could depend on many factors, among which is the fact that we are looking at SME value added, while R&D is measured at the aggregate level. Moreover, the effects of investment in R&D are not usually expected to materialize in such a short time-span. While R&D increased on average in the analysed period as well as capital investments, contrary to what happened for capital investments, the sectors investing the most in R&D are mostly services sectors, in particular all professions, with scientific research and development standing out among the others, wholesale and retail and information and communication. Among the manufacturers, technologically

\textsuperscript{15} Coke manufacture and accommodation and food provision have been excluded due to lack of data.

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Note: B, Mining and quarrying; D, Manufacturing; E, Electricity, gas and water supply; F, Construction; G, W/sale and retail trade, repair of motor vehicles/cycles, personal and h/hold goods; H, Hotels and restaurants; I, Transport, storage and communications; K, Real estate, renting and business activities. Average values for the following countries: Austria; Belgium; Czech Republic; Denmark; Estonia; Finland; France; Germany; Greece; Hungary; Ireland; Italy; Luxembourg; Netherlands; Poland; Portugal; Slovak Republic; Slovenia; Spain; Sweden; United Kingdom; Latvia; Lithuania; Malta; Romania.

Source: CSIL elaboration on OECD SDBS data.
intensive sectors such as motor vehicles, machinery, and equipment not elsewhere classified, other transport equipment, and pharmaceuticals grew above the average in terms of R&D, while more traditional sectors such as in particular wood, paper and printing invested considerably less than the average. Food, beverages, and tobacco also stand out among traditional manufacturers in terms of R&D investment. These results resonate with those obtained above in terms of the growth in SME value added between 2008 and 2013 (see Figure 7): *firms increasing their R&D investment in this period seem also to have increased their value added in the longer time-span*. Of course these results can by no means be interpreted in a causal way, but they seem to suggest, consistently with the economic literature, that R&D investment is an important factor in firms’ growth.

To further understand the challenges faced by SMEs with respect to R&D expenditure as a proxy for technology level, we provide a focus (Figure 13) on two representative sectors and plot R&D expenditures, normalized by aggregate employment, by size class. Data is taken from the different waves of the Community Innovation Survey between 2000 through 2012 for Manufacturing and for a composite sector, namely “Innovation core services activities”,\(^{16}\) for which data was available only between 2004 and 2010. Size classes are defined as follows: firms in class 1 are those with 10 to 49 people employed, those in class 2 have 50-249 people employed, in class 3 there are more than 250 people employed, while total represents the average figure for all firms, irrespective of their size.

Starting from manufacturing, what clearly emerges is the *linear relationship between firm size and business R&D expenditure* (for both internal and external R&D) per employee, with larger firms spending more on R&D. While it should be kept in mind that this figure uses data only on firms in the manufacturing sector, what emerges is a sobering picture for SMEs. Not only do smaller firms invest less in R&D, but the crisis has probably hit them harder. In fact, after 2010, firms in size classes 2 (50-249 people employed) and 3 (more than 250 people employed) show an increasing trend, more pronounced for larger firms, small SMEs in size class 1 are still experiencing a downward trend. Not only do smaller firms spend less than larger firms, but the trend is also negative hinting towards a structural challenge small SMEs face in terms of R&D expenditures and, ultimately, technology levels.

Focusing instead on “Innovation core services activities” allows us to reach similar general conclusions, albeit with some qualifications. The general temporal trends are confirmed, along with a generally lower R&D expenditure per employee as size class decreases. However, in the latest year available the smallest SMEs seem to have been slightly recovering (a result due to both an increase in expenditure and a drop in employment) to the expense of SMEs with 50-249 people employed. However, it is worth stressing once again that for both manufacturing and innovative service sectors, R&D expenditures per employee are lower for smaller SMEs and firms in general.

\(^{16}\) Corresponding to NACE sectors G51, I, J, K72, K74.2 and K74.3.
Figure 12. Relationship between changes in SME value added and in Business R&D expenditure – EU28 (2009-2011)

Legend of NACE codes: C10: Food products; C11: Beverages; C12: Tobacco products; C13: Textiles; C14: Wearing apparel; C15: Leather and related products; C16: Wood and products of wood and cork, except furniture; articles of straw and plaiting materials; C17: Paper and paper products; C18: Printing and reproduction of recorded media; C19: Coke and refined petroleum products; C20: Chemicals and chemical products; C21: Basic pharmaceutical products and pharmaceutical preparations; C22: Rubber and plastic products; C23: Other non-metallic mineral products; C24: Basic metals; C25: Manufactures of basic metals; C26: Manufactures of metal products; C27: Manufactures of machinery and equipment; C28: Manufactures of transport equipment; C29: Manufactures of motor vehicles, trailers and semi-trailers; C30: Manufactures of other transport equipment; C31: Furniture; C32: Clothing; C33: Repair and installation of machinery and equipment; G45: Wholesale and retail trade and repair of motor vehicles and motorcycles; G46: Wholesale trade, except of motor vehicles and motorcycles; G47: Retail trade, except of motor vehicles and motorcycles; I55: Accommodation; I56: Food and beverage service activities; J58: Publishing activities; J59: Motion picture, video and television programme production; J60: Programming and broadcasting activities; J61: Telecommunications; J62: Computer programming, consultancy and related activities; J63: Information service activities; M69: Legal and accounting activities; M70: Activities of head offices; M71: Architectural and engineering activities; M72: Scientific research and development; M73: Advertising and market research; M74: Other professional, scientific and technical activities; M75: Veterinary activities.

Source: Own elaborations based on Eurostat and EC SME Performance Reviews data.
Figure 13. Business R&D expenditure per employee for SMEs in the manufacturing sector by size class– EU28 (2000-2012)

Note: Average figures for Manufacturing sector for the following countries: Belgium; Bulgaria; Czech Republic; Denmark; Germany; Estonia; Ireland; Spain; France; Croatia; Italy; Cyprus; Latvia; Lithuania; Luxembourg; Hungary; Malta; Netherlands; Austria; Poland; Portugal; Romania; Slovenia; Slovakia; Finland; Sweden; United Kingdom.

Figure 14. Business R&D expenditure per employee for SMEs in the Innovation core services activities by size class– EU28 (2000-2012)

Note: Average figures for Manufacturing sector for the following countries: Belgium; Bulgaria; Czech Republic; Denmark; Germany; Estonia; Ireland; Spain; France; Croatia; Italy; Cyprus; Latvia; Lithuania; Luxembourg; Hungary; Malta; Netherlands; Austria; Poland; Portugal; Romania; Slovenia; Slovakia; Finland; Sweden; United Kingdom.
Source: CSIL elaboration on Eurostat’s Community Innovation Survey data (2004-2010 Waves)
2.2 Clustering EU regions

This section is dedicated to the analysis of the economical context in geographical terms and in particular with the regional disaggregation (NUTS2) at which most ERDF’s interventions operate. The idea is to provide an overview of the aggregate macroeconomic conditions, at the regional level, in which firms, including SMEs, operate, and to highlight in dynamic terms the evolution of the real implications of the 2008 crisis. The analysis centres around value added, employment and unemployment and technology levels, proxied by the human resources in science and technology as a percentage of total employment. A more in depth analysis of the performance of SMEs at the regional level is provided with respect to innovation, with regional data, at the NUTS1 level, on innovative SMEs.

Figure 15. lets us briefly explore the dynamics of two of the main socio-economic variables: GDP per capita and the unemployment rate. The percentage change in both variables between 2007 and 2011 is mapped at the regional (NUTS2 classification) level, with a 5 class clustering based on the Jenks natural breaks optimization method.

Between 2007 and 2011 GDP per capita growth has been negative in most EU15 regions, with the exception of Germany and Austria, reflecting the consequences of the 2008 economic crisis. Moreover, there are signs of polarization: Convergence regions, such as in particular the southern part of Spain and Greece, receded at a higher pace than in the rest of the EU15 countries. On the other hand, Eastern countries (EU12 plus Croatia) show signs of convergence, having all grown in the period, with the exception of Estonia, Czech Republic and the EU part of the Balkans (Slovenia and Croatia).

The unemployment rate (whose variations are mapped on the right hand sided map) rose overall in the EU regions, again with the exception of Germany, where the unemployment rate decreased between 2.5 and 7.3 percentage points, and of Poland, where it decreased or stayed constant. In contrast, the unemployment rate of Portugal, Greece and in particular Spain increased between 3.2 and 18.8 percentage points, respectively. Unemployment rates rose sharply (between 7.7 and 18.8 percentage points) also in Ireland, while the effect of the crisis on unemployment in the UK was less severe than that on GDP. Furthermore, there are no signs of convergence in the EU13 countries, with the exception of northern Poland. In particular, the unemployment rate increased by more than 3.2 percentage points in the Baltic countries, in most of Hungary, in eastern Slovakia and in Bulgaria.

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17 Ideally, this analysis would have been undertaken together with the analysis at the industrial level, focusing on SMEs. Unfortunately, data at the regional level are only available for the aggregate of all firms, which is why we prefer to focus on the regional context separately.

18 For more detailed and up to date information on the socio-economic situation of EU regions refer to (European Commission, 2014ii).

19 Jenks optimization produces an optimal classification by intervals, such that the sum of the variances of the values within each class is minimized.
Figure 15. Clusters of regions by GDP per inhabitant and by Unemployment rate: 2007-2011 percentage variation

Note: Clusters estimated with Natural Breaks (Jenks). The map on the left-hand-side represents the percentage variation in GDP per capita between 2007 and 2011. The map on the right-hand-side represents the percentage variation of unemployment rate between 2007 and 2011.

Source: CSIL elaboration based on Eurostat data.

Figure 16, in parallel with the analysis in section 2.1.2, presents a scatter-plot of EU28 NUTS2 regions, with value added percentage changes on the vertical axis and employment percentage changes on the horizontal axis. The axes represent the average values for the two variables, while the dashed lines cross the axes at the value of zero. The four quadrants formed by these latter lines separate the regions into those growing in both variables (first quadrant, top right), regions growing in terms of value added but not with regards to employment (second quadrant, top left), regions where both variables are decreasing (third quadrant, bottom left) and regions where employment increased while value added decreased (fourth quadrant, bottom right). The map located below the graph allows these four classes of countries to be visualised spatially.

In line with the findings of the previous section (it must be noted that here our starting year is 2007, thanks to data availability), this figure shows that the employment level declined on average over the period, while the value added increased, reflecting the 2011 recovery.

The polarization caused by the crisis seems even more evident when we consider employment and value added together. Indeed, we can identify a green 'belt' encompassing most of Central Europe and in particular France, Belgium, Germany, Austria, Poland and part of Northern and Central Italy: in most of these areas, value added grew in the period considered. Also employment grew in a great number of these regions. Notable exceptions (red areas) in this trend are Lorraine (France), Liguria and Friuli Venezia Giulia (Italy). Also Limousin (France) and Piedmont (Italy) were characterized by a decreasing value added, while employment stayed constant (pink areas). However, it must be pointed out that these exceptions do not present extremely negative values in either variable.

Conversely, the regions suffering most in terms of both value added and employment are EU15 convergence regions such as Greece, Southern Italy, Southern Spain (Andalusia, Murcia Region and Valencian Community) and Southern Portugal, with the addition of
Ireland and part of the United Kingdom. Indeed, consistently with the analysis of the socio-economic context, the crisis had a major effect on production in the United Kingdom, but this did not immediately translate into job losses. On the contrary, employment increased up to 5% in some regions.\footnote{Anecdotal evidence seems to point toward two main reasons for this phenomenon. On the one side, firms operating in increasingly specialised manufacturing adopted a holding strategy, even negotiating salary reductions rather than laying off staff, because of the increasing costs of training staff. One of the effects has been a marked fall in productivity. On the other side, and mostly in services sectors, there has been a big increase in part-time working and self-employment, which might have had a more direct effect on gross value added. It has also been argued that the financial sector has been less efficient since the crisis in channelling funds to the private sector and this may have impacted on gross value added. Finally, it must be considered that we are analysing a short time window after the crisis: the recent relatively strong recovery in output may suggest that the slow gross value added growth may have been a temporary phenomenon (see also Beatson, 2013, available at: www.cipd.co.uk).}

With respect to Nordic countries, they all are characterized by a diffused decline in employment, while value added grew in the period, more markedly in Sweden than in Finland and Denmark, which are closer to the European average.

Finally, most of the EU13 countries suffered a decline in employment, with the already mentioned exceptions of most of Poland and of Prague and Central Bohemia (Czech Republic), Central Slovakia, South-East Oltenia and Bucarest (Romania), Cyprus and Malta. At the same time, most of the EU13 countries, included the regions listed above, present quite high growth rates in term of gross value added during the period, which points towards an important growth in terms of productivity. From this convergence trend are excluded Hungary (with the exception of the Central Hungary region, which presents almost constant values for both variables) and the northern and central part of Romania, although their decline in value added is mostly smaller than that observed in most EU15 Convergence regions.

Figure 17. allows us to analyse geographically the relationship between fixed capital investments (gross fixed capital formation) and gross value added. It mirrors Figure 16 in showing both a scatterplot and a map, where clusters of regions are identified through a colour code, green for countries where both value added and capital investments increased in the period, light green for countries where only value added increase, pink for countries where only capital investment increased and red for countries that showed a decline in both variables.

First of all it can be noted that the positive relationship between the two variables appears to be stronger than that observed for employment and gross value added. This may suggest that at the onset of the crisis, firms reacted first by cutting investments, which are also, similarly to value added more closely connected with the financial markets, while the reaction in the labour market was slower due to greater frictions. Indeed capital investments fell by 7% on average in the period.

Unfortunately, we lack data on capital investment variations for France and Spain, but the pattern traced above seems partially preserved here. However, variations in capital investment present much more variability than employment across regions belonging to the same country, which couples with greater variability over the whole sample, with changes in capital investment ranging from about minus 60% to about plus 60%.
Capital investment grew considerably in most of Germany, with peaks in North-Rhine Westphalia (excluding the Düsseldorf region), where they grew between 30% and 40%, and in most of Poland, with peaks in the East and in particular in the Subcarpathian region (between 30% and 60%). They also grew in Austria (excluding Carinthia), in the Flanders and in a great part of Wallonia. In Slovakia, capital investments grew considerably in the capital region, while they remained constant or decreased in the rest of the country. Investments rose between 20% and 30% in the Northern part of Czech Republic and in Lithuania. With respect to the Nordic area, Northern Sweden and Finland both had increasing capital investment, although they registered smaller variations, with the exception of the capital region of Stockholm, where the increase was of more than 20%. In Southern Sweden and Finland the decline in investment was very slight.

In most of Northern and Central Italy, with the addition of Apulia, capital investments were constant during the period. Only the Autonomous Province of Bolzano stands out with an increase of more than 7% over the period. Capital investments were also almost constant in West and Central Bulgaria.

Again most convergence EU15 regions, i.e. Southern Italy (excluding Apulia), Greece, Portugal (excluded Alentejo) with the addition of Romania (South-West Oltenia), declined markedly during the period in terms of capital investments. To these declining countries must be added Latvia, where the decline in capital investment was of almost 40% and most of the United Kingdom, where investment declined considerably, with the exception of the inner region of London.

Finally, Figure 18. illustrates the relationship between business R&D and value added. We are following the same approach as in Figure 15. and Figure 17. As in Section 2.1.2, variations in R&D investment are here meant to proxy changes in technological level, which, according to the economic theory, should be an important driver of growth. Indeed, the graph plotting variations in R&D vis-à-vis variations in value added seems to point toward a weakly positive relationship between the two variables. Of course we cannot derive any information on the causal relationship between R&D investments and value added growth from this graph, but it will serve as a guide in order to describe the behaviour of EU28 countries in the period following the crisis, which is also the period of interest for the analysis of ERDF activity.

R&D investment grew 28% on average between 2007 and 2011 in EU28. This very high result is mostly driven by the extremely high percentage changes registered by some Polish regions (the Opole region more than quintupled its investments in R&D and Southcarpathia tripled them), Slovak, Czech, Dutch regions (the region of Groningen tripled its investments in the period) and Hungarian regions. Moreover, the share of regions where R&D variations were positive during the period is higher than with respect to employment and capital investment. It must also be noted that variability within the same country and between countries can be very high, as for example in Romania, where R&D grew of 91% in the North-West region, while decreasing 64% and 97% in West and East Romania respectively.

Nonetheless, in this map as well we can recognize a green belt - wider than with respect to employment variations - of countries where both gross value added and R&D increased. Indeed, regions belonging to France, the Netherlands, Denmark, Germany, Northern Italy, Austria, the Czech Republic, Slovakia and Poland almost uniformly registered positive variations in terms of R&D and value added.
Important exceptions to this trend are North Brabant (Netherlands) where R&D decreased by 40%, Warmia-Masuria (Poland), where the decline in R&D was of 36%, Champagne-Ardenne, Languedoc-Roussillon (France), Lower Bavaria and Dresden (Germany), where it decreased by up to 20%. Of a smaller magnitude (no more than 5%) were the declines in Lorraine (France), Kuyavian Pomerania (Poland), Koblenz (Germany), Lazio (Central Italy), the capital regions of Prague (Czech Republic) of Copenhagen and of Vienna (Austria). This relatively lower level of investment in R&D in metropolitan regions could depend on policies aiming to spread innovation in lagging rural regions.

To this generally positive situation in Central Europe, we can add the positive trends registered in the Baltic regions, with the exception of Latvia, in Finland, in Ireland and in Sweden, though with some variability, since Upper Norrland and North-Middle Sweden both registered an important (30%) decline in R&D, while the rest of the country registered positive trends.

Substantial reductions in R&D investment were registered in Southern Italy (from 46% in Calabria to 14% in Campania), in Southern Portugal (Algarve 22%, Alentejo 38%), where we can also find great variability (e.g. the region of North Portugal grew by 52%), in most of Spain, where Galicia, Castile-Leon, La Rioja, Balearic Islands, Murcia Region and Canary Islands suffered reductions between 36% and 14%, while Catalonia and the Region of Madrid declined 5% and 2% respectively, while the rest of the country registered a moderate growth.

Finally, the United Kingdom also presented a very wide range of results, varying from a reduction of 77% in Lancashire to a growth of between 38% and 66% in Northern Ireland, Northern-West Scotland and the Highlands and 135% in Cumbria.

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21 Data are available only for North and West Finland.
Figure 16. Clusters of regions by value added and employment level: 2007-2011 % change.

Note: GVA stands for Gross Value Added; EMPLO stands for employment rate. The percentage variation has been calculated between 2007 and 2011. Dark green identifies regions where both GVA and employment grew between 2007 and 2011, light green identifies regions where GVA grew, while employment declined in the period, pink identifies regions where GVA declined while employment increased and red identifies regions where both variables declined.

Source: CSIL elaboration based on Eurostat data.
Figure 17. Clusters of regions by value added and gross fixed capital formation: 2007-2011 % change.

Note: GVA stands for Gross Value Added; GFCF stands for Gross fixed Capital Formation. The percentage variation has been calculated between 2007 and 2011. Dark green identifies regions where both GVA and GFCF grew between 2007 and 2011, light green identifies regions where GVA grew, while GFCF declined in the period, pink identifies regions where GVA declined while GFCF increased and red identifies regions where both variables declined. No data on Gross Fixed Capital Formation are available for Ireland and Cyprus. The 2007-2011 variation for Estonia, France, Hungary and Spain cannot be computed due to missing data for 2011.

Source: CSIL elaboration based on Eurostat data.
Figure 18. Clusters of regions by value added and business R&D: 2007-2011 % change.

Note: GVA stands for Gross Value Added; BERD stands for Business Expenditure on R&D. The percentage variation has been calculated between 2007 and 2011. Dark green identifies regions where both GVA and BERD grew between 2007 and 2011, light green identifies regions where GVA grew, while BERD declined in the period, pink identifies regions where GVA declined while BERD increased and red identifies regions where both variables declined. Greece was excluded from this analysis due to breaks in the series. We only have data for Belgium at the NUTS 1 level.

Source: CSIL elaboration based on Eurostat data.

To provide additional insight on the spatial differences related to the technology level, Figure 19 plots the geographic distribution of the difference between 2013 and 2007 and
the levels in 2013 of human resources in science and technology as a percentage of total employment. Looking first at changes, while on average there is an increase (corresponding to values greater than one), there are clear regional differences, suggesting the existence of geographical imbalances. In particular, several Italian regions, Andalucía in Spain, Köln in Germany, regions in the Czech Republic and Slovakia, Crete in Greece and some regions in Turkey, exhibit a decrease in employment in science and technology since the inception of the crisis. Comparing these figures with the most recent pattern in levels in 2013, the regions with lower increases or even decreases roughly correspond to the regions with the lowest levels of employment in science and technology, corroborating the existence of structural imbalances at the regional level that persist over time of the technological capabilities and achievement.

**Figure 19. Human resources in Science and Technology as a % of employment-levels in 2013 and change 2007-2013.**

<table>
<thead>
<tr>
<th>Human resources in science and technology (HRST) by NUTS 2 regions (% of active population, 2013, based on comparison with 2007)</th>
<th>Human resources in science and technology (HRST) by NUTS 2 regions (% of active population, 2013)</th>
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<tbody>
<tr>
<td>![Map of HRST levels 2013]</td>
<td>![Map of HRST levels 2013]</td>
</tr>
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</table>

Note: The map on the left-hand-side represents the variation in HRST between 2007 and 2013. The map on the right-hand side represents HRST in levels in 2013.

Source: Eurostat.

Focusing specifically on SMEs, the Regional Innovation Scoreboard data allows analysing the evolution of SME innovative behaviour from 2007 to 2014. Figure 20 plots, at the NUTS1 level, the evolution of an indicator accounting for the percentage of SMEs which are innovating in-house from 2007 to 2014. The underlying indicator ranges from 0 to 1 and is computed based on the relative positioning of each region from the original data (not publicly available) of the percentage of innovative SMEs.

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22 Data in the RIS is provided at NUTS1 and NUTS2 level, depending on data availability. Information has been aggregated at the NUTS1 level for comparability.

23 Data for French regions in 2007 is not shown due inconsistency of underlying figures and is substituted with data for 2009.
What emerges from inspection of the figure is that there is wide regional heterogeneity and that the crisis has had a differentiated spatial impact on the innovative activities of SMEs.

Most of the regions are clustered in the main diagonal quadrants (upper-right and lower-left) suggesting that the crisis has not altered significantly their relative positioning. Those regions where SMEs were innovating are still doing so, while regions where SMEs were innovating less are still facing difficulties. While not numerous, some regions however have improved their position (upper-left quadrant) while for very few the crisis has implied a decrease in in-house innovative activities of SMEs.

Focusing on the upper-right quadrant, which identifies regions in which SMEs innovate in house more than the average in both periods, we find several German and British regions and Denmark along with some regions from other countries such as France, Italy, Sweden, Finland, Belgium, Ireland and Portugal.

In the lower-left quadrant, instead, are located regions in which SMEs innovate in house less than the average in both periods. These regions mainly belong to Eastern Europe states (Romania, Bulgaria, Hungary, Slovakia) and to some Southern European States (Italy, Spain and Portugal).

Regions in the upper-left quadrant have improved their position after the crisis and belong to the Netherlands, Greece, France, Finland, Belgium and Sweden.

Some UK regions, along with one Italian and Czech region, have instead worsened their position and are, in 2014, below the average in terms of in house innovation of SMEs.
2.3 Main findings from the context analysis

The context analysis presented in this section points to a number of considerations that are relevant to shed light on the background scenario against which to assess the impact of Cohesion Policy programme. They are the following:

- As of 2013, **20.7 millions of SME** were counted throughout Europe, employing 66.8% of the total number of people employed and generating almost 58.1% of the total value added. Their share over the total number of enterprises varies both across countries and sectors and is higher in the Southern countries of the EU.

- **In the aftermath of the economic crisis**, the total number of SMEs dropped, as well as their level of employment and their value added. From 2009 on, the value added began to recover, although progressively at a slower pace. **The employment level**, instead, **continued to decline** over the years.

- Within SMEs, size matters. Classifying SMEs according to their employment levels suggests that **small SMEs have shown greater signs of recovery in 2012 with respect to larger SMEs**, with respect to value added, number of firms and employment.

- Size matters also for business R&D expenditures: **investment in R&D is increasing in firm size** and this result holds also when considering different size

classes within SMEs. Further, small SMEs in manufacturing have been hit hard by the crisis and, contrary to larger SMEs and large firms, are still experiencing, as of 2012, a negative trend in R&D expenditure, suggesting a structural challenge, although a slightly more promising picture emerges when considering innovative service sectors.

- Size matters also when looking at the internationalisation process, with small SMEs having lower exports as a percentage of turnover, with respect to larger SMEs, suggesting a **negative relationship between firm size and exporting behaviour**.

- **Access to finance** is a problem for SMEs. While the situation is improving, it is doing **so more slowly the smaller the firm is**, suggesting once again the importance of the size dimension in shaping firms’ needs and performance.

- A disaggregation at the sectoral level uncovers a high degree of heterogeneity in the dynamics of production across sectors. While all **service sectors recorded a positive average annual growth rate** between 2008 and 2013, the majority of the **traditional manufacturing sectors declined** over the same period. Among the most successful manufacturing sectors are technologically intensive sectors such as pharmaceutical products and other transport equipment.

- Focusing on structural trends, data disaggregated at the sectoral level between 1997 and 2007 for firms belonging to different employment size classes allows to uncover longer term dynamics and suggest that both sector and size matter. The **service sectors present a stronger structural positive trend** in terms of both output (value added) and inputs (employment and gross investment), more traditional sectors, such as manufacturing and mining and quarrying, were already showing signs of weakness. These pre-crisis negative trends were more pronounced for larger firms and for large SMEs.

- Putting together information on the number of enterprises and the value added at the sectoral level suggests that **most of the manufacturing sectors that recorded positive growth rates between 2008 and 2013 might owe this success to an increase in efficiency**. This idea is reinforced by the fact that these sectors were among those that invested more in R&D in the period following the deepest dip in the recession.

- There is a high degree of heterogeneity in the dynamics of employment, fixed capital investment and R&D investment in the period following the crisis, although some patterns emerge, connecting together sectors belonging to the same productions chains. Similar problems emerge when analysing data at the geographical level, highlighting a great degree of heterogeneity, which crosses the national borders, affecting also regions within the same country. **A ‘green core’ of Europe emerges, composed of Germany, Austria and Poland.** During the period of analysis, these countries **registered mostly positive dynamics** in

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24 There are no official statistics available at the same time at size-level and NUTS2 level disaggregation. Therefore, in order to analyse the dynamics of production, employment and investment in EU28 NUTS2 level regions, we must again rely on the assumption that SME behaviour does not diverge too much from the behaviour of the aggregate of enterprises. The time-window adopted for the geographical analysis, from 2007 to 2011, allows us to fully capture the effect of the economic crisis on the dynamics of the variables of interest throughout EU28 NUTS2 regions.
terms of GDP pro capita, production, employment and R&D and capital investment.

- Eastern (EU13)\textsuperscript{25} countries are characterized by a large variability in terms of outcomes, with some regions experiencing major (mostly positive) changes in terms of investments level. **Positive results in terms of production in a majority of EU13 regions suggest that a process of catching-up is going on.**

- The crisis has affected European territories unevenly from a geographic standpoint and has also had a differentiated impact on firms depending on size. Given the uneven distribution of SMEs across space, these two forces, along with sectoral considerations, adds to the dimensions to be considered when examining the impact of the crisis and the efficacy of policy instruments for SMEs.

On top of that, it is worth stressing that despite the significance of SMEs, **the statistical information base supporting territorial policy decision making on SMEs is still unsatisfying.** First, most statistics do not come at size-level disaggregation for the 2007-2013 time period. This means that the statistics on R&D expenditure and capital investment for this period refers to the aggregate of firms in each sector. To corroborate these findings, however, we have added information with a size disaggregation for an earlier time period (1997-2007) for capital investment, and for two aggregate sectors between 2000 and 2012 for R&D expenditures. Moreover, data on R&D expenditure and capital investment at NACE 2 digits disaggregation are missing for some countries and the time series are not always complete. This is also an obstacle to a macro-level analysis. Second, similar problems emerge when analysing data at the geographical level. There are no official statistics available at the same time at size-level and NUTS2 level disaggregation. Therefore, in order to analyse the dynamics of production, employment and investment in EU28 NUTS2 level regions, we must again rely on the assumption that SME behaviour does not diverge too much from the behaviour of the aggregate of enterprises. To provide additional information and on the spatial distribution of innovation and the differential impacts of the crisis, especially for SMEs, an indicator summarizing innovative activities of SMEs at the NUTS1 level has been analysed.

All in all, this evidence and the lack thereof, suggests the need for finer analyses, to the purpose of ‘opening up the black box’ and look into the mechanisms underlying investment choices and economic results of SMEs.

\textsuperscript{25} EU12 plus Croatia.
3 POLICY INSTRUMENTS FOR SME DEVELOPMENT AND INNOVATION: A LITERATURE REVIEW

3.1 Introduction

Rather than attempting to present an overview of the large array of literature and policy documents relevant to the evaluation, the aim of the literature review is to identify those specific elements that can make a practical contribution to the development of the analysis. To this extent, the review covers material potentially relevant to the identification and characterisation of policy instruments co-financed by the ERDF in favour of SMEs in the 2007-2013 programming period.26 It has been selective and has tried to focus on insights where the basis is provided for making clear distinctions and/or pursuing particular lines of enquiry.

A relevant methodological caveat needs to be done at this point. In the initial tender relating to this evaluation and subsequently in the Inception Report, it was proposed that the approach to be adopted in the analysis would consist of a Theory-based evaluation of business support programmes and more specifically would rely on the Realist evaluation tradition. We chose to refer a realist approach which acknowledges the importance of context variables in explaining the outcomes of policy interventions, but also the mechanisms by which they are delivered. This is usefully articulated in ‘Context-Mechanisms-Outcome’ (CMO) configurations which are so important when accounting for ERDF interventions taking place in highly diversified contexts. While a full account of the implications and guidance offered by such an approach will be developed in conjunction with Task 4 (when theory-based impact evaluations of selected policy instruments will be proposed), it is useful here to highlight the consequences this has for the present literature review. In particular, a useful feature arises from the analysis of theory-based approaches set out in Mark, Henry and Julnes (2000), which combines a counterfactualist definition of cause and effect with a Realist view of underlying generative mechanisms revealed by a process of ‘principled discovery’. This applies particularly in investigations where discovery of mechanisms is part of the on-going process of analysis in contrast to situations where explanations can be articulated a priori. In the current case, it is difficult to conceive of how, in this sense, there could be a theory that can predict the effects of policy instruments. Rather the account has to be elaborated by detecting underlying uniformities in the processes observed to be at work across various Operational Programmes. Hence, high-level theory of enterprise behaviour is less likely to be helpful than more detailed descriptive accounts of institutions and the behaviour of the relevant actors. Overall, therefore, rather than offering a definitive framework within which to conduct a systematic analysis of the context and mechanisms that determine the effectiveness of policy instruments, the literature review is of a suggestive kind, pointing to elements to explore further in the investigation of the concrete workings of policy instruments.

In the following, we first review the rationale for supporting SME in general terms, mostly using input from the academic literature. We then switch to a more empirical investigation of the evidence and conditions for policy effectiveness cast at the level of policy instruments.

26 Particular use has been made of other summary studies or literature providing overviews of past work in a specific area, as a way of taking on board a wider range of enquiries.
3.2 Rationale for SME support policy

Why supporting SMEs? It is commonly argued that SMEs, the “backbone of the European economy”, are a source of employment and growth but that their small size prevents them from developing and innovating. Indeed, a series of market failures are particularly stringent in the case of SMEs and need to be addressed through appropriate policy measures. Alternatively, however, the positive attributes of SMEs can be put forward: the very size of SMEs could in fact well represent an advantage in the context of heightened global competition, where the terms of competitiveness increasingly rely on knowledge-related assets. It is worth clarifying the terms of this apparent alternative as it possibly has important policy implications before reviewing market failures as traditional justifications for policy intervention in the specific case of SMEs.

3.2.1 Factors accounting for SME development and innovation

Economic theory contributes to shedding light on an issue particularly relevant for this evaluation, i.e., the factors that account for SMEs development and innovation.

**SME differentiated development path**

From a theoretical perspective, small and medium sized enterprises pose a specific threat to neoclassical economics. While large enterprises are disturbing for the standard economic model that assumes perfect competition, i.e. large number of small firms, the latter are disturbing for another reason, which is often misunderstood. The theory of industrial organization has since its beginning acknowledged that the emergence of the giant corporation in manufacturing, and later on in services, may be related to economies of scale arising from fixed costs in technology, distribution, branding, etc. Once this is admitted, the question arises: why then do SMEs exist in industries where such economies of scale should lead to large enterprises and oligopoly?27 One of the most surprising patterns of contemporary economies is the resilience of SMEs even in industries where industrial economics theory would have predicted oligopoly. While some firms are ‘large’ at birth, most are small or very small at birth; some will die in a few years, others will grow and become ‘medium size’ and possibly large ones. **What has been found puzzling by some is that in fact, particularly in the EU, most surviving firms never become large, they remain SMEs, and to a certain extent successfully compete with larger firms** (Becattini, 1989; Bannock, 2005). **Is it actually optimal for firms to remain small? Or is their growth blocked by some constraints?** The answer to the question possibly lies in an understanding of the growth drivers and constraints within SMEs.28

According to Bianchi et al (2010) there are many factors that influence how firms develop over time and what form of growth trajectory they exhibit – and this can include a no-

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27 Florio (1982), for example, discusses the issue for a typical SME industry: wood furniture, going back to ‘large-group imperfect competition models’ in the tradition of Chamberlin and others, pointing to flexibility and variety of products.

28 A possibility is to look back to the most basic questions on the nature of the firm and of markets. In his seminal paper Coase (1937) pointed to the fact that firms exist because, due to transaction costs, perfect contracts are not always available, hence it is efficient to build organisations where internal decisions are not based on market interactions, but on hierarchies or other arrangements. Thus any firm is a compromise between technological factors pushing it to a certain ‘optimal size’ in terms of output, and transaction and related costs that constrain the ability of the firm to reach an optimal size. Later, alternative coordination mechanisms between markets and hierarchy have been identified in the form of networks (or clusters or systems, e.g. Grabher, 1993).
growth trajectory. The influencing factors are external (market conditions, sector competitiveness, availability of finance) as well as internal (the ambitions and aptitude of the owners, access to family resources). Bianchi et al suggest that there is no such thing as a ‘normal’ development for an SME but that the literature has a tendency to put forward SME growth archetypes that imply some notion of normal growth, typically with a growth curve following an ‘S’ shaped trajectory (which implies ‘normal’ growth) and this is a curve that has been widely used in management sciences over many decades, but which, it has been suggested is too simplified and does not take into account complexities around SME development (Dattee, 2007).

The specific relationships between innovation and SMEs

Changes in theories relating to how SMEs develop and innovate, in particular shedding light on the relationship between SMEs and innovation, are highly relevant for understanding the puzzle of SME resilience highlighted above. The 21st century era of globalisation and its focus on technological and social innovation is changing the comparative advantages arising from strengths that have traditionally been associated with industrial inputs – the classic ‘factors of production’ (land, labour and capital) – towards those derived from the input of knowledge. This shift has had important implications for European industry and for its SMEs in particular. For example, Audretsch et al suggest that there is a circular dependence between entrepreneurship and innovation – when radical new technologies arise, this is accompanied by the arrival of numerous small firms (Audretsch, Grilo and Thurik, 2012). Fundamentally this is because changes in technology may have shifted the competitive advantage away from larger scale organisations to smaller organisations. This is not the case in general, but it might apply in specific sector (e.g. the advent of the ICT revolution directly favoured SMEs and entrepreneurship) or market niches. There are also other (less structural and more transient) reasons behind the links between SMEs and innovation, in particular:

- A new technology creates new markets and also destroys incumbent market positions and the entry barriers typical for the older technology and its market. As a result, market entry is made easy.
- Price elasticity is low because of the novelty of the product. The small firm has no disadvantage since there is nobody benefiting from economies of scale (Audretsch, Grilo and Thurik, 2012).

SME heterogeneity: broad categories and specific types

These observations are particularly important as far as policy measures supporting SMEs growth and/or innovation are concerned. They suggest that not all SMEs aim for growth; many, including ‘life-style’ enterprises, may deliberately choose to stay small and flexible. In fact, beyond this broad distinction, SMEs are a deeply heterogeneous category and this requires a special effort in targeting them. The literature suggests that there is no agreed classification system, since the categories used vary with the nature of the analysis. However, an awareness of the different approaches that have been adopted can contribute to the definition of targets in the current exercise. A useful overview of SME typologies is provided by Mazzarol et al. (2011).

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Box 1.  
Examples of SMEs typologies

Mazzarol et al., (2011) review literature on SMEs typologies and conclude that some of these are taxonomies relating to generic strategy, while others classify SMEs in relation to innovation activities. They also point out that most of those in the entrepreneurship and small business management area are focused on the classification of the entrepreneur rather than the enterprise. The following groups of typologies are identified:

*Governance*: The first group would encompass typologies that differentiate SMEs managed by owner-managers, from those managed by executive managers, whether they are shareholders or not.

*Strategy typologies*: these use the *strategy implemented or the potential growth* of the firm as the main criteria. Most of these taxonomies focus on the level of entrepreneurial orientation and the growth focus of the firm’s management team.

*Growth*: The third group is based on reference to the growth cycle of the SMEs and the implicit hypothesis that all the firms are going to grow.

*Sector of activity*: The last group is based on the sector of activity and the type of market addressed by the SME.

*Innovation*: A few typologies have focused specifically on innovation within small firms. Rizzoni (1991) provided taxonomy of six types (static, traditional, dominated, imitative, technology-based, new-technology based) while others (Tidd (2001) and Mazzarol and Reboud (2009)) focus on complexity and turbulence as the main discriminant axes.

Within the innovation strand, different types of enterprises are identified. Orsenigo and Decastri (2002) identify four major types, ranging from ‘Schumpeterian’ firms born on the basis of an innovation to ‘Marshallian’ firms, active in a specific geographical area and specialised in some stage of the value chain or in a product niche, ‘Smithian’ firms specialised in the supply of intermediate products and components to other (often larger) companies and ‘Marginal’ firms, characterised by low technological skills and little efforts explicitly devoted to learning.

Bessant, Tsekouras and Rush (2009) identify different states of development of capability or absorptive capacity, from search through selection to effective implementation of new knowledge, as the key differentiating factor and their limitations to absorbing new knowledge. The typology of the differing states of absorptive capacity within SMEs can help explain the barrier that may need to be overcome when trying to engage SMEs in knowledge exchange.

Source: Mazzarol et al. (2011).

Building on the literature relating to various SME classification systems and making use of the results of an OECD study in 11 countries, Mazzarol et al propose the use of multiple variables grouped in 7 dimensions to differentiate groups of SMEs. The dimensions relate to size, managerial characteristics, organisational configurations, governance, business strategy, market orientation and firm growth. The important point is that all of the dimensions are empirically observable and have measureable characteristics. On the basis of the analysis, however, the authors propose that it is safe to use a general two-part taxonomy classifying SMEs into ‘SME Ordinaire’ and the ‘SME Entrepreneuriale’. Such a distinction may be relevant to the difference perceived under Cohesion Policy between promoting employment creation or maintaining existing jobs and supporting more dynamic developments, notably through support for innovation. It relates to the distinction used in an extensive body of literature on high-growth firms, frequently referred to as’gazelles’, following the categorisation introduced by Birch.
(1981). Mitusch and Schimke (2011) provide a useful overview of the debate on gazelles, as it has been applied in an EU context and also incorporate the work of the European Cluster Observatory. They show that gazelles can be of all sizes but small firms tend to be overrepresented, i.e. gazelles tend to be small and relatively young firms. There is not too much evidence that the sector as such determines the emergence of gazelles, but rather the industry’s growth rate, although they can be found in all industries and sectors. The main consideration, however, is that gazelles tend to be highly successful innovators.

However, it is also useful to have a more differentiated characterisation of the whole range of small enterprises and one that takes into account the distribution of SMEs across sectors with differing degrees of dynamism. Ecorys (2012) provides an overview of the proportion of SMEs vis-à-vis large firms in high-tech manufacturing sectors. It shows that there are over 45,000 SMEs in these sectors, accounting for 0.2 per cent of all EU SMEs. The importance of SMEs in Knowledge Intensive Service (KIS) sectors is more extensive, accounting for almost 21 per cent of all SMEs. This compares with 17 per cent KIS large firms. The majority of SMEs however are to be found in low-tech sectors (typically wholesale and retail trade, warehousing, travel agency and services to buildings).

*Changes in the spatial and organisational contexts of SMEs: the role of proximity and entrepreneurship*

Besides the policy implication of SMEs heterogeneity – and more particularly the broad distinction between *SME Ordinaire* and *SME Entrepreneuriale* – the specific links between innovation and entrepreneurship and SMEs as highlighted above have at least two further important implications for SME policy: the regional/local dimension of innovation and the role of entrepreneurship in influencing enterprises performance. They are briefly outlined below.

First, **entrepreneurship and innovation have a fundamental regional context**. The OECD and World Bank recently went as far as to state that ‘Industrial and innovation policies characterised by top-down government interventions are not the right approach to development’. They point to new innovation activities that have emerged from agencies and actors on the periphery of policymaking and that have been very successful and have been so in collaboration with non-governmental actors, such as private and social enterprises, foundations and other civil society organisations (OECD and World Bank, 2014). There is ‘compelling evidence that [...] entrepreneurial activity accordingly tends to spatially cluster within close geographic proximity to the knowledge source’ (Audretsch and Feldman, 2003). This phenomenon indicates that the era of globalisation is not merely about internationalisation and the diminishing of state borders, but also about an increased importance of the regions as a factor in enhancing entrepreneurship and innovation. It follows that regional policies that support research, development, innovation and entrepreneurship have taken on a new importance.

Second, **investments in knowledge do not spontaneously develop into innovation**, the commercialisation of knowledge, or economic growth. One central factor in supporting innovation is that of the role of entrepreneurial activity. Entrepreneurship, in the organisational context of an SME, plays an increasingly key role in the progression of knowledge into commercial products and services both within and between
organisations. Over a series of books and articles, Casson (2014, 2010, 2005) has developed an analysis that attributes a key role to entrepreneurship, as the critical response to information asymmetries. Entrepreneurial judgement is necessary to success in making complex decisions in conditions of uncertainty. Differential access to information generates radical differences in the perception of the business environment between different groups of people. Entrepreneurs are the ones who exploit these differences of perception. At the same time Casson locates this insight in an institutional approach to the firm, distinguishing between different kinds of enterprise and differing roles within conventional management structures. Indeed the analysis is related to management theory and has been applied in extensive analysis of business history. It has also seen applications in the study of the internationalisation of businesses (for example Casson 2014). The potential and immensely positive attributes of entrepreneurship are also documented by Audretsch and Keilbach (2005). They challenge traditional economic theories on entrepreneurship that tend to perceive entrepreneurial attributes as a constant (‘Entrepreneurs are born not made’), which – if true – would leave no room for policy intervention. They focus instead on variations in the knowledge context and how particular contexts can impact on the cognitive process underlying the entrepreneurial choice model. From this perspective, entrepreneurship becomes ‘a rational choice made by economic agents to appropriate the expected value of their endowment of knowledge’. Policymakers that wish to support innovation may therefore need to take their interventions beyond investments in human capital, R&D, and university research, since these types of support policy do not sufficiently take entrepreneurial activities into account.

The latest Global Entrepreneurship Report (Amorós and Bosma, 2013), examining entrepreneurship in over 70 economies, outlines a number of important framework conditions as a precondition for entrepreneurship, including financial support, general government support, specific regulations, market openness, R&D transfer, entrepreneurship education and cultural norms, as well as physical infrastructure and commercial and legal infrastructure (Amorós and Bosma, 2013) – conditions arguably also important for SMEs.

In conclusion, the increasing role of knowledge and innovation as factors of competitiveness has offered a small share of SMEs new opportunities to develop and flourish, while a majority remains hampered in their growth path by difficulties related to their small size. The importance of entrepreneurship and the local dimension of innovation have also important policy implications. Beside growth-oriented strategies, many EU countries have indeed adopted an increasingly refined approach for the deployment of the Structural Funds and other interventions and they now focus on broader competitiveness factors and exploitation of regional potential and strengths in the context of smart specialisation strategies (European Policies Research Centre, 2010).

The consideration of entrepreneurship as a relevant variable opens the door to the investigation of those mechanisms inside SMEs that explain how the latter react to policy stimuli, which will be at the core of Task 4. While the relevant literature will be reviewed in relation with Task 4, it can be anticipated here that the aspects of economic theory that appear to be most useful in opening the black box of the firm and contributing to a characterisation of the key mechanisms involved in transforming policy interventions into positive outcomes, derive from the managerial tradition and evolutionary economics, notably because of their references to drivers relating to the internal organisation and management of businesses.
3.2.2 Addressing SME market failures

In a more conventional approach to SMEs focusing on size as a limiting factor, policy designers need to shape policy measures so that they address underlying market failures. This needs to be done not only to ensure effective support to SMEs but also to ensure that interventions that may disrupt market mechanisms are justified (i.e. following EU state aid rules).

A 2009 Commission Staff Working Document published on behalf of DG Enterprise and Industry distinguishes between market failures and systemic failures affecting innovation levels. The former focuses on resource allocation to knowledge production and other innovative activities and is associated with risk and uncertainties. The latter, systemic failure, is concerned with the efficiency of the innovation system as a whole, implying actors have different motivations when engaged in knowledge creation and diffusion.

Although these are two separate concepts, it can be difficult to clearly distinguish between market and system failures, and they may in practice overlap. It may be easier to differentiate between the two concepts in terms of interventions; policies to stem market failure tend to aim at compensating the negative impact of specific identified barriers. But there is no common approach to addressing market failures that impact on innovation. Traditionally, market failures are viewed from the point of view of national markets and there are many different approaches deployed. When examining the policy rationale, it is not always transparent how innovation support measures are supposed to address market failures.

In contrast, policies addressing systemic failures tend to focus on specific weaknesses of the innovation system as a whole. The rationale behind interventions is that innovation activities are often organised by cooperating enterprises or through informal, cooperative and open networks, which together make up a system. In the last decade or so, market as well as system failure interventions have been influenced by the economic crisis as well as the increased need to support innovation that addresses major societal challenges (‘Grand Challenges’).

Specifically with regards to interventions under Cohesion Policy, SMEs may face different sets of market failure (as a result of their location, type of activity or as a result of general market conditions). For example, one of the consequences of the difficulties faced by less developed regions is that there are relatively low levels of entrepreneurial activity and lower than average rates of business start-up and consequently less positive externalities.

In the EU Regulation on state aid, 31 reference is made to the market failures that justify certain categories of aid when they are granted in favour of SMEs (CSES 2012). For example, the development of SMEs may be limited by market failures in that SMEs often have difficulties in obtaining capital, risk capital or loans, given the risk-averse nature of certain financial markets and the limited collateral that they may be able to offer. Their limited resources may also restrict their access to information, notably regarding new technology and potential markets. There are also ‘market failures affecting SMEs in general, including difficulties of access to finance, result in even greater obstacles to the

31 Commission Regulation (EC) No 800/2008 of 6 August 2008 declaring certain categories of aid compatible with the common market in application of Articles 87 and 88 of the Treaty (General block exemption Regulation)
development of small enterprises as compared to medium-sized enterprises’. An overview of ‘general’ market failures is provided in the Box below.

**Box 2. Market failures generally faced by SMEs**

**Competition failures**: the market power of (usually larger) established firms can inhibit competition in markets in a variety of ways, including gaining financial advantages through the exercise of market dominance and the ability to impede market entry and access to resources. More generally, for markets to allocate resources efficiently, all market participants must have the same information. Because of the scale at which they operate, smaller enterprises have difficulty accessing information and markets where there are competition failures. Conversely strengthening the position of enterprises in this situation increases competition.

**Transactions costs**: smaller enterprises often face disproportionate transaction costs themselves or alternatively cause them to arise for others. A particular example is evident in relation to credit, where, it is more difficult or disproportionately costly for banks or other investors to obtain information on the creditworthiness of potential SME clients and they are therefore likely either to charge more for finance or refuse to provide it altogether.

**Asymmetric information**: a particular type of information problem arises where one party in transactions has more or better information than the other. Smaller enterprises are often at a disadvantage, because of their restricted capacity to obtain or communicate appropriate information. Lenders, for instance, may perceive the risk of lending to smaller enterprises to be greater than it actually is.

**Spillover effects**: Smaller enterprises may find it more difficult to appropriate the benefits from investment in training, R&D or in areas such as the development of intellectual property.

Source: Authors

There are also market failures that tend to impact on SMEs with particular (internal/external) characteristics. CSES (2012) summarises the disadvantages and market failures faced by SMEs in the less developed regions in the EU to include:

- **Exacerbated conditions**: many of the disadvantages faced by smaller enterprises in the economy generally are exacerbated in less developed regions. Accessing finance, for example, may be even more difficult, as a result of more pronounced information asymmetries and other failures;

- **Non-availability of positive externalities**: in more prosperous areas, enterprises often benefit from agglomeration effects and other externalities and these can be particularly important to smaller enterprises, enabling them to work with firms engaged in complementary activities or take advantage of a common pool of skilled labour. For enterprises in less developed regions, these externalities are often less available;

- **Under-provision of public goods**: similarly, enterprises in less developed regions may have less infrastructure available and fewer facilities and supporting institutions and may thus incur greater costs in getting their goods to market.

With regards to research and innovation, the principal disadvantages and market failures faced by SMEs in the areas of research and innovation include:

- **Positive externalities/knowledge spill-overs**: the social value of knowledge can exceed its private value with the consequence that there is an underinvestment in knowledge generation;
- **Public good/knowledge spill-overs**: firms can free ride on the research efforts of others;

- **Imperfect and asymmetric information**: add to the risk and uncertainty of R&D&I projects and make it difficult for financiers and others to accurately evaluate the associated innovation opportunities;

- **Coordination and network failures**: these impede the ability of the relevant actors to collaborate in the R&D&I process (CSES 2012).

### 3.3 Policy instruments and their effectiveness

This section moves on to concrete policy instruments and looks at a more practical and empirical literature. It seeks to contribute to the discussion of the specific contexts in which the ERDF is implemented by considering the policy instruments supporting SMEs that are generally used in Operational Programmes. A wide range of policy instruments are in principle available to policy makers: these are first reviewed, before the factors contributing to their effectiveness are addressed.

#### 3.3.1 Different policy instruments to support SMEs: possibilities and trade offs

There is a vast array of measures adopted and many instruments are used to promote SME development and innovation. In selecting an appropriate mix the policy makers must take into account the objective followed and the context in which the instrument is to be implemented. This requires making strategic choices between alternatives, for example between direct vs. indirect support, individual vs. collective support, grants vs. repayable support, etc.

**Categorising the different types of instrument** poses a number of challenges and it is evident from the review that this can be done in a number of different ways using different typologies. In fact, much depends on the precise objectives of the measure and the context in which it has been developed. In general, most measures are attempting to address variations of some basic market failures relating to information deficits, the difficulties smaller firms experience in accessing finance, the need to enhance capacities or take advantage of agglomeration effects or other positive externalities. There are also basic similarities between certain instruments underlying applications in significantly different circumstances. In the following, we argue that attempting to categorise the different instruments to be considered in abstract terms, i.e., independently from the context in which these are implemented is pointless because of the strong context-dependence of the latter. Rather, it is as well to highlight some basic distinctions and also some significant principles for the design of effective support for SMEs and innovation.

An important distinction is between general SME support and support for innovation. However, the literature do not always make neat differences in this respect (Commission of the European Communities, 2001; Saublens, 2013; GHK, 2010; Rigby and Ramlogan, 2012).

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32 The 2013 European Commission’s SME Performance Review conducted to analyse responses to the Small Business Act refers (in 2010-2012 only) to a total of almost 2,400 policy measures to support SMEs implemented by the EU’s Member States, i.e. an average of 800 measures per year, and almost 90 measures per country. Many of these fall beyond the ERDF context, yet there is still clearly a large number of ERDF instruments to be taken into account. (http://ec.europa.eu/enterprise/policies/sme/facts-figures-analysis/performance-review/index_en.htm).
Other work, including the major survey conducted for the Manchester Compendium of Evidence on the Effectiveness of Innovation Policy (Edler et al 2013), is oriented towards instruments that specifically support innovation. Furthermore, especially in relation to measures that aim to promote innovation there has been a series of elaborations of existing instruments, but with applications in new areas and for new purposes. Cluster development, for instance, often makes use of basic instruments, such as specialised advice services, incubators and other developments of premises and particular forms of access to finance, but within a particular context and policy framework. This is not to say that there are not new instruments that have been developed. The Manchester Compendium, for instance, includes demand-side interventions as a relatively new category. These involve a series of policy developments ranging from improvements in the regulatory framework and the standards regime to changes in public procurement practice intended to encourage innovation by suppliers. Generally, they are characterised, as explained in the Aho Report (2006), as measures to stimulate innovation in enterprises.

Others derive support categories in a pragmatic way by identifying types of support that are prevalent in the areas that they are examining.

Overall, one lesson that can be derived from the existing categorisation attempts is that the different ways in which SMEs can be supported are relatively restricted in number. They broadly consist of providing finance or premises, giving information and advice and promoting networking, either between enterprises or with other organisations, such as research institutes. To this can be added the relatively new approach of creating frameworks that provide a stimulus to innovation. However, these basic tools can be used in a large variety of ways, with different target groups, differing contexts and objectives and combined in varying formations. This suggests that the categorisation of the instruments used in the current exercise does have to be derived from the analysis of OPs on the ground. Nonetheless the literature does point to significant elements that should help to define the categorisation to be used. These already include the need to specify:

- The type of SME targeted for support
- The regional context of the intervention, including the sectoral composition of the local economy, geo-physical considerations, including transport and communications infrastructure etc.
- The specific objectives of the intervention
- The type of barrier or market failure being addressed
- Whether the intervention is intended to help develop the capacity of the enterprise to develop and grow or whether it aims to offer a demand-side stimulus
- The precise nature of the basic tools used (finance, advice etc.) and their combination.

A particularly fruitful approach consists in considering different alternatives around key discriminating criteria. This is to help develop strategic thinking when selecting the most adequate policy instruments (and their mix). While the next sections present the evidence from the literature about the effectiveness for success of a selected list of policy instruments, as well as the respective success factors of different alternatives.
3.3.2 Literature on specific instruments

The next stage is to give consideration to evidence from the literature on specific support instruments. At the end of the section, we present a table (Table 6) providing an overview, albeit not exhaustive, of evidence on effectiveness of each policy instrument discussed below.

**Access to finance & financial instruments**

Although financial instruments have been part of the Structural Funds since 1994, their role increased in the 2007-2013 programme period, during which they represented approximately 5% of total ERDF resources (DG REGIO, 2014ii). The main role of financial instruments is to complement and increasingly replace direct grants.

The deployment of financial policy instruments varies across the EU and there are multiple underlying reasons behind this. The financial sector and the use of financial instruments have changed profoundly, as a result of new technology as well as a result of deregulation, during the lifetime of the Structural Funds. The design and use of financial instruments also vary significantly between countries – and SMEs rely on debt and equity financing to a varying degree depending on the financial system within which they operate, the culture and traditions of the country in which they operate, and (to a lesser extent) characteristics such as size, sector, age or profitability of the business. There are two types of financing system in Europe:

- A bank-based system (e.g. Austria, Germany): financial system loans are the preferred source for financial investment, i.e. banks play the most important role at providing finance.
- A market-based financial system (e.g. the UK): this system is characterised by competitive markets, where other forms of finance (e.g. equities and bonds) are more important than bank loans (KPMG and ENSR, 2003; Ramboll 2010).

Empirical research analysed by CSES (2011) shows that access to finance is still one of the major constraints for SMEs. As a concrete example, access to finance through the EU’s Entrepreneurship and Innovation Programme (EIP) was assessed to have made a significant consideration in the difficult circumstances for SMEs following the economic crisis and subsequent recession. About two-thirds of the beneficiaries of High Growth and Innovative SME facility, set up under the EIP, indicated that they would not have set up the business or made a particular investment without the financial support received.

The European Investment Bank (2015), among others, recognise that “SMEs in particular face a difficult investment environment”. The EIB also says that since the economic crisis across Europe, perceptions of the risk of lending to small businesses have increased. Unsurprisingly, SMEs located in those European countries where banking sectors have been hardest-hit by the crisis suffer the most from financial constraints.

This sentiment is echoed by the OECD (2015) writing that the loosed monetary policies which followed the economic crisis (the lowering of lending rates) disproportionately favoured larger firms. SMEs, in particular in EU countries under duress, were still faced with paying relatively high interest rates compared to their larger counterparts. Overall, credit conditions improved but not in relation to large enterprises (OECD, 2015).

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33 This distinction, however, is largely academic as it related to the overall system. E.g. even in the UK, the vast majority of SMEs are reliant on banks for funding and certainly not equities or bonds.
In this regards Structural funds support has become an important source of funding when national sources have dried up to provide SMEs in general and innovative SMEs with credit; the role of the Funds as a provider of credit is not yet clear, but is necessary. However, further action is needed. The OECD recently argued that it is becoming “necessary to broaden the range of financing instruments available to SMEs and entrepreneurs“ if they are to continue to be able to contribute investment, growth, innovation and employment (OECD, 2015).

Although there is an agreement that SMEs need access to credit, there is some contradictory evidence on the effectiveness of related instruments. Edler et al (2013) and Ramlogan and Rigby (2012) suggest that the evidence on credit guarantee schemes indicates that they help business growth, sales and employment, although does not impact positively (or at all) firm productivity, R&D, innovation or investment intensity. However, KPMG and ENSR (2003) say there are important links between the use of financial instruments and innovation, as these are instruments that are generally deployed to support niche SMEs, such as start-ups, innovation or technologically-oriented enterprises, or female entrepreneurship.

There is also some contradictory evidence on effectiveness of general support as we have examples of academic studies which find zero or even negative evidence of firm-level investment support:

- Bergström (2000) finds no significant effect of firm-level investment support on total factor productivity in Sweden.
- Harris and Robinson (2004) find that firm-level investment support in the UK had no effect on productivity by comparing the supported firms to similar firms within the supported area.

The mixed results on access to credit type instruments may come down to the selection of businesses in the intervention. Edler et al’s (2013) evidence review suggest that policymakers may make adverse selection in their support to businesses and end up funding struggling or under-performing firms, which could potentially be disadvantageous to more innovative competitors and ultimately also has an adverse effect on the use of the policy instrument.

**Capital investment**

Bank lending is the most common source of external finance for many SMEs and entrepreneurs (OECD, 2015). Small firms are often heavily reliant on traditional debt in order to survive and to grow. Although generally needed to support small businesses, traditional bank finance also poses challenges to SMEs, in particular those with a higher risk-return profile (which in turn can be linked to higher levels of innovation).

Firms’ productivity relies on adequate investment. Although investment in innovation and intangible assets (competence, education and R&D) is becoming increasingly important, one cannot overlook the complementary role of more traditional gross fixed capital formation. Both types of investment are needed. For example, high-quality infrastructure investments contribute to cost reductions and productivity increases, but they can also provide indirect support by facilitating, e.g. labour market flexibility and make SMEs more competitive.

However, a very recent (2015) report by the EIB on Investment and Investment Finance in Europe indicates that gross fixed capital formation in the EU remains weak. The EIB provides a warning in this regard saying that given the fast pace of technological change, low levels of investment can lead to an unwarranted decline in productivity which can be difficult cycle to break. The same report provides a more positive outlook on investment
in innovation and intangible capital, which is performing relatively well, although the EIB does not believe that the current investment patterns are likely to be sufficient to address the competitiveness challenges faced by the European SMEs. Investment is also lacking in financing the on-going adaptation to a knowledge based economic structure (EIB, 2015).

Support to internationalisation

Of the more than 20 million SMEs operating in the EU, up to 30% of businesses have had some sort of international business activities over the last few years. However if one looks beyond the remit of the Single Market this group of SMEs becomes somewhat smaller:

- Some 14% of SMEs import from third markets
- Some 13% export to third markets
- Some 3% are engaged in different forms of international (technical) cooperation
- Less than 1% have own establishments in third markets.

The above figures stem from 2011 and have been derived from the study Opportunities for the internationalisation of European SMEs (EIM Business & Policy Research, et al 2011), which also undertook a survey of EU SMEs and their use and results from using support instruments to facilitate internationalisation.

The same source also lists 300 support measures provided by the Member States and at EU level and which broadly aim to facilitate SME internationalisation. Having said this a main finding from study was that nearly three quarters of all internationally active SMEs were not aware of the existing support measures. From among the 27% that are aware, only about 26% – or 7% of all internationalised SMEs – report using such support.

Although (a lack of) uptake may be an issue, internationalisation support is generally regarded as having a number of advantages.

One of the classical arguments for internationalisation is that of reaching and exploiting economies of scale. In their paper commenting on the existing literature, Lloyd-Reason and Mughan (2002) suggest that firms who succeed in internationalising their operations gain a number of advantages, such as low cost production facilities, economies of scale in production, distribution marketing and management. These benefits allow for lower prices, and compete favourably in the market. It is also argued that (domestic) markets are increasingly becoming international as a result of a globalisation process – firms that do not internationalise still face competition from foreign businesses that enter into the former’s domestic market. Domestic firms therefore still need a strategy for internationalisation (Lloyd-Reason and Mughan, 2002).

Most new businesses cater for the local market and Autio et al (2007) point out that several empirical studies confirm the importance of high-growth firms for job creation and economic growth, which could be an important side-effect in encouraging internationalisation.

However the literature also brings up a number of challenges vis-à-vis internationalisation support, and if not tackled appropriately may deem the policy
instrument (more or less) ineffective. It is largely recognised\(^{34}\) that the international markets constitute a complex environment. Lloyd-Reason and Mughan (2002) equally warn that international expansion takes the SME into a more complex, volatile and uncertain competitive environment. They also make the observation in their review of the literature that much of the analysis available is based on experiences by large firms rather than SMEs and it can therefore not be assumed that benefits falling to larger firms would also benefit SMEs (and vice versa).

This brings us to the important point of the vast heterogeneity of SMEs. Fernández and Nieto (2006), conducting a survey of Spanish SMEs, conclude that different types of ownership affect the operations of the firms, and this in turn will influence the internationalisation strategy adopted. As such, some types of SMEs (e.g. family driven businesses) may even be adverse internationalisation. The Spring Singapore study (2011) makes a similar point in arguing that internationalisation barriers are both internal and external. Common internal barriers include a lack of organisational resources, capabilities, and management approach and external barriers refer to business environments of the current and potential overseas markets. Lloyd-Reason and Mughan (2002) argue that the “key to the successful internationalisation of business operations is the international orientation of the decision maker” (the SME management), who also need to be the starting point for policy support mechanisms.

Support to internationalisation therefore requires good coordination. Policy instruments supporting SME internationalisation need to be able to take into account and meet both internal and external complexities. For example, a review undertaken by Brown et al (2014) indicates that support for high-growth SMEs is often misdirected as public policy largely neglects the real needs of high growth businesses. According to Brown et al some research suggests (Bleda et al, 2013) that high-growth SMEs are in a constant state of change, which makes designing support difficult and interventions that are designed to work for the majority of SMEs are not likely to be appropriate for the most dynamic cohort of businesses.

In their inventory of SME internationalisation support in the EU, EIM Business & Policy Research, et al (2011) concludes that there is a variety of support offered, and which often responds to local circumstances, but which a sufficient scale or available to all EU SMEs. The study also highlighted a number of gaps in support policies, which includes:

- A lack of assistance to identify human resources in some third countries
- A lack of information on the local business environment
- A lack of information on market opportunities at a regional level
- A lack of coordination between organisers of trade missions
- A lack of assistance in finding reliable business partners in some countries
- Uneven provision of information on technical standards in third countries.

**Support for improving capacities**

Support for improving capacities is a key, but broadly defined instrument for support. Advisory and other support services are often a key element in e.g. incubator schemes,

and they can be provided as a ‘package’. But support for improving SME capacity can also be a main objective of policy instruments, for example through support for training and re-training.

Support for improving capacities often use intermediaries – business support organisations. These are services, originating in a public policy initiative, that aim to assist enterprises or entrepreneurs to successfully develop their business activity and to respond effectively to the challenges of their business, social and physical environment’. (Commission of the European Communities, 2001, p.7) Agencies that provide support of this kind to businesses have a long history and, as pointed out in the box below, have arisen in various different policy and institutional contexts.

The basic policy rationale for the support provided by these agencies – information, advice, networking etc. was considered in a 2002 report for the Commission by the Foundation for SME Development at the University of Durham. This report addressed the issue of ‘Business Support Services and Market Failure’ as a rationale for the public provision of business support services in general and information and advice services in particular. Relevant market failures were identified in the form of adverse selection, resulting from information discrepancies, the nature of information and advice as a public good and the existence of both positive and negative externalities, the effects of which should either be encouraged or obviated respectively. The report did, however, point out that there are other reasons for policy interventions in this area other than the need to address market failures. Other rationales include the need to respond to wider social issues, such as social exclusion, a wish to promote development of particular sectors, to facilitate employment retention and creation; and to enhance the small business base for a variety of economic and social reasons.

Box 3. The institutional dimension of innovation and business support

| Public authorities in most Member States have developed specialised agencies that are dedicated to innovation support which are often different from the agencies providing general business support. So ‘innovation centres’ or ‘technology centres’ are fairly common, as are incubators and science parks, whereas, in many countries, general business support is provided by Chambers of Commerce, especially in countries where chamber membership is compulsory. Alternatively, there may be small business centres or enterprise agencies primarily aiming to provide general SME support. Furthermore, these can either form part of national systems or be developed and promoted by regional or local authorities. Frequently, general support agencies will have a different institutional status (legally) from the innovation support instruments and will be supported by different government ministries. Often too, innovation support organisations will have links with universities. Some support services can be provided by industry associations. Increasingly, information and training can be provided online and this might be seen as a reason to reduce traditional provision based on paper publications and direct contact with clients. In addition, there is a range of specialist providers of support. Most Intellectual Property Offices, for instance, have expanded their information and advice services in recent years, diversifying away from a strict concentration on patent registration, although in the best cases these have been integrated into the support provided by other agencies (CSES 2010). |

There have been movements across the institutional distinction between support for SMEs and support for innovation. In general, this institutional dimension appears to be under-researched, even though it can be an important contextual element in explaining the nature and extent of support provision, including that funded by the ERDF.

Source: authors
It has not been possible to identify any systematic description of the different forms that support agencies can take in the EU, though there are explanations of developments elsewhere in the world (Bennett 2014) and frequent historical accounts of particular institutions. Chambers of Commerce and Industry, in particular can claim origins going back centuries and in a number of EU Member States, such as Italy, France, Germany and Spain, have public law status and compulsory membership. In contrast, in countries such as the UK, Ireland, and Sweden, Finland, Norway and Denmark, enterprises are not obliged to become chamber members, since a private law model is applied (Fedotov, 2007).

Chambers of Commerce continue to provide a substantial range of services over a wide area. Eurochambers’ Manifesto of 2012 claimed that 1.3 million entrepreneurs are assisted every year in setting up their businesses and that Chambers provide direct start-up support to 265,000 businesses every year. 88% of Chambers also provide access to finance services to businesses and 60% of Chambers provide specialised business transfer support. However, Chamber support is not restricted to general business services. Chambers have a significant role in supporting innovation in businesses and ensuring effective alliances between the research community and the private sector. Over a quarter of a million businesses benefit from Chamber innovation services each year (Eurochambers 2012).

However, it is evident in the grey literature that in most countries there are other systems of support agencies with a public policy remit, often supported by local or regional authorities, but also constituting national systems, as is the case of with Regional Business Development Centres (‘Vaeksthus’) in Denmark and the former Business Links in the UK.

The evaluation of enterprise support in the 2000-2006 period (Ramboll, 2010) provided evidence on the performance of advice and support, networking and clustering and infrastructure, such as business incubators. The report suggests that tailored assistance to enterprises is particularly effective, highlighting the case of the High Growth Company Support Programme in the East Midlands in the UK, which had been very effective in creating jobs and increasing turnover. Overall, although there is no universal way of calculating job creation, the report reminds us, advice and support are seen to be effective in creating changes at an enterprise level. However, there is also a comment that there were many cases of measures, using multiple instruments, notably combining information and advice with grants and the use of grants in particular as a complementary instrument was perceived to be an important explanatory factor of job creation.

Networking and clustering supported by the ERDF in 2000-2006 were strongly interlinked with advice and support and technology transfer activities with a clear sector focus. In this way, it was suggested, networking and clustering can be considered as specific forms of advice and support.

Other evidence (Bennett 2012, Bennett 2008) relates to assessments of specific support networks. Mole et al (2008) examined publicly supported advisory services for small firms in England, mainly the Business Link network, testing propositions on anticipated performance derived from the programme theory underlying the support services, using data from a 2003 survey of over 3,000 English small firms. The study found that the Business Links’ approach to market segmentation allowed more intensive assistance to be targeted on younger firms and those with limited liability status. In terms of the outcomes, positive and significant employment growth effects were found to result from intensive assistance, but no significant effects on growth from ‘other’ – more general – assistance could be found. The authors conclude that they have found partial support for
the programme theory assertion that the support leads to improvements in business growth performance and stronger support for the proposition that there would be differential outcomes from intensive and other assistance.

Some of the literature also relates to specific types of support. GHK (2010) considered SME access to Public Procurement, and various reports have considered specialised support to SMEs on Intellectual Property Rights (Rigby and Ramlogan, 2012, CSES 2010, Radauer et al 2007). Saublens (2013) has information on policy instruments addressing competitiveness and innovation and provides some high-level data on the types of SME that tend to benefit from this kind of support. Specifically, these are said to be mid-sized enterprises, enterprises in niche markets and enterprises in specific sectors: ICT, materials (chemistry, nano, bio), the green and blue economies, transport & logistics, health & wellness, food & drinks and administrative and other services. Saublens also suggests a ranking in the different types of support intervention in terms of the added-value provided for users.

Support services can also lead to more effective and efficient firm operations. According to Shapira and Youtie’s (2013) evidence review, innovation support services provide positive – albeit relatively modest – benefits for participating firms, such as reductions in costs, improved quality, reduced waste and improved environmental performance, higher productivity, and new product development and innovation. However, on a larger scale, these efficiency savings can become substantial. An evaluation of the EU’s Entrepreneurship and Innovation Programme (EIP) indicated that the Community programme for the reduction of administrative costs, supported under the EIP, is expected to lead to a reduction in administrative burdens for European businesses valued at EUR 40.7 billion (CSES, 2011).

Support for improving capacities in the form of training can strengthen SMEs innovation and management skills. Jones and Grimshaw (2012) point out that there appears to be a positive association between innovative firms and the level of expenditures on formal and informal training compared to non-innovative firms. Secondly, SMEs receiving capacity support can also benefit in the longer-term as the firm develops a ‘knowledge pool’, particularly with respect to the organisation’s legacy of past innovations and the technical competences of SME owner-managers.

As explained above, capacity building support ideally needs tailoring and the literature suggests that any generalisation of SME advice support weakens any possible effects. For example, the Mole et al (2008) study found no significant employment effects on growth from general assistance from business support organisations. Similarly, according to Shapira and Youtie’s evidence review suggest that if there is policy pressure for a capacity building instrument to serve as many firms as possible, this may lead to service assistance is less intense than may be desirable and subsequently have less impact.

Given the need to tailor support, designing effective interventions can be difficult. Furthermore, policy interventions face a number of challenges, as training and skills policies are usually part of a wider policy effort that seeks to improve economic growth and employment participation. According to Jones and Grimshaw (2012), although linkages between firm skills and innovation can be identified in principle, the real-world mechanisms through which they interact remain somewhat opaque.

In terms of general discussion, results from the open consultation on the Small Business Act (EC, 2008), suggest ways of improving policy instrument intervention by support agencies. A number of points raised echo the good practice principles highlighted at the start of this section, for instance, referring to the need for coherence in provision and the introduction by the authorities of single contact points at national level, as a route to information. (In a repeat exercise in 2014, the consultations results indicated that
stakeholders were highly appreciative of the Enterprise Europe Network in its work in developing local cooperation with SMEs’ stakeholders and providing new service (EC, 2014 iv).

**Support to R&D projects**

Support that encourages SMEs to undertake R&D projects can take many forms. The rationale for the provision of direct support for R&D is largely based on the linear model of innovation (i.e. the assumption that R&D conducted within firms will, directly or indirectly stimulate innovation that leads to the production of new marketable products, processes or service) and although a long-established theory, it is not universally accepted as providing a complete picture of innovation systems and support. Nevertheless, there is a multitude of empirical evidence of both pros and cons for types of R&D support which we will put forward in this section.

According to the Cunningham et al (2013) extensive literature review on direct R&D support, this is an effective policy instrument to use for targeted interventions. A key benefit of R&D grants is that they may be targeted at specific areas where public intervention may make a marked difference, for example by supporting a key sector or type of business. On the other hand, the policy instrument is not sufficient in its own right. If not appropriately designed for its target group(s) or region, it may also misfire. Similarly if applied too broadly, it is less effective in supporting change. Cunningham et al suggest that instruments such as fiscal incentives may be more appropriate in facilitating a broader support mechanism.

If direct R&D support is delivered in tandem with other (complementary) set of services and support (e.g. advice or networking opportunities), it tends to be more effective (Cunningham et al 2013). An Austrian study analysing regional support in the country (Kaufmann and Tödtling, 2002) suggest that SMEs also need the support to strengthen internal strategic, organisational, and technological weaknesses, many of which SMEs are not aware exist in the first place. Kaufmann and Tödtling (2002) found that some Austrian support for SME R&D is miss-targeted as it overlooks certain characteristics of SMEs. For example the financial support neglects the commercialisation of R&D. Support is also bias towards high-technology projects, while less technologically advanced or innovative firms lack adequate support.

A well-documented approach to increasing effectiveness of direct business support to R&D is to support partnerships between SMEs and research organisations as collaborative initiatives may increase positive impacts of firms’ R&D as SMEs are exposed to knowledge and expertise outside of their own remit. In general, the literature on collaboration between firms and research organisations observes that the role of governments in supporting collaborative practices is significant because of the availability of economies of scope and scale. Positive impacts can include leading edge research knowledge, research infrastructures or research services, support to develop in-house capabilities or to identify potential future employees. Cunningham and Gök’s evidence review on policies to support collaboration for R&D and Innovation found that SMEs receive a number of benefits:

- Saving transaction costs where there are incomplete contracts
- Attaining economies of scale and scope
- Using networks as a way to increase synergy, efficiency and power
- Accessing complementary resources to exploit firms’ own resources and learning from partners, which in turn create new capabilities and enhance competitiveness
- Creating and exploiting high risk high opportunity situations
- Decreasing R&D costs by pooling risks and co-opting competition.

By way of definition, there are several aspects underpinning the collaboration between firms and research organisations, which are deemed to be positive for both parties and which are briefly summarised in Table 5.

**Table 4. Rationale of Intervention explained**

<table>
<thead>
<tr>
<th>SMEs</th>
<th>Universities</th>
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<tbody>
<tr>
<td>To access leading edge research knowledge, research infrastructures or research services</td>
<td>To access industrial capabilities and resources</td>
</tr>
<tr>
<td>to develop in-house capabilities or to identify potential future employees</td>
<td>to commercialise research ideas or test their commercial potential</td>
</tr>
<tr>
<td></td>
<td>to develop ‘real world’ links and build experience or to develop potential career pathways for students</td>
</tr>
</tbody>
</table>

Source: adapted from Cunningham and Gök (2012)

Cosh et al. (2005) find that cooperation with other actors such as research organisations and higher education institutions allows firms to expand their range of expertise, develop specialist products, and achieve various other corporate objectives. This may lead to greater commercial success for the new products, and enhances the returns to innovation through economics of scale. All this may result in higher productivity as a result of the innovation activities.

A large part of the literature addressing the effectiveness of innovation policy schemes has contributed to the understanding of the design and implementation of collaborative support instruments. Overall, the principal objective of these policy interventions is to stimulate change in the practices of the participating organisations and those with which they interact. This leads to secure a long-term, stable commitment of government funding and support and enables the purpose and implementation of the programme to be clearly defined in advance (Wilson, 2012; O’Kane, 2008).

In return, collaborative R&D projects require strong management and clear objectives. It is a policy instrument that requires a more sophisticated design in order to optimise the full range of potential benefits arising from collaboration. This means that programme managers must be in a position to be able to adjust the underlying rationale and objectives of a collaborative programme according to participants’ interests in activities, and throughout the course of its development (Wilson, 2012). It also helps if collaborative support programmes are aligned with a broader set of supporting and complementary of policies which can capitalise on their outcomes (Lambert, 2003) or are aligned with other objectives of the collaborating institutions, such as bringing in postgraduate students as part of an educational objective, enabling them to gain experience of project management in an industrial context.

Wilson (2012) identifies different strategies to consolidate business-university collaboration, including response to change motivated by good management, improving an organisation’s performance in pursuit of its objectives, change motivated by direct or indirect funding incentives and change motivated by regulatory requirements. Overall, not unexpectedly, the management of relationships figures prominently in the literature on collaboration between SMEs and research organisations.

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35 Conclusion driven from reviewing Cunningham and Gök (2012) review.
Support to start ups and spin offs

Policy support under this heading covers several themes, most notably, i) Support for start-ups, including, but not exclusive spin offs, but firms in general, and ii) Targeted support to spin-offs, as a particular type of start-ups, which are of particular importance to innovation.

Like SME R&D support, support to start up SMEs and spin off businesses can be deployed in many different ways and can encompass a range of support mechanisms.

Targeted support to spin-offs

The literature largely agrees that start up and spin-off policies support the knowledge economy, as – if the policy instruments are successful – these newly created companies tend to be innovative and require high-skilled staff.

Spin-offs policies have seen a recent period of over-buoyancy. Recent success of spin-off policies (e.g. at the MIT in the US) have led to high expectations more generally of the policy instrument yet a more recent realisation has led to a more balanced appreciation of the support. This appreciation is less focused on creating new firms and realise the need for laying the potential for long term relationships with research-focused firms.

Support for start-ups

There are arguments against supporting start-up companies, which largely focus on the lack of (relative) additionality compared to supporting existing ones. According a discussion paper by Shane (2008), encouraging start-ups in general is poor public policy as “there is no evidence that people create too few or the wrong businesses in the absence of government intervention. Moreover, there is evidence that these policies lead to start ups of marginal businesses that are likely to fail, have little economic impact, and generate little employment.” Shane also point to a lack of evidence of causation, suggesting that there is no evidence that new firm formation causes economic growth; rather, economic growth probably causes people to start businesses. In other words, it is more effective to help existing/surviving firms to grow rather than focus on new start-ups, which have a higher risk of not surviving in the longer-term.

But other aspects of the literature – notably evaluations – indicate there are number of positive effects which can be derived from start up support. One general argument for start-up support is that new firms are needed to replace dying or declining firms. Moreover, this can be particularly important for innovating SMEs as one generation of innovators replaces another.

In the UK, the One North East Programme (a regional policy instrument) aimed to increase the number of business start-ups, their survival and their growth through large events and conferences, where there might be inspirational and high profile speakers, including SME and student conferences, dinners, smaller meetings, and mentoring activities. The evaluation of the Programme reported high levels of additionality from the activities undertaken (Ramlogan and Rigby, 2012).

There is also evidence of positive impacts from incubators (as a kind of start up support), indicating that incubators accelerate the creation of new firms. Ramlogan and Rigby’s (2012) evidence review suggests that the primary added value of business incubation is to accelerate the start-up of new businesses and helping to maximise their growth potential in a way that is more difficult for alternative SME support structures to achieve. A key element of incubators’ effectiveness is their ability to combine a wide portfolio of different types of support (including the advice and support services. Furthermore, analysing US incubator programmes, incubators are cost-effective policy instrument (CSES, 2002).
Ramlogan and Rigby’s (2012) review of existing evidence show that overall, some schemes find positive impacts in terms of sales, employment and survival while in others impacts were statistically insignificant. The schemes offering support to pre start-up entrepreneurs again varied in outcome. In the short term, all schemes increased employment; however, schemes do not tend to show persistence of employment effects at five years.

Mixed evidence can be the result of the policy instrument being difficult to measure. The 2010 Ramboll ERDF evaluation suggests that there is a longer time lag between effects of business incubators, in particular in terms of job creation, compared with other types of interventions. This can be due to the fact that the causal link between making premises available and the creation of jobs can be quite weak. According to Ramboll (2010), a causal link can be found between the use of incubators and employment, but it is not very common. Similarly, Cueto and Meager (1996) and Mato (2006) all indicate that empirical evidence in business start-up support is very rare.

However if one looks beyond ERDF-supported incubators to broader support, there is some quantification of the added-value effects of incubators. In an EU and US benchmarking exercise (covering just under 80 incubators) undertaken in 2002 the key messages conveyed were that business incubators in the EU – which now number around 900 – make a significant contribution to job and wealth creation. Some 40,000 new (net) jobs are generated each year by incubators. The primary added value of business incubation is to accelerate the start-up of new businesses and helping to maximise their growth potential in a way that is more difficult for alternative SME support structures to achieve. The study also suggested a number of best practices of relevance to incubation as policy instrument. Business incubators should be designed to support and be part of a broader strategic framework – either territorially orientated or focused on particular policy priorities (e.g. development of clusters), or a combination of these factors. They should be promoted by an inclusive partnership of public and private sector stakeholders. During the development phase, it is important for the market to be tested and a business plan to be devised that can provide a framework for incubator operations. There are a variety of set-up funding models but the evidence is that public support for the establishment of incubators in Europe will remain critical for the foreseeable future. Likewise, there are different ways in which incubators can cover their operating costs and whilst many incubators rely on public subsidies, there is a strong argument in favour of minimising dependence on this source of revenue funding. Overall, it is concluded that business incubators are a very cost-effective instrument for the promotion of public policy objectives (CSES, 2002).
Box 4. **Incubators**

Business incubators are seen as a key activator of growth, competitiveness and entrepreneurship. A reason behind the widespread use of incubators as a measure of support is that it is a type of indirect support, which is increasingly popular across industry and innovation policy alike (Vedovello and Godinho, 2003).

European policy on Incubators (European Commission, 2010ii) defines the process of incubation as being constituted of three stages, from business plan and modelling (pre-incubation) through access to finance, coaching and advanced business planning (incubation) to innovation diagnostics and business development (post-incubation).

Despite the widespread existence of measures supporting Business Incubators across Europe, the type of support, policy focus and implementation varies across countries and regions (Bergek, and Norrman, 2008; CSES, 2002). Such differentiation is due to different policy frameworks and to the geographical scale in which it aims to cover (CSES, 2002). Merging the findings of CSES (2002) and Bergek and Norman (2008)36 we can derive three types of incubator:

**Traditional incubators:** The ultimate objective is to promote entrepreneurship, innovation, employment opportunities and growth. As such they are mostly operated by national or local authorities, although specialised ones are established by universities or private sectors organisations.

**New Economy incubators:** They tend to be funded by venture capital companies or set up by large multidisciplinary consultancies that are able to offer a complete range of technological, advisory and other business support services to their clients;

**Incubators emphasising Physical Space and Process:** These are defined by a framework which underlines the importance of providing a physical space in which policy tools can operate as well as the business incubation processes.

Another type of incubator, supported in the Smart Guide for Innovation-Based Incubators (IBI) (European Commission, DG REGIO, 2010), is the Innovation-based Incubator, which aims to link Innovation with Entrepreneurship (European Commission, DG REGIO, 2010). Accordingly, an IBI is defined as a ‘business development centre for new entrepreneurs and SMEs that intend to develop innovative ideas. (…) Innovation-based incubators work in the intersection between the sets of innovation and entrepreneurship supporting entrepreneurs to profit from the added value of innovative ideas’ (European Commission, DG REGIO, 2010).

**Support to innovation**

Edler *et al* (2013) in their evidence review on the effectiveness of innovation policy interventions developed a typology of innovation instruments. This distinguishes between supply-side instruments (influencing the generation of innovations) and demand-side instruments (influencing those requesting, buying or applying innovations. Although recognising that instruments often have multiple policy objectives and impacts, Edler *et al* also organise instruments according to seven major innovation policy goals: (i) increasing research and development investment; (ii) augmenting skills; (iii) enabling

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36 The literature also advances some criticism on the lack of clarity in business incubators definitions: they fail in providing a transparent description of whether they refer to an organisation or a more general entrepreneurial environment. Moreover, it is difficult to understand what part of the venture development process is considered. See for example Bergek and Norrman (2008).
access to expertise; (iv) strengthening system-wide capabilities and exploiting complementarities; (v) enhancing innovation demand; (vi) improving frameworks for innovation, including regulation and standards; and (vii) facilitating exchange and dialogue about innovation.

Looking at evidence on the success rate of innovation instruments, the literature suggests there are several advantages with providing innovation support.

In their analysis, Edler et al (2013) summarises among other things evidence on the effectiveness of cluster policies, network policies and support for R&D (and innovation) cooperation. Their observations are that in general, evaluations of measures to strengthen system-wide capabilities find positive intermediate results in building linkages and exploiting complementarities. Interventions tend to work best in facilitating further improvements – i.e. where innovation activities already exist – as they do not always succeed in building clusters or networks from scratch.

According to Cunningham and Ramlogan’s (2012) evidence review networks can have very positive effects on the stimulation of learning processes and the enhancement of skills levels. Policy instruments that facilitate innovation networks are often successful in achieving their broad objectives, while also being a low-cost intervention. Having said this, networks are highly idiosyncratic and there is a general lack of understanding on precisely how networks facilitate innovation, and as a result, this type of policy instrument can be difficult to implement.

Another common innovation instrument is the Innovation voucher. Innovation vouchers have a number of advantages, as they are e.g. relatively simple and cost-efficient to deploy. They also need little administration to implement (OECD, 2010). Innovation vouchers can also be effective in brokering relationships between SMEs and High Education Institutes (HEIs), as well as support the maintenance of links and interactions between businesses and HEIs.

But there may also be drawbacks with innovation vouchers. According to the OECD (2009), the most serious concern is that vouchers only facilitate one-off and subsidised industry-university co-operation, which may well not affect the long-term attitude of SMEs towards innovation. Furthermore, if the voucher links regional HEIs and businesses, this can limit the horizon of SMEs and its ability to find an effective solution to its technological problems.

There is also a relative wealth of evidence on cluster support to innovation; in particular high-tech innovation. Cluster policies are generally regarded as an important tool directly aimed at creating growth and innovation in SMEs. Porter (1998) sees a number of additional advantages associated with clusters, namely the presence of demanding customers, greater rivalry and complementarities in products and technologies. Cluster support is likely to lead to wider regional impacts. These impacts are linked to e.g. the strengthening of specialised labour markets, input suppliers and knowledge spillovers, which can facilitate further innovation and productivity benefits. Clusters can also lead to supply side advantages as intermediate industries provide downstream businesses with local access to e.g. specialised materials and components, finance, marketing and business services. Suppliers benefit from reduced transport costs.

However, clusters require dedicated management teams with a blend of skills and competencies to reconcile the interest of the private and public sector participants. Uyarra and Ramlogan (2012) argue that there is a need for a number of improvements in cluster policy deployment, including the need for policies to improve their clarity and focus in their choice of objectives and rationales to ensure effectiveness of investments.
Cluster policies are generally regarded as an important tool directly aimed at creating growth and innovation. There are no official statistics on cluster type interventions, but some quantitative research have been undertaken through the Global Cluster Initiative Survey, which identified about 500 cluster initiatives, mostly in Europe, North America, Australia and New Zealand (Sölvell et al, 2003). Equally the European Cluster Observatory37, which is supported by the European Commission, conducts a mapping of clusters in Europe and provides access to statistical information, analysis and information on cluster policy. The European Cluster Observatory had in 2013 identified more than 2,000 regional clusters in the EU (EC, 2013).

Similar to SMEs, Clusters are seen to have a lifecycle consisting of embryonic, growth, maturity and decay stages (Rosenfeld 2002, Swann et al, 1998). Building on the lifecycle concept, Hospers et al (2008) observe that the origin of clusters is institutionalised in past economic activities and structures and that, within clusters, competitive advantages in declining sectors can be transformed over time or recombined with other strengths to exploit emergent niches and new market trends.

There are no major or clear-cut trends in either cluster policy nor on evaluations pertaining to cluster policies and deployment. Instead cluster policy rationales stem from the desire to capture known cluster benefits (e.g. knowledge spillovers, skills and tacit knowledge, supply chains, and other public goods effects). Some cluster policies are designed to gain, foreign direct investment. Cluster policies are also deployed to combat market failures associated with underinvestment in knowledge and technology. It is in this case that systemic failures stem from the fact that innovation comes about from the interaction between the different agents, and failures arise where those connections between actors are poor or not sufficiently conducive to knowledge generation. Cluster policies can also be justified by reference to perceived governmental failures (institutional lag in certain regions or poor performance of current programmes) and it is often expected that cluster policies will address these failures (Uyarra and Ramlogan, 2012).

Indeed, Uyarra and Ramlogan (2012) argue for a number of improvements in cluster policy deployment, including the need for policies to improve their clarity and focus in their choice of objectives and rationales, the need to allow for evaluation early on in the process, the use of flexible and adapted interventions that are realistic rather than a rigid cluster model and a more careful targeting and a better balance between a hands-off approach and direct steering of clusters.

Uyarra and Ramlogan (2012) have also usefully summarised some key observations emerging from cluster studies:

There is a general finding that cluster policies provide the resources and framework to advance the innovation potential of different interest groups.

In terms of the governance, early private sector involvement is important to secure market-oriented strategies in the targeted clusters.

Clusters require dedicated management teams with a blend of skills and competencies to reconcile the interest of the private and public sector participants.

37 http://ec.europa.eu/enterprise/initiatives/cluster/observatory/index_en.htm
The provision of support services within clusters is an important element for generating long-terms benefits for cluster participants.

Public sector cluster investments have been successful in leveraging private funding but this seems to be contingent on the nature of the cluster. High technology clusters appear to be better placed than more traditional industry clusters in attracting private sector funding.

**Support to access to ICT**

SME access to ICT can be an important kind of support with the potential of creating synergies along with other support measures. Improved ICT facilitates can have an amplifying effect in improving not only technical capabilities but also SMEs performance at large, in particular productivity. According to Barba-Sánchez et al (2007) ICT have a valuable potential for developing SMEs through more effective use and better integration of ICT in business processes while assisting them to make more efficient decisions relevant to their performance. Lopez-Nicolas and Soto-Acosta (2010) showed that, based on a sample of around 300 Spanish SMEs, ICT has a significant positive influence on key processes for creating knowledge. ICT support instruments therefore have the potential to generate a step change among SMEs in a way which facilitates competitiveness, innovation and economic growth.

ICT applications an also reduce transaction costs and increase the speed and reliability of transactions for both business-to-business and business-to-consumer transactions. In addition, they are effective instruments for helping SMEs to improve their external communications and quality of services for established and new customers. Specific examples, provided via Lopez-Nicolas and Soto-Acosta (2010) include:

- Enhancement of the productivity and effectiveness of certain activities or functions
- A revised innovative adoption of new organisational, strategic and managerial models
- Enabling access to new environments as well as the generation of new markets and business models.
- Improvement of qualification and specialization of human resources, which increases the efficiency and efficacy.

The potential contribution ICT to improving the competitiveness SMEs is long recognised, but the instruments aiming to support access to ICT need to take into account SME heterogeneity. According to Morgan et al (2005) the realisation of this potential has been problematic. One of the range of factors that has been identified as impacting upon the level of ICT adoption amongst SMEs is access to, and confidence in, external specialist advice. Similarly, access to ICT may need to be accompanied by external advice and/or training. Martin and Matlay (2001) suggest that there are a large number of support measures to aid SMEs’ use of ICT. However, they recommend a more discriminant approach, focused upon factors such as firm size, age, managerial structure and information and communications technology adoption stages.
Table 6. Examples of policy instruments and evidence of effectiveness

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<tr>
<th>Policy instrument</th>
<th>Pros (Evidence of positive elements and impacts achieved)</th>
<th>Cons (Evidence of challenges with policy instrument)</th>
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| Support to internationalisation   | **Economies of scale**  
Lloyd-Reason and Mughan (2002) suggest that firms able to access the benefits of international markets, including low cost production facilities, economies of scale in production, distribution marketing and management and able to translate these benefits into lower prices, are able to decimate those enterprises still stuck in their old assumptions about the way in which the business world works. | **Complexities of internationalisation**  
Lloyd-Reason and Mughan (2002) equally warn that international expansion takes the SME into a more complex, volatile and uncertain competitive environment (but which can be offset with the proper use of market and strategic intelligence).  
Spring Singapore underlines that internationalisation barriers as being internal and external where the former referred to the lack of organisational resources, capabilities and management approach, while the latter referred to business environments of the current and potential overseas markets.  
Lis et al (2012) list one major challenge of going international is to keep control of the activities, especially when having deployed a local management team that does not necessarily know the companies’ and the founders’ culture. | Lloyd-Reason and Mughan (2002)  
Uyarra and Ramlogan (2012) (Compendium of Evidence on the Effectiveness of Innovation Policy Intervention)  
OECD (2009)  
Lis et al (2012)  
Spring Singapore (2011)  
Fernández and Nieto (2006)  
Autio et al (2007)  
Brown et al (2014)  
Audretsch (2015) |
|                                  | **Globalisation forces competition**  
Up to 30% of European SMEs have had some sort of international business activities over the last few years and there are business support services that specialise in supporting SME internationalisation outside of the single market. Domestic markets are no longer the preserve of indigenous companies since the latter are under attack from overseas competitors. SMEs are not immune from this impact of the internationalisation of markets and are in turn faced with the need for a strategic response. | **Heterogeneity of SMEs**  
Fernández and Nieto (2006) conclude that different types of ownership affect firms, and this in turn will influence the internationalisation strategy adopted. Their results show that internationalisation is negatively related to family ownership and positively related to corporate ownership. | |
|                                  | **Supporting high-growth firms support employment and growth**  
Autio et al (2007) point out that several empirical studies confirm the importance of high-growth firms for job creation and economic growth. In order to promote economic growth, new jobs and new growing firms who actually generate employment, are needed. | **Support to internationalisation requires good coordination**  
Spring Singapore raise a number of key issues needed to be taken into account when supporting internationalisation  
- Financing-related challenges pose the foremost threat to firms who wish to internationalise  
- Effective utilisation of ICT is a major internationalisation enabler  
- Aspiring and active SMEs require differing areas of assistance  
- Internationalisation requires the pooling of | |
|                                  | **Promotes innovative niche strategies**  
Simon, Hermann (1996, 2009) and Audretsch (2015) point out that by identifying and pursuing opportunities outside of the home country, European SMEs are able to develop and sustain an innovative advantage in product niches in global markets. The “Hidden Champions” identified across the EU and elsewhere dominate their product niches through a strategy involving product quality and innovation. | | |

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<td>Support to R&amp;D projects</td>
<td><strong>Effective policy instrument to use for targeted interventions</strong>&lt;br&gt;• According to the Cunningham et al review, a key benefit of direct R&amp;D grants is that they may be targeted at specific areas where government intervention may make a direct difference (supporting a key sector or type of business for example).&lt;br&gt;• However, direct grants are more effective if delivered in tandem with other complementary set of services and support (e.g. advice or networking opportunities).&lt;br&gt;• Czanitzki and Hottenrott, (2011) point out that SMEs confronted by financing constraints which policy can help alleviate</td>
<td><strong>R&amp;D Projects mostly undertaken by large enterprises</strong>&lt;br&gt;• SMEs do not undertake a high share of R&amp;D, rather R&amp;D is mostly undertaken by large companies&lt;br&gt;<strong>Expected effects based on the linear model of innovation</strong>&lt;br&gt;• The rationale for the provision of direct support for R&amp;D is largely based on the linear model of innovation (i.e. the assumption that R&amp;D conducted within firms will, directly or indirectly stimulate innovation that leads to the production of new marketable products, processes or service) and which is not universally accepted as a complete picture.</td>
<td>Cunningham and Gök (2012) (Compendium of Evidence on the Effectiveness of Innovation Policy Intervention) Wilson (2012) O’Kane (2008) Cunningham et al (2013) (Compendium of Evidence on the Effectiveness of Innovation Policy Intervention)</td>
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<td><strong>Partnerships between SMEs and research organisations lead to positive impacts of firms’ R&amp;D</strong>&lt;br&gt;• SMEs collaborate with universities in order to access leading edge research knowledge, research infrastructures or research services, to develop in-house capabilities or to identify potential future employees.&lt;br&gt;• Cunningham and Gök’s evidence review on policies to support collaboration for R&amp;D and Innovation found that SMEs receive a number of benefits:&lt;br&gt;  o saving transaction costs where there are incomplete contracts&lt;br&gt;  o attaining economies of scale and scope&lt;br&gt;  o using networks as a way to increase synergy, efficiency and power&lt;br&gt;  o accessing complementary resources to exploit firms’ own resources and learning from partners, which in turn create new capabilities and enhance competitiveness&lt;br&gt;  o creating and exploiting high risk high opportunity situations&lt;br&gt;  o decreasing R&amp;D costs by pooling risks and co-opting competition.</td>
<td><strong>Policy instrument is not sufficient in its own right/may have the wrong focus</strong>&lt;br&gt;• Direct grants, including for R&amp;D, are less effective in supporting broad policy concerns (e.g. structural challenges). Cunningham et al suggest that instruments such as fiscal incentives may be more appropriate in facilitating a broader support mechanism.&lt;br&gt;• Kaufmann and Tödtling (2002) found that some Austrian support for SME R&amp;D is miss-targeted as it overlooks certain characteristics of SMEs. For example the financial support neglects the commercialisation of R&amp;D. Support is also bias towards, high-technology projects, while less technologically advanced or innovative firms lack adequate support.&lt;br&gt;• Unless the policy instrument requires collaboration SMEs risk lacking interaction with knowledge providers from outside the business sector (e.g., universities).&lt;br&gt;• The Austrian study also found that there is a lack of proactive consultancy concerning strategic, knowledge and networks</td>
<td>Kaufmann and Tödtling (2002) European Commission Czanitzki and Hottenrott, (2011)</td>
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| Support to start-up and spin off | **Support to start ups in the form of networking show positive effects**  
- In the UK, the One North East Programme aimed to increase the number of business start-ups, their survival and their growth through large events and conferences, where there might be inspirational and high profile speakers, including SME and student conferences, dinners, smaller meetings, and mentoring activities. The evaluation of the Programme reported high levels of additionality from the activities undertaken. | **organisational, and technological weaknesses, which is necessary because often the SMEs are not aware of such deficiencies.**  
**Collaborative R&D projects requires strong management and clear objectives**  
- The policy instrument often requires a more sophisticated policy design in order to optimise the full range of potential benefits arising from collaborations.  
- Programme managers must be in a position to be able to adjust the underlying rationale and objectives of a collaborative programme according to participants' interests in activities, and throughout the course of its development.  
- According to Cunningham and Gök it can be difficult to identify the types of outcome and impact that arise from a collaborative relationship in the absence of counterfactual examples or benchmarks established prior to the formation of the collaborations.  
**A great variety in types of start up and spin off support give mixed results**  
- Ramlogan and Rigby's (2012) evidence review show that overall, some schemes find positive impacts in terms of sales, employment and survival while in others impacts were statistically insignificant. The schemes offering support to pre start-up entrepreneurs again varied in outcome. In the short term, all schemes increased employment; however, schemes do not tend to show persistence of employment effects at 5 years.  
- Shane (2008) would prioritise supporting existing firms to creating new ones, which may be supported under artificial or misleading policy objectives and with a low chance of longer-term survival. It is more effective to focus on existing, surviving firms.  
**Spin-offs policies have seen periods of over-buoyancy**  
- The success of spin-off policies (e.g. at the MIT in the US) have led to high expectations of the policy instrument yet a more recent realisation has led to a more balanced appreciation of the support, which are less focused on creating new firms but also realise the | [Ramboll (2010)](Compendium of Evidence on the Effectiveness of Innovation Policy Intervention), [CSES (2002)](Compendium of Evidence on the Effectiveness of Innovation Policy Intervention), [Shane (2008)](Compendium of Evidence on the Effectiveness of Innovation Policy Intervention), [Minshall and Bill Wicksteed (2005)](Compendium of Evidence on the Effectiveness of Innovation Policy Intervention), [Eckl et al (2009)](Compendium of Evidence on the Effectiveness of Innovation Policy Intervention), [Brown et al (2014)](Compendium of Evidence on the Effectiveness of Innovation Policy Intervention) |
| **Spin-offs policies support the knowledge economy**  
- If successful, spin-off companies (stemming from e.g. universities and research organisations) tend to need be innovative and require high-skilled staff | **Incubators accelerate the creation of new firms**  
- The primary added value of business incubation is to accelerate the start-up of new businesses and helping to maximise their growth potential in a way that is more difficult for alternative SME support structures to achieve. | |
| **Incubators accelerate the creation of new firms**  
- The primary added value of business incubation is to accelerate the start-up of new businesses and helping to maximise their growth potential in a way that is more difficult for alternative SME support structures to achieve. | | |

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<td>Incubators are cost-effective policy instrument</td>
<td>• Business incubators are a very cost-effective instrument (CSES, 2002).</td>
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<td><strong>Longer time lag between deployment of incubators and effect (weak causal link)</strong></td>
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<td>• The 2010 Ramboll ERDF evaluation suggests that there is a longer time lag between effects of business incubators, in particular in terms of job creation, compared with other types of interventions. This can be due to the fact that the causal link between making premises available and the creation of jobs can be quite weak.</td>
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<td>• According to Ramboll (2010), a causal link can be found between the use of incubators and employment, but it is not very common.</td>
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<td>• Empirical evidence in business start-up support is very rare. E.g. Cueto and Meager (1996) and Mato (2006).</td>
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<td><strong>Supporting new firms is less effective than supporting existing ones</strong></td>
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<td>• According to Shane (2008) encouraging start-ups in general is poor public policy as there is no evidence that people create too few or the wrong businesses in the absence of government intervention. Moreover, there is evidence that these policies lead to start ups of marginal businesses that are likely to fail, have little economic impact, and generate little employment.</td>
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<td>• There is no evidence that new firm formation causes economic growth; rather, economic growth probably causes people to start businesses.</td>
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<td>Network support to facilitate innovation</td>
<td><strong>Network support to facilitate innovation increase skills</strong></td>
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<td>• According to Cunningham and Ramlogan's (2012) evidence review networks can have very positive effects on the stimulation of learning processes and the enhancement of skills levels. Policy instruments that facilitate innovation networks are often successful in achieving their broad objectives, while also being a low-cost intervention.</td>
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<td>• Networks facilitate the transfer and spillover of knowledge and ideas from sources to SMEs</td>
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<td><strong>Innovation vouchers are simple to administer</strong></td>
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<td>Support to innovation</td>
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<td>Networks are highly idiosyncratic</td>
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<td>• Cunningham and Ramlogan (2012) also point out that as a result of the diversity and the complexity of various network forms, there is little evidence to explain which forms of network most contribute to innovation or, indeed, whether networks do and, precisely how, lead to innovation. They can therefore be difficult to get right.</td>
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<td>Innovation vouchers may only provide short-term benefits for SMEs (and few benefits for HEIs)</td>
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<td>• According to the OECD, the most serious concern is that Uyarrara and Ramlogan (2012) (Compendium of Evidence on the Effectiveness of Innovation Policy Intervention) Cunningham and Ramlogan (2012) (Compendium of Evidence on the</td>
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<td>Innovation vouchers</td>
<td>Innovation vouchers are simple and low-cost instruments to deploy.</td>
<td>Vouchers only facilitate one-off and subsidised industry-university co-operation, leaving unaltered the long-term attitude of SMEs towards innovation. Furthermore, if the scheme provides for the knowledge institution to be from the same country or region of the firm, this can limit the search patterns of SMEs and its ability to find an effective solution to its technological problems.</td>
<td>Effectiveness of Innovation Policy Intervention) Langlois and Robertson (1996) Porter (1998) Pitelis et al., (2006) OECD (2010)</td>
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<td>Innovation vouchers are efficient in brokering relationships between SMEs and HEIs</td>
<td>Innovation vouchers can support both SMEs as well as support the development of links and interaction with HEIs.</td>
<td>In some experiences the brokering role of the HEI has been assigned to a specific university. However, this practice is likely to cause potential conflicts of interest and be too heavy a burden on the university management.</td>
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<td>Clusters support innovation and growth</td>
<td>Cluster policies are generally regarded as an important tool directly aimed at creating growth and innovation in SMEs. Technological externalities can also favourably arise through shared technological information and knowledge spillovers.</td>
<td>Cluster instruments requires strong management and clear objectives</td>
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<td>Cluster support is likely to lead to wider regional impacts</td>
<td>The advantages of geographical proximity are linked to e.g. specialised labour markets, input suppliers and knowledge spillovers, facilitating innovation and productivity benefits. There are supply side advantages with intermediate industries providing downstream firms with local access to e.g. specialised materials and components, finance, marketing and business services, while the suppliers benefit from reduced transport costs. Porter (1998) sees a number of additional advantages associated with clusters, namely the presence of demanding customers, greater rivalry and complementarities in products and technologies.</td>
<td>Uyarra and Ramlogan (2012) argue for a number of improvements in cluster policy deployment, including the need for policies to improve their clarity and focus in their choice of objectives and rationales to ensure effectiveness of investments. Clusters require dedicated management teams with a blend of skills and competencies to reconcile the interest of the private and public sector participants.</td>
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<td>High tech clusters more beneficial than traditional industry clusters</td>
<td>Public sector cluster investments have been successful in leveraging private funding but this seems to be contingent on the nature of the cluster. High technology clusters appear to be better placed than more traditional industry clusters in attracting private sector funding.</td>
<td>Uyarra and Ramlogan (2012) (Compendium of Evidence on the Effectiveness of Innovation Policy Intervention) KPMG and ENSR (2003) Harris and Trainor</td>
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<tr>
<td>Access to finance</td>
<td>Access to finance is a basic need for SMEs</td>
<td>Contradictory evidence on effectiveness</td>
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<tr>
<td>It is broadly recognised that SMEs have difficulties in accessing finance and have to pay more than their larger counterparts (EIB, OECD 2015) Empirical research analysed by CSES (2011) shows that access to finance is still one of the major constraints SMEs. As a concrete example, access to credit through the EU's Entrepreneurship and Innovation Programme has been assessed to have made a significant consideration in the current difficult circumstances for SMEs. About two thirds of the beneficiaries of High Growth and Innovative SME facility, set up under the EIP, indicated that they would not have set up the business or made a particular investment</td>
<td>There is, according to Ramlogan and Rigby's (2012) evidence review limited evidence on innovation related results from financial instrument support to SMEs.</td>
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<tr>
<td>Contradictory evidence on effectiveness of general support</td>
<td>There are many studies which find zero or even negative evidence of firm-level investment support. Bergström (2000) finds no significant effect of</td>
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<tr>
<td>Policy instrument</td>
<td>Pros (Evidence of positive elements and impacts achieved)</td>
<td>Cons (Evidence of challenges with policy instrument)</td>
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<td><strong>Access to finance may contribute to SME innovation</strong></td>
<td>without the financial support received.</td>
<td>firm-level investment support on total factor productivity in Sweden. o Harris and Robinson (2004) find that firm-level investment support in the UK had no effect on productivity by comparing the supported firms to similar firms within the supported area.</td>
<td>OECD (2015) EIB (2015) Brandsma et al (2011) CSES (2011)</td>
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<tr>
<td><strong>Support for improving capacities</strong></td>
<td><strong>Tailored advice to firm support growth and employment creation</strong></td>
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<td>Ramboll, 2010 suggests that tailored assistance to enterprises is particularly effective, in particular in creating jobs and increasing turnover of supported firms. Mole et al (2008) found that support services which took into account market segmentation allowed for more intensive assistance to be targeted on younger firms and those with limited liability status. This in turn led to positive and significant employment growth effects. Ramboll 2010 also noted that providing a range of business support services, notably combining information and advice with grants and the use of grants, was perceived to be an important explanatory factor of job creation.</td>
<td></td>
<td>Ramboll (2010) Mole et al (2008) Shapira and Youtie (2013) (Compendium of Evidence on the Effectiveness of Innovation Policy Intervention) EIM Business &amp; Policy Research et al (2011) Jones and Grimshaw (2012) (Compendium of Evidence on the Effectiveness of Innovation Policy Intervention) CSES (2011)</td>
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<td><strong>Support services lead to more effective and efficient firm operations</strong></td>
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<td>According to Shapira and Youtie’s evidence review innovation support services provide positive – albeit relatively modest – benefits for participating firms: reductions in costs, improved quality, reduced waste and improved environmental performance, higher productivity, and new product development and innovation. As a concrete example, an evaluation of the EU’s Entrepreneurship and Innovation Programme (EIP) indicated that the Community programme for the reduction of administrative costs, supported under the EIP, is expected to lead to a reduction in administrative burdens for European businesses valued at € 40.7 billion.</td>
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<td></td>
<td><strong>Training strengthens SME innovation and management</strong></td>
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<td>Jones and Grimshaw (2012) point out that there appears to be a positive association between innovative firms and the level of expenditures on formal and informal training compared to non-innovative firms. Secondly, firms benefit from a significant positive effect by</td>
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(2005) KPMG and ENSR, 2003 say there are important links between the use of financial instruments and innovation, as these are instruments that are generally deployed to support niche SMEs, such as start-ups, innovation or technologically-oriented enterprises, or female entrepreneurship.

Harris and Robinson (2004) find that firm-level investment support in the UK had no effect on productivity by comparing the supported firms to similar firms within the supported area.

Ramboll, 2010 suggests that tailored assistance to enterprises is particularly effective, in particular in creating jobs and increasing turnover of supported firms.

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Policy interventions face a number of challenges as training and skills policies are usually part of a wider policy effort that seeks to improve economic growth and employment participation. According to Jones and Grimshaw (2012), although linkages between skills and innovation can be identified in principle, the mechanisms through which they interact in the real-world economy remain somewhat opaque.
<table>
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<tr>
<th><strong>Policy instrument</strong></th>
<th><strong>Pros (Evidence of positive elements and impacts achieved)</strong></th>
<th><strong>Cons (Evidence of challenges with policy instrument)</strong></th>
<th><strong>Sources</strong></th>
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<td>developing their ‘knowledge pool’, particularly with respect to the organisation’s legacy of past innovations and the technical competences of SME owner-managers.</td>
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<td>Support to access to ICT</td>
<td><strong>Access to ICT can create synergies</strong>&lt;br&gt;• Improved ICT facilitates can have an amplifying effect in improving not only technical capabilities but also SMEs performance at large, in particular productivity. According to Barba-Sánchez et al (2007) ICT have a valuable potential for developing SMES through more effective use and better integration of ICTs in business processes while assisting them to make more efficient decisions relevant to their performance. ICTs have the potential to generate a step change among SMEs and make them more competitive, innovative and generate growth.&lt;br&gt;• Lopez-Nicolas and Soto-Acosta (2010) showed that, based on a sample of around 300 Spanish SMEs, that ICT has a significant positive influence on key processes for creating knowledge.&lt;br&gt;• ICT applications can contribute to improve information and knowledge management inside the SME, reduce transaction costs and increase the speed and reliability of transactions for both business-to-business and business-to-consumer transactions. In addition, they are effective tools for improving external communications and quality of services for established and new customers. Specific examples, provided courtesy of Lopez-Nicolas and Soto-Acosta (2010) include:&lt;br&gt;  o Enhancement of the productivity and effectiveness of certain activities or functions&lt;br&gt;  o A revised innovative adoption of new organisational, strategic and managerial models&lt;br&gt;  o Enabling access to new environments as well as the generation of new markets and business models.&lt;br&gt;  o Improvement of qualification and specialization of human resources, which increases the efficiency and efficacy.</td>
<td><strong>Access to ICT need to take into account SME heterogeneity</strong>&lt;br&gt;• The potential contribution ICT to improving the competitiveness SMEs is long recognised. However, according to Morgan et al (2005) the realisation of this potential has been problematic. One of the range of factors that has been identified as impacting upon the level of ICT adoption amongst SMEs is access to, and confidence in, external specialist advice.</td>
<td>Morgan et al (2005)&lt;br&gt;COST (2010)&lt;br&gt;Martin and Matlay (2001)&lt;br&gt;Cela (2005), Brady et al (2002), Johnston and Lawrence, (1998; Kahn (1996, 2001), Corbitt (2000) Javalgi and Ramsey (2001), Vilaseca, (2003) all via Lopez-Nicolas and Soto-Acosta (2010)</td>
</tr>
<tr>
<td>Capital investment</td>
<td><strong>Firms’ productivity also relies on adequate capital investment</strong>&lt;br&gt;• Although investment in innovation and intangible assets (competence, education and R&amp;D) is becoming increasingly important, one cannot overlook the complementary role of more traditional gross fixed capital formation. Both types of investment are needed. For example, high-quality infrastructure investments contribute to cost reductions and productivity increases, but they can also provide indirect support by facilitating, e.g. labour market flexibility and make SMEs more competitive.</td>
<td><strong>Gross fixed capital formation in the EU remains weak</strong>&lt;br&gt;• However, a very recent (2015) report by the EIB on Investment and Investment Finance in Europe indicates that gross fixed capital formation in the EU remains weak. The EIB provides a warning in this regard saying that given the fast pace of technological change, low levels of investment can lead to an unwarranted decline in productivity which can be difficult cycle to break.</td>
<td>EIB (2015)&lt;br&gt;OCCD (2015)</td>
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**Interaction between policy instruments and the wider policy mix**

Some explicit consideration should be given to the factors determining the efficiency of interactions between different policy instruments. This is useful when looking within Operational Programmes (Task 1), but also and especially when looking at the broader policy mix within which Operational Programmes are implemented (Task 3).

The idea of policy interaction (or policy mix) recognises that policy interventions are deployed in an already busy (and interacting) environment, which includes other policy interventions. The latter may be part of a portfolio which targets a specific group, technology, sector or societal challenge. Policy mixes also need to consider pre-existing policy paradigms and traditional preferences of national, regional and local actors. As a consequence of this interaction, **policymakers – when designing and deploying new activities – are affected by the interventions that already exist**. New policies deployed can in turn e.g. counteract or enhance existing instruments. In conclusion – a policy mix is not the outcome of one policy actor, but is the result of a multitude of actors from different policy positions that all have influence on a given space (geographical or sectoral).

Policy change (or a lack of change) can also be analysed in the light of path dependence, which is a concept arguing that new developments are significantly determined by what has happened in the past. Generally, existing institutional arrangements are important determinants of what is possible, but it is also often difficult to change policies because policy making institutions are ‘sticky’, and actors tend to protect whatever existing model is in place – regardless of its effectiveness. This implies that once an institution, region or country has implemented one policy, reversal costs are high (Cerna, 2013).

Although policy interaction is a very interesting concept, recent key literature indicates ‘the interplay of policies and instruments, as well as the deliberate design of policy mixes and portfolios of interventions, has received surprisingly little practical and theoretical attention so far’ (Cunningham et al, 2013).

What the literature can tell us is that policy interaction can take a number of forms and that this interaction is typologised in different ways.

For example, Gunningham and Sinclair (1999) derive four classes of interaction in an (innovation) instrument mix: instruments that are inherently incompatible; instruments that are inherently complementary; instruments that are complementary if sequenced in a particular way; and instruments whose complementarity or otherwise is essentially context-specific.

Bressers and O’Toole (2005) identify five classes of interaction between science policy instruments in a policy mix, depending on the actors or groups, processes targeted by policy, on the one hand, and the interdependence between different domains of policy action, on the other.

Other literature aims to conceptualise policy mixes. The OECD (2010), Flanagan et al. (2011) and most recently Borràs and Edquist (2013) are predominantly preoccupied with providing a prescriptive model of how innovation policy mixes can or should be designed. Flanagan et al (2010, 2011) aim to establish a basis for better understanding the evolution of actual policy mixes as a precondition for any evaluative or prescriptive efforts.

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38 For example the Manchester innovation compendium

Cunningham et al continue with these typologies. They summarise and synthesise the key elements of these three approaches and suggest the typology outlined below.

Table 7. Policy instrument blends or mixes

| Increased intensity of policy intervention | Multiple instruments targeting a specific actor or group of actors |
| Integration of multiple instruments into one interactive process between government and target groups | Multiple instruments targeting different actors/actor groups involved in the same process |
| Instruments and actions at different levels of governance | Interactions between instruments and actions taken at different levels of multi-level governance |
| Competition and co-operation between different but interdependent policy fields | Interaction and tensions across policy areas/domains |
| Mutual strengthening or weakening of the effects of interventions at different points of action in the broader system | Interaction mediated through processes in a broader system |

Source: Authors’ elaboration based on Cunningham et al (2013).

Having undertaken an evidence review of EU country R&D interaction, Cunningham et al conclude that EU countries are not concerned with policy mixes in the design of their policies. Instead, the strength of path dependency and ‘national preferences’ in terms of the types of instruments selected is identified as the main driver. The only convergence the review could identify was in the search for simplification in the handling of policy at central government through the process of centralisation. The review could not, however, establish any impact from this on target groups or the system as such (Cunningham et al 2013). What can however be shown empirically is that Structural Fund recipient countries (as well as Norway) tackle regional disparities with differentiated policy mixes.40

Recent empirical reports (Walendowski et al, 2014) analysing policy instruments aiming to support innovation suggest that EU regions with a significant amount of experience in policy design and implementation are strengthening their leadership in setting new policy trends, while progress in establishing synergies with national policies varies to a large extent. Overall European regions are making attempts to achieve a better balance and to combine horizontal and (cross-) sectoral approaches.

Policy interplay between direct and indirect support to business R&D is an acknowledged important issue. Direct financial support targeted to SMEs, is more fruitful if it is

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40 For example, in a study that grouped together policy mix challenges, the European Policies Research Centre identified six broad categories of policy mix deployment (2010): 1) Member States where regional disparities are considered to be relatively limited, particularly in comparison to other EU countries, and this is not seen to justify major regionally targeted interventions; instead, an all-region approach to regional policy is generally adopted (Austria, Denmark, Ireland, Luxembourg and the Netherlands), 2) Member States where there are perceived to be differentiated regional problems, which call for fine-tuned policy responses, often at the sub-regional level (Belgium, France, and the United Kingdom), 3) Member States and European countries with sparsely populated regions – and certain areas facing problems of structural adjustment – (Finland, Sweden and Norway) continue to be acknowledged by targeted policy measures, although a competitiveness-oriented focus on all regions has gradually moved centre stage, particularly in Finland and Sweden, 4) Member States where severe internal regional differences remain between east-west or south-north, and where these continue to lie at the heart of policy (Germany and Italy), 5) Member States where despite significant internal disparities and some new analyses of the regional problem the main concern is enhancing national development (Greece, Portugal and Spain), 6) Member States where internal disparities are marked (particularly between capital city and lagging regions often along eastern borders) and there is generally also a major development gap with the rest of the EU. In these countries, too, the policy stress is on national development (Poland and most of the remaining EU12) (European Policies Research Centre, 2010).
complemented by non-financial support both for internal management and for market access. Yet the mechanisms of interplay between financial and non-financial support are still unknown (or are not closely examined in evaluation literature). Equally, there is little econometric analysis available. The evidence there tends to conclude that there is a significant level of complementarity, especially for small firms. According to the Cunningham et al review, there is some evidence that loosely targeted instruments such as tax credits are more useful in supporting firms to develop their product range (predominantly incremental innovations), while targeted support tends to focus on new technologies and is as such more closely linked to radical innovations. The balance between direct and indirect R&D support is thus dependent on specific factors, stemming from the target group(s) and the particular circumstance in which they operate (Cunningham et al, 2013).

There is little evidence on the interplay between supply and demand driven instruments. Cunningham et al only identified one recent study that attempts to analyse complementarities between direct R&D supports and innovation procurement. The results are very positive for public intervention in general in that there seems to be a positive effect on innovation input and output for both the supply side and for innovation procurement. However, there is an overall lack of evidence and this interplay remains mostly a theoretical possibility.

Looking at innovation processes as a whole, there is an interest from policymakers in ‘building a portfolio of instruments that covers the spectrum of stages of an innovation process (regardless of whether one adopts a linear or a network model of innovation). Cunningham et al argue that the policy mix can be identified as a portfolio ‘because instruments are more efficient if they are specialised to focus each on one stage’. One crucial element is the development of the interplay between demand and supply measures in the so-called ‘technological space over time’. That is, the focus shifts over time between specific demand side measures and supply side measures, in tandem with the emergence of a new generation of technologies that require further R&D investment before a growing demand can facilitate further marketisation.

Overall then, the review of literature on specific SME and innovation support instruments has highlighted an additional series of considerations that need to be taken into account in looking at how these instruments contribute to enhancing the performance of SMEs. These are over and above those that apply to the characterisation of support instruments generally. Some of these considerations are particular to the specific instrument being analysed, but there are also some additional more general themes highlighted. With regard to the services of business support agencies for instance, the institutional arrangements that a region inherits can make a significant difference, both in terms of what is there to build on and also in shaping the path dependency of intended developments. Similarly, the relative advantages of different forms of financial instrument, the importance of the structuring of relationships in clusters and in co-operation between enterprises and research institutes and the interaction and mutual support arising in the design of a set of instruments are other factors to take into account.

This conclusion appears to indicate that a set of policies (a policy mix) is needed to truly make SME innovation support effective.

### 3.4 Main findings from the literature review

In conformity with the realist approach underlying the development of the evaluation, the literature helps identify lines of enquiry but cannot provide a high level theory of
enterprise predicting causal relations between policy stimuli and outcomes. The following main findings can be highlighted:

- The increasing importance of knowledge content of production as competitive advantage further deepens the heterogeneity of SMEs discriminating between high growth SMEs and other SMEs whose development path is hampered by obstacles traditionally linked to their small size.

- The literature acknowledges the role of entrepreneurship as an important variable determining the performance of SMEs in particular. Managerial capacity is one factor contributing to the mechanisms thereby policy stimuli affect SMEs behaviour and performance.

- Different market and system failures justify policy intervention in favour of SMEs. It is useful to distinguish between failures hampering SME growth and failures hampering SME innovation.

- There is a long list of policy instruments available to policy makers which advantages and inconvenient depend on the objective pursued, and the context in which they are implemented. Strategic decisions on which instrument to select can be done on the basis of possible alternatives, including: direct (grants) vs indirect (business service support, incubators) support, aid vs repayable support (loans, equity finance), individual vs collective (e.g. collaborative R&D projects, clusters) support, single instrument vs integrated package of instruments.

- There is a series of specific lessons on these policy instruments that can be learnt from practical experience. Giving just one example, direct financial support to SMEs is more fruitful if it is complemented by non-financial support both for internal management and for market access. There is a range of evaluative and analytical literature providing evidence of the level of effectiveness of different policy instruments, also indicating regional or sectoral conditions which are likely to strengthen or weaken effectiveness.

- Among broad conditions of effectiveness, firm capacity is particularly important. The literature repeatedly confirms the need to distinguish between high growth and other SMEs and calls for effective explicit targeting.

- Institutional setting and implementation arrangements form a second group of conditions of effectiveness. In particular, the presence of intermediaries – which form and function are to a high extent ascribable to the specific institutional context – may be decisive inasmuch as it brings about a close relationship between providers of funds and beneficiaries.

- Also, much depends on the effectiveness of the policy mix within which specific policy instruments are embedded. For example, the way that the regions and national governments take steps to stimulate innovation and growth from the demand-side are beginning to become an element in the overall package.
ANALYSIS OF 50 OPERATIONAL PROGRAMMES

A key activity of Task 1 was the in-depth analysis of 50 Operational Programmes (OPs) and a comprehensive mapping and assessment of the policy instruments selected by MAs to address SMEs' innovation and development. The first section describes the sample OPs and illustrates some avenues of analysis suggested by the review of the relevant evidence on types of expenditures and achievements that is already available and is held by the European Commission. The core of the chapter then consists of the presentation of the results of the comparative analysis of the OPs' contribution to SME development and innovation at a policy instruments level. In particular, we concentrate on the characteristics of the policy instruments mobilised in these OPs and those of the beneficiary SMEs, set out the logic of intervention and discuss the evidence of achievement relating to the identified instruments. A more detailed analysis of each OP is contained in Volume II.

4.1 The 50 OPs under examination

A total of 50 OPs were indicated in the Terms of Reference as those representing 62% of the amounts committed in the categories of expenditure concerning support to SMEs (WP2 codes hereafter). To better understand the scope and relevant dimensions of analysis we present in this section some considerations emerging from the already existing data and information available in a series of official databases (i.e. Eurostat, DG Regio database of ERDF raw data, DG Regio database of OP reprogramming, State Aid Scoreboard and a database of indicators made available by Work Package Zero – Ex-post evaluation of EU Cohesion Policy 2007-2013). They raise the following points:

- Since the areas covered by the 50 OPs are heterogeneous ranging from large country to small region with different socio-economic and industrial performances, as well as large differences in the number of SMEs and their distribution by size class, an in-depth understanding of the characteristics of the specific context influencing the policy mix and its effectiveness is a necessary starting point for the assessment of the OPs;

- The significance of ERDF for WP2 themes both in terms of volume and as a share of total expenditure is a relevant consideration influencing the possible strategies adopted by the OPs and helping to determine the understanding of the role of ERDF: while in some regions and territories it is marginal in others it plays a crucial role in mobilising a critical mass of financial resources;

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41 'Codes of expenditure' or 'categories of expenditure' or 'WP2 codes' or 'WP2 priority themes' are terms used interchangeably throughout this report. They are: 03 Technology transfer and improvement of cooperation networks; 04 Assistance to R&TD, particularly in SMEs (including access to R&TD services in research centres); 05 Advanced support services for firms and groups of firms; 06 Assistance to SMEs for the promotion of environmentally-friendly products and production processes (...); 07 Investment in firms directly linked to research and innovation (...); 08 Other investment in firms; 09 Other measures to stimulate research and innovation and entrepreneurship in SMEs; 14 Services and applications for SMEs (e-commerce, education and training, networking, etc.); 15 Other measures for improving access to and efficient use of ICT by SMEs; 68 Support for self-employment and business start-up; 74 Developing human potential in the field of research and innovation, in particular through post-graduate studies. In turn, these codes are grouped under 'priority themes' in the following way: Codes from 3 to 9 under the Priority Theme 'Research and technological development, innovation and entrepreneurship' priority theme; Codes 14 and 15 under 'Information society'; Code 68 under 'Improving access to employment and sustainability'; Code 74 under 'Improving human capital'.
In the same way, the relevance of ERDF in the overall national policy mix addressing SMEs has to be determined since it has an influence in shaping the strategies;

Both aspects have been affected, sometimes significantly, by adjustments through reprogramming: this aspect, which mainly reflects new emerging needs brought about by the economic crisis, is expected to have played a relevant role in reshaping regional and national strategies in support of SMEs;

To better understand the logic of intervention there is the need to move from an expenditure-based to an operations-based level of analysis, getting behind the figures to establish the real processes at work;

The analysis of output and result indicators reported by the Managing Authority for accountability purposes provides a preliminary aggregated indication of a systematic misalignment of achievements in relation to targets set. Whether this is due to delays or poor performance in terms of implementation will be investigated in the analysis of 50 OPs and in the case studies.

While some the aspects mentioned here are already addressed in this analysis of the 50 OPs some other will be better addressed in the case studies.

4.1.1 Geographical coverage and SMEs in numbers

The selected OPs were implemented in 23 Member States during the 2007-2013 period. They include:

- 1 regional OP at NUTS 3\textsuperscript{42} level (Belgium - Hainaut);
- 22 regional OPs at NUTS 2 level;
- 6 regional OPs at NUTS 1 level (in Germany and UK);
- 5 multiregional OPs;
- 16 national OPs, addressing entire countries at NUTS 0 level. This group includes 3 OPs in countries where NUTS 0 and NUTS 2 levels coincide.

\textsuperscript{42} NUTS is the Nomenclature of territorial units for statistics.
The two national Spanish OPs cover the highest number of SMEs, followed by the national Polish OP. Some regional OPs in Southern or Eastern Europe are confronted with especially high proportions of micro-enterprises, while UK or Austrian regional OPs operate in an industrial fabric characterised by higher shares of small to medium enterprises (see the two figures in Annex II). It is interesting to assess the relevance of these distinctive traits when delving into the intervention logics governing single policy instruments or whole Operational Programmes: were these specificities explicitly taken into account when defining the intervention logics?

4.1.2 The ERDF amount in WP2 codes

According to the DG Regio database of ERDF raw data, the total ERDF amount programmed at the end of 2012 in the WP2 codes for the 50 OPs amounts to EUR 34.2 billion, i.e., approximately 59% of the total ERDF allocation on WP2 codes. The following graph presents the ERDF amount programmed in WP2 codes for both the selected 50 OPs (inner circle) and the remaining 388 OPs (outer circle). It is worth noting that the share of ERDF allocated in WP2 codes to total ERDF for the selected 50 OPs (42%) is significantly higher than that allocated by the remaining 388 OPs (9%).

Note: The NUTS codes of areas covered by regional OPs are shown on the map.
Source: CSIL.

Considering the breakdown of the total amount programmed by the ERDF for the 50 OPs by WP2 priority themes, around half of the total ERDF financing under evaluation has been allocated to ‘Investment in firms directly linked to research and innovation’ and to the general label of ‘Other investment in firms’. This is partly explained by the broadness of these two categories. Clearly, a large and varied range of interventions are classified under these two expenditures codes.

On average, each OP allocated 39% of its total budget in the codes under consideration, but there are large variations within the sample. The OPs where the highest share of funding (more than 80%) has been allocated to research, innovation and SME-related fields are the Hungarian OP Economic Development, the Portuguese OP Factors of Competitiveness, the Danish OP Innovation and Knowledge, the Bulgarian OP Development of Competitiveness, and the Austrian OP Burgenland. In absolute terms, the OPs which have invested the most in the relevant priorities are the Polish OP Innovative Economy and the already mentioned Hungarian and Portuguese national programmes.

4.1.3 The relevance of the ERDF in the overall national policy mix

In order to investigate the role of ERDF in regional strategies for SMEs it is necessary to understand whether the significance of ERDF support for SMEs increased as access to finance for SMEs deteriorated across Europe as a result of the financial crisis. The complementarity and the importance of the ERDF within national policy mixes is therefore a starting point to assess the intervention logic of ERDF support to SMEs.

Useful indications come from a comparison of the amount of ERDF allocated in WP2 codes with the amount of State Aid expenditures by Member States for the horizontal objective of common interest “SME including risk capital”. The figure below suggests...
that in some countries such as Portugal, Hungary and Slovenia, the ERDF is basically the only policy instrument for state aid, while in other countries such as France, Belgium and UK the role of national state aid as compared to ERDF support to SMEs is much higher. This suggests that in countries where ERDF is the only (or more relevant) source of funds for industrial policy measures addressed to SMEs, the expected effects are perhaps more ambitious than the ones where ERDF may play a pivotal role in a few selected areas but does not provide a critical mass of funds.

**Figure 23.** ERDF allocation for WP2 themes and State Aid expenditures for “SME” by Member States where the 50 OPs are implemented (Million Euro/GDP)

This picture is broadly confirmed when comparing ERDF allocation in WP2 themes with the main national policies and programmes aiming to facilitate access to finance for SMEs\(^\text{45}\), which mainly consist of loan programmes, equity finance measures and guarantee funds, according to a recent study by DG Enterprise.\(^\text{46}\) In countries such as Estonia, Lithuania and Slovenia, ERDF seems to play a fundamental role in supporting SMEs, while in countries such as Austria, Denmark and the UK, which receive a smaller share of funds in comparison with the new Member States and which, generally have a stronger and much more developed industrial policy, the ERDF seems to play a more marginal role.

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formal decision or received an information fiche from the Member States in relation to measures qualifying for exemption under the General Block Exemption Regulation.

\(^{45}\) Data on policies and programmes to facilitate access to finance for SMEs have been retrieved from a review conducted by Ernst & Young on behalf of the European Commission, DG ENTR, in 2014. However, this review is not an exhaustive presentation of all existing Member State measures to facilitate access to finance.

\(^{46}\) http://ec.europa.eu/enterprise/policies/finance/guide-to-funding/indirect-funding/index_en.htm#maplinks
4.1.4 OP Reprogramming

A general reaction to the global crisis was to strengthen the public support addressing the main barriers hampering SME competitiveness. During the reprogramming in 2012, most of the Managing Authorities reallocated funds within their Operational Programmes in order to better take into account the emerging needs brought about by the crisis. Changes related either to a revision in the total allocation or a change in the co-financing rate\(^48\) (or in some cases both).

According to data made available by DG Regio, only six out of the 50 OPs under consideration (the Danish OP Innovation and Knowledge, the Dutch OP West Netherlands, the Austrian OP Burgenland, the OP Northern Finland, the OP Central Sweden, the Swedish OP Upper Norrland) have made no changes to their programmes (neither in the allocation nor in the co-financing rate). Seven other OPs (the OP Development of the Competitiveness of the Bulgarian Economy, the Czech OP R&D for Innovation, the German OP Brandenburg, the German OP Sachsen, the German OP Sachsen-Anhalt, the Slovak OP R&D, the English OP Yorkshire and Humberside) were not affected by any changes in the total initial allocation (no change in the co-financing rate), but they were subjected to an internal

\(^47\) Ministry of Economic Development (2013).

\(^48\) Usually this meant an increase in the rate which implies a decrease in the national public amount.
reshuffling among the priority axes. According to interviews performed to Managing authorities, this reallocation is essentially motivated by the recognition that some measures are more suitable than others to promote growth, competitiveness and employment, as was required by the adverse economic financial context.

The changes (up or down) in the initial allocation affected 37 OPs, although for some of these OPs the change is only in the co-financing rate, since the community contribution remained constant in absolute terms.49

Figure 25. Changes in the total initial allocation by OPs (2013, EUR)

Note: In this and the following graphs synthetic labels are used for each OP which full description is in Annex II. The figure presents only the reprogramming of OPs which were not affected by any changes in the co-financing rate.

Source: DG Regio database on reprogramming.

In other cases, either an increase or decrease of total allocation, with no change in the co-financing rate, was made. They are illustrated in Figure 26.

49 They are: the Belgian OP Hainaut, the Spanish OPs (Development of Economic Environment, Knowledge-based economy, Andalucía, Castilla y León, Comunidad Valenciana), the French OP Provence-Alpes-Côte d’Azur, the Italian OP Research and Competitiveness, the Italian OP Puglia, and the English OP West Wales and the Valleys.
Figure 26. Changes in the total initial allocation by OPs whose co-financing rate remained unchanged (2013, Eur)

Note: The figure presents only the reprogramming of OPs which were not affected by any changes in the co-financing rate.
Source: CSIL elaboration of DG Regio database on reprogramming.

4.1.5 Available achievement Indicators

Structured and validated information on achievements in the 50 OPs is available from the activities carried out within the Work Package Zero (WP0) – Ex-post evaluation of EU Cohesion Policy 2007-2013. However, reflecting the specificities of territorial strategies and reporting systems, the type and availability of relevant indicators greatly varies among the selected OPs. Moreover, the target setting exercise was not as rigorous as expected, therefore such data should be taken with care. The quality of the monitoring systems and the accuracy in the target setting will be further explored in the case studies. Yet, an analysis of available achievement indicators provides some relevant hints on the challenges of monitoring and evaluating the effectiveness of SMEs support.

Three main categories of indicator (including the respective targets) are available for the 50 OPs at programme or axis priority level and have been reviewed in WP0, i.e. Core Indicators, Future Indicators and Specific Indicators. Among Core Indicators, seven are linked to SME growth and innovation (three of them are specifically related to direct investment aid to SMEs), while an additional five indicators are relevant in selected cases for specific OPs or measures (for example the number of jobs in tourism can be relevant if some OPs have dedicated measures for SMEs in the tourism sector). Not all indicators are available for all 50 OPs from WP0.

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50 They are those recommended to be used by the European Commission during the 2007-2013 programming period. (Working Document n. 2, 2006; Working Document n. 7, 2009).
51 They are those recommended to be used by the European Commission during the 2014-2020 programming period. (Guidance Document on Monitoring and Evaluation, 2014).
52 They have been used by Managing Authorities in specific Ops. WP0 team has classified this vast group of indicators into 11 sub-groups corresponding to the different themes of the ex-post evaluation programme.
Box 6. Core indicators relevant for business support

Monitoring indicators which could provide some relevant information on the achievements of business support expenditure are: 1) Jobs created, 2) Jobs created for men, 3) Jobs created for women, 4) Number of RTD projects, 5) Number of cooperation projects involving enterprises – research institutions, 6) Research jobs created (preferably 5 years after project start), 7) Number of projects, 8) Number of start-ups supported (first two years after start-up), 9) Jobs created in SMEs (gross, full time equivalent), 10) Investment induced (million €), 35) Number of jobs created in tourism, 40) Number of projects seeking to promote businesses, entrepreneurship, new technology. In addition, there is the ‘Aggregate job’ indicator calculated by the WP0 team as the sum of Core Indicators 1, 6, 9 and 35.

Core indicators referred to job creation

According to the monitoring indicators contained in the Annual Implementation Reports (2013), the 50 OPs have contributed to creating nearly 393 thousand jobs, i.e. approximately 51% of the reported jobs created by all the ERDF OPs. Nearly 40% of the total has been reported by the Hungarian OP Economic Development, the Spanish Andalucía OP, the Czech Innovation Programme and the German Nordrhein-Westfalen OP.

When looking at the reported jobs created in SMEs (gross, full time equivalent), the selected OPs declare they have contributed to creating nearly 137 thousand jobs, i.e. approximately 50% of the reported jobs created by all the ERDF OPs. The Spanish Andalucía OP, the Hungarian OP Economic Development and the West Wales and the Valleys OP are those where there is the highest number of reported jobs in SMEs. Based on the reported data, the degree of achievement for both the indicators “Aggregated Jobs” and “Jobs created in SMEs” is low. Among the seventeen for which the indicator have both target and achievement, only for four OPs, i.e. Attiki, the Polish National Programme, the Polish Mazowieckie and Wielkopolskie OPs, the reported target number of jobs created in SMEs is declared to have been met or exceeded.53

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53 This result shall be taken with care for a number of reasons: for some OPs the number of jobs created in SMEs has not been collected separately but it has been merged with the more general indicators monitoring the overall jobs created thanks to the OP contribution; it must be taken into account that a number of projects contributing to the creation of new jobs are still ongoing, as shown by the analysis at the policy instruments level; finally, in some case there are concerns about the meaningfulness of the initial targets.
**Figure 27.** Jobs created by the 17 OPs for which the indicator “Jobs created in SMEs have both target and achievement values available – Degree of achievement”

![Figure 27](image)

Source: CSIL elaboration based on WP0 dataset of indicators.

**Specific indicators linked to SMEs and innovation themes**

As to the Specific Indicators, of those more strictly linked to SMEs and innovation themes, according to the classification made by the WP0 team, which are available for the 50 OPs in the sample of, there are 359 indicators, of which only 53 specifically refer to SMEs. There are also large variations within OPs in terms of the number and nature of the indicators.

**Figure 28.** Number of Specific Indicators relevant for WP2 by OP

![Figure 28](image)

Note: The Programmes not displayed in the graph do not present any specific indicators relevant for WP2 evaluation according to the classification made by the WP0 team.

Source: CSIL elaboration based on WP0 dataset of indicators.

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54 This has been calculated with a semantic analysis.
Overall, 82% of the specific indicators have both target and achievement values (for 2012 or 2013) available,\textsuperscript{55} of which \textbf{nearly 30\% have an achievement value} (in 2012 or 2013) \textbf{which exceeds the target}. Among those with an achievement value lower than the target, 25\% have a zero achievement value, which in some cases may also mean that it is too early to obtain some results since a number of the projects under the relevant OP are still ongoing.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{specific_indicators_degree_of_achievement.png}
\caption{Specific indicators – Degree of achievement}
\end{figure}

Note: The graph includes only indicators which have target values available. More specifically, out of the total 359 specific indicators 49 do not have targets. These are not included in the graph.

Source: CSIL elaboration based on WP0 dataset of indicators.

Despite the fact that each indicator is specific to one particular OP, there is a short list of broad categories to which these indicators belong. For instance, a number of indicators can be grouped into three broad categories, i.e. “Products, processes, innovations created or developed”, “R&D centres, technology transfer centres, clusters, incubators supported” and “Patents” and thus some information about the general degree of achievement of these categories can be provided (see the two following Figures).

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{specific_indicators_three_categories_degree_of_achievement.png}
\caption{Specific indicators under three categories – Degree of achievement (Number of indicators)}
\end{figure}

Source: CSIL elaboration based on WP0 dataset of indicators.

\textsuperscript{55} 14\% of total specific indicators have no target values.
The three groups of indicators show a low degree of achievement, with less than 30% of indicators under all the three categories meeting (or exceeding) their target. Among the indicators which are still below the target value, a large proportion records a nil achievement value, especially those in the category which refers to “patents”. Turning to the distribution of indicators by OP, it is interesting to note that they are concentrated in a small number of OPs. It should be clarified to what extent this achievement reflects only the delays in the implementation of some policy instruments within the OPs, or rather actual difficulties in implementation. This issue is further discussed in Section 3.4.

Annex II provides a snapshot of relevant information concerning the OPs under review.
4.2 Characteristics of the policy instruments funded and of beneficiary SMEs.

4.2.1 The policy instrument as unit of analysis

In this section we aim to identify and characterise the policy instruments in favour of SME development and innovation mobilised in the 50 OPs selected. To do so, we adopted the following working definition of policy instrument:

**Policy instruments are the most basic intervention to which it is possible to attribute an expenditure, a mode of delivery, a type of beneficiary SME, and specific objective.**

In general terms, this definition of policy instrument corresponds with the level of policy action carried out by the Managing Authority, as described in the Operational Programme and/or in the Annual Implementation Report, but this is not always so. In some cases (particularly in France and the UK), policy instruments do not clearly emerge from the programming and implementation documents, which requires greater efforts to identify the relevant instruments. Usually, this was achieved through a bottom-up process, by looking at the single projects financed and aggregating them into consistent and homogenous policy instruments, usually with the help of Managing Authorities.

In agreement with the study’s Terms of Reference, the analysis focuses on instruments whose expenditure is classified by the Managing Authority under one of the codes of expenditure which are considered the most relevant for business support (see footnote number 41 in Section 3.1). However, the empirical analysis has revealed that codes of expenditure are only partially useful for identifying SME-related policy instruments, it was for instance the case of the UK OP of West Wales and the Valley and the Danish OP.

A team of country experts have been in charge of examining the OPs below the priority axis and measure level, both through desk research and interviews with the Managing Authorities, in order to identify the relevant policy instruments and to obtain the desired data. These data and related information were then centralized in a common database covering all 50 OPs. The database was used to 1) produce OP “summary fiches” (contained in Volume II) following a common template suitable for comparison purposes and 2) carry out a horizontal / comparative analysis of the policy instruments mobilized in the OPs under review and of the SMEs supported. While the OP fiches are presented in Volume II, we report the results of the horizontal analysis below.

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56 The set of codes under consideration excludes a number of instruments which some Managing Authorities also identify as particularly relevant to support SMEs, even if indirectly: it is the case, for example, of instruments classified under priority code 2 ‘R&TD infrastructure and centres of competence in a specific technology’, which are also intended and expected to generate some effects on SMEs. In addition, it can be the case that more than one of the codes are referred to at the level of a measure or actions (as with the two Portuguese OPs or the Romanian Regional Operational programme), that no code can be attributed to expenditure at policy instrument level, or that the very reliability of the way in which expenditures have been categorised into the selected codes by some Managing Authorities is questionable (for example with the UK OP of West Wales and the Valleys). When a reliable code of expenditure was lacking, a pragmatic approach was adopted: those instruments which could be anyway related to one of the relevant themes of expenditure were included in the analysis.

57 Although with some variations (and different terminologies), OPs are generally organised along three levels: Axes, measures and actions.
4.2.2 Number of policy instruments and related contribution paid by OP

Overall, a total of 670 policy instruments addressed to SMEs and corresponding to expenditure in the WP2 themes were identified in the 50 OPs reviewed. Data on ERDF and other public contributions already paid to projects from which SMEs benefit by the end of 2013 are available for 566 instruments (84% of the total) and amount to 26.9 billion Euro. For another 51 instruments (8% of the total), paid amount are available at a more aggregate level (e.g. at measure level) only, therefore refer to more than one policy instrument. The value of the contribution paid for these instrument amounts to another 315 million Euro.

Figure 32. Availability of contribution paid data

For the remaining 53 instruments (8% of the total), national/regional expenditure monitoring systems do not allow the contribution paid at the instrument level to be determined. For the German OP of North Rhine-Westphalia, for example, the Managing Authority delivered only numbers referring to approved eligible total cost, which includes all expenditure made by the beneficiaries regardless of the source: since these data are not comparable with those collected for the other OPs they are not considered in the analysis.

The following table gives the first important pieces of information on the number and the quantitative importance of policy instruments in each of the OPs considered. While the average number of policy instrument in each OP is close to 13, there are in fact large variations in the number of policy instruments mobilised.

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58 They refer to the public amount (ERDF and national/regional funds, excluding the private co-financing) paid for selected and implemented projects. In case of indirect instruments this paid amount does not go directly to SMEs (see next sections). Paid amount are provided by the Managing Authority.
59 Paid amount data at policy instrument level are typically not provided in the Annual implementation Report, but are retained by the Managing Authorities.
60 It is the case of some instruments within the Spanish, Polish and Belgium OPs.
61 While paid amount data on the large majority of policy instruments have been retrieved, more difficult was detecting the volume of funds programmed ex-ante for each policy instrument. Actually, Managing Authorities usually consider a different unit of analysis when programming the use of funds, the Priority Axis and, in some cases the measure, so that the determination of the volume of resources dedicated to each instrument has often turned out to be impossible or too discretionary.
OPs are characterised by very high numbers of policy instruments particularly in Greece and Spain. Together with the Italian regional OP Apulia and the national Polish OP, they have between 22 and 40 different policy instruments. In contrast, OPs having a fewer number of policy instruments are the Czech OP on R&D, national Spanish OP ‘Knowledge-based economy’ which is focused on ICT infrastructures, the Romanian Regional OP, the Slovak OP on R&D, the German OP of Saxony and the West Netherlands OP.

This is partly reflected in the average paid amount per policy instrument. It is particularly high for the Czech OP Research and Development, which has only two policy instruments, which develop public research infrastructures (424 Million euro on average). The other Czech OP (Enterprise and Innovations), the national Hungarian OP and the national Polish OP also have a high average levels of paid amount per policy instrument, in a context of higher numbers of policy instruments overall (respectively, 110, 160, and 197 Million euro on average). On the face of it, the Greek OP Attiki or the Spanish OP Comunidad Valenciana have small amounts of paid amount per policy instrument (8 and 9 million euro on average), but an above-the-average number of policy instruments. The average size of policy instruments also conceals some variations between ‘small’ and ‘important’ policy instruments from a quantitative perspective and the fact that some actions are intrinsically more expensive than others.

All this shows different patterns in the propensity to concentrate funding on a few policy instruments, a feature which could have some importance in accounting for the effectiveness of ERDF intervention. While concentrating funding could testify to sharper strategic choices, distributing funding across specific policy instruments could show a greater ability to adapt and respond to local specific needs, an issue which will be explored in the case studies.
<table>
<thead>
<tr>
<th>OP label</th>
<th>OP code</th>
<th>Number of policy instruments identified</th>
<th>Number of policy instruments for which paid amount is available</th>
<th>Share of policy instruments with paid amount data available</th>
<th>Total paid amount for the policy instrument (Million Euro)</th>
<th>Average paid amount per policy instrument (Million Euro)</th>
<th>Minimum paid amount per policy instrument (Million Euro)</th>
<th>Maximum paid amount per policy instrument (Million Euro)</th>
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<tbody>
<tr>
<td>AT - Burgenland</td>
<td>2007AT161PO001</td>
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<td>118</td>
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<td>110</td>
<td>3</td>
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<td>2</td>
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<td>424</td>
<td>333</td>
<td>515</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>0</td>
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<td>FR - Aquitaine</td>
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<td>Share of policy instruments with paid amount data available</td>
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<td>Average paid amount per policy instrument (Million Euro)</td>
<td>Minimum paid amount per policy instrument (Million Euro)</td>
<td>Maximum paid amount per policy instrument (Million Euro)</td>
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<td>29%</td>
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<td>20</td>
<td>7</td>
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<td>16</td>
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<td>443</td>
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<tr>
<td>IT - Convergence</td>
<td>2007IT161PO006</td>
<td>15</td>
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<td>IT - Piedmont</td>
<td>2007IT162PO011</td>
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<td>6</td>
<td>60%</td>
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<td>76</td>
<td>9</td>
<td>180</td>
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<tr>
<td>IT - Veneto</td>
<td>2007IT162PO015</td>
<td>12</td>
<td>12</td>
<td>100%</td>
<td>214</td>
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<tr>
<td>LT - Lithuania</td>
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<td>100%</td>
<td>576</td>
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<tr>
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<tr>
<td>NL - West</td>
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<td>4</td>
<td>67%</td>
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<td>2</td>
<td>1</td>
<td>4</td>
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<td>29%</td>
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<td>22</td>
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<tr>
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<td>13</td>
<td>100%</td>
<td>289</td>
<td>22</td>
<td>0</td>
<td>99</td>
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<tr>
<td>PT - Norte</td>
<td>2007PT161PO002</td>
<td>10</td>
<td>10</td>
<td>100%</td>
<td>327</td>
<td>33</td>
<td>1</td>
<td>186</td>
</tr>
<tr>
<td>PT - Portugal</td>
<td>2007PT161PO001</td>
<td>14</td>
<td>14</td>
<td>100%</td>
<td>1,395</td>
<td>100</td>
<td>1</td>
<td>775</td>
</tr>
<tr>
<td>RO - Romania (Compet.)</td>
<td>2007RO161PO002</td>
<td>17</td>
<td>17</td>
<td>100%</td>
<td>819</td>
<td>48</td>
<td>0</td>
<td>367</td>
</tr>
<tr>
<td>RO - Romania (ROP)</td>
<td>2007RO161PO001</td>
<td>3</td>
<td>3</td>
<td>100%</td>
<td>269</td>
<td>90</td>
<td>5</td>
<td>186</td>
</tr>
<tr>
<td>SE - Norra Mellansverige</td>
<td>2007SE162PO006</td>
<td>10</td>
<td>10</td>
<td>100%</td>
<td>117</td>
<td>12</td>
<td>0</td>
<td>48</td>
</tr>
<tr>
<td>SE - Övre Norrland</td>
<td>2007SE162PO008</td>
<td>12</td>
<td>12</td>
<td>100%</td>
<td>143</td>
<td>12</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>SK - Slovakia (Compet.)</td>
<td>2007SK161PO006</td>
<td>10</td>
<td>10</td>
<td>100%</td>
<td>647</td>
<td>65</td>
<td>1</td>
<td>282</td>
</tr>
<tr>
<td>OP label</td>
<td>OP code</td>
<td>Number of policy instruments identified</td>
<td>Number of policy instruments for which paid amount is available</td>
<td>Share of policy instruments with paid amount data available</td>
<td>Total paid amount for the policy instrument (Million Euro)</td>
<td>Average paid amount per policy instrument (Million Euro)</td>
<td>Minimum paid amount per policy instrument (Million Euro)</td>
<td>Maximum paid amount per policy instrument (Million Euro)</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>------------------------</td>
<td>----------------------------------------</td>
<td>---------------------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>SK - Slovakia (R&amp;D)</td>
<td>2007SK16UPO001</td>
<td>5</td>
<td>4</td>
<td>80%</td>
<td>154</td>
<td>38</td>
<td>15</td>
<td>78</td>
</tr>
<tr>
<td>SL - Slovenia</td>
<td>2007SI161PO001</td>
<td>13</td>
<td>13</td>
<td>100%</td>
<td>681</td>
<td>52</td>
<td>2</td>
<td>168</td>
</tr>
<tr>
<td>UK - Highlands and Islands</td>
<td>2007UK161PO001</td>
<td>8</td>
<td>6</td>
<td>75%</td>
<td>137</td>
<td>23</td>
<td>0</td>
<td>75</td>
</tr>
<tr>
<td>UK - West Wales and The Valleys</td>
<td>2007UK161PO002</td>
<td>14</td>
<td>14</td>
<td>100%</td>
<td>603</td>
<td>43</td>
<td>3</td>
<td>129</td>
</tr>
<tr>
<td>UK - Yorkshire and the Humber</td>
<td>2007UK162PO009</td>
<td>7</td>
<td>7</td>
<td>100%</td>
<td>672</td>
<td>96</td>
<td>8</td>
<td>265</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>670</td>
<td>566</td>
<td>84%</td>
<td>26,946</td>
<td>48.2</td>
<td>0</td>
<td>1,142</td>
</tr>
</tbody>
</table>

Source: CSIL elaboration.
Finally, the Figure 33 presents total paid amount on the policy instruments for which data is available. This compares with Figure II.4 above in Annex II where data on the EU programmed amount in the OPs is given. There is a broad alignment apart from some mismatch explained by incomplete data availability and differences in units of analysis. For example, the Polish national OP remains characterised by the highest paid amount for SME growth and innovation, even when considering only 19 out of a total of 26 relevant policy instruments. It is followed by Hungary (Economic Development), Czech Republic (Innovation), Portugal, Spain (Technology Fund) and all national OPs. The Spanish OP for the Knowledge-based economy (with only one relevant instrument), the OP of West Netherlands and the French regional OP Midi-Pyrénées have the lowest contribution paid.

**Figure 33. Number of policy instruments and public contribution paid by OP**

![Image of Figure 33](image)

Note: Labels also indicate the share of policy instruments considered for each OP (i.e. those for which paid amount data are available), out of all instruments identified.

Source: CSIL elaboration.

### 4.2.3 The main types of policy instruments

As discussed in the literature review there is no widely accepted categorisation of policy instruments (see Chapter 3) that can support a manageable classification of the instruments into main typologies. Rather, the normal practice is to define categories in line with the needs of the analysis being conducted. For this reason we followed a pragmatic bottom-up approach: we grouped the 648 policy instruments identified across the 50 OPs according to their main aim and type of activity supported. Doing so enabled us to identify the following twelve main categories of policy instrument, to which we refer in the rest of the Chapter:

1. **Business creation and development.** Policy instruments designed to stimulate investments in the business sector, without a predominant emphasis on R&D and innovation, are included in this category. This category comprises instruments for the promotion of business creation, early development, modernization, structural change, financing e.g. building construction or modernization, purchase of...
tangible and intangible assets, employment. Technological innovation can be one of the possible activities eligible for financing, even if this is not the main focus of the instrument.63

2. Support for R&D projects. This category includes instruments supporting research and applied development activities of enterprises individually or in collaboration with the research centres of other firms, in any field/sector or in a specific one. Instruments contribute to the implementation of an entire R&D project, which may go, in some cases, up to the development and commercialization of innovation.64

3. Support for the development of technological and non-technological innovation. Unlike the previous typology, instruments under this category support innovation only, without any activity regarding research and experimental development. It includes, for example, instruments supporting a technology upgrade in already existing enterprises, as a way to increase innovation, managerial and organisational innovation, and the commercialisation of innovative products.

4. Creation of innovative companies. While the previous category is about support measures to existing firms, this typology relates to specific support for the creation or development of new companies with a strong innovative base, e.g. oriented towards the commercialisation of innovative products (e.g. innovative spin-offs).

5. Support to, access to and diffusion of ICT. Some instruments contribute to achieving innovation among SMEs by supporting a very specific type of activity: the access to and diffusion of ICT services and solutions for SMEs or enterprises in general. ICT solutions can be used, for example, for e-commerce, business to business communication, or for increasing the efficiency of the production system.

6. Support for material and immaterial infrastructures and improvement of related services. This category includes different instruments which benefit both SMEs and all enterprises only indirectly, via the provision of infrastructures aimed at improving the conditions for doing business and the introduction of new services targeting the business sector. No activities directly implemented by SMEs or specific services directly addressed to SMEs are funded. Examples of actions financed are: land preparation and construction of training centres, competence centres, congress venues, technology parks, incubator facilities, logistic centres; creation or strengthening of the networks of business support organisations; development of other new material or immaterial infrastructures for the business sector.

7. Internationalisation and visibility. This category comprises policy instruments with a very specific objective: supporting SMEs (or all enterprises) in going

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63 Otherwise the instrument would be categorized under ‘Support for the development of technological and non-technological innovation’.

64 While some instruments have a broad scope, in that they finance entire R&D projects, others have a more specific goal, being focused on specific activities related to the R&D cycle. For example, they may support the construction of laboratory infrastructures, the employment of researchers, the purchase of equipment, specific technological services or expertise, and the conduct of feasibility studies for R&D projects.
international, mainly by means of support for participation in fairs, partner search, incoming missions; support for promotional and visibility actions.

8. **Support for improving capacities.** A set of policy instruments aim to promote the development of skills and capabilities of SMEs or enterprises in general. Support is provided with the specific purpose of increasing human capital for doing business, so as to stimulate an entrepreneurship culture and capacities in general, or to provide knowledge on specific issues, such as the development of a business plan, ICT and green energy opportunities, management and marketing methods, insolvency, second chance and business transfer. Support can often be in the form of the development of centres providing information and advice.

9. **Eco-innovation.** This category includes a specific type of instrument, meant to introduce environmentally friendly products, processes and technologies into enterprises.

10. **Networking.** Establishment of partnership, networking, clustering among companies (often operating in the same sectors) and the formation of cooperation platforms.65

11. **Support for knowledge and technology transfer.** Some policy instruments support knowledge and technology transfer from research centres/universities to enterprises, for the adoption of innovative product and process. Instruments promoting the transfer of innovation are included in this category.

12. **Generic access to finance.** This category comprises different tools to provide SMEs (or enterprises in general) with capital for their activities, without any indication or condition on the use of this capital.

Each category of policy instruments are characterised by own constituent features and a common underlying logic of intervention, which are better explored in the following sections.

Overall, more than three quarters of the policy instruments can be classified as support for business creation and development (26%), support for R&D projects (23%), provision of infrastructures and related services (12%), support for technological and non-technological innovation (8%) and support to internationalisation (7%). However, when considering the volume of public contributions made, a slightly different scenario emerges: even if a relatively high number of instruments aiming to provide generic infrastructures and stimulating internationalisation have been included in the 50 OPs, they are associated with a limited share of paid amount. In contrast, instruments supporting innovation have much more importance if their relative share of paid amount is considered. Instruments aiming to improve capacities are less numerous, as this type of activity is more often funded by the European Social Fund. Even if the relative share of instruments supporting the establishment of new clusters (‘Networking’ category) seems marginal, this should not be interpreted as little attention on cluster promotion: in fact, those instruments and contribution paid supporting R&D projects carried out within existing clusters are classified under ‘Support for R&D projects’.

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65 But note that the financing of research projects carried out by groups of SMEs within clusters is classified under “Support for R&D projects”
Beyond aggregate figures, some patterns emerge in the use of the above types of policy instrument in specific OPs. For example, the three main categories (support for innovation, support for business creation and development, and support for R&D projects) are mobilized in the vast majority of the OPs but they are particularly privileged by some OPs, in the following way:

- Support for business creation and development by the two Greek OPs, the UK OP of Highlands and islands, the German OP Berlin and the Swedish OP Upper Norrland;
- Support for R&D projects by the Slovak and Czech OPs focused on R&D, as well as the OPs of Latvia and Estonia;
- Support for innovation by the two German regions of Brandenburg and North-Rhine Westphalia and in the Slovakian OP ‘Competitiveness and Economic Growth’.

On the face of it, the other types of policy instrument are generally the preserve of a minority of OPs which make some use of them. This is the case of instruments for internationalization and visibility (mostly mobilized by three Spanish OP, one Swedish and one Slovak OP) or of support for improving capacity (used by the Austrian OP Styria). Generic access to finance is largely used by the region Piedmont, in Italy. Instruments providing infrastructure and services of business activities are preferred by the Regional Operational Programme of Romania and the national Polish OP.

Each of the identified types of policy instrument pursue a goal in terms of growth or innovation, or both (Figure 35). Half of the identified typologies of instruments pursue objectives almost exclusively in terms of innovation. They are instruments supporting technological and non-technological innovation, eco-innovation, the creation of innovative companies, support for R&D projects, knowledge and technology transfer.

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66 But no significant patterns emerge when comparing the Convergence objective OPs with those of the Competitiveness and Employment objective.
and support for ICT access and diffusion. Conversely, instruments providing generic access to finance and supporting internationalisation aim to support mainly the growth and development of SMEs.

Other policy instruments are associated with a less clear-cut goal, as they pursue a combination of the two or more objectives at the same time. While, in general terms, all instruments focused on increasing innovation indirectly aim to promote business development in line with the best practice referred to in the literature review, instruments in the categories ‘support for improving capacities’, ‘support for infrastructure and related services’ and ‘business creation and developments’ explicitly aim to favour the growth and development of SMEs using innovation as a possible leverage.67

**Figure 35. Number and Paid Amount of policy instruments by main category and goal**

Source: CSIL elaboration.

Overall, as illustrated in the pie charts below, policy instruments are predominantly geared to objectives specified in terms of SMEs innovation (around half of all instruments and of the public contribution disbursed) whereas a quarter of policy instruments do not make clear cut distinctions and refer to innovation as a way to promote SME development and 21% of paid amount so far refers exclusively to SME growth and development. In a few cases, policy instruments pursue objectives other than business innovation and growth, such as territorial cohesion (by trying to induce the development of economic activity in specific territorial areas) and environmental sustainability objectives (particularly for eco-innovation instruments). The in-depth analysis in selected

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67 For instance, an instrument which co-finance various activities aimed at fostering the growth of SMEs, including for instance the construction of new buildings, the purchase of equipment and the installation of modern and more innovative technologies, contemporary pursue innovation and growth objectives.
case studies is expected to shed some light on the rationale for introducing more or less instruments to address one or the other goal.

**Figure 36. Number and Paid Amount of policy instruments by main goal**

<table>
<thead>
<tr>
<th>Number of instruments</th>
<th>Paid Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Innovation</strong></td>
<td><strong>Growth</strong></td>
</tr>
<tr>
<td>46%</td>
<td>33%</td>
</tr>
<tr>
<td><strong>Innovation &amp; Growth</strong></td>
<td><strong>Growth</strong></td>
</tr>
<tr>
<td>21%</td>
<td>25%</td>
</tr>
</tbody>
</table>

Source: CSIL elaboration.

As shown in section 3.1.4, some reshuffling among priority axes has occurred in the course of the programme implementation, mainly as a result of the economic crisis. The empirical analysis shows that this may have often implied a **shift of resources away from innovation to more generic growth objectives**, with the aim of increasing efforts to safeguard jobs. Examples of countries and regions where this shift clearly occurred are:

- **Austria**: the changing framework conditions caused a reduction of funding for R&D projects towards other more generic investment (new machineries, new constructions and creation of jobs in the short term). Also, due to heavy administrative burden to beneficiaries of the ERDF programmes, the Managing Authority decided to support research projects by national funding only.

- **Portugal**: the 2012 reprogramming led to a reinforcement of measures focused on improving competitiveness and employment, seeking to give a more forceful response to the ongoing economic and financial crisis. In particular, more resources were allocated to strengthening private productive investment and the upgrading of the competitive business environment (with particular attention to SMEs) within a framework of promoting territorial cohesion based on internationalization, stimulating employment (especially youth employment) and sustainable growth.

- **Hainaut (Belgium)**: one pro-innovation instrument originally envisaged was not implemented and funds were redirected to the more traditional instruments, especially in relation to access to finance.

A shift of funds from innovation to growth objective has been highlighted also for other OPs, such as the Greek and Czech (Enterprise and Innovations) OPs. Furthermore, there are examples of OPs (e.g. the Scottish Highlands and Island, or the Apulia OP in Italy) where in practice, the projects supported were more in the area of ensuring SME survival and growth than in promoting innovation, so that projected developments in the latter area were much less significant.
We should also point out that the opposite trend has been highlighted in a few other case, e.g. for the Swedish Upper Norrland OP and the national Hungarian OP. In these cases the reprogramming allowed for additional funding to innovation, deriving from other priorities.

4.2.4 Main characteristics of the policy instruments reviewed

In our analysis we have characterised policy instruments along three main dimensions, inspired from the literature review: their mode of delivery (i.e. the form of support received by the SMEs), the type of beneficiary targeted by the instrument and the type of intermediate actor channelling funds to SMEs (if any). For each dimension, country experts selected the option applicable to each policy instrument. The full list of possible options is included in the box below.

**Box 7. Definitions of variables used to characterise the policy instruments**

<table>
<thead>
<tr>
<th>Mode of delivery of the policy instrument</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant</td>
<td>Non-repayable aid aiming at different objectives and addressed to different categories of specified or unspecified potential beneficiaries usually selected with open calls for tenders.</td>
</tr>
<tr>
<td>Repayable financial support</td>
<td>Financial aid aiming to overcome market failures in access to finance. It generally involves loans, loan guarantees or interest subsidy, but sometimes in hybrid form, such as facilitating mezzanine finance.</td>
</tr>
<tr>
<td>Equity finance</td>
<td>Financial support providing equity capital in different forms (participation, venture capital fund, etc.).</td>
</tr>
<tr>
<td>Information campaign, events, seminars</td>
<td>On-the-spot sensitisation and awareness raising support activity.</td>
</tr>
<tr>
<td>Consulting, advice, technical assistance</td>
<td>Non-financial support aimed at providing a wide range of technical services provided directly by support agencies or by arrangement with professional advisers.</td>
</tr>
<tr>
<td>Provision of infrastructures</td>
<td>Construction or modernisation of material and immaterial infrastructures for the business sector, including the development of the business support organisation network.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Targets of the policy instrument</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual enterprises</td>
<td>The policy instrument is targeted to single enterprises, regardless of whether they are large enterprises or SMEs and regardless of their economic sector.</td>
</tr>
<tr>
<td>Individual enterprises in a specific sector</td>
<td>The instrument is targeted to single enterprises, regardless of whether they are large enterprises or SMEs, which operate in specific economic sectors.</td>
</tr>
<tr>
<td>Individual SMEs</td>
<td>The instrument is targeted to single SMEs only. Large enterprises are not eligible.</td>
</tr>
<tr>
<td>Individual SMEs in a specific sector</td>
<td>The instrument is targeted to single SMEs only which operate in specific economic sectors.</td>
</tr>
<tr>
<td>Group of enterprises</td>
<td>The instrument is targeted to clusters, associations or partnerships of enterprises, which include a certain number of both large enterprises and SMEs, without any condition on their economic sector.</td>
</tr>
<tr>
<td>Group of enterprises in a specific sector</td>
<td>The instrument is targeted to clusters, associations or partnerships of enterprises, which include a certain number of both large enterprises and SMEs and operate in specific economic sectors.</td>
</tr>
<tr>
<td>Group of SMEs</td>
<td>The instrument is targeted to clusters, associations or partnerships between SMEs only, without any condition set on their economic sector.</td>
</tr>
<tr>
<td>Group of SMEs in a specific sector</td>
<td>The instrument is targeted to clusters, associations or partnerships between SMEs only and operate in specific economic sectors.</td>
</tr>
</tbody>
</table>
### Type of intermediary

<table>
<thead>
<tr>
<th>Definition</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No intermediate body</td>
<td>The policy instrument is directly targeted to enterprises or entrepreneurs without any intermediary. Enterprises are the direct beneficiaries of the instrument.</td>
</tr>
<tr>
<td>Business support organisations</td>
<td>Enterprises are indirect beneficiaries of the instrument, which is delivered by business support organisations (other than Chambers of Commerce).</td>
</tr>
<tr>
<td>Universities or research centres</td>
<td>Enterprises are indirect beneficiaries of the instrument, which is delivered by universities or research centres.</td>
</tr>
<tr>
<td>Municipalities, other local public authorities or associations of local public authorities</td>
<td>Enterprises are indirect beneficiaries of the instrument, which is delivered by municipalities or other local public authorities.</td>
</tr>
<tr>
<td>Chambers of commerce</td>
<td>Enterprises are indirect beneficiaries of the instrument, which is delivered by the Chambers of Commerce.</td>
</tr>
<tr>
<td>Financial institutions/Fund managers</td>
<td>Enterprises are indirect beneficiaries of the instrument, which is delivered by the financial institutions (banks) or fund managers (e.g. venture capital fund manager).</td>
</tr>
<tr>
<td>Cluster managers or Incubators/Technology parks</td>
<td>Enterprises are indirect beneficiaries of the instrument, which is delivered by cluster management organisations or technology parks.</td>
</tr>
<tr>
<td>Various</td>
<td>Enterprises are indirect beneficiaries of the instrument, which can be delivered by more than one of the above intermediaries.</td>
</tr>
</tbody>
</table>

Source: CSIL.

**Mode of delivery**

Grants appear to be by far the most prevalent mode to deliver support to SMEs, being slightly less than half of the identified policy instruments and corresponding to more than EUR 12 billion of public contribution already paid. Packages, which are defined as a combination of modes of delivery, are in second position (a quarter of policy instruments). These instruments tend to be more strategic, aiming at well-defined objectives and are expected to bring about effects that reinforce one another. Around 67% of these policy instruments (associated to around EUR 5.5 billion of public contribution paid) were delivered through combination of different modes that contained

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68 It is in fact a diversified category since a non-repayable form of financial support can take different forms depending on whether it is granted on the basis of calls for tender, on the frequency of the latter, or on degree of competition characterising the calls.
a grant element (usually combined with consulting services), which makes the total volume of non-repayable financial support even more significant.

Support in the form of consulting, advice and technical assistance are more important if measured in terms of the number of policy instruments than in terms of paid amount, which indicates their relatively low level of financial endowment. Repayable financial support follows before equity finance which still represents a very marginal share of support. The financing of infrastructure for the business sector is negligible.

With reference to the distinction between direct and indirect support, often referred to in the literature (see Chapter 3), the great majority of policy instruments and related paid amount during the 2007-2008 period concentrated on forms of direct support, such as grants, repayable financial support, equity finance (also in combination with other modes). Indirect support, in the form of consulting services, information campaigns, provision of incubators and other infrastructures for the business sector, represent 11% of total contribution paid targeted to SMEs, and 23% of the total number of policy instruments identified.

![Figure 37. Number and Paid Amount of direct and indirect policy instruments](image)

Source: CSIL elaboration.

![Figure 38. Number and Paid Amount of policy instruments by mode of delivery](image)

Source: CSIL elaboration.

It is interesting to note that 15 policy instruments are not characterised by a definite form of support. This is the case of the two Portuguese OPs, which foresee some refundable incentives that can be converted into a non-refundable grant according to the project performance,69 and grants which are combined with repayable financial support only for projects above EUR 50 thousand.70 As another example, one instrument included

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69 They have been classified under the ‘Repayable financial support’ mode of delivery.
70 They have been classified as ‘Packages’.
in the French OP of Île-de-France provides grants which become repayable loans if the project is a success.\textsuperscript{71}

Looking at different categories of policy instrument (Figure 39), grants are the prevalent mode of delivery of instruments supporting eco-innovation, R&D projects, business creation and development, access and diffusion of ICT and networking. Instruments providing generic access to finance more often deliver repayable financial support (usually loans or guarantees to credit). Actions promoting internationalisation and the improvement of capacities make a large use of consulting services. The use of the information campaigns and events is limited to instruments aiming to promote knowledge transfer and internationalisation.

**Figure 39.** Modes of delivery by types of policy instruments

Source: CSIL elaboration.

\textsuperscript{71} It has been classified under the ‘Grant’ mode of delivery.
Figure 40. Modes of delivery by OP

Note: OPs which make the largest use of grants are shown by dotted squares.

Source: CSIL elaboration.
Some OPs are characterised by a pronounced preference for one or another mode of delivery. The following preferences can be highlighted:

- Convergence (CONV) objective OPs make a larger use of grants than Competitiveness and Employment (COMP) objective OPs (55% vs. 33% of paid amount); among these, grants are the prevalent form of support to enterprises in the German region of Saxony, the two Slovakian OPs, the national and regional Greek OPs and the two OPs in the Baltic countries of Estonia and Latvia;

- Conversely, the combination of different modes of delivery are more common in Competitiveness and Employment objective area (41% vs. only 21% in Convergence regions): this pattern could reinforce the idea that these more complex instruments require a stronger design and implementation capacity which COMP regions are more likely to have. However, there are some OPs addressed to Convergence regions which also show some preference for a combination of different modes of delivery, such as the Portuguese OPs, the National Italian OP for research and the multi-objective Spanish Technology Fund.

- Some additional patterns and preferences can be found at OP level. For instance, the Danish OP and the UK regional OPs largely resort to consulting services and advice and consulting services paired with grants (within a package). Information campaigns are also largely used by the three regional OPs of Spain. Three regional OPs in France also attach great preference to consulting services as a mode of support to SMEs.

Target beneficiaries

Policy instruments are by and large addressed to individual enterprises without distinction according to firms’ size, and individual SMEs (including single entrepreneurs). The share of public expenditure\(^{72}\) allocated to individual enterprises is on average higher than paid amount on SMEs, as it could include the support to large enterprises too (Figure 41). In this respect, it is worth noting that in many cases where the policy instrument is conceived of as targeting all enterprises regardless of size class, in fact paid amount is allocated to a large extent or entirely to SMEs. Actually, more than 30% of policy instruments targeted to all enterprises have in fact dedicated more than 90% of paid amount to SMEs only.

The amount of public contribution to each SME is variable, ranging between a minimum of less than 10 thousand Euro to more than 200 million Euro, depending on the specific instrument.

In less than 15% of the cases, policy instruments support partnerships (among enterprises / SMEs, or between enterprises and research organisations). Some policy instruments (12% of the total number of identified policy instruments, 7% of the total public contribution already paid) are specifically addressed to SMEs operating in particular sectors, the most common of which is tourism and, in some cases, various high-tech sectors. However, policy instruments generally do not target specific sectors.\(^{73}\)

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\(^{72}\) Defined, as already mentioned, as the ERDF and other public contributions related to the policy instruments which have been already paid by the end of 2013.

\(^{73}\) The analysis has revealed that the economic crisis did not lead to broadening in the scope of targeted SMEs, through a change of selection criteria. Actually, instruments were already sufficiently open to SMEs.
Figure 41. Number and Paid Amount of policy instruments by typologies of target beneficiaries

Source: CSIL elaboration.

As illustrated in Figure 42, instruments providing generic access to finance and supporting the creation of innovative companies (start-ups) are predominantly dedicated to individual SMEs, in many cases micro enterprises only. This is in line with the fact that the issue of financing tends to be much larger for smaller firms, as also shown in the context analysis (Chapter 2). As it is reasonable to expect, instruments promoting networking are targeted either to groups of enterprises or to partnerships involving enterprises and research institutes. Instruments aiming to improve capacities are more often addressed to various targets, including enterprises individually and in collaboration with other subjects.

Figure 42. Target beneficiaries by types of policy instruments

Source: CSIL elaboration.
The number of policy instruments targeted to individual SMEs is on average the same in Convergence and Competitiveness countries (40% out of the total instruments in CONV regions, and 36% in COMP regions). However, in terms of paid amount, the share of the public contribution paid to individual SMEs is higher in the CONV regions (34% against 24% of total public contribution paid in COMP regions). Moreover, in Competitiveness and Employment objective OPs (e.g. Italian regions of Piedmont and Veneto and the Swedish OPs) there is a higher preference for instruments targeted to a mix of diverse types of beneficiary (27% of paid amount against only 4% in CONV regions). The rationale of the preference for instruments being much more focused and targeted on very specific types of beneficiary in Convergence countries, and its implications, will be further investigated through case studies.

More patterns emerge at OP level (see Figure 44):

- The Czech OP R&D, the Slovakian OP R&D and the Danish OP 'Innovation and Knowledge' deliver a higher share of support to partnerships between SMEs and research organisations than other OPs;

- all the French regional OPs included in the sample dedicate great attention to SMEs, to which the majority of instruments are specifically and explicitly addressed;

- the two regional Austrian OPs, on the other hand, have a stronger preference for supporting large enterprises. Actually, these OPs include a high share of instruments targeted to enterprises regardless of their size and more than half of the related paid amount has been disbursed to the benefit of large enterprises.

- In contrast, the Greek OPs, which also include various instruments targeted to generic enterprises, have in fact allocated more than 90% of paid amount to SMEs. These OPs distinguish themselves also for having designed and introduced a large number of instruments devoted to specific industrial sectors (e.g. tourism, ICT, microelectronics, freight transport, etc.).
Note: Examples of OPs which mostly target individual enterprises, individual SMEs and partnership of enterprises and research centres are shown by dotted squares (respectively light green, dark green and lilac).

Source: CSIL elaboration.

Finally, it is interesting to match data on the modes of delivery of policy instruments with their types of target beneficiary (Figure 45) in order to highlight patterns in the form of support typically used to address the needs of different categories of beneficiaries. This correlation shows that:

- repayable financial support is mainly targeted to individual companies, both only SMEs and enterprises in general;
- equity finance almost exclusively benefits SMEs;
- the largest volume of non-refundable public contribution (grants) has been used to support individual enterprises and individual SMEs, but also groups of enterprises (clusters);
- partnerships between enterprises and universities and research centres have predominantly received support in the form of grants and consulting services.
Intermediaries

In a large majority of cases the support is directly granted to SMEs. **Intermediaries are resorted to by 37% of the policy instruments, corresponding to 28% of the public contribution** already paid out. This is not to be confused with intermediate bodies (or implementing bodies) in charge of managing a portion of the OP budget on the behalf of the Managing Authority, as provided for by EU regulations. For our purposes, intermediaries are defined as the direct beneficiaries of ERDF funding, which in turn use such resources to provide support to enterprises (or SMEs in particular), e.g. by providing consulting services or technical assistance. Hence, enterprises are targeted by the policy instrument in an indirect way, via an intermediary actor.

The literature suggests that the case for a policy instrument making use of intermediaries can be that they can facilitate reaching out to SMEs, knowing better their specific needs and capabilities and helping them to build their skills and capacities. Intermediaries can also make available specialised knowledge and expertise and also facilitate the interaction of SMEs in networking or developing clusters. In addition, it is often argued that using intermediaries alleviates the administrative burdens bearing on SMEs that characterise the direct forms of support to SMEs available from the OP, but this issue will be more directly analysed through the case studies.

In general, **intermediaries channelling the most significant share of funding are financial institutions and fund managers** (Figure 46), which are associated with policy instruments providing access to equity finance and repayable financial support (Figure 47). **Universities and research organisations** are the second most important type of intermediary, **generally serving SMEs through consulting services and advice**. Interestingly, they are thus not only potential partners of SMEs in R&D projects.
Instruments delivered through municipalities are numerous in number, but much less relevant as far as the volume of funds is concerned. They are more involved in the provision of infrastructures to strengthen the business environment, and other forms of support. Some instruments are associated to more than one possible type of intermediary (e.g. business support organisations and municipalities), indicated with the label “Various” in the graphs.

Grants are generally delivered directly to SMEs. Only 4% of contribution delivered in the form of a grant is channelled through intermediaries, which can be the universities and municipalities.

**Figure 46. Number and Paid Amount of policy instruments by type of intermediary**

Source: CSIL elaboration.
The next two graphs show to what extent each typology of policy instrument exploits intermediaries to support SMEs, and which intermediaries are usually employed.

**Figure 48. Use of intermediaries by types of policy instruments**

Source: CSIL elaboration.
The empirical analysis on the use of intermediaries across different types of policy instrument points to the following findings:

- **Instruments providing generic access to finance, the provision of infrastructure and services to favour the business environment, and support for knowledge transfer** are those more often delivered through various intermediaries. So are instruments promoting the creation of innovative companies, which deliver 95% of funding through intermediaries, even if corresponding to only 38% of the number of policy instruments under this category.

- The **types of intermediary mobilised** by the above mentioned policy instruments are however **diverse**. Instruments for the creation of innovative companies and bringing generic access to finance, which usually provide SMEs with equity finance and repayable financial support (see Figure 49 above), see the significant involvement of financial institutions and fund managers as intermediaries. Instruments for knowledge and technology transfer are generally delivered by means of universities and research centres. There is no predominant type of intermediary for instruments regarding the provision of infrastructures and related services.

- Cluster managers are the direct recipients of funding aimed at stimulating networking among enterprises, while universities are involved when providing support for implementing R&D projects.
• Support targeted to increasing ICT and eco-innovation in enterprises (mainly in the form of grants) is conveyed by municipalities.

Finally, the next two graphs (Figure 50 and 51) explore the use of intermediaries across the 50 OPs.

• **Convergence objective regions make a more limited use of intermediaries** (27% of all paid amount) as compared with Competitiveness and Employment objective regions (42% of all paid amount). The predominant type of intermediary used in Convergence regions is represented by financial institutions and fund managers, responsible for around half of total funds delivered via intermediaries (this volume however represents on average only 16% of all relevant contribution paid in the Convergence regions).

• However, Polish OPs depict a different scenario. They rely to a greater extent on intermediaries (as compared with other Convergence areas) and municipalities are the most common type of intermediary mobilised. Municipalities and local public authorities channel a large number of instruments also in the two Swedish OPs and in Piedmont (Italy).

• In Spain, Chambers of Commerce have a predominant intermediary role, much larger than in any other OP of the sample. Conversely, projects carried out by SMEs in Portugal are more often supported by the universities and research centres, which are the direct recipients of ERDF support.

• In some French regions and in the Belgian province of Hainaut, business support organisations other than the Chambers of Commerce are the main category of intermediary.

**Figure 50. Use of intermediaries by OP**

![Graph showing the use of intermediaries by OP](source: CSIL elaboration.)
Figure 51. Types of intermediaries by OP

Source: CSIL elaboration.
4.2.5 Characteristics of the beneficiary SMEs

Besides describing the different policy instruments targeted to SMEs, this study has the ambition to map the type of SMEs which actually benefited from these instruments during the 2007-2013 period. To that end, we searched for as many as possible data on beneficiary SMEs which are available in the OP’s monitoring systems.

Retrieving data on the number of beneficiary enterprises at policy instrument level is particularly challenging especially for those policy instruments providing indirect support to SMEs, since the monitoring systems keep track of the number of ERDF recipients, which in these cases are intermediary actors, not SMEs. Nevertheless, we achieved to collect data on beneficiary SMEs for a sample of 399 policy instruments out of the 670 reviewed (60% of all policy instruments). A total of 222 thousand beneficiary SMEs have been identified at single policy instrument level. Another 23 thousand beneficiary SMEs have been detected only for groups of instruments, making the total number of beneficiary SMEs counted in the empirical analysis nearly 246 thousand.

This exercise granted us access to a set of relevant information on a very high number of beneficiary SMEs, which could be conveniently processed in order to highlight the main characteristics of SMEs not just targeted by the ERDF, but actually benefitting from it.

The number of beneficiary SMEs by policy instrument is extremely variable, ranging from one beneficiary of an instrument in the Austrian OP Burgenland (which promotes basic research) and in the Belgium OP Hainaut (which started very late), to 8,000 beneficiaries of a policy instrument in the Spanish OP Technology Fund and 9,000 beneficiaries of another instrument (‘Guarantee Fund’) in the Italian OP Piedmont.

Figure 52. Average number of beneficiary SMEs by type of instrument

Source: CSIL elaboration.

On average, the largest number of beneficiaries is attained by policy instruments involving the promotion of business creation and development, and generic access to finance (Figure 52 above). This finding is consistent with the picture on the average number of beneficiaries by mode of delivery (Figure 53), which is the highest in...
case of grants and repayable financial support (especially those involving guarantees for credit). Instruments providing access to ICT, supporting R&D projects and technological and non-technological innovation are also addressed to large numbers of beneficiaries, while other types of instrument are more intensive and are associated with a lower number of beneficiary SMEs per instrument.

In order to better distinguish the factors determining innovation and growth patterns of SMEs, we aim to characterise beneficiary SMEs along two main variables: their size and their technological intensity, which in turn depends on the industrial sector. Actually, these specific factors influence innovation and growth of SMEs and this should be acknowledged by policy makers when designing SME support measures.

As to the size, we consider the number of employees, so as to differentiate between micro enterprises (0-9 persons employed), small enterprises (10-49 persons employed) and medium enterprises (50-249 persons employed), according to the EU definition.

Out of the total number of beneficiaries for which the size class is available, the micro-enterprises represent the large majority, often being the unique beneficiaries of policy instruments. A rough estimation finds the following proportion: 54% are micro-enterprises, 30% small enterprises and 16% medium enterprises.

Information on sectoral distribution by NACE branch is reflected in Figure 55 below. Around 44% of beneficiary SMEs are in the manufacturing sector, 16% are in the wholesale and retail trade; repair of motor vehicles and motorcycles; 10% in Information and communication; 6% in the tourism sector (Accommodation and food service activities). Beneficiary SMEs within the manufacturing sector are concentrated in the following sub-sectors: C25 Manufacture of fabricated metal products, except machinery and equipment (26% of the manufacturing total); C28 Manufacture of machinery and equipment n.e.c. (15%); C22 Manufacture of rubber and plastics products (8%); C10 Manufacture of food products (9%).

It is interesting to compare this breakdown with corresponding figures characterising the overall SME population as presented in Chapter 2. For example, we note that beneficiary SMEs are concentrated in manufacturing to a significantly greater extent than in the overall SME population: 44% of beneficiary SMEs as against around 10% in terms of the number of firms for the overall SME population and slightly more than 20%, in terms of employment (see Figures 6 in Chapter 2). Conversely, wholesale is under-represented among beneficiary SMEs.
We proxy technological intensity through that of the NACE sector to which the SMEs belong. This required adopting an indicator of technological intensity that can take into account not only inter-sectorial variability, but also inter-country variability. The box below shows how we establish the technological classification used in this analysis.

### Box 8. Sectors technological classification

In order to achieve our technological classification, we follow the OECD by proxying our measure of technological intensity with R&D intensity, computed as the ratio between business R&D expenditure and total value added in each 2 digits NACE sector of interest\(^ {74}\) and for each country. We then define four levels of technological intensity, based on the average values of R&D intensity across the EU.\(^ {75}\) This is done separately for manufacturing versus all the other industries (service industries), for reasons of comparability.\(^ {76}\)

The figure below shows, for each industry of interest, the share of countries where that industry is classified in technological level 1, 2, 3 or 4. A colour code helps in the interpretation of the figure: red stands for a low-tech classification, while green stands for a high-tech classification. Hence, industries presenting a higher share of red and orange are those generally classified as low-tech, while industries where yellow and green are prevalent are those generally classified as mid to high-tech. On the one hand we see, for example, most of the manufacturing traditional sectors showing a higher share of red, together with transportation and accommodation and food provision services. On the other hand it can be observed that manufacturing sectors such as pharmaceutical and computer, electronic and optical products, which are generally acknowledged as high-tech sectors, show a prevalence of green and yellow, together

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74 We considered NACE sectors from B to N (excluding K – Financial and insurance activities).

75 For each sector and each country we compute a unique value of R&D intensity that is obtained by averaging yearly R&D intensities for the available years.

76 The suitability of R&D intensity as a proxy of technological intensity has been widely discussed in the literature (see e.g. Pavitt, 1984 and the OECD, 2003). It is acknowledged that R&D intensity is not the optimal measure of technological intensity in service industries. However, even when adopting a different measure, such as the share of higher educated employees over total employees, the same or very similar classification of NACE sectors by level of technology intensity is obtained.
with scientific R&D, computer and information services and, in general, the other professional services.

Figure. Share of countries by technological level over sector (NACE rev.2 2 digits disaggregation)

Note: Technological level based on average technological intensity over the available period. Source: CSIL elaboration based on Eurostat data.
Figure 56 clearly documents the predominantly low technological intensity of beneficiary SMEs. More than half of them belong to sectors where the share of R&D expenditure over the value added is particularly low (as compared to other sectors in the same country). However, it should also be noted that about a quarter of SMEs have a medium-high level of technology intensity.

Results on the proportion of beneficiary SMEs according to their size and technology intensity can provide an even clearer picture when they are compared among each other. In Figure 57 we map beneficiary SMEs along the two dimensions.

Figure 57. Matrix of beneficiary SMEs: size vs technology intensity

Note: The size of bubbles relates to the share of beneficiary SMEs with a certain size and technology intensity level over the total number of beneficiary SMEs. The graph is based on data for nearly 60 thousand SMEs, for which both size and sector data (at 2 digit level) are available.
Source: CSIL elaboration.

The resulting matrix allows to gather very interesting findings on SMEs benefiting from ERDF support, even if variability across policy instruments is large:

- In general, ERDF policy instruments tend to favour especially low-tech SMEs regardless of their size. This finding can have different interpretation: focusing on low tech SMEs can be pursued as a specific objective aiming at improving the
innovation potential of the less competitive SMEs, or rather it can be the effect of more conservative strategies aiming at safeguarding employment during the crisis period. The case studies will shed light on the strategies adopted in the different contexts.

- The majority of micro enterprises are characterised by either a low intensity level (48% of all micro enterprises) or a medium high-one (36% of all micro enterprises). The latter group comprises dynamic and innovative enterprises, those which the literature usually refers to as ‘gazelles’. The same distribution, even if slightly less pronounced, is found for small enterprises.

- On the other hand, medium enterprises are more often selected as beneficiaries of support for innovation and growth if their current level of innovativeness is quite low. Actually, the share of beneficiary medium enterprises operating in low-tech sectors is higher than in the other size classes (approximately 55% out of the total of medium firms).

4.3 Logics of intervention

4.3.1 Conceptual scheme

In the previous section we have classified the policy instruments identified in the 50 OPs into broad types and we have described the main features of policy instruments across three dimensions, namely the mode of delivery, the target beneficiaries and the types of intermediary of support. Here we go more in depth into the analysis of the instruments’ logic of intervention.

We define the logic of intervention as the model describing the causal chain related to the deployment of specific policy instruments, explaining why and how certain interventions are expected to work.

The identification of the logic of intervention stems from the assumption that policy makers, aware of specific barriers to SME development and innovation in their region (or in their context of reference), mobilize certain policy instruments with the expectation that they will modify the business environment and induce a certain behavioural change in the target SMEs. Thus, policy makers aim to leverage certain drivers within SMEs, while expecting that this will produce specific outcomes on SME performance. Whether this holds true or whether the identified logic is actually robust and backed by theory or by evidence from the context will be tested with the case studies and the survey of beneficiaries (Task 3 and 4). For the purpose of the present analysis the reconstruction of the logic is based on the considerations that policy instruments are generally associated with specific barriers and expected effects.

To account for the expected effects generated by the policy instrument, we find it useful to refer again to the standard production function introduced in Chapter 2, which distinguishes between the main inputs into the production function (capital, labour and technology) and the output (or performance). Moving the analysis to the micro-level allows us here to identify more specific drivers of change in SME performance.

Therefore, we outline the logic of intervention of specific OPs as the combination of the following variables:

- the ‘barriers’, corresponding to market failures, which justify the policy intervention to support SME development and innovation. In order to analyse the policy instruments, we defined different categories of market failure hampering
SME development and affecting SMEs’ capabilities to innovate, selecting those that seemed specifically pertinent to Structural Funds interventions from the literature (see Chapter 3).

- The **changes** expected to be triggered by the policy instruments **on production inputs**, describing the desired behavioural change in SMEs.

- The **changes** expected to be produced in **SME performance**, affected by the above change in production inputs.

The set of possible options related to each variable is listed in Box 3.4. Country experts have been asked to investigate, with the help of programming documents and interviews with the Managing Authorities, the logic of each policy instrument by selecting the most relevant barrier that the instrument aims to address (either explicitly or implicitly) and the change expected to be produced in SME production inputs and performance.

**Box 9. Definitions of variables used to characterise the policy instruments**

<table>
<thead>
<tr>
<th>Barrier (or market failure) to be tackled by the policy instrument</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition failure:</td>
<td>The market power of (usually larger) established firms can inhibit competition of SMEs in markets in a variety of ways, including gaining financial advantages through the exercise of market dominance, the ability to impede market entry, access resources and the opportunities to embark on new investment ventures.</td>
</tr>
<tr>
<td>Transactions costs:</td>
<td>Smaller enterprises often face disproportionate transaction costs themselves or alternatively cause them to arise for others. These issues are due to limited internal resources and capacities to optimise and standardise procedures with customers and suppliers. Market failures from transaction costs are more pronounced in less developed regions.</td>
</tr>
<tr>
<td>Asymmetric information:</td>
<td>Information problems arise where one party in transactions has more or better information than the other. Smaller enterprises are often at a disadvantage, because of their restricted capacity to obtain or communicate appropriate information. The issue of asymmetric information is particularly evident in relation to credit, where, it is more difficult or disproportionately costly for banks or other investors to obtain information on the creditworthiness of potential SME clients and they are therefore likely either to charge more for finance or refuse to provide it altogether. Information asymmetries are more pronounced in less developed regions.</td>
</tr>
<tr>
<td>Non-availability of positive externalities arising from agglomeration effects:</td>
<td>In more prosperous areas, enterprises often benefit from agglomeration effects and other externalities and these can be particularly important to smaller enterprises, enabling them to work with firms engaged in complementary activities or take advantage of a common pool of skilled labour. For enterprises in less developed regions, these externalities are often less available.</td>
</tr>
<tr>
<td>Under-provision of infrastructures and institutions:</td>
<td>Enterprises, particularly in less developed regions, may have less infrastructure available, fewer facilities, fewer or less efficient supporting institutions and may thus incur greater costs in getting their goods to market or in producing innovation.</td>
</tr>
<tr>
<td>Risk related to the uncertainty of R&amp;D</td>
<td>The uncertainty related to research and experimental development, particularly at a pre-competitive stage, can discourage SMEs from investing money and efforts in R&amp;D activities.</td>
</tr>
<tr>
<td>Lack or inefficiency of intellectual property protection</td>
<td>Smaller enterprises face greater difficulties in protecting their intellectual property and thus are more exposed to the risk of imitation from other enterprises. As a consequence there is an underinvestment in knowledge generation.</td>
</tr>
<tr>
<td>Imperfect information on innovation opportunities</td>
<td>Smaller enterprises may fail to recognise the value of new, external information associated with innovation opportunities, and to assimilate it, and apply it to commercial ends.</td>
</tr>
<tr>
<td>Coordination and network failures</td>
<td>The unwillingness or inability of smaller enterprises to participate in networks and establish partnerships with other enterprises impedes the ability of the relevant actors to collaborate in the research, development and innovation process.</td>
</tr>
<tr>
<td>Lack of human capital</td>
<td>Smaller enterprises may lack adequate technical and research personnel able to carry out research, development and innovation activities.</td>
</tr>
<tr>
<td>Limited capacity to absorb spillover effects</td>
<td>Smaller enterprises may find it more difficult to appropriate the benefits arising from investment (e.g. in training, R&amp;D or in areas such as the development of intellectual property) carried out by other firms. Hence they do not manage to benefit from positive externalities.</td>
</tr>
<tr>
<td>Expected change on SME production input (behavioural change)</td>
<td>Definition</td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Create jobs</td>
<td>The policy instrument contributes to increasing the number of employees in already existing SMEs</td>
</tr>
<tr>
<td>Safeguard jobs</td>
<td>The policy instrument contributes to increasing the number of safeguarded jobs in already existing SMEs</td>
</tr>
<tr>
<td>Improve the quality of work</td>
<td>The policy instrument contributes to improving the quality of work and employment conditions (e.g. reducing the risk of accidents) in already existing SMEs</td>
</tr>
<tr>
<td>Improve human capital</td>
<td>The policy instrument helps an SME’s managers and employees to increase their skills and knowledge or contributes to attracting a labour force with higher skills</td>
</tr>
<tr>
<td>Increase fixed capital</td>
<td>The policy instrument relaxes constraints on the purchase of equipment or the construction of new facilities for SMEs</td>
</tr>
<tr>
<td>Increase the R&amp;D and innovation level</td>
<td>The policy instrument contributes to improving the level of R&amp;D and innovation embedded in SMEs’ products and processes</td>
</tr>
<tr>
<td>Increase entrepreneurship</td>
<td>The policy instrument contributes to improving the level of ICT embedded in SMEs’ products, processes and their organisation</td>
</tr>
<tr>
<td>Increase managerial/organisational capacity</td>
<td>The policy instrument contributes to favouring entrepreneurialism and, thus, the creation of new enterprises</td>
</tr>
<tr>
<td>Expected change on SME performance</td>
<td>Definition</td>
</tr>
<tr>
<td>Increased turnover</td>
<td>The policy instrument contributes to increasing the turnover of assisted SMEs on domestic and/or international markets</td>
</tr>
<tr>
<td>Increased export share</td>
<td>The policy instrument contributes to increasing the share of exports over total turnover, and also by opening up new markets</td>
</tr>
<tr>
<td>Strengthened equity structure</td>
<td>The policy instrument contributes to strengthening the equity structure of assisted SMEs by increasing equity capital, and also by attracting Foreign Direct Investment</td>
</tr>
<tr>
<td>Increased profitability</td>
<td>The policy instrument contributes to increasing the profitability of assisted SMEs, by increasing domestic/international sales and/or reducing production costs</td>
</tr>
<tr>
<td>Increased probability of survival</td>
<td>The policy instrument reduces the probability for the SMEs to become bankrupt by mitigating the risk of failure</td>
</tr>
</tbody>
</table>

Source: CSIL.

Sorting the information collected for all the 648 instruments by the twelve main types of instrument shows that similar logics of intervention, in terms of barriers tackled and effects pursued, are generally associated to the same category of policy instrument, as described in the next section.

**Figure 58. Simplified representation of the logic of intervention of a policy instrument**
4.3.2 Preliminary understanding of the logic of policy instruments

In this section we put forward some propositions regarding the logic of intervention of different types of policy instruments. The identified logics describe very broadly the expected causal chain associated with policy instruments that has emerged from the study of the 50 OPs and the discussions with the Managing Authorities. It will be the task of case studies to test the models that have emerged from this preliminary analysis, to define a full theory of change of specific OPs, particularly by taking into consideration the context where the instruments operate, and to further investigate to what extent the chosen policy mix is backed by the theory rather than deriving from other considerations. Moreover, both the case studies and the Bayesian Network Analysis of selected policy instruments (Task 4) will help us understand whether the instruments’ implementation paths corresponded to the intended logics.

As discussed above, the policy instruments most used to promote innovation in SMEs are those providing support for R&D projects. These instruments offer grants or other forms of financial support (such as venture capital or guarantees) with the explicit aim of supporting R&D activities, as a means to increase the turnover and profitability of SMEs. The main barrier generally tackled by instruments supporting R&D projects, is that generated by the risks related to the uncertainty of conducting R&D, particularly at a pre-competitive stage. Coordination and network failures and a lack of or inefficiency in intellectual property exploitation and protection are other barriers that may justify the policy intervention in this area.

Moving away from stimulating research and experimental development and towards the facilitation of commercial exploitation of innovation, two main categories of policy instrument can be mentioned: those involving the creation of innovative companies, such as university spin-offs, and those promoting the development of technological and non-technological innovation in already existing companies. Both these types of instrument are designed to reduce competition failures (related to the limited financial capacities of smaller enterprises), and address asymmetric and imperfect information that generally characterises SMEs, and which prevents them from innovating. The lack of proper human capital is another obstacle meant to be addressed by some instruments. By increasing managerial and organisational capacities, creating new (skilled) jobs and supporting the introduction or commercialisation of innovative products, these policy instruments are expected to lead to an increase in the turnover and profitability of the supported enterprises, as well as improving the probability of their survival in the long term. A similar logic of intervention can be attributed to instruments supporting the access to and diffusion of ICT, as a sub-category of technological innovation.

Instruments relating to knowledge and technology transfer for the benefit of SMEs and networking are also pro-innovation, but they are generally motivated by the need to address different market failures: the lack of sufficient coordination and networking among companies and the limited capacities to absorb spillover effects. For a few policy instruments, the non-availability of positive externalities arising from agglomeration effects has also been identified as a barrier to overcome.

Although all aim to support SME innovation, these categories of instruments differ in their modes of delivery, their main targets and the types of intermediary used. As described in section 3.2, instruments aimed at the creation of innovative companies are more frequently targeted to SMEs only, where these are supported mainly through venture capital delivered via financial intermediaries. As another example, instruments promoting knowledge transfer are more likely to be addressed to SMEs in partnership with universities, so as to overcome the limited propensity to collaborate.
Another category explicitly associated with the innovation objective includes ‘Eco-innovation’ instruments, however a different logic can be highlighted here. While in some cases the justification for promoting eco-innovation measures is to overcome imperfect information on more environmentally friendly products and technologies, by co-financing the modernisation of buildings and the purchase of new machineries or by promoting the diffusion of more environmentally sustainable practices, more often these instruments stem from the need to comply with EU environmental regulations or are moved by a political focus on environmental quality.

The prevalent action put in place by the EU regions and countries to promote SME growth refers to the co-financing, mainly through non-repayable grants, of investment projects for the creation of new businesses or the development of existing companies (category labelled as ‘Business creation and development’). The market failures generally addressed by these policy instruments are competition failures and asymmetric information relating to the financing opportunities that are available for start-ups. The increase in entrepreneurship, the creation of new jobs, the safeguarding of employment and the increase in fixed capital are the main changes expected to be induced within beneficiary SMEs. Successful projects aim to generate an increase in the turnover of SMEs, and to increase their probability of survival. A few instruments are designed to stimulate the business development in specific areas, so as to achieve a territorial cohesion objective too.

A two other types of policy instrument aim to stimulate the growth of SMEs, but, unlike with the previous type, by financing more specific activities. They include instruments supporting internationalisation and the improvement of SME capacities. In the former case, consulting services and technical assistance, information campaigns and events, sometimes in combination with grants, are delivered in order to achieve an increase in export share and turnover on the international markets, by improving the managerial and organisational capacity of SMEs. These instruments tackle asymmetric information and competition failures which usually prevent SMEs from taking advantage of opportunities on international markets. As for the latter type, advisory and consulting services (or grants to buy these services) are provided with the idea of overcoming the lack of human capital in SMEs which prevents them from properly developing. Support to improving capacities encourages entrepreneurship and the acquisition of new skills, with desired effects in terms of higher turnover and profitability, as well as an improved probability of survival of the company.

In contrast to these instruments financing very specific activities, are instruments providing generic access to finance (usually in the form of loans, micro credit, compensation for credit interest and guarantees on credit). They are usually associated with the need to address asymmetric information barriers, which prevent SMEs from easily obtaining credit from the banks. Such a need was particularly strong in recent years due to the financial and economic crisis affecting many EU countries. Access to credit is favoured with the idea that it will help disadvantaged SMEs to survive and increase or at least maintain their turnover.

For the last category of policy instruments, expected effects are more uneven, even if a general logic of intervention can still be observed. Instruments regarding the improvement of material and immaterial infrastructures and of related services are focused on improving the contextual conditions for the companies to do business; even if not supporting SMEs directly, but remedying the under-provision of proper infrastructure and services, they create the conditions that could help SMEs to either grow or innovate (e.g. through premises to accommodate new enterprises, or an improved network of business support organisations). Depending on the type of
infrastructure provided, this is expected to contribute to increased entrepreneurship or to stimulating R&D and innovation, with the mid/long term target of increasing SME turnover, profitability and probability of survival.

Table 13. Logic of intervention of main typologies of policy instruments

<table>
<thead>
<tr>
<th>Type of policy instrument</th>
<th>Barrier to be tackled</th>
<th>Expected change on SME production inputs</th>
<th>Expected change on SME performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support for R&amp;D projects</td>
<td>• Risk related and networking failures&lt;br&gt;• Coordination and networking failures&lt;br&gt;• Lack of efficiency of intellectual property protection</td>
<td>• Increase the R&amp;D and innovation level&lt;br&gt;• Increase turnover&lt;br&gt;• Increase profitability</td>
<td></td>
</tr>
<tr>
<td>Creation of innovative companies</td>
<td>• Imperfect information on innovation opportunities&lt;br&gt;• Competition failures&lt;br&gt;• Asymmetric information</td>
<td>• Increase the R&amp;D and innovation level&lt;br&gt;• Increase entrepreneurship</td>
<td>• Increase turnover&lt;br&gt;• Increase probability of survival</td>
</tr>
<tr>
<td>Development of technological and non-technological innovation</td>
<td>• Lack of human capital&lt;br&gt;• Imperfect information on innovation opportunities&lt;br&gt;• Competition failures&lt;br&gt;• Asymmetric information</td>
<td>• Increase the managerial/organisational capacity&lt;br&gt;• Create jobs&lt;br&gt;• Increase the R&amp;D and innovation level</td>
<td>• Increase profitability&lt;br&gt;• Increase turnover&lt;br&gt;• Increase probability of survival</td>
</tr>
<tr>
<td>Access and diffusion of ICT</td>
<td>• Imperfect information on innovation opportunities&lt;br&gt;• Competition failures&lt;br&gt;• Transaction costs&lt;br&gt;• Under-provision of infrastructures and institutions</td>
<td>• Increase ICT</td>
<td>• Increase profitability&lt;br&gt;• Increase turnover</td>
</tr>
<tr>
<td>Eco-innovation</td>
<td>• Imperfect information on innovation opportunities</td>
<td>• Increase the managerial/organisational capacity&lt;br&gt;• Increase fixed capital&lt;br&gt;• Increase the R&amp;D and innovation level</td>
<td>• Increase profitability (in some cases)&lt;br&gt;• Environmental sustainability&lt;br&gt;• Compliance with EU rules</td>
</tr>
<tr>
<td>Knowledge and technology transfer</td>
<td>• Limited capacity to absorb spillover effects&lt;br&gt;• Imperfect information on innovation opportunities&lt;br&gt;• Coordination and networking failures</td>
<td>• Increase the managerial/organisational capacity&lt;br&gt;• Create jobs&lt;br&gt;• Increase the R&amp;D and innovation level</td>
<td>• Increase turnover&lt;br&gt;• Increase profitability</td>
</tr>
<tr>
<td>Networking</td>
<td>• Coordination and networking failures&lt;br&gt;• Limited capacity to absorb spillover effects&lt;br&gt;• Non-availability of positive externalities arising from agglomeration effects</td>
<td>• Create/safeguard jobs&lt;br&gt;• Increase the R&amp;D and innovation level&lt;br&gt;• Increase the managerial/organisational capacity</td>
<td>• Increase turnover&lt;br&gt;• Increase profitability&lt;br&gt;• Increase probability of survival</td>
</tr>
<tr>
<td>Business creation and development</td>
<td>• Under-provision of infrastructures and institutions&lt;br&gt;• Competition failures&lt;br&gt;• Asymmetric information</td>
<td>• Create/safeguard jobs&lt;br&gt;• Increase entrepreneurship&lt;br&gt;• Increase fixed capital</td>
<td>• Increase turnover&lt;br&gt;• Increase probability of survival&lt;br&gt;• Territorial cohesion</td>
</tr>
<tr>
<td>Internationalisation and visibility</td>
<td>• Competition failures&lt;br&gt;• Asymmetric information</td>
<td>• Increase the managerial/organisational capacity</td>
<td>• Increase export share&lt;br&gt;• Increase turnover</td>
</tr>
<tr>
<td>Support for improving capacities</td>
<td>• Lack of human capital</td>
<td>• Increase entrepreneurship&lt;br&gt;• Improve human capital</td>
<td>• Increase turnover&lt;br&gt;• Increase profitability&lt;br&gt;• Increase probability of survival</td>
</tr>
</tbody>
</table>
### 4.4 Evidence of achievement of policy instruments

#### 4.4.1 Methodology to score the quality of evidence

Assessing the effectiveness of policy instruments for SME growth and innovation requires relevant data and information describing the results achieved by the instrument. This would imply that, after the support has been delivered and some time has elapsed to allow the potential change to actually materialise, there is a system in place to record and describe this change. Ideally, these data would be available in a consistent form, clearly based on the Commission’s Indicative Guidelines on reporting on core indicators, for instance. However, this system is not in fact in place in all the OPs and instruments under assessment, but only episodically and on a selected small number of instruments. In particular:

- Monitoring indicators collected for the identified policy instruments usually refer to the instrument’s outputs (number of projects financed and number of beneficiaries), which however are not useful *per se* to assess the effects of the instrument. In many cases, result indicators are also available (more often in terms of private investment activated, number of jobs created, sometime as increase in turnover, patents, percentage increase of exports, etc.). However, some interviewees argued that the reliability of result indicators is questionable: since result indicators can sometimes rely on beneficiaries’ declarations made ex-ante at the moment of project application, therefore describing the beneficiaries’ expectations or commitments, rather than actual achievements.

- Results declared by beneficiaries (either ex-ante or ex-post) in principle can be compared with targets set by the Managing Authority, whenever these are specified. However targets could be controversial too, for instance when they are set at a particularly low level for the sake of prudence.

- Indicators are not always available at policy instrument level, but at a more aggregated level (OP measure or Priority Axis, for example summing the effects of instruments addressed to SMEs with those addressed to large enterprises), which prevents the attribution of certain outputs and results to single instruments.

- Monitoring indicators collected by the Managing Authorities are not always relevant to determining the achievement of the instrument’s intended objectives, in terms of expected change in SME behaviour and performance. For example, the number of jobs created in beneficiary SMEs is not necessarily useful to determine whether an instrument intended to increase, e.g., internationalisation, was effective. To this end, the increase in exports would be a more suitable indicator.

- In many cases, projects are still ongoing and investments can continue up to the end of 2015; therefore, monitoring indicators, if available, provide only a preliminary and partial picture of the instrument’s effectiveness.
Only in a few exceptional cases are ad hoc ex-post studies available and their quality and results could not always be assessed. Indicators collected for WP0 do not solve the problems mentioned above. There are only a very small number of core indicators that relate directly to SMEs\(^{77}\) and these are usually not available at policy instrument level and, most importantly, are not useful in assessing the effect of the instrument on SME performance (see section 3.1.5). As to the other specific indicators used by the Managing Authorities in specific OPs, while these could in principle provide some additional relevant evidence (although not comparable across different OPs), as a matter of fact this is rarely the case: even when relevant specific indicators on business support exist, these are usually not suitable for the present evaluation, either because they are not specifically related to SMEs or because they are not available at policy instrument level.

While acknowledging the limitations, an assessment on the degree of effectiveness of the policy instruments is nevertheless provided. This assessment relies on available, even if not optimal, result and output indicators, complemented by other quantitative and qualitative evidence about the achievement of the policy instruments, its coherence, good or bad functioning and other features. In order to ensure consistency, the assessment is made by the Core Team on the basis of the evidence collected by country experts and their preliminary assessment.

In more detail, the degree of effectiveness of policy instruments is expressed through a synthetic score – from A to D – based on different criteria. When available, evaluation studies or other documents (e.g. survey results) concerning the effectiveness of the instruments were the first source of information for attributing a score. Additional evidence from interviews to beneficiaries’ representatives were relevant in some cases. The availability of relevant evidence relating to the achievement of the policy instrument, as reflected by result indicators from the monitoring system or other sources (e.g. interim or ex-post independent evaluation studies) was also considered in attributing a score. Output indicators (number of projects implemented and number of beneficiaries), and preferably their achievement as compared to the initial target, could provide complimentary evidence signalling whether the instrument can at least be expected to produce some results.\(^{78}\)

Other evidence on the design and delivery process of the instrument could also be taken into account in the assessment, whenever available. This may include the fund absorption rate (i.e. paid amount as a share of allocated resources), or the number of applications received against the number of projects approved, as a proxy for the degree of interest for SMEs of the policy instrument and thus its ability to meet SMEs’ needs and tackle the existing barrier to growth and innovation. Qualitative information e.g. about any implementation problems experienced could also back the assessment and the score attribution.

Furthermore, the Core Team has duly considered the specific nature and typology of the instruments: for example, acknowledging that evidence on results is more easily

\(^{77}\) WP2 relevant Core Indicators, as already identified in the Inception Report, are: the number of direct investment aid projects to SMEs, investment induced in SMEs, male or female jobs created in SMEs.

\(^{78}\) In some cases Managing Authorities do not explicitly distinguish between output and result indicators (as with the Estonian OP or the French Provence-Alpes-Côte d’Azur). The Piedmont OP uses so-called ‘impact indicator’ for job creation, which is usually labelled as ‘result indicator’ by other OPs. However, the data collection has revealed that the ‘output’ or ‘result’ label is usually accurate.
available and causal effects more straightforward for direct instruments than for indirect ones (e.g. technical assistance and consulting services); the assessment of indirect instruments is more often grounded on available output indicators and qualitative evidence, rather than proper result indicators. For more traditional and consolidated instruments, in a few cases the assessment is based, among other indicators, also on the evidence from past performance as a proxy for expected performance.

When the relevant output and result indicators are not available at the level of policy instruments but at a more aggregated level, the country expert has established how it is possible to attribute the quantified effects to specific instruments, with the support of the Managing Authority.

The four scores on the achievement of the policy instruments are described in the Table below.

**Table 14. Scores on the achievement of the policy instrument**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Type of evidence available</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>The policy instrument has <strong>achieved</strong> or exceeded the expected effects on SME production inputs and performance</td>
<td>Relevant and reliable result indicators or other evidence of achievement coming from ex-post evaluations or other studies point out that the instrument has already achieved the intended objectives. Effectiveness could also be demonstrated by other information (even qualitative) on the quality of the instrument, for example suggesting that the instrument was properly designed and delivered.</td>
</tr>
<tr>
<td>B</td>
<td>The policy instrument has <strong>partially achieved</strong> the expected effects on SME production inputs and performance; alternatively, there are <strong>some preliminary indications</strong> that the instrument could achieve at least some of the intended effects</td>
<td>This score is attributed to policy instruments for which some qualitative and/or quantitative evidence and/or useful output and/or result indicators are available, pointing to potential, but still not conclusive, effectiveness of the instrument. This score, in particular, is assigned to instruments for which i) there is evidence (even qualitative) from ex-post evaluations and similar suggesting that they could potentially produce some positive effects; ii) result indicators and evidence of achievement indicate partial effectiveness, still below initial expectations/targets; and ii) there is evidence suggesting that they could potentially produce some positive effects, e.g. preliminary result indicators, promising output indicators (even without any result indicator) or other qualitative evidence on their functioning. A more precise assessment would be feasible only when all projects, currently ongoing, will be completed and/or additional relevant evidence will become available.</td>
</tr>
<tr>
<td>C</td>
<td>The policy instrument has <strong>not achieved</strong> the expected effects on SME production inputs and performance.</td>
<td>Available result indicators and other evidence of achievement coming from ex-post evaluations or other studies suggest that the instrument failed to achieve its intended objective. Even when result indicators are not available, the policy instrument can be claimed to be ineffective, for example, because output indicators are clearly underperforming, the instrument was cancelled in the course of the period and/or there is qualitative evidence revealing that the instrument was not properly designed.</td>
</tr>
<tr>
<td>D</td>
<td><strong>No evidence</strong> about the effectiveness of the policy instrument</td>
<td>This score is attributed to instruments for which there are neither relevant result indicators nor other evidence of achievement, and output indicators and other qualitative evidence are either missing or insufficient to determine the possible effectiveness of the instrument.</td>
</tr>
</tbody>
</table>

Source: CSIL.

Another score is assigned by the Core Team on the basis of the quality of the OP monitoring system, which allows the evidence on the achievement of the instrument, provided by the output and result indicators or other evidence, to be qualified better. A score on a three-point scale (Good, Modest, Poor) is assigned by the Core Team to the monitoring system according to the criteria presented in the following Table: in short, the more robust, complete and relevant is the information available at policy instrument level
allowing the effectiveness of the policy instrument to be determined, the better the monitoring system.

### Table 15. Scores on the quality of the OP’s monitoring system

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>The OP has a good monitoring system, producing a number of relevant indicators</td>
<td>✓ Output indicators are available at the level of the policy instrument for all or most of the identified instruments; ✓ Result indicators are available at the level of the policy instrument for all or most of the identified instruments; ✓ Available result indicators are generally relevant to assess the capacity of the instrument to achieve its expected objectives; ✓ Additional quantitative evidence is available on the effectiveness of at least some policy instruments, e.g. from previous evaluation studies (not necessary criterion).</td>
</tr>
<tr>
<td>Modest</td>
<td>The OP has a modest monitoring system in place, producing a few number of relevant indicators</td>
<td>✓ Output indicators are available at the level of the policy instrument for some of the identified instruments; ✓ Result indicators are available at the level of the policy instrument for some of the identified instruments; ✓ Available result indicators are not always relevant to assess the capacity of the instrument to achieve its expected objectives.</td>
</tr>
<tr>
<td>Poor</td>
<td>The OP has a poor monitoring system in place, producing only a few number of or no relevant indicators.</td>
<td>✓ Output indicators are available at the level of the policy instrument for few or none of the identified instruments; ✓ No relevant result indicators are collected at the level of policy instrument.</td>
</tr>
</tbody>
</table>

Source: CSIL.

### 4.4.2 Assessment of the evidence of achievement

When applying the methodology described above to assess the evidence of achievement for each of the 670 policy instruments, it can be argued that **only 12% of all policy instruments have robust evidence of positive achievements.**

**Policy instruments which can be assessed as ineffective amount to 5% of the total.** The most common reason behind such a negative assessment is the low demand by potential target enterprises, causing, in some cases, the discontinuation of the instrument. The **economic crisis has negatively affected the performance of some instruments too:** for example, a number of instruments introduced by the Greek OPs failed to reach the desired outcomes due to the difficulties of SMEs in accessing the co-financing credit. As another example, one instrument included in the Latvian OP experienced significant budget cuts and was eventually suspended.

In **30% of the cases** no conclusive assessment on the achievement of policy instrument can be provided, due to the **lack of any sort of evidence about the possible effectiveness of the instruments.** In the absence of information about effectiveness made available by ex-post evaluations or other studies as well as any relevant output and result indicator at policy instrument level it is not possible to judge whether these instruments are (or will be) more or less effective.

The **remaining 53%** of instruments have been scored ‘B’, which indicates that there is **some evidence pointing to possible achievement of the policy instruments’ objectives**, but it is still too early to provide a conclusive assessment. More specifically, for **33%** of instruments scored ‘B’, corresponding to **16%** of the total number of instruments, some evidence of results is already available but initial objectives have not been met yet since most of the projects are still in the implementation phase. For **69%** of all instruments (36% of B-scored ones) there is some evidence suggesting that the
instruments have been well-designed and implemented, but neither result indicators from the monitoring systems nor other evidence of achievements is available at this stage. Thus, specific studies would be needed in order to produce a final assessment on their effectiveness. We will seek to do so for 8 selected OPs, with as many case studies, at least for those policy instruments which are at a sufficient stage of implementation.

**Figure 59. Distribution of scores on the achievement of policy instruments**

![Distribution of scores on the achievement of policy instruments](image)

Source: CSIL elaboration.

The next bar graph (Figure 60) presents the distribution of the scores on achievement for each type of policy instrument. The largest number of instruments for which evidence of positive achievement is available are those supporting R&D projects of SMEs and business creation and development. These are also the types of instruments where the largest share of public financing has been allocated and already paid (see again Figure 44).

Among the most successful instruments are also those promoting networking among companies, usually through the establishment of clusters, even if their number is marginal within the whole set of instruments.

On the opposite side, eco-innovation instruments record the most negative achievements in terms of SME performance. In many cases they have suffered from problems in committing expenditure. However, as pointed out in section 3.3 on the logic of intervention of policy instruments, it should be acknowledged that eco-innovation measures do not aim to produce a relevant change in the general performance of beneficiary SMEs, being mainly inspired by the aim of improving environmental sustainability.

For half of the instruments regarding generic access to finance no evidence is available to assess their effectiveness, while for another third output indicators suggest that the target number of supported companies has been achieved but no evidence exists on the capacity of the instrument to affect the performance of SMEs. This is consistent with the logic of the instrument: having practically no conditions on the use of funds, usually no effective monitoring system is in place to describe and quantify the results of support, unless proper evaluation studies have been conducted.
In general, the highest share of instruments under each category is scored ‘B’, typically because there is some positive evidence about the performance of the instrument, but not enough to determine whether the expected effects have been achieved.

**Figure 60. Scores on achievements by types of policy instruments**

Note: Numbers indicate the number of policy instruments receiving a given score. Source: CSIL elaboration.

An aggregate graph showing the number of instruments to which a certain score is assigned is included here above (Figure 61). It can be observed, for example, that policy instruments of the two Greek OPs have underperformed, mainly due to the bad macroeconomic context which interfered with the firms’ capacity to provide the necessary...
co-financing. The Czech OP ‘Business and Innovations’, the Berlin OP and the Slovenian OP have performed quite well according to available evidence. A more precise justification of these scores can be found in each OP summary fiche of Volume II.

The assessment of single policy instruments presented here confirms the overall finding derived from the analysis of the monitoring indicators collected and validated by the WP0 study (see section 3.1.5): only a small share of ERDF support has already generated documented effects, achieving or exceeding the initial targets. However, our empirical analysis enables us to better qualify this finding and to reveal the reasons of this performance. First, in the large majority of cases it is too early to verify the achievements, because project are still ongoing and funds are still being allocated.

Second, even if all projects had been completed, or monitoring indicators were analysed again in a couple of years, it would still not be possible to systematically evaluate the achievement of policy instruments on SME performance. The reason for this is that information retained in the national and regional monitoring system is usually insufficient to properly evaluate the effectiveness of the OP at policy instrument level, since they usually focus on a different level of analysis (often the priority axis, or the entire OP).

Out of the 50 OPs reviewed, the monitoring system is considered suitable to assess the instruments’ achievements in only 7 cases. In these cases, monitoring indicators are often complemented by evaluation studies which give important indications about the effectiveness of single policy instruments. Among these, the German OPs are those where most evidence is already available.

The monitoring system of 11 OPs is considered poor at accounting for the effectiveness of specific policy instruments, either because some output and result indicators are available only at priority axis level, or because no pertinent result indicators are set. The monitoring system of 30 OPs is scored as modest: evidence is available for some instruments, but not for all of them. For more details about the quality of the monitoring system of each OP, see Volume II.

### Table 16. Capacity of the OP monitoring systems to assess single policy instruments

<table>
<thead>
<tr>
<th>Quality</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>7</td>
</tr>
<tr>
<td>Modest</td>
<td>30</td>
</tr>
<tr>
<td>Poor</td>
<td>11</td>
</tr>
<tr>
<td>N.A.</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: The monitoring system of two OPs could not been fully assessed due to lack of cooperation of the Managing Authorities at providing the evidence. Source: CSIL elaboration.
4.5 Main findings from the horizontal analysis

A number of salient features emerge from a horizontal analysis of the 50 OPs reviewed in this Chapter which could be best further investigated through case studies.

- There is some fragmentary evidence that in countries having an already well developed industrial policy, the relevance of the ERDF is more limited, at least in expenditure terms in relation to other national and regional sources of financing.

- The analysis confirms the need to move from an expenditure-based reporting (as the one used in the adopted reporting system in place in the 2007-13 programming period – namely codes of expenditure) to an operations-based reporting to account of the specific form of the initiatives deployed ‘on the ground’. The analysis at the level of policy instruments shows promising heuristic developments since it allows to better characterise policy action in favour of SME growth and innovation.

- Around three quarters of the policy instruments co-funded by the ERDF are concentrated on providing support for R&D projects, support for innovation, and support for business creation and development. The remaining 25% covers especially generic access to finance, infrastructures and services for the improvement of the business environment, support for ICT access and diffusion, and the creation of innovative companies. Support to networking, knowledge and technology transfer, improvement of business capacity, internationalisation and eco-innovation have only marginal relevance.

- Around half of the instruments are designed to specifically promote innovation, one quarter is focused on SME growth and the remainder pursue a combination of innovation and growth objectives. It is clear however, that in the course of the OP implementation some resources have been shifted away from the innovation objective to reinforce more traditional measures focused on SME growth.

- In contrast to some of the trends identified earlier in the literature review, overall conventional picture of the forms of intervention mobilised over the 2007-2013 programming period seems to emerge from the analysis. Traditional non-repayable grants appear to be by far the predominant mode of delivery. Policy instruments are generally targeted at single enterprises (SMEs) with little sector specifications and without extensive recourse to intermediaries (although the latter are generally thought of facilitating reaching out to SMEs). Indirect support in the form of services are far behind grants, while more innovative forms of support like equity finance or repayable loans are still marginal. Partnerships also appear to be relatively unimportant – despite the great attention they attract in the literature. A significant share of policy instruments are delivered through a combination of modes, in general grants complemented with other forms, which often denote a more developed strategic intention as they generally follow well-defined specific objectives. That said, the characteristics of single policy instruments differ depending on their main type: for instance, instruments providing SMEs with generic access to finance make large use of repayable financial support delivered by means of financial intermediaries.

- In spite of large variations across different OPs, not only in terms of number of the policy instruments mobilised (without this being indicative of the actual
capacity of Managing Authorities to concentrate funding on strategic areas), but also in the very types of policy instruments implemented, \textbf{some interesting country-patterns are detectable in the choice of policy instruments, or a distinction stemming from the difference between Convergence and Competitiveness and Employment objectives}. In contrast, no clear patterns arise when comparing new vs. old Member States, or national vs. regional OPs.

- Evidence on \textbf{beneficiary SMEs} show that they are \textbf{prevalent in the manufacturing sector}, and, more than half of them, \textbf{classified as low tech, regardless of their size}. This could in fact reflect an objective of diffusing innovation rather than concentrating on poles of excellence. However, a relevant share of funding has also been absorbed by micro but quite innovative and dynamic enterprises, operating in medium-high technology sectors.

- Evidence relating to the performance of policy instruments in achieving the expected change in SME production inputs and outputs points to \textbf{substantial difficulties in accounting for the effects of specific instruments}. This result, in line with the analysis of WP0 indicators, is mainly due to the impossibility of observing yet the results of most of the unfinished projects, and to the weaknesses of the monitoring systems which do not collect systematic evidence of achievements at the level of policy instruments. A more in-depth analysis is needed to disentangle the latter issue from the former and to gather stronger evidence about the achievements of instruments'.
5 NEXT STEPS: CASE STUDIES AND POLICY INSTRUMENTS SELECTION

This Chapter puts forward proposals regarding the Operational Programmes selected as case studies to be carried out in Task 3 and policy instruments that will be the object of theory-based impact evaluation under Task 4.

5.1 Selection of case studies

The criteria for selecting the eight case studies are inspired by the need to ensure the greatest degree of representativeness in terms of socio-economic context and regional strategy and the opportunity to discover relevant lessons on mechanisms concerning SME support.

More specifically, case studies are selected in order to fulfil the following conditions:

- to include territories with different SME typologies;
- to account for strategies based on a full range and different mixes of policy instruments (e.g. to cover both traditional forms of support and more recent forms (cluster development, demand-side initiatives etc.);
- to ensure a balance between regional and national cases, though recognising that national OPs do not always lend themselves well to an investigation based on a case study methodology given the wide geographical and financial scope;
- to ensure a balance between Convergence and regional Competitiveness objectives, as well as between EU 12 and EU 15;
- (at least) one case study should be characterised by the allocation of a significant amount of ESF support to SMEs, with the aim of exploring synergies played between the ERDF and ESF funds;
- the presence of a collaborative Managing Authority and a suitable monitoring and reporting system for data collection.

On this basis, the following cases are selected:

1. Italy – Apulia (2007IT161PO010), pilot case study
2. France – Île-de-France (2007FR162PO012)
3. Germany - Saxony (2007DE161PO004)
4. Denmark - Innovation and Knowledge (2007DK162PO001)
5. Spain - Castilla y León (2007ES162PO009)
6. Czech Republic - Business and Innovation (2007CZ161PO004)
7. Poland - Innovative Economy (2007PL161PO001)

The figure shows on the map the proposed case studies.

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79 As requested by the Terms of Reference.
Note 1: Small circles indicate the OP where a policy instrument is suggested for theory-based impact evaluation (Task 4); see next section.

Note 2: EU Community contributions shown in the map are the 2007-2013 ERDF amount programmed at end 2012.

Source: CSIL.

The reasons for selecting the above mentioned OPs for case studies, according to the proposed selection criteria, are explained in what follows.
**SME typologies and context**

Statistics on the number of SMEs in the countries and regions targeted by the 50 OPs indicate that:

- The **Polish national Innovative Economy OP** targets one of the largest number of SMEs, with over 1.5 million SMEs. The **regional OP of Île-de-France** also targets the widest SME basis among all regional OPs, being above 700 thousand SMEs (see Figure II.1 in Annex II). It is relevant to include in the sample case studies with such a large scope.

- In relative terms, when the number of SMEs is compared to population, the **Czech Republic** (OP ‘Business and Innovation’ and OP ‘R&D for Innovation’) has one of the highest number of SMEs per inhabitant. A high intensity of SMEs is another relevant aspect to be considered in the selection.

- The size of SMEs is on average smaller in Southern Europe, i.e. Spain, Southern Italy and Greece. Among these, in the **Spanish region of Castilla y León** and the **Italian region of Apulia** more than 96% of SMEs are micro enterprises, one of the highest shares across the territories of the 50 OPs. The **Czech Republic** has a similar proportion of micro enterprises.

- On the contrary, in **Lithuania** and **Denmark** the share of micro enterprises is relatively low (below 90%), while the number of small and medium enterprises is above 10% of total enterprises. With the aim of investigating and comparing strategies of intervention for areas characterised by a different business fabric (in terms of SME size), we suggest selecting OPs in areas where the size of SMEs is either relatively small or large (i.e. with less micro and more small and medium enterprises).

Furthermore, according to the context analysis presented in Chapter 2 and in each OP fiche (see Volume II), during the 2007-2013 period, the core of Europe recorded more positive trends in terms of GDP per capita, production, employment, R&D and capital investment. This area includes, for example, the region of **Saxony**, a catching-up and dynamic region of Eastern Germany, where total R&D spending and the number of R&D jobs increased significantly during 2007-2009 and the rate of investments in tangible assets significantly exceeded the national average. On the contrary, the region of **Île-de-France** which is one of the top region in terms of RD& intensity is fighting to preserve its leading position and connect the regional SMEs to the R&D base. Comparing the two regions offers the chance to explore how the targeting strategies have been adapted to the territorial specificities.

**Policy mix and relevance of support**

Chapter 4 provided an overview of the volume of ERDF funds programmed for the 50 OPs and targeted to SME support (see also the table in Annex II). Based on that, the case study proposals rest on the following facts:

- The **Polish national OP** (5.3 billion Euro) and the **Czech ‘Business and Innovation’ OP** (2.3 billion Euro) are among those with the highest volume of programmed ERDF for WP2 expenditure themes. Among the regional OPs **Saxony** in Germany is among those with the highest volume of ERDF programmed (around 850 million Euro).

- In contrast, the **Danish Innovation and Knowledge OP**, with its 203 million Euro devoted to innovation and SME support, and the French **regional OP of Île-**
**Île-de-France** with 60 million Euro are among those where the lowest bulk of ERDF was programmed: they rank 36th and 48th out of the sample of 50 OPs, respectively. A volume of ERDF contribution to SMEs below the average of the 50 OPs has been programmed also in the region of **Castilla y León**, which allows consideration to be given to the effectiveness of relatively modest ERDF support in different EU contexts.

- The share of ERDF programmed contribution devoted to WP2 themes over the total ERDF contribution to the OP, which clearly points to a strategic focus on SME support, is highest (above 80%) in **Denmark**. On the contrary, although **Apulia** has a higher volume of ERDF programmed on WP2 relevant themes (645 million Euro), this represents a minor share of the overall programme (around 25%), thus it cannot be considered the core priority of the OP.

In addition to data about the volume of ERDF support, the selection of OPs has been guided by the aim of accounting for different intervention strategies, which will support the process of deriving interesting narratives about the contribution of policy instruments to SME growth and innovation. In general, it can be seen that the policy instruments featuring in the different case studies that have been proposed represent an interesting range, encompassing both traditional forms of support and newer elements.

- As a general trend, in EU12 the number of policy instruments aiming to improve the business context, by providing infrastructure for businesses or business support organisations, and new services for enterprises, are generally more numerous than in EU15, sometimes even prevailing over instruments directly supporting SMEs. The logic behind this strategy, which would have to be tested in the case studies, is that reinforcing the environment for doing business is the precondition for any form of direct support. This logic emerges from OPs such as **Lithuania** (‘Economic Growth’).

- While still attaching great importance to indirect support, the **Polish national OP ‘Innovative Economy’** followed a different logic. Recognising that the lack of any culture of innovation among SMEs represents a serious obstacle to innovation and that, removing this obstacle is a necessary condition for innovation, various policy instruments have been designed to favour the diffusion of a kind of ‘awareness of innovation’ among SMEs. Since removing this barrier is felt to be a necessary, though not sufficient, condition for SME innovation, the strategy is complemented by other policy instruments addressing the different stages of the innovation process (from R&D to innovation commercialisation).

- The **French regional OP Île-de-France** privileges indirect measures aiming to structure the network of SME support or to strengthen and make more effective support services to SMEs through so-called “collective actions”. The **Danish OP ‘Innovation and Knowledge’** adopts a similar strategy: individual SMEs cannot typically receive support, but networks of SMEs, SMEs in partnership with large enterprises or with universities and research institutions are eligible for support, which is often channelled through various types of intermediaries. However, while preliminary evidence suggests that policy instruments in Denmark have generally been successful and achieved their objectives, some of the policy instruments initiated in Île-de-France attracted very marginal shares of funds as they encountered limited interest of targeted SMEs. A comparative analysis of these OPs, both between them and in comparison with other strategies, is very worthwhile with a view to analysing the reasons and conditions for the instruments’ effectiveness.
The capability of a Convergence region to grow and resist the effects of the economic crisis by increasing its level of technology intensity and R&D can be explored in the German region of Saxony. There, more than in other German regions, the regional OP has fostered the implementation of R&D projects by SMEs, either individually or in collaboration, and technology transfer. Preliminary evidence suggests that this strategy may have provided an important contribution to the increase of the innovation level of SMEs, thus favouring their development.

Large enterprises often play a pivotal role for SME development, by involving them in their supply chain, thereby increasing their growth and innovation potential through knowledge transfer. The degree of collaboration between large and smaller companies and the extent to which policy instruments, targeted to either one or the other group, complement each other can be investigated in a case study on the Czech 'Business and Innovation’ OP. This OP addresses a territory where the local manufacturing industry is undergoing a process of structural change, towards increasing internal production capacities, technology intensity and internationalisation. The case study would assess to what extent SMEs participate in and contribute to this transformation process, and how ERDF instruments support this process.

The Italian Southern region of Apulia is specialised in declining traditional sectors but a regional strategy is in place to stimulate the development of industrial and technology clusters in existing or emerging high-tech fields (mechatronics, ICT, automotive). ERDF funds significantly contribute to this strategy by supporting both growth and innovation of SMEs, through some traditional forms of support (grants) but also a variety of financial instruments. A useful contrast could be made with the measures to promote clusters that have a significant place in the Danish Innovation and Knowledge OP. More generally, both OPs can throw light on the performance of relatively new forms of support (cluster development, demand-side initiatives). The role of the ERDF in supporting enterprises during a period of economic crisis is also a notable feature of the Apulian case.

With the aim of further exploring policy instruments targeting more generic growth objectives the selection includes the OP Castilla y León which provides a major effort in the promotion of business competitiveness, increase in productivity and diversification of the regional SMEs. A number of instruments are addressed to foreign promotion of business and improve the global perspective in the SME through the support to trade missions, foreign promotion, internationalization plans, external advisory services, support groups of exporters, etc. The role of intermediate bodies in implementing such measures and improving the SMEs capacities to go international is another relevant aspect of the OP which deserves further investigation.

Geographical balance

The type of territory targeted by the Operational Programme can be a relevant factor, albeit not the only one, in explaining the rationale and effectiveness of different policy instruments. In this respect, case studies should preferably cover different types of territory, both single regions and entire countries, Convergence and Competitiveness and Employment objective areas, Western Old Member States (EU15) and Eastern New Member States (EU 12). The 8 OPs proposed for a case study ensure a fairly balanced coverage of the different combinations of EU territories, as shown in the Figure below.
Synergies with ESF support

The database of ESF budget allocation over the 2007-2013 period\(^80\) has been inspected with the aim of detecting for which of the countries and regions targeted by the WP2 evaluation the European Social Fund contributes the most to support SMEs. The database provides the figures of the ESF financial allocations, as decided in 2007, in each EU country, by each Operational Programme and by priority areas.

The following considerations can be made:

- The largest ESF budget targeted to enterprises\(^81\) has been allocated by the **Polish Human capital Operational Programme**, covering the entire country: almost 8.8 billion Euro were programmed in 2007 for ESF priority areas 62-74 (Increasing the adaptability of workers). Within the group of EU15 countries, the **national ESF OP of France** has the largest volume of funds allocated in the considered codes of expenditure (4.2 billion Euro). Among regions, a relevant

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\(^{81}\) ESF priority areas are referred to 'Increasing the adaptability of workers' (expenditure themes 62-64), 'Improving access to employment and sustainability' (expenditure themes 65-70), 'Improving the social inclusion of less favoured persons' (expenditure theme 71), 'Improving human capital' (expenditure themes 72-74) and others. ESF priority areas which give the most relevant and direct contribution to SME growth and innovation are those regarding measures for increasing employment and adaptability of workers through trainings; measures for improving human capital and acting on the education system can also have an effect on the business sector, even if indirectly.
amount of ESF has been allocated in the **German region of Saxony** (840 million Euro).

- Out of the total 50 ESF OPs considered,\(^\text{82}\) measures directly addressed to employees and enterprises receive on average 20% and 30% respectively of total ESF budget. The **Czech national OP ‘Human Resources and Employment’** and **Italian national OP** addressing Convergence regions, including Apulia, allocate a high share of funds to improving adaptability of workers (above 30%); the same Czech OP and the **Italian regional OP of Apulia** allocate an above the average share of ESF to improving access to employment and sustainability (higher than 45% of the entire ESF programme).

- If considering the fields of intervention which, more than others, are expected to complement the ERDF resources for SME growth support, i.e. Active and preventive measures on the labour market to support employment (priority 66) and Support self-employment and new businesses (priority 68), the highest volume of ESF resources in these areas are allocated by the **Polish Human Capital Operational Programme**, the **Czech Human Resources and Employment OP** and the **German OP ESF Saxony**.

This analysis shows that it will be interesting to explore the synergies between the ESF and the ERDF in more than one of the proposed case studies.

**Figure 64. Volume (Euro) and share of ESF allocation to priority areas 62-74 (2007-2013)**

Source: CSIL elaboration based on EC data.

**Degree of collaboration by the Managing Authority**

The Managing Authorities for all the proposed OP case studies have collaborated in the implementation of the evaluation and, in most cases, have already provided important

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\(^{82}\) Out of all 117 national and regional ESF Operational Programmes in the EU27, 50 of them provide support under priority areas 62-74 (see previous footnote) and are targeted to WP2 regions and countries.
data on beneficiary SMEs and policy instruments. For example, the Managing Authority of the **Czech OP ‘Business and Innovation’** has identified a specific contact person for the WP2 evaluation. In **Saxony (Germany)**, some instruments activated by the regional ERDF OP have already been subject to a mid-term evaluation and an enterprise survey and some findings on outputs and results are already available. While that survey does not compare the achievements of treated and non-treated firms, targets only a small number of firms and is not specifically focused on SMEs, it provides a useful initial analysis to be further developed in the case study.

The **Danish** Managing Authority have already provided quite a lot of information and their AIR (for 2013) is quite informative. There is an interesting high level analysis of all Structural Fund support that compares the performance (in terms of employment and turnover growth) of the 10,000 enterprise beneficiaries with a control group that received no support. A clear difference is demonstrated. At a more disaggregated level, there are more data in the AIR on performance on the three main areas of intervention (innovation, SME support and technology support – IT and energy).

A number of Managing Authorities have, however, brought attention to the additional burden represented by the necessary co-operation. Nonetheless, almost all have co-operated to some degree and methodologically it would not be appropriate to avoid those Managing Authorities that have raised these matters.
Table 17. Overview of the proposed case studies (Task 3)

<table>
<thead>
<tr>
<th>OP proposed for a case study</th>
<th>Cohesion Policy objective</th>
<th>NUTS level</th>
<th>Volume of EU contribution for WP2 themes</th>
<th>% of EU contribution for WP2 themes over total contrib. for the OP</th>
<th>Context</th>
<th>Mix of policy instruments and logic of intervention</th>
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<tbody>
<tr>
<td>1. Italy – Apulia, pilot case study</td>
<td>CONV, EU15</td>
<td>NUTS 2 region</td>
<td>EUR 645 Million</td>
<td>25%</td>
<td>The small size of Apulian firms is a major barrier for both growth and innovation, coupled with the specialisation in some declining traditional manufacturing sectors. The launch of a regional strategy to foster R&amp;D and innovation, along with the pivotal role of some large multinational companies, is stimulating the development of some industrial and technology clusters in high-tech fields (automotive, mechatronics and biomedics).</td>
<td>The OP provides support for both growth and innovation of enterprises, including SMEs, under two dedicated priority axes. Instruments are targeted to specific categories of SMEs: medium-high tech companies belonging to regional industrial excellence are the main recipients of support for innovation; as to instruments aimed at increasing competitiveness of SMEs, the Managing Authority has targeted its support to stronger firms, with higher probability of surviving the crisis and completing the investment project.</td>
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<tr>
<td>2. France – Île-de-France</td>
<td>COMP, EU15</td>
<td>NUTS 2 region</td>
<td>EUR 60 Million</td>
<td>42%</td>
<td>Île-de-France is characterised by excellence in R&amp;D and is a leading region as far as innovative SME are concerned (R&amp;D carried out by SMEs), but it is experiencing decreasing dynamism and the research potential appears to be insufficiently exploited. There are weaknesses on the front of creation of enterprises. There are also disparities with SMEs in traditional sectors that are less innovative and make little use of new technologies.</td>
<td>The OP makes the deliberate choice to emphasise indirect measures of support to SMEs seen as a more efficient way to use Structural Funds. 'Collective actions' are to provide SMEs through advice and coaching, while other measures promote the development of structures enabling technology transfer. These are completed by a couple of instruments providing SMEs with direct financial support promoting networking between SMEs and between SMEs and research organisations.</td>
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<tr>
<td>3. Germany - Saxony</td>
<td>CONV EU15</td>
<td>NUTS 2 region</td>
<td>EUR 846 Million</td>
<td>29%</td>
<td>Saxony in a catching up and dynamic region of Eastern Germany, which has been very limitedly affected by the world economic crisis. SMEs in Saxony employ a higher share of workforce than the national average. The region around Dresden (the capital of the state Saxony) developed very well technologically over the last years. Here the R&amp;D to GDP ratio is 3.77% and ranks among the highest in Germany.</td>
<td>The approach of supporting SMEs is rather classic (grants for collaborative and individual R&amp;D projects, support of technology transfer, provision of risk capital for technology-oriented firms and support of e-business and business networks). Of particular interest is the support of R&amp;D in the OP. Compared to the other German OPs under examination, the spending of more than 350 million Euro on instruments regarding direct R&amp;D support, i.e. grants for collaborative and individual R&amp;D projects, is the highest in this</td>
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83 See Figure 22 in Chapter 4.
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<thead>
<tr>
<th>OP proposed for a case study</th>
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<th>Volume of EU contribution for WP2 themes</th>
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<tr>
<td>4. Denmark - Innovation and knowledge</td>
<td>COMP, EU15</td>
<td>NUTS 0 country</td>
<td>EUR 203 Million</td>
<td>82%</td>
<td>Denmark has a strong economy that has recovered well in the aftermath of the financial crisis, but growth is concentrated around major urban areas and the peripheral areas are lagging behind. A big challenge is to make industry more innovative and knowledge-based. Surveys have shown that more than half of Danish businesses do not focus sufficiently on innovation and development, especially outside the major urban areas. Improving the conditions for doing business throughout the entire country and ensuring the transfer of knowledge and technology from research centres to enterprises, especially those located far away from R&amp;D facilities, are therefore the main priorities.</td>
<td>The design and implementation of the OP's logic of intervention has quite distinctive features. The Managing Authority sets the overall priorities of the national OP, but six different Growth Fora in each Danish region decide their own priorities (in line with the general ones) and the mix of instruments. SMEs are usually not targeted individually but in partnership with other enterprises, universities and research institutions. For most of the instruments the resources have to be channelled through various types of intermediaries and aim to contribute to the improvement of the business environment and networking, for both innovation and growth.</td>
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<tr>
<td>5. Spain – Castilla y León</td>
<td>Competitiveness and Employment, EU15</td>
<td>NUTS 2 region</td>
<td>EUR 269 Million</td>
<td>36%</td>
<td>Castilla y León region can be understood as an industrial region in the context of Spanish economy (27% above the Spanish average). Within the regional industrial tissue, manufacturing industry represents nearly 73.4% in terms of total industrial employment. The share of SMEs over the total number of enterprises in Castilla y León’s is bigger than the EU28, and even bigger than the Spanish average.</td>
<td>The OP promotes a diverse mix of policy instruments that should tackle the multiple barriers to growth and innovation of SMEs. The two main objectives are: to improve the competitiveness in the region, by promoting research, technological development and use of IT; and to promote productivity and diversification among the SMEs. The OP combines financial incentives (grants and credits) for R&amp;D and innovation projects, especially collaborative projects in order to foster collaboration and knowledge transfer with more indirect measures such as dissemination of information, expert...</td>
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<tr>
<td>6. Czech Republic - Business and Innovation</td>
<td>Multi-objective, EU12</td>
<td>NUTS 0 country</td>
<td>EUR 2,282 Million</td>
<td>73%</td>
<td>Heavy industry and manufacturing are deeply rooted in Czech Republic, but they are currently undergoing a process of structural change. Efforts are made to increase foreign direct investments, start new production capacities and increase technological innovation. Large enterprises play a pivotal role of development, as SMEs are generally involved in the production of simple components for large foreign chains instead of production of goods for end market. This main focus of this OP is to support SMEs which are able to increase their innovation potential and knowledge development. While some individual areas of intervention allow that support is provided also to large enterprises, the majority of beneficiaries are SMEs. The OP promotes the ongoing industrial structural change, by creating the conditions for the incorporation of Czech firms into international cooperative groupings, encouraging the forming and development of SMEs through the ‘business angels’ networks and incubators, favouring the knowledge transfer from innovation centres and science and technology parks and the participation in the R&amp;D projects of domestic research institutions. The analysis of the logic of intervention and policy instruments for SMEs will be enriched by a contemporary analysis of the interventions addressed to large enterprises (specifically investigated by the WP4 team), so as to assess the strategy for business growth and innovation from multiple perspectives. Combining findings and deriving a more comprehensive view of the effectiveness of the OP is of great value for a context where large enterprises and SMEs are in fact strictly connected among each other, such as Czech Republic.</td>
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<td>7. Poland - Innovative Economy</td>
<td>CONV, EU12</td>
<td>NUTS 0 country</td>
<td>EUR 5,287 Million (the highest allocation among the sample OPs)</td>
<td>62%</td>
<td>Poland is the only EU economy that avoided a recession in 2008-2010 and which did not suffer any increase in unemployment. Since 2006 Poland has successfully upgraded its large and diversified industry by adopting international good practice, acquiring cutting-edge machinery and attracting foreign direct investments, start new production capacities and increase technological innovation. The OP foresees a comprehensive mix of policy instruments to address the different stages of the innovation process and to help SMEs to growth and internationalise. The mix of policy instruments, some of which very quickly spent, helped some Polish enterprises to become more innovative. Even if the scale of the OP is the largest one in the sample of 50 OPs under...</td>
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<td>foreign direct investment. The share of public sector R&amp;D is higher than EU average, even if concentrated in few regions, but the business sector R&amp;D lower. Several barriers are in place and limit the degree of innovation and development of SMEs, such as low coordination and networking, poor offer of SME support services, lack of awareness among entrepreneurs about the positive effects of innovation on SMEs performance.</td>
<td>evaluation, it is still small comparing to the total number of SMEs in Poland and it is complemented by a variety of other sources of financing, both at national and regional level. The main contribution expected by the OP was to create and diffuse a kind of ‘fashion for innovation’ among enterprises. The provision of a different forms of consulting services, advice, training and technical assistance along with grants and other direct support served that purpose.</td>
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<tr>
<td>8. Lithuania - Economic Growth</td>
<td>CONV, EU12</td>
<td>NUTS 0 (= NUTS 2) country</td>
<td>EUR 760 Million</td>
<td>25%</td>
<td>Lithuania’s economy is dominated by sectors characterised by low value added and labour-intensive technologies, building their competitive advantage on relatively cheaper operating costs rather than on knowledge and innovations. The economic crisis had a huge impact, but the country has now on a recovery path. The significant growth of domestic demand, stimulated by the recovering labour market and increasing wages, can be identified as a new driver of growth.</td>
<td>The OP activates a quite diverse mix of instruments which seeks to overcome barriers hindering SMEs development and innovation. They focus on: stimulating greater R&amp;D investment by R&amp;D performing firms, stimulating public private collaboration and knowledge transfer, increasing business productivity, increasing access to finance, creating and developing business services for companies, facilitating efforts to attract R&amp;D investment from abroad. In general, the OP reinforces a systemic tendency to favour ‘passive’ absorption of technology and innovation developed elsewhere (mainly through capital investment) as a way to compensate for limited funds for carrying out own business R&amp;D activities.</td>
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Source: CSIL.
5.2 Selection of policy instruments

As for the selection of the seven policy instruments to be evaluated in Task 4, the main criterion is the degree of representativeness of the typologies of policy instruments used in the 50 OPs, as shown in Chapter 4, and the feasibility of a theory-based impact evaluation based on a survey of beneficiaries with Bayesian Networks. The following considerations are also taken into account:

- policy instruments should be chosen within the OP proposed for the case studies, in order to ensure a deep knowledge of the context and maximise the efficiency of data collection;
- balance should be ensured between different categories of policy instruments, particularly those which absorb the largest amount of resources in the sample of 50 OPs;
- geographical balance should be ensured between Convergence and Competitiveness and Employment objectives, between regional and national OPs;
- instruments with a large number of beneficiaries have generally been preferred to ensure higher robustness to the results of the Bayesian network analysis, together with the availability of disaggregated data on beneficiary SMEs;
- collaboration by the Managing Authority for providing the support needed, as well as existence of a set of relevant data for the purpose of the evaluation (especially on beneficiary SMEs). The availability of outcome indicators should not be considered as a necessary prerequisite for the instruments’ selection. Actually, it is very unlikely that already existing monitoring indicators are suitable to properly and fully describe the behavioural change produced by an instrument on beneficiary SMEs. Instead, the ‘black box’ of the firm will be opened and relevant CMO (Context-Mechanisms-Outcome) configurations related to each policy instrument will be identified by collecting the needed information through on-line surveys to beneficiaries.

Policy instruments proposed for evaluation are:

1. ‘Aid to investment by micro and small enterprises’ in Apulia (Italy), as an example of the typology of instruments dedicated to business creation and development, though the use of grants, sometimes combined with credit guarantees;
2. Support for R&D projects to individual enterprises in Saxony (Germany) through the use of grants;
3. As another example of instrument providing support for R&D projects but in a very different context, grants for industrial research and experimental development projects implemented in Castilla y León (Spain);
4. Development of institutions of business support, as an example of instrument providing infrastructures and related services for the business sector (Poland, OP Innovative Economy): SMEs are indirect beneficiaries of this type of instrument, quite common in some New Member States;
5. An instrument providing a combination of grants and consulting services in Poland (National OP ‘Innovative Economy’) aimed to encourage the uptake of innovative technological solutions in SMEs: this instrument belongs to the category “Support for the development of technological and non-technological innovation”;
6. Given the widespread use of policy instruments supporting technological innovation in the EU, another instrument belonging to this category is proposed: it is the action ‘LEADER’ providing grants to individual enterprises for technological innovation in Lithuania;

7. One example of instrument promoting non-technological (management and organisational) upgrade in Lithuania through a package of grants and consulting services is proposed;

8. **Support for networking**, through grants to SMEs in partnership with universities and research institutes for the development of clusters (Denmark - Innovation and Knowledge OP). This instrument is proposed by virtue of the relevance given by the literature to the theme of clustering, but also by the overall good achievements generally attained by this typology of policy instrument, as shown in the analysis of the 50 OPs (Chapter 4).

The proposed list of policy instruments may be subject to further refinement on the basis of comments by DG REGIO and also of additional information to be gathered by the country experts when carrying out the case studies.
Table 18. Proposed policy instruments (Task 4)

<table>
<thead>
<tr>
<th>Typology of the policy instrument proposed for in-depth study</th>
<th>Identification name and number of the instrument, as presented in the OP fiche, Volume II</th>
<th>Related OP</th>
<th>Cohesion Policy objective</th>
<th>NUTS level</th>
<th>Description of the instrument</th>
<th>Public paid amount for the instrument</th>
<th>Number of beneficiary SMEs and evidence of achievement</th>
<th>Level of cooperation by the Managing Authority and data availability</th>
</tr>
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<tbody>
<tr>
<td>Business creation and development (in some cases in combination with generic access to finance)</td>
<td>‘Aid to investment of micro and small enterprises’ (instrument n. 11)</td>
<td>Italy - OP Apulia (2007IT161 PO010)</td>
<td>CONV, EU15</td>
<td>NUTS 2 region</td>
<td>It supports the creation and development of micro and small enterprises through grants. The policy instrument has been delivered through an open call. Examples of projects comprise the financing of the purchase of machineries, computer systems, buildings, construction works for enterprises (water, electrical, heat systems). Out of the total number of projects financed (around 3,311), around 30% benefitted also from credit guarantees (delivered through another policy instrument included in the OP). The Bayesian Network Analysis would therefore compare the outcome generated by the instrument on SMEs which have or have not benefitted also from credit guarantees, to detect whether the combination of the two instruments leads to better effects.</td>
<td>80 Million Euro (100% to SMEs)</td>
<td>It is estimated that the instrument activated 254 MEUR of investment for a total of nearly 3,311 projects implemented. The instrument, launched in 2009, was delivered in two calls. Two third of supported projects are now completed. While initially targeted to a limited number of sectors, with the second call eligibility conditions were relaxed and other sectors could benefit from the grants.</td>
<td>The Managing Authority and intermediate agencies have ensured their cooperation and confirmed that data on beneficiary SMEs can be made available at the level of policy instrument. Given the large number of beneficiaries, this instrument would be particularly suitable for launching an on-line survey in order to disentangle its logic of intervention and assess the effects through a Bayesian Network Analysis. The complimentary efforts of two different instruments (grants for SME growth and guarantee fund) and the resulting effectiveness could be investigated.</td>
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<tr>
<td>Support for R&amp;D projects</td>
<td>‘R&amp;D project grants for individual enterprises’ (instrument n. 1)</td>
<td>Germany, OP Saxony (2007DE161PO004)</td>
<td>CONV, EU15</td>
<td>NUTS 2 region</td>
<td>The instrument provides grants to individual enterprises for supporting the implementation of R&amp;D projects.</td>
<td>117 Million Euro (almost 100% to SMEs)</td>
<td>Grants to micro enterprises: 35, Grants to small enterprises: 99, Grants to medium enterprises: 51, Grants to large enterprises: 71,</td>
<td>The level of cooperation of the Managing Authority is very good, even it should be further investigated to what extent it is possible to get access to email address of beneficiary SMEs, in</td>
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<tr>
<td>Support for R&amp;D projects</td>
<td>’Grants for Industrial Research and Experimental Development’ (instrument n. 1)</td>
<td>Spain, Castilla y León (2007ES162P0009)</td>
<td>COMP, EU15</td>
<td>NUTS 2 region</td>
<td>This policy instrument encourages the development of R&amp;D projects by regional companies in order to improve their competitiveness by means of improving products, process or services or</td>
<td>Around 200 Million Euro (55% to SMEs)</td>
<td>secured R&amp;D jobs (male): 1,139.5, secured R&amp;D jobs (female): 222, created R&amp;D jobs (male): 132, created R&amp;D jobs (female): 32. In 2011, this instrument was subject of an enterprise survey. Almost 50% of the supported firms indicated that without public grants they would not have been able to do R&amp;D, about 73% could expand an R&amp;D project and 57% could accelerate the project. The supported projects contributed to market expansion for 78% of the supported firms, increase in turnover for 52% of the firms and employment growth in 45% of the firms. This study, however, does not use non-treated firms as control group. In 2013, this instrument was again subject of an enterprise survey.</td>
<td>The level of cooperation of the regional Agency for Economic Development is very good. Given the quite large number of beneficiaries, this instrument would be particularly suitable for launching an on-line survey in order to disentangle its logic of intervention and assess the effectiveness of this policy instruments through a survey inspired to the logic of theory-based impact evaluation. By comparing the result of the survey with those of the previous analysis, it will be possible to better qualify the instrument’s achievements and to investigate how certain effects have been produced.</td>
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In total 901 project were supported, of which 759 realized by SMEs. The SMEs generated employment is 2,175 (FTE) and the SMEs generated employment in R&D is 1,488 (FTE). The number of SME...
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<tbody>
<tr>
<td>Support for the development of technological and non-technological innovation</td>
<td>‘Financing of individual projects for SMEs’ (instrument n. 11)</td>
<td>Poland, OP Innovative Economy (2007PL161 PO001)</td>
<td>CONV, EU12</td>
<td>NUTS 0 country</td>
<td>This instrument provides support by means of grants for technological innovation through the use of the Technological Fund (managed by the Bank Gospodarstwa Krajowego) and directly targets individual SMEs.</td>
<td>Nearly 330 Million Euro (100% to SMEs)</td>
<td>The instrument performs far better than expected. Until 2013 698 projects were realized and 737 (target value 100; 737%) goods or services were improved. According to qualitative evidence collected, the support allowed firms to finance more risky and innovative solutions that otherwise would not be financed by the financial institutions.</td>
<td>This instrument is an example of a successful action which promotes the technological innovation in a Convergence country. It well represents the OP’s aim of spreading innovation culture in Polish enterprises. The Managing Authority proved to be very responsive and cooperative. Contact details of beneficiaries at the level of specific instrument could be retrieved. b</td>
</tr>
<tr>
<td>Support for the development of technological</td>
<td>‘Support for technological upgrade - LEADER LT’ (instrument n. 12)</td>
<td>Lithuania - Economic Growth (2007LT161 PO002)</td>
<td>CONV, EU12</td>
<td>NUTS 0 (= NUTS 2) country</td>
<td>The instrument supports the increase of productivity in enterprises by supporting production technology upgraging. The</td>
<td>92 Million Euro (79% to SMEs)</td>
<td>Almost all projects funded by this instrument are finished now, which led to the installation of 163 new high degree of cooperation has been granted by both the Managing Authority and the Implementing Agencies, especially the Lithuanian</td>
<td>High degree of cooperation has been granted by both the Managing Authority and the Implementing Agencies, especially the Lithuanian</td>
</tr>
<tr>
<td>Typology of the policy instrument proposed for in-depth study</td>
<td>Identification name and number of the instrument, as presented in the OP fiche, Volume II</td>
<td>Related OP</td>
<td>Cohesion Policy objective</td>
<td>NUTS level</td>
<td>Description of the instrument</td>
<td>Public paid amount for the instrument</td>
<td>Number of beneficiary SMEs and evidence of achievement</td>
<td>Level of cooperation by the Managing Authority and data availability</td>
</tr>
<tr>
<td>---</td>
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<td>---</td>
</tr>
<tr>
<td>and non-technological innovation</td>
<td>5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

aim of the action is to support the investments of the enterprises, that would increase the productivity and open new export opportunities, and also support the launch of the new products. The investment into the acquisition or upgrade of technologies and related internal engineering infrastructures are supported.

Technology lines. These projects attracted 175.2 million Euro private investment in 69 SMEs. According to data of the Structural Fund Management Information System (SFMIS), the beneficiaries increased export by 47.5% and increased their turnover by 39.5%. The labour productivity of beneficiaries increased by 19.5%. A counterfactual impact evaluation, conducted when not all project were already finished, shows that the instrument had positive effect on SMEs turnover and number of employees, while there was no positive impact on profitability. It must be noted that some SMEs received other funding from other policy instruments, so part of the effect could be assigned to other instruments as well. Moreover, the survey of SMEs which received funding shows positive effect of the instrument in terms of export growth.

Business Support Agency. Detailed data on beneficiaries (contact data, sector, budgets, output and results indicator etc.) are collected in the e-system SFMIS, and can be extracted within minutes (no need for manual collection of data) and provided to the team within 1-2 days.

One counterfactual analysis has been already carried out in the past years but this covered different policy instruments. A theory-based impact evaluation would allow to dig into the causal mechanisms of this specific policy instrument, and to highlight to what extent counterfactual and theory-based impact evaluation could complement each other.
<table>
<thead>
<tr>
<th>Support for the development of technological and non-technological innovation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Identification name and number of the instrument, as presented in the OP fiche, Volume II)</strong></td>
</tr>
<tr>
<td><strong>Related OP</strong></td>
</tr>
<tr>
<td><strong>Cohesion Policy objective</strong></td>
</tr>
<tr>
<td><strong>NUTS level</strong></td>
</tr>
<tr>
<td><strong>Description of the instrument</strong></td>
</tr>
<tr>
<td><strong>Public paid amount for the instrument</strong></td>
</tr>
<tr>
<td><strong>Number of beneficiary SMEs and evidence of achievement</strong></td>
</tr>
<tr>
<td><strong>Level of cooperation by the Managing Authority and data availability</strong></td>
</tr>
<tr>
<td>‘Support for non-technological innovation - PROCESS LT’ (instrument n. 9)</td>
</tr>
<tr>
<td>Lithuania - Economic Growth (2007LT161 PO002)</td>
</tr>
<tr>
<td>CONV, EU12</td>
</tr>
<tr>
<td>NUTS 0 (equal to NUTS 2) country</td>
</tr>
<tr>
<td>The instrument aims to increase productivity in enterprises by implementing modern management methods and processes, except of personnel management systems. The purchase of external consulting services is supported in order to upgrade enterprises management processes. Specifically, the action aims to encourage SMEs to implement modern management methods and quality management systems (organisational innovations), and so provide favourable conditions for productivity and exports growth. The tangible investments are not supported within this action.</td>
</tr>
<tr>
<td>2.2 Million Euro (75%)</td>
</tr>
<tr>
<td>119 SMEs received support from this instrument. More than half of the projects are finished now. These projects attracted 4.1 million Euro (the target is 1.3 million Euro) private investment. 110 new management systems were installed. According to the Structural Fund Management Information System (SFMIS), the beneficiaries of this instrument increased export by 14.7%. However, the survey of SMEs which received funding (around 120) has shown lower (compared to the SFMIS figures) effect on beneficiaries turnover, export growth and profitability – the beneficiaries experienced 1.5-2% increase in export, profitability, income from sales and average salary. The number of employees decreased by 0.75% in the beneficiaries of this instrument. This may be because the beneficiaries optimized their manufacturing and other processes, organization often precludes effective initiation, management and completion of product innovation ideas.</td>
</tr>
<tr>
<td>Selecting this instrument for a theory-based impact evaluation would allow to analyse the logic of intervention of an instrument focused on non-technology innovation. A comparison would be possible with another instrument specifically aimed at technological innovation / technology upgrade, implemented in the country (see above). The need for in-depth study is particularly important since there is conflicting evidence of achievement of this instrument from monitoring indicators. As for the previous instrument, collecting detailed data on beneficiaries would be easy. This instrument is also perceived as highly relevant by the target beneficiaries and implementing agencies, based on an argument that in the catching up economies poor management and processes organization often precludes effective initiation, management and completion of product innovation ideas.</td>
</tr>
<tr>
<td>Typology of the policy instrument proposed for in-depth study</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Support for networking</td>
</tr>
</tbody>
</table>

Source: CSIL.
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ANNEX

Overview of the 50 Operational programmes

The following table shows the territorial level covered by each OP of the sample under evaluation, and the related contribution paid by the end of 2013 (according to Annual Implementation Reports 2013), both as a total and for the only priority codes related to SME development and innovation, indicated the study’s ToR.

Table 19. Overview of the sample of 50 OPs

<table>
<thead>
<tr>
<th>OP Name</th>
<th>Country</th>
<th>OP Code</th>
<th>OP label</th>
<th>Cohesion Policy Objective</th>
<th>NUTS level</th>
<th>Programme d ERDF at the end of 2012 (Million Euro)</th>
<th>Programme d ERDF at the end of 2013 in WP2 Priority themes (Million Euro)</th>
<th>Programme d ERDF in WP2 themes as a share of the total programme d ERDF for the OP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burgenland 2007-2013: Ziel Konvergenz/Phasing Out / EFRE</td>
<td>AT</td>
<td>2007AT161PO001</td>
<td>AT - Burgenland</td>
<td>CONV</td>
<td>2</td>
<td>102</td>
<td>83</td>
<td>81%</td>
</tr>
<tr>
<td>Steiermark 2007-2013: Ziel Regionale Wettbewerbsfähigkeit &amp; Beschäftigung / EFRE</td>
<td>AT</td>
<td>2007AT162PO007</td>
<td>AT - Steiermark</td>
<td>COMP</td>
<td>2</td>
<td>111</td>
<td>85</td>
<td>76%</td>
</tr>
<tr>
<td>'Convergence' Hainaut - FEDER</td>
<td>BE</td>
<td>2007BE161PO001</td>
<td>BE - Hainaut</td>
<td>CONV</td>
<td>3</td>
<td>451</td>
<td>212</td>
<td>47%</td>
</tr>
<tr>
<td>Development of the Competitiveness of the Bulgarian Economy</td>
<td>BG</td>
<td>2007BG161PO003</td>
<td>BG - Bulgaria</td>
<td>CONV</td>
<td>0</td>
<td>990</td>
<td>767</td>
<td>77%</td>
</tr>
<tr>
<td>Podnikání a inovace</td>
<td>CZ</td>
<td>2007CZ161PO004</td>
<td>CZ - Czech Republic (Innov)</td>
<td>CONV</td>
<td>0</td>
<td>3,106</td>
<td>2,282</td>
<td>73%</td>
</tr>
<tr>
<td>Výzkum a vývoj pro inovace</td>
<td>CZ</td>
<td>2007CZ161PO012</td>
<td>CZ - Czech Republic (R&amp;D)</td>
<td>CONV</td>
<td>0</td>
<td>1,797</td>
<td>46</td>
<td>3%</td>
</tr>
<tr>
<td>EFRE Brandenburg 2007-2013</td>
<td>DE</td>
<td>2007DE161PO002</td>
<td>DE - Brandenburg</td>
<td>CONV</td>
<td>1</td>
<td>1,308</td>
<td>542</td>
<td>41%</td>
</tr>
<tr>
<td>EFRE Sachsen 2007-2013</td>
<td>DE</td>
<td>2007DE161PO004</td>
<td>DE - Sachsen</td>
<td>CONV</td>
<td>1</td>
<td>2,962</td>
<td>846</td>
<td>29%</td>
</tr>
<tr>
<td>EFRE Sachsen-Anhalt 2007-2013</td>
<td>DE</td>
<td>2007DE161PO007</td>
<td>DE - Sachsen-Anhalt</td>
<td>CONV</td>
<td>1</td>
<td>1,829</td>
<td>811</td>
<td>44%</td>
</tr>
<tr>
<td>EFRE Berlin 2007-2013</td>
<td>DE</td>
<td>2007DE162PO004</td>
<td>DE - Berlin</td>
<td>COMP</td>
<td>1</td>
<td>900</td>
<td>340</td>
<td>38%</td>
</tr>
<tr>
<td>EFRE Nordrhein-Westfalen 2007-2013</td>
<td>DE</td>
<td>2007DE162PO007</td>
<td>DE - Nordrhein-Westfalen</td>
<td>COMP</td>
<td>1</td>
<td>1,290</td>
<td>643</td>
<td>50%</td>
</tr>
<tr>
<td>Innovation og Viden</td>
<td>DK</td>
<td>2007DK162PO001</td>
<td>DK - Denmark</td>
<td>COMP</td>
<td>0</td>
<td>249</td>
<td>203</td>
<td>82%</td>
</tr>
<tr>
<td>ID</td>
<td>Region/Program Description</td>
<td>Country Code</td>
<td>Code</td>
<td>Start-End</td>
<td>Type</td>
<td>Funding Source</td>
<td>Multi-objective</td>
<td>NUTS 2 Combination</td>
</tr>
<tr>
<td>----</td>
<td>----------------------------</td>
<td>--------------</td>
<td>------</td>
<td>-----------</td>
<td>-------</td>
<td>----------------</td>
<td>----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>13</td>
<td>the Development of Economic Environment</td>
<td>EE</td>
<td>2007EE161PO001</td>
<td>EE - Estonia</td>
<td>CONV</td>
<td>0</td>
<td>1,450</td>
<td>303</td>
</tr>
<tr>
<td>14</td>
<td>FEDER de Andalucía</td>
<td>ES</td>
<td>2007ES161PO008</td>
<td>ES - Andalucía</td>
<td>CONV</td>
<td>2</td>
<td>4,102</td>
<td>487</td>
</tr>
<tr>
<td>15</td>
<td>FEDER de Castilla y León</td>
<td>ES</td>
<td>2007ES162PO009</td>
<td>ES - Castilla y León</td>
<td>COMP</td>
<td>2</td>
<td>744</td>
<td>269</td>
</tr>
<tr>
<td>16</td>
<td>FEDER de la Comunidad Valenciana</td>
<td>ES</td>
<td>2007ES162PO010</td>
<td>ES - Comunidad Valenciana</td>
<td>COMP</td>
<td>2</td>
<td>1,171</td>
<td>300</td>
</tr>
<tr>
<td>17</td>
<td>FEDER de Investigación, Desarrollo e innovación por y para el beneficio de las empresas - Fondo Technologico</td>
<td>ES</td>
<td>2007ES16UPO001</td>
<td>ES - Spain (TF)</td>
<td>Multi-objective</td>
<td>Combinaion of NUTS 2</td>
<td>2,301</td>
<td>1,746</td>
</tr>
<tr>
<td>18</td>
<td>FEDER de Economía basada en el Conocimiento</td>
<td>ES</td>
<td>2007ES16UPO003</td>
<td>ES - Spain (Know.)</td>
<td>Multi-objective</td>
<td>Combinaion of NUTS 2</td>
<td>1,160</td>
<td>47</td>
</tr>
<tr>
<td>19</td>
<td>Pohjois-Suomen EAKR-toimenpideohjelma 2007-2013</td>
<td>FI</td>
<td>2007FI162PO002</td>
<td>FI - North Finland</td>
<td>COMP</td>
<td>2</td>
<td>348</td>
<td>195</td>
</tr>
<tr>
<td>20</td>
<td>FEDER AQUITANE</td>
<td>FR</td>
<td>2007FR162PO001</td>
<td>FR - Aquitaine</td>
<td>COMP</td>
<td>2</td>
<td>377</td>
<td>118</td>
</tr>
<tr>
<td>21</td>
<td>FEDER ILE-DE-FRANCE</td>
<td>FR</td>
<td>2007FR162PO012</td>
<td>FR - Île de France</td>
<td>COMP</td>
<td>2</td>
<td>143</td>
<td>60</td>
</tr>
<tr>
<td>22</td>
<td>FEDER PROVENCE ALPES COTE D´AZUR</td>
<td>FR</td>
<td>2007FR162PO020</td>
<td>FR - Provence-Alpes-Côte d’Azur</td>
<td>COMP</td>
<td>2</td>
<td>293</td>
<td>87</td>
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<tr>
<td>23</td>
<td>FEDER MIDI-PYRENEES</td>
<td>FR</td>
<td>2007FR162PO021</td>
<td>FR - Midi-Pyrénées</td>
<td>COMP</td>
<td>2</td>
<td>433</td>
<td>152</td>
</tr>
<tr>
<td>24</td>
<td>Ανταγωνιστικότητα και Επιχειρηματικότητα</td>
<td>GR</td>
<td>2007GR161PO001</td>
<td>EL - Greece (no Attiki)</td>
<td>CONV</td>
<td>0</td>
<td>2,042</td>
<td>1,354</td>
</tr>
<tr>
<td>25</td>
<td>Αττική</td>
<td>GR</td>
<td>2007GR161PO006</td>
<td>EL - Attiki</td>
<td>CONV</td>
<td>2</td>
<td>3,322</td>
<td>923</td>
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<td>Economic Development Operational Programme</td>
<td>HU</td>
<td>2007HU161PO001</td>
<td>HU - Hungary</td>
<td>CONV</td>
<td>0</td>
<td>3,197</td>
<td>2,868</td>
</tr>
<tr>
<td>27</td>
<td>Central Hungary</td>
<td>HU</td>
<td>2007HU162PO001</td>
<td>HU - Central Hungary</td>
<td>COMP</td>
<td>2</td>
<td>1,597</td>
<td>503</td>
</tr>
<tr>
<td>28</td>
<td>Ricerca e competitivita’</td>
<td>IT</td>
<td>2007IT161PO006</td>
<td>IT - Convergence</td>
<td>CONV</td>
<td>Combinaion of NUTS 2</td>
<td>3,071</td>
<td>1,412</td>
</tr>
<tr>
<td>29</td>
<td>FESR Puglia 2007-2013</td>
<td>IT</td>
<td>2007IT161PO010</td>
<td>IT - Puglia</td>
<td>CONV</td>
<td>2</td>
<td>2,619</td>
<td>645</td>
</tr>
<tr>
<td>30</td>
<td>Regione Piemonte FESR</td>
<td>IT</td>
<td>2007IT162PO011</td>
<td>IT - Piemonte</td>
<td>COMP</td>
<td>2</td>
<td>379</td>
<td>218</td>
</tr>
<tr>
<td>31</td>
<td>Veneto FESR</td>
<td>IT</td>
<td>2007IT162PO015</td>
<td>IT - Veneto</td>
<td>COMP</td>
<td>2</td>
<td>229</td>
<td>103</td>
</tr>
<tr>
<td>32</td>
<td>2007-2013 m. Ekonomikos augimo veiksmų programa</td>
<td>LT</td>
<td>2007LT161PO002</td>
<td>LT - Lithuania</td>
<td>CONV</td>
<td>0</td>
<td>3,041</td>
<td>760</td>
</tr>
<tr>
<td>No.</td>
<td>Project Name</td>
<td>Country Code</td>
<td>Project Code</td>
<td>Region</td>
<td>Type</td>
<td>Combinaison of NUTS 2</td>
<td>Total</td>
<td>Convergence (%)</td>
</tr>
<tr>
<td>-----</td>
<td>------------------------------------------------------------------------------</td>
<td>--------------</td>
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<td>-----------------</td>
<td>---------------</td>
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<td>-----------------</td>
</tr>
<tr>
<td>33</td>
<td>Entrepreneurship and Innovations</td>
<td>LV</td>
<td>2007LV161PO001</td>
<td>LV - Latvia</td>
<td>CONV</td>
<td>0</td>
<td>618</td>
<td>406</td>
</tr>
<tr>
<td>34</td>
<td>West 2007-2013</td>
<td>NL</td>
<td>2007NL162PO002</td>
<td>NL - West</td>
<td>COMP</td>
<td>Combination of NUTS 2</td>
<td>317</td>
<td>131</td>
</tr>
<tr>
<td>35</td>
<td>Innowacyjna Gospodarka, 2007-2013</td>
<td>PL</td>
<td>2007PL161PO001</td>
<td>PL - Poland</td>
<td>CONV</td>
<td>0</td>
<td>8,577</td>
<td>5,287</td>
</tr>
<tr>
<td>36</td>
<td>Regionalny Program Operacyjny Województwa Mazowieckiego</td>
<td>PL</td>
<td>2007PL161PO011</td>
<td>PL - Mazowieckie</td>
<td>CONV</td>
<td>2</td>
<td>1,681</td>
<td>318</td>
</tr>
<tr>
<td>37</td>
<td>Rozwój Polski Wschodniej 2007-2013</td>
<td>PL</td>
<td>2007PL161PO003</td>
<td>PL - Eastern Poland</td>
<td>CONV</td>
<td>Combination of NUTS2</td>
<td>2,308</td>
<td>209</td>
</tr>
<tr>
<td>38</td>
<td>Województwa Wielkopolskiego</td>
<td>PL</td>
<td>2007PL161PO17</td>
<td>PL - Wielkopolskie</td>
<td>CONV</td>
<td>2</td>
<td>1,220</td>
<td>284</td>
</tr>
<tr>
<td>39</td>
<td>Factores de Competitividad 2007-2013</td>
<td>PT</td>
<td>2007PT161PO001</td>
<td>PT - Portugal</td>
<td>CONV</td>
<td>0</td>
<td>3,941</td>
<td>3,490</td>
</tr>
<tr>
<td>40</td>
<td>Regional do Norte 2007-2013</td>
<td>PT</td>
<td>2007PT161PO002</td>
<td>PT - Norte</td>
<td>CONV</td>
<td>2</td>
<td>2,696</td>
<td>712</td>
</tr>
<tr>
<td>41</td>
<td>Regional Operational Programme</td>
<td>RO</td>
<td>2007RO161PO001</td>
<td>RO - Romania (ROP)</td>
<td>CONV</td>
<td>0</td>
<td>4,153</td>
<td>449</td>
</tr>
<tr>
<td>42</td>
<td>Sectoral Operational Programme Increase of Economic Competitiveness</td>
<td>RO</td>
<td>2007RO161PO002</td>
<td>RO - Romania (Compet.)</td>
<td>CONV</td>
<td>0</td>
<td>2,415</td>
<td>952</td>
</tr>
<tr>
<td>43</td>
<td>krepitve regionalnih razvojnih potencialov za obdobje 2007 - 2013</td>
<td>SI</td>
<td>2007SI161PO001</td>
<td>SL - Slovenia</td>
<td>CONV</td>
<td>0</td>
<td>1,745</td>
<td>786</td>
</tr>
<tr>
<td>44</td>
<td>Competitiveness and Economic Growth</td>
<td>SK</td>
<td>2007SK161PO006</td>
<td>SK - Slovakia (Compet.)</td>
<td>CONV</td>
<td>0</td>
<td>953</td>
<td>562</td>
</tr>
<tr>
<td>45</td>
<td>Research and Development</td>
<td>SK</td>
<td>2007SK16UPO001</td>
<td>SK - Slovakia (R&amp;D)</td>
<td>Multi-objective</td>
<td>0</td>
<td>1,341</td>
<td>305</td>
</tr>
<tr>
<td>46</td>
<td>Norra Mellansverige</td>
<td>SE</td>
<td>2007SE162PO006</td>
<td>SE - Norra Mellansverige</td>
<td>CONV</td>
<td>2</td>
<td>203</td>
<td>135</td>
</tr>
<tr>
<td>47</td>
<td>Övre Norrland</td>
<td>SE</td>
<td>2007SE162PO008</td>
<td>SE - Övre Norrland</td>
<td>COMP</td>
<td>2</td>
<td>255</td>
<td>157</td>
</tr>
<tr>
<td>48</td>
<td>Highlands and Islands of Scotland ERDF phasing out Convergence programme</td>
<td>UK</td>
<td>2007UK161PO001</td>
<td>UK - Highlands and Islands</td>
<td>CONV</td>
<td>2</td>
<td>116</td>
<td>64</td>
</tr>
<tr>
<td>49</td>
<td>West Wales and the Valleys ERDF Convergence programme</td>
<td>UK</td>
<td>2007UK161PO002</td>
<td>UK - West Wales and The Valleys</td>
<td>CONV</td>
<td>2</td>
<td>1,235</td>
<td>259</td>
</tr>
<tr>
<td>50</td>
<td>Yorkshire and Humberside England ERDF Regional Competitiveness and Employment programme</td>
<td>UK</td>
<td>2007UK162PO009</td>
<td>UK - Yorkshire and the Humber</td>
<td>COMP</td>
<td>1</td>
<td>522</td>
<td>232</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>81,408</td>
<td>34,150</td>
</tr>
</tbody>
</table>

Source: CSIL elaboration based on DG Regio raw data of EU contribution.
Figure 65. Number of SMEs in the area targeted by the 50 OPs

Note: The graph shows the total number of SMEs operating in NACE sectors from B to N, excluding K, which represent the overwhelming majority of all SMEs. Consistency is therefore ensured with figures included in Volume II. The most recently available figures have been considered, which in most of the cases correspond to year 2013.

Source: CSIL elaboration based on EC SME Performance Review data at NUTS 0 (country) level, and national statistical sources for NUTS 1 and NUTS 2 (regional) data.
Figure 66. Share of micro, small, medium enterprises over total SMEs in the area targeted by the 50 OPs

Note: The graph considers SMEs by size class operating in NACE sectors from B to N, excluding K, which represent the overwhelming majority of all SMEs. Consistency is therefore ensured with figures included in Volume II. For the Highlands and Islands regions, the number of micro and small enterprises are available only in aggregate way. No data by size class are available for the Swedish regions (Norra and Övre Norrland) and for Attiki (Greece).

Source: CSIL elaboration based on EC SME Performance Review data at NUTS 0 (country) level, and national statistical sources for NUTS 1 and NUTS 2 (regional) data.
**Figure 67.** ERDF allocation of the 50 OPs by WP2 codes (2013, Million Euro)

Note: The number on the top of the columns refers to the number of OPs which allocate funds to the considered WP2 code.
Source: CSIL elaboration based on DG Regio raw data of EU contribution.

**Figure 68.** Volume of EU contribution for WP2 themes (2013, Million EUR) and share of EU contribution for WP2 themes over total EU contribution for the OP

Source: CSIL elaboration based on DG Regio raw data of EU contribution.
Note: The “Aggregated Jobs created” is a composite indicators calculated by the WP0 team as the sum of indicators 1) Jobs created, 6) Research jobs created, 9) Jobs created in SMEs (gross, FTE), 10) Investment induced (million €), 35) Number of jobs created in tourism.

Source: CSIL elaboration based on WP0 dataset of indicators.
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