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A PLACE-BASED STRATEGY TO SMART SPECIALISATION: THE CASE OF APULIA

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A PLACE-BASED STRATEGY TO SMART SPECIALISATION: THE CASE OF APULIA

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Abstract

A debated policy issue is how to combine the excellence goals chased by Research and Innovation (R&I) policies and the need to reduce regional disparities as of the EU Cohesion Policy priorities. In other words there is a tension between concentrating funds in core and well-endowed urban areas, in order to reach economies of scale and scope, or rather favouring less endowed, peripheral and economically weaker regions, which could be less prepared to achieve excellence in innovation and research.

A way to address this trade-off has been proposed by the recent smart specialisation approach. This approach admits the possibility for any region to generate innovation, by leveraging its own strengths and competitive advantages and selectively targeting its place-based R&I strategy on those economic activities in which the region can hope to excel. However, the conditions which could actually ensure a synergic relation between different policies aiming at enhancing European competitiveness, overcoming possible obstacles and tensions, still have to be explored.

This paper aims at providing some insights on how and at which conditions regional innovation policies can be effective in promoting both excellence and cohesion objectives in lagging behind EU regions. To this end, the case of the regional innovation policy carried out by Apulia region (Southern Italy) is presented. The experience of Apulia indicates that there is scope for lagging behind regions to develop well-designed regional innovation systems, supporting the development and implementation of far reaching innovation strategies adapted to the specific needs and assets of regional economy. At the same time, there is a pressing need to develop novel practices of governance in particular as regards avoiding demand-driven approach which adapts excessively to the perspectives of local firms and can be more easily (and in difficult circumstances perhaps even necessarily) prone to short termism.

This paper critically describes elements of strengths and weaknesses observed within the case study of Apulia region, to produce lessons learned of more general relevance.

Key words: smart specialisation, place based, cohesion policy, regional innovation system

JEL codes: O25, O38, R58

1. Introduction

More than a decade ago the EU set the goal to become the most competitive knowledge-based economy in the world (Lisbon Strategy¹, then restated in 2010 with the 'Europe 2020' Strategy²). European institutions took a leading role in the promotion of the conditions making it possible for European countries to compete with the research and innovation levels recorded in the USA and Japan. Indeed, research and innovation (R&I) are today recognised as drivers of all EU policies, from industrial policy, where technological improvements are instruments to ensure a strong, competitive and diversified manufacturing value chain, to environmental and energy policies and initiatives, where they are meant to provide sustainable solutions to tackle climate or energy challenges (European Commission 2010b and 2011a, European Union 2013a). R&I have become key ingredients also of the Cohesion Policy implemented by DG Regional and Urban Policy (DG Regio) of the European Commission (European Commission 2011b; European Union 2013b). Even more, Cohesion Policy has become a key instrument to effectively implement and enforce the principles of "Europe 2020". This in fact is the culmination of a process that took place over the past twenty years, when the European Union has been striving to promote integration between research and innovation strategies with regional economic development (European Commission 1993, 1998, 2010a, European Council 2000, 2005).

Since both are intended as growth enhancing policies, complementarities between investments in R&I policy and economic and social cohesion policies have been continuously emphasised by the European authorities (European Commission 1993, 1998, European Commission 2006, EURAB 2007, European Commission 2012a). Yet, there might be also tensions between different policy goals, targeting strategies and implementation mechanisms. The excellence principle underlying research and innovation policies, which mainly stresses the potentialities of the most endowed areas, may be at odd with the fundamental objective of Cohesion Policy in terms of economic social and territorial cohesion, which provides support especially to less well-off regions.

This paper aims at discussing the potential successes and failures of a lagging behind region in carrying out an effective innovation system, and to design and implement effective measures targeting innovation. To do so, the paper mainly relies on an in-depth illustrative case study of an Italian Southern region, Apulia. This analysis focuses in particular on instruments targeting SMEs, building to a great extent on the work carried out for the ex post evaluation of Cohesion Policy programmes 2007-2013, for European Regional Development Fund (ERDF) and the Cohesion Fund (CF), Work Package 2: "Support to SMES - Increasing research and innovation in SMEs and SME development" (European Commission, 2015). This has to be considered the source of presented data, unless differently indicated.

The paper is structured as follows. The first section provides a brief literature review illustrating the potential frictions in the paradigms underpinning regional innovation and cohesion policies. The second section describes the socio-economic context and the regional innovation governance of Apulia region: after a description of the economic weaknesses and potential strengths of Apulia, the set-up of its new regional innovation system is discussed. The third section describes the strategic objectives of the innovation policies with a specific emphasis on SMEs, and illustrates and discusses the challenges in implementing it: the regional actors' ability to pursue concretely the innovation objectives stated in its regional strategies is tested analysing the allocation and management of the ERDFs targeting SMEs, within the frame of the regional 2007-2013 Operational Programme.

¹ European Council (2000).

² European Commission (2010a).

2. Analytical framework

The following paragraphs discuss the potential tension between innovation policies, which tend to concentrate investments in advanced areas, and the EU Cohesion policies, pursuing the economic convergence of lagging behind regions. The smart specialization strategy has been proposed as a way to relax this friction, synthesizing the two approaches. The first section provides a brief review of the issues at stake, focusing to (a) the importance of the local context to explain the dynamic of innovation, and the “innovation paradox” (b) the stress on innovation progressively marking EU regional policy, and its potential friction with the equity purposes on which they are based (c) the possibility to find a reconciliation of the two principles within the frame of the Smart Specialization Strategy.

2.1 The local basis of innovation and the innovation paradox

The mix of assets, institutional settings, skills and ideas upon which the comparative advantages that drive innovation are built, is often a regional or even local issue. Different strands of literature have contributed to trace the relation between innovation and the territorial context.

Systemic models supported the idea that innovation is developed from a system of interactions between various stakeholders operating in the territory, overcoming the so called “linear approach”, that sees innovation as the result of a linear sequence from fundamental research, to experimental development, and new or improved products. Systemic models are represented in the well-known Triple Helix model (Etzkowitz 1996, Etzkowitz and Leydesdorff 1996), which recognises a prominent role in the generation and transfer knowledge to university, industry and government. From this perspective, innovation can arise both within each of these three spheres and through their interaction³.

Another contribution to the analysis of the relation between innovation and regional characteristics lies in the studies highlighting the role of geographical proximity in easing intellectual, commercial and financial exchanges, which heavily influence the innovation process (see e.g. Sternberg 1990, Puga and Venables 1996, Baldwin and Martin 2004, Rosenthal and Strange 2004; Lehto 2007, Martin 2010). Research and innovation activities tend to physically and spatially agglomerate in defined geographical areas and this trend finds a theoretical argumentation in the Porter’s theory of competitive advantage (1990, 2003). Other theoretical foundations can be found in the literature on industrial districts (originating from Marshall, 1890), explaining how Small and Medium Enterprises (SMEs) with a coherent specialisation profile and vertically or horizontally integrated among each other spontaneously cluster in specific areas, often centred on one or few large catalysing enterprises. Even if this literature is more focused on industrial, rather than research and innovation processes, similar aggregation patterns can be highlighted for R&D ventures.

The notion of ‘regional innovation system’ was proposed by Cooke (1992, 2001) to indicate the regional place-based nature of the system of factors which can ensure knowledge based growth. A possible conceptualisation of regional innovation systems is made by Asheim and Coenen (2005), who identify different types of systems, depending on their degree of internal interactions and openness to the outside of the cluster.

The analysis of the relation between innovation and territorial characteristics is justified and fuelled by the fact that the innovation performance can vary considerably across different regions, within the same nations. Landabaso *et al* (2002) showed that in 1999 for 12 EU nations most of the variation of innovation activity (measured in terms of patents per capita) and R&D intensity (R&D expenditure as a percentage of GDP) across European regions was due to regional disparities within nations, rather than to national disparities.

Indeed, research and innovation activities tend to show agglomeration effects leading to geographical concentration, usually in core and well-endowed urban contexts or in nearby areas. In large cities the concentration of enterprises and labour force in the same or related sectors constitutes a condition allowing to “trigger a mechanism of self-reproducing innovation and growth” (Rodríguez-Pose 1999a).

³ Universities are seen as the places where new knowledge is generated, but that can also contribute to technological development by promoting the establishment of incubators for start-ups and by joining public-private organizational mechanisms for knowledge creation and diffusion, such as science parks, networks, associations. Industry is the locus of production but enterprises also participate in the knowledge creation process within their own research laboratories and/or in collaboration with external research centres and academia. The government intervenes to define contractual relations among different actors, but also to finance fundamental and applied research and innovation diffusion, and to take part of the risks associated to innovation (as recently reaffirmed by Mazzucato, 2013).

The results of some studies suggest that more developed areas are also those in which investments in R&D are overall more effective, i.e. they turn more easily into regional economic growth, and conversely less advanced areas are those in which investments tend to be less rewarding.

One factor leading to this outcome is that a critical mass of R&D activities is required to achieve returns on investments (Bilbao-Osorio and Rodríguez-Pose 2004). The importance of the existing R&D assets not only determines the existence of an ideal “threshold” under which investments are poorly fruitful, but is reflected also in increasing returns on investments. The cumulative effects of innovation investments have been pointed out by several scholars, and explained by the presence of economies of scale and scope (Scherer, 1982; Dosi, 1988; Audretsch and Feldman 1996).

A further insight comes from the recognition that softer regional socio-economic characteristics are inherent factors needed for innovation investments to be more rewarding at regional level. Rodríguez-Pose (1999b) conceptualized this point distinguishing between “innovation prone” and “innovation adverse” regions. The former are those “featured by a weak social filter, which facilitates the transformation of innovation into growth”, the latter are characterized by a lower permeability to potential changes, both in terms of product and process innovation. Analysing a pool of 69 regions belonging to six EU members between 1977 and 1993, it emerged that those for which R&D investment is associated with a relatively lower economic growth, i.e. those which seem less able to turn innovation into growth, on average were characterized by rigid labour markets, skills shortages, emigration of skilled workers, and aging workforce (Rodríguez-Pose 1999b). All these factors are seen as determinants of a “thick” social filter. In this view a particular emphasis is put on the contribution of the younger and more skilled cohorts of the labour force, who are expected to be a more dynamic component, to facilitate the adoption and development of innovative solutions. In their work on 166 regions from 15 different EU countries, Rodríguez-Pose and Crescenzi (2008) showed that both locally-generated knowledge and knowledge flowing from neighbouring regions improves regional growth performance, but the presence of local socio-economic conditions for the assimilation of innovation (in particular the level of education) represent a fundamental aspect.

Along this line, institutional characteristics such as the existence of an effective innovation governance system are also recognised to be a relevant precondition for an effective regional innovation policy. As pointed by Kroll (2015), it is necessary that lagging behind regions change routine and practices of their governance system to engage in effective and far reaching innovation policies. To break path-dependencies, the selection and empowerment of competent and client-oriented bodies, usually in-house or arm’s length regional development agencies, is an unmeasurable but important step.

Thus both the existing “stock” of cumulated R&D investments and the composition of local socio-economic structure as well as an effective governance system can influence significantly the capacity of a region to generate, absorb and leverage innovation, so to achieve economic returns. This might be among the causes of the fact that most advanced areas are those spending a higher percentage of their total revenue in R&D, even though less advanced regions in theory should need to a greater extent to improve their R&D intensity and innovation activity in order to catch-up (Landabaso *et al.*, 2002). This phenomenon is referred as the “Innovation Paradox”. Thus richer and more innovative areas are also those in which more resources from government, business and education are invested in innovation. Which also reflects a greater capacity to absorb R&D funds, even when these are constituted by public subsidies. The Innovation Paradox has been explained as the result of a poor regional innovation system. In scarcely advanced regions on the one hand firms often lack a tradition of cooperation, both within themselves and other relevant actors as universities. They probably also tend to underestimate the importance of innovation, and however they express a lower demand. On the other hand, the regional research structure is not integrated in the territory, so that it scarcely knows the needs of the local industrial fabric, which entails its achievements turn more rarely in opportunities for local firms to innovate.

2.2 Cohesion policy and innovation

As claimed by Bachtler and Yuil (2001), since the mid-80s in Western Europe the strategy of regional policies was marked by a profound change, along with the diffusion of new concepts of regional development that ascribed the success of economies mainly to their ability to innovate. The theoretical shift from the linear approach to the systemic models of innovation went along with a new model of regional policy embedding the ideas of self-sustained growth, innovation and competitiveness (Pellegrin, 2008). At EU level this shift was identifiable in the evolution of the Structural Funds (SF) programming. In particular, though R&I objectives were already set at the beginning of Structural Funds programming, they became increasingly more important (Nordregio *et al.*, 2005). The Strategic Guidelines for Cohesion for the 2007-13 programming period put competitiveness at the centre of the SFs, and two of the three top priorities was to encourage innovation and the growth of the knowledge economy. The objective was to make of innovation and knowledge a priority for both the ‘Convergence’ and ‘Regional Competitiveness’ regions. As a matter of fact, whereas in 2000-2006

between 5.5% and 7.4%⁴ of all Structural Funds expenditure were invested in research and innovation, in 2007-13, the proportion increased to nearly 25%.⁵

This evolution has led to the emerging of a possible friction. On the one hand, the primary aim of the Cohesion Policy is to reduce regional disparities and concentrates funds in lagging behind regions. On the other hand, R&I policies seek efficiency and possibly world-class excellence objectives, thus there is a case for focussing on most advanced areas being the ones in which investments in innovation are likely to entail stronger effects in the regional economy.

Some emphasis has been put by the literature to study this trade-off. A few studies (D'Aurizio 2005, Pellegrin 2008, Koschatzky and Stahlecker 2010) have explicitly discussed the potential difficulty that the European Commission and Member States authorities might face in ensuring a balance between cohesion and innovation objectives. The Danish Technological Institute (2005) noted that an argument that might enlighten this problem is the "Williamson inverted U-curve" theory, predicting that the typical pattern of national development creates regional divergence in the early stages and regional convergence in later stages, which suggest that an "initial" increase in disparities between more advanced regions and others can naturally evolve in a greater convergence, due to the progressive emerging of diseconomies of agglomeration, such as congestion and high factor costs, in "growth poles" (Williamson 1965). Thus the frictions cohesion and innovation policies may be smoothed away over time thanks to endogenous economic development dynamics. However, Davies and Hallet (2002) did not find significant evidence of the 'descending' side of the Williamson curve in Italy, Germany and the UK.

In general, to a certain extent congruence and synergies between the two types of policies are emphasised in this literature, whereas the lack of evidence, the role of rhetoric, or specific weaknesses (e.g. related to the implementation of the Lisbon strategy) are also identified.

2.3 A smart synthesis

In the policy discourse, decisive steps for a conceptual reconciliation between cohesion and innovation purposes were the formal recognition of territorial cohesion as an explicit objective pursued by the EU (Lisbon Treaty, 2007) and the development of a "place-based" approach to Cohesion Policy (Barca, 2009)⁶. Through these developments, equity and growth are no longer seen as conflicting priorities but rather complementary principles underlying Cohesion Policy.

The so called "Smart Specialisation" approach promoted by the European Commission applies the place-based approach in the field of innovation. Developed, among others, by Foray and Van Ark (2007) and Foray, David and Hall (2009), the approach aims at reinforcing the complementary dimensions of excellence and convergence objectives during the 2014-2020 period. The new European regional innovation strategy (European Commission, 2012a) relies on the idea that competitive advantages are not concentrated in specific regions, but that any region can have a competitive advantage with regard to specific resources. In principle, any region can contribute to increase the EU knowledge-base, by focusing on a limited number of innovation and research priorities in those fields where the region 'can realistically hope to excel.' In this context, priority setting should ensure a "match between a top-down process of identification of broad objective aligned with EU policies and a bottom-up process of emergence of candidate niches for smart specialisation, areas of experimentation and future development stemming from the discovery activity of entrepreneurial actors" (European Commission, 2012a).

National/Regional Research and Innovation Strategies for Smart Specialisation are defined as integrated, place-based agendas based on the principles of focusing on a short list of priorities for knowledge-based development and building on territorial assets and specificities by involving all stakeholders with territorial dialogue (European Commission 2012a).

The multi-level governance perspective that characterized the Smart Specialization contributes to ease the potential tensions between R&I policies and Cohesion Policy: while research policy pursuing excellence is best dealt with at EU or national level, innovation is best promoted (also) at regional level by Cohesion Policy and its place-based approach. What is decisive is the effective articulation between the different relevant levels in a proper multi-level governance setting. As argued by the European Commission (2012b), it is also possible to distinguish between absolute and relative excellence. While absolute excellence is used as a criterion

⁴ Respectively according to Technopolis (2006) and European Commission (2005).

⁵ Amounting to approximately EUR 86 billion (European Commission 2014).

⁶ A place-based approach to Cohesion Policy implies: i) "a long-term development strategy whose objective is to reduce persistent inefficiency (underutilization of the full potential) and inequality (share of people below a given standard of well-being and/or extent of interpersonal disparities) in specific places; ii) the production of bundles of integrated, place-tailored public goods and services, designed and implemented by eliciting and aggregating local preferences and knowledge through participatory political institutions, and by establishing linkages with other places; iii) the promotion of the place from outside through a system of multilevel governance where grants subject to conditionalities on both objectives and institutions are transferred from higher to lower levels of government" (Barca 2009).

by Research Policy, regardless the country or region of origin, Cohesion Policy would rather consider the relative dimension of excellence, according to which excellence emerges considering the relative position of the research system in the international context and the respective competitive advantages. The way is thus paved at least at strategic level and in conceptual terms for a synergetic relation between different policies aiming at enhancing European competitiveness.

Overall, while some regions are *a priori* more prepared than others to compete and excel on the ground of innovation, and to exploit technological advancement as engine for growth with the risk that this brings about further territorial imbalance (concentration of activities in promising and endowed regions), the regionalization of the innovation policy in the context of the recently developed place-based approach to Cohesion Policy and an effective multi-level governance setting offer a solution to mitigate such risk.

3. Background and context

After a brief description of Apulia's region economic characteristics, this chapter describes its regional innovation system and discusses its innovation policy focusing more in detail on its 2007-2013 Operational Programme.

3.1 Delays and talents of a convergence region

Apulia is a peripheral region located in the South East of Italy, populated by about 4 million inhabitants. With a GDP per capita representing the 68% of the EU28 average⁷, Apulia was classified as a 'Convergence' region during the 2007-2013 EU programming period, and 'less developed' region over the current 2014-2020 period (Eurostat)⁸. According to the regional competitiveness index⁹, it ranks among the medium-low performing EU regions.

In the 2001-2007 period, the Apulian economy grew steadily, although at a slower pace than the rest of Italy. However, it experienced a significant fall after the financial crisis, with GDP decreasing by 4.5% in 2009 compared to the previous year. The global crisis severely hit the regional economy. A recent report by the Bank of Italy (2014) indicates a decrease in the regional added value of 2.4% in 2013, a continuing negative trend in turnover in industry and an unemployment rate reaching 19.8%. The negative effect on fixed capital formation, dropping to 20% of regional GDP in 2011 as compared to 23% in 2008 (Istat), was exacerbated by the cost of access to credit, which was particularly severe in Southern regions as compared to the rest of Italy (Bank of Italy 2014).

The regional economic structure shows a higher contribution from the agricultural sector to the regional added value with respect to Italy or Southern Italy as a whole. In dynamic terms, in the last ten years there has been an alignment toward the national composition, in terms of added value, with an increased significance of the service sector and a decrease in the share of agriculture and industry.

Apulia's industrial fabric is marked by a polarization between a prevalence of micro enterprises mostly operating in traditional sectors, such as textiles, food and furniture, and few large companies which in some cases have played a pivotal role in the development of some industrial districts, particularly in the automotive, mechatronics and aerospace fields. According to the last national census of 2011.

Micro enterprises are concentrated in the wholesale and retail trade and professional, scientific and technical activities while among small and medium sized enterprises a major share is in manufacturing and construction.

It is widely recognised that a major barrier to growth of regional SMEs is poor performance in terms of innovation and exports, with a specific concern about their capacity to cooperate and build networks to overcome their small size and to capitalise on the territorial knowledge assets of non-business actors. Recent evidence on the performance of Italian clusters¹⁰ suggests in fact that firms included in productive and technological districts are more competitive than others and could better cope with the pressures of the global crisis.

For what concerns human capital, in 2007 only 28% of Apulia's inhabitants aged 25-64 had a tertiary education, against an average of about 30% in Italy and 50% for EU28 (European Commission 2014). The already poor skill intensity of the regional workforce is seriously hampered by a harsh 'brain drain', as shown by the negative net migration of university students (-6,72% in 2012), which is the most significant among Italian regions¹¹.

⁷ In Apulia GDP (PPS) per inhabitant was EUR 17,100 (vs. a national average of EUR 26,000 and an EU28 average of EUR 25,000) in 2007. In the same year, the regional unemployment rate was at 11.2% compared to 6.1% for Italy and 7.2% for the EU28. Source: Eurostat.

⁸ A region is defined as "less developed" when its GDP/head falls below 75% EU27 average.

⁹ The Regional Competitiveness Index (RCI) captures different dimensions of competitiveness at the regional level including the quality of institutions, infrastructure endowments, education, labour market, innovation system and many others. See Annoni, P. and Dijkstra, L. (2013).

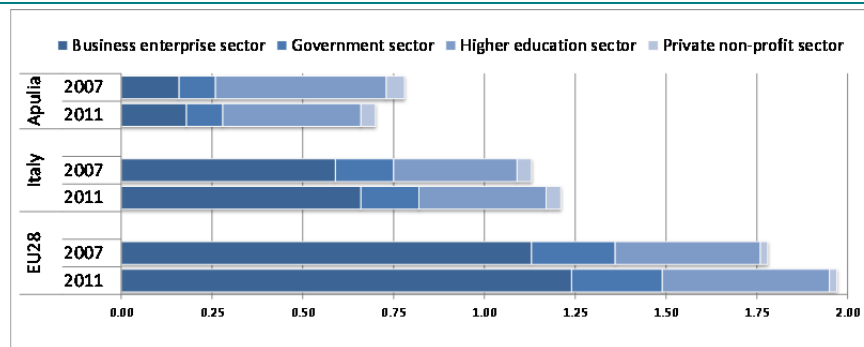
¹⁰ Intesa SanPaolo (2014).

¹¹ Miur-Cnvsu (Comitato nazionale per la valutazione del sistema universitario) data, gathered from ISTAT – "Indicatori Territoriali per le politiche di sviluppo", <http://www.istat.it/it/archivio/16777>. The net migration is defined as the difference between the registered members in regional universities and the number of residents enrolled in the university system in the region. Neither foreign students enrolled in Italian universities nor Italians living abroad and enrolled at telematics universities are accounted for.

Indeed also in terms of innovation Apulia's performance is generally poor, if compared to other European regions. According to the Regional Innovation Scoreboard (European Commission 2014a), Apulia is classified as a 'moderate innovator', i.e. the third out of four categories of regions by level of innovation, as for the categorization adopted by the European Union.

The total intramural R&D expenditure of Apulia is 0.77% of GDP, against 1.26% and 2.01% for Italy and EU-27 respectively, in 2010. The majority of R&D expenditure in Apulia is concentrated in the higher education sector, compared to the national and EU averages where R&D expenditure in the business enterprise sectors prevails. Against an overall decrease in the total intramural R&D expenditure of Apulia in 2011 compared to 2007, R&D expenditure in the business sector increased slightly (from 0.16% to 0.18% of GDP).

Fig. 1 Total intramural R&D expenditure by sector, 2007-2011, % of GDP



Source: Author's processing of Eurostat data

Overall, in Apulia a relatively poor innovation performance goes along with a set of socio-economic characteristics that can be reasonably associated with what Rodriguez-Pose (1999b) calls a "social filter": a relatively low percentage of skilled worker with a high net migration rate, a high unemployment rate and a relatively high weight of the agricultural sector in the region's economy. All these factors are expected to be associated with a low overall regional ability to absorb innovation and turn it into new economic activities or added value.

However, the picture includes also brighter figures. The region shows a well-functioning network of universities and independent research laboratories, which represents a potential competitive advantage. The regional system of research is made up of five universities, one technological park¹², and a large number of technological districts. According to recent data¹³, the scientific production of this system shows examples of excellence by national, European and even world standards. Interestingly, some examples of scientific excellence are in the same fields as some of the best performing regional sectorial specialisations as in the case, for example, of mechatronics and ICT productive specialization in the Bari area and the aerospace sector in the Brindisi area.

Apulia's higher education sector plays a pivotal role in the regional innovation panorama, accounting for more than 50% of total R&D expenditure in 2011 (Eurostat). However, also other public and private entities constitute significant actors in the regional innovation environment. Among public centres of research there are more than twenty institutes belonging to the National Council of Research (CNR), including the National Laboratory for Nanotechnology, the Institute for Microelectronics and Microsystems, the Institute for Industrial and Automation Technologies and the Laser Innovation Technology Transfer and Training centre. Private centres of research include for example Bosch's "Centro Studi Componenti per Veicoli S.p.A.", established after Fiat's sale of its local "Centro Ricerche Fiat" to the German company. Fiat was among large companies attracted in the Bari province in late 60s and early 70s by financial incentives granted by the national government to investors in Southern Italy (Florio, Pellegrin and Sirtori 2014).

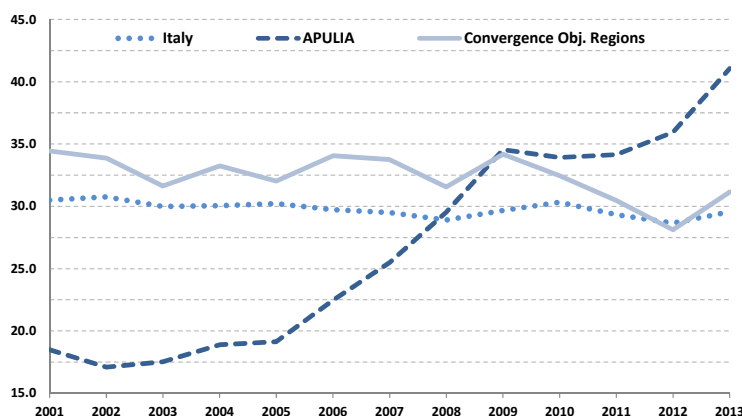
In recent years some indicators suggest that the innovation potential lying on Apulia's areas of excellence started to be exploited to a greater extent. For example, according to Istat indicators for cohesion policy, between 2004 and 2012 the percentage of enterprises introducing product or process innovation in Apulia out of total ones increased by 7.8 percentage points to 28%, against an average of 25% for the Italian convergence regions (33% for Italy). In addition, the improving performance in terms of innovation is reflected in the trend of the regional value of exports in dynamic world demand sectors, which was lower than any other Italian macro areas in 2007 (25%) and became the best performer in 2013 (41%).

¹² "Tecnopolis" in Bari.

¹³ DPS // Department of Economic Development and Cohesion Policies and Invitalia – Italian Agency for attracting investments and enterprise development (2014)

Among determinants of these positive signals it is reasonable to include the local region's efforts to develop a more effective regional innovation system.

Fig 2. Share of export in dynamic world demand sectors, % on total. 2001-2013



Source: Own processing on National Statistical Office data (2012)

3.2 An ambitious regional innovation system

Over the last ten years Apulia has revolutionized its regional innovation system, which is based on principles that clearly echo those characterizing the Smart Specialization strategy.

After the first steps made in the early 2000s¹⁴, with the regional government taking office in April 2005 the Apulia's strategy for research and innovation gained momentum until its formal adoption in 2009¹⁵. This identified innovation as the fundamental leverage for economic development and the quality of life in Apulia, in the same spirit of the new approach characterizing the European Cohesion Policy 2014-2020. The Strategy put innovation as a cross-cutting objective for all regional actions that should be promoted in a systematic effort by various stakeholders. One of the key objectives was to strengthen the links between research and the productive system. It also identified a list of priority sectors¹⁶, indicating that wide networks with competences for scientific and technological applications had to be developed in these ambits. The strategy has been conceived as a flexible instrument and has been further adapted to better meet the needs emerged after its approval (i.e. those related to the economic crisis, as it shall be seen).

The Smart Specialisation Strategy for Apulia was prepared between 2012 and 2013¹⁷. 'SmartPuglia 2020' is characterised by three priorities: the exploitation of innovation to overcome societal challenges such as climate change and population ageing, the support of Key Enabling Technologies as a way to develop the regional productive system¹⁸ and the encouragement of the mobilisation of private finance for innovation.

Another key step in shaping the regional innovation system was the reorganization of the relevant agencies, with specific responsibilities being defined for the implementation and evaluation of the regional policy for research and innovation.

Such reorganization, as well as the overall strengthening of Apulia regional authorities' role in defining and managing the regional innovation policy, was facilitated by a constitutional reform passed in Italy in 2001, that changed the balance of powers between regions and central government, delegating more power to regional administrations. Up to 2001, innovation policy was a prerogative of the national government. The reform of Title V of Italian Constitution marked a turning point, establishing concurrent legislative powers for the national government and regions in a number of policies, including those for scientific and technological research and

¹⁴ Apulia Region (2001) 'Strategia regionale per la ricerca scientifica e lo sviluppo tecnologico' Assessorato allo Sviluppo Economico. Apulia Region (2003) 'Piano di attuazione della strategia regionale per la ricerca scientifica e lo sviluppo tecnologico' Assessorato allo Sviluppo Economico.

¹⁵ Apulia Region (2009a) 'Strategia Regionale per la Ricerca e l'Innovazione della regione Puglia 2009', Assessorato allo Sviluppo Economico.

¹⁶ Such sectors are Biotech and life sciences, Agro/food, Technologies for Energy and the Environment, Aerospace, Mechanics and mechatronics, New materials and nanotechnologies, ICT, Logistics and Production System Technologies. See D.G.R. n. 1552 of 07/08/2009 published on regional bulletin n. 139 of 04/09/2009 (Apulia Region 2009b)

¹⁷ Apulia Region (2014) 'SmartPuglia 2020'

¹⁸ A mapping of regional competences on a number of KETs has been carried out by ARTI following a participatory approach (see Apulia Region, 2014, Smart specialization strategy, SmartPuglia 2020). Admittedly, the mapping focuses on a long-list of key competences thus failing a selective prioritisation attempt.

support to innovation. Regional administrations were made responsible for policy making, provided they observe some fundamental principles set by national law. This reform set the motivation for Italian regions to reorganize their institutions in order to carry out the new tasks.

The first step towards a rationalization of the regional institutional system in Apulia was the establishment in 2004 of ARTI (Regional Agency for Technology and Development), an administrative machine designed to ensure an active dialogue with local stakeholders¹⁹. Operational since 2005, ARTI was conceived as an independent agency to which outsource all the Region's activities concerning the implementation of the regional strategy for innovation.

Also in this context the election of the new regional government in 2005 entailed a substantial acceleration in the setting of a new regional innovative system. The mission of ARTI was revised: rather than appointing one single and independent agency with all operational powers for technological research and innovation, it was decided to set up a system of agencies, including ARTI and other two bodies controlled by the Region's Department for Economic Development: InnovaPuglia S.p.A. and PugliaSviluppo S.p.A.²⁰

In 2008, the Region acquired the majority of shares of both InnovaPuglia and PugliaSviluppo and gave them a more strategic role as intermediate bodies for regional innovation policies. The division of responsibilities was clear and with no overlap: building on their respective traditions, InnovaPuglia is in charge of the implementation of e-government policies and ICT infrastructure investments; PugliaSviluppo is in charge of the promotion of business competitiveness, delivering Structural Funds' grants and engineering financial instruments to support entrepreneurship, innovation and internationalisation. ARTI, which remains an independent agency, supports the regional administration in policy design, and facilitates networking of all the regional research and innovation actors.

PugliaSviluppo provides support to enterprises through a diversified portfolio of instruments, designed to address the specific needs of possible beneficiaries in the region. The regional company supports its clients during the whole process going from the development of project idea, through the procedures to get administrative permits, up to the project final approval. In some cases funds are allocated on the basis of a negotiated procedure, aimed at exploring the specific investment need of the company and identifying the nature and volume of public support that could be provided to address that need. This procedure has been set up in order to offer more targeted support to enterprises and to avoid the bureaucratic complexity and slowness usually affecting open tenders (as experienced in the past with business support provided through national law 488/1992), where beneficiaries are selected on the basis of a number of qualitative and quantitative criteria.

For what concerns ARTI, the measures taken to facilitating networking of all the regional research and innovation actors included for example the creation of a network of Industrial Liaison Offices (ILOs), linked to existing universities and aimed at promoting technological transfer and the generation of spin-offs.

Moreover, ARTI has supported the creation of Technological Clusters, i.e. consortia involving regional authorities (with financing, promotion and coordination roles), enterprises, business representative associations and universities committed to cooperate to produce technological innovation, with a view of becoming excellence centres at national and international level. Four TCs have been set up between 2005 and 2008 and two others have been identified and are waiting for being formally approved. Relevant stakeholders have participated to the creation of clusters, under ARTI's coordination, and are now directly involved in the clusters' management.

ARTI has also got the responsibility of monitoring activities carried out by Technological Clusters and to evaluate socio-economic effects generated by research and innovation projects in the framework of the Apulian regional innovation system.

¹⁹ By regional law n°1/2004.

²⁰ The former was established by the Region in 2008 from the merger between the science and technology park Tecnopolis S.c.r.l. and the financial agency FinPuglia S.p.A.; the latter originates from the regional branch of Sviluppo Italia, the national agency for promotion of investments and enterprise development (now Invitalia).. Up to 2008 the Sviluppo Italia regional branch served as a desk for local enterprises applying for national public financing but had few experiences in directly managing contracts under the 2000-2006 period. It was then transferred to the Apulia Region in compliance with Law n. 296 27/12/2006.

4. Evidence from the 2007-2013 programming period

The key funding instrument for Apulia's innovation policy implementation comes from the 2007-2013 European Regional Development Fund (ERDF) Operational Programme (OP). Focusing on how resources were managed and allocated provides interesting insights on the extent to which the objectives of the regional innovation strategy were pursued by regional bodies in the 2007-2013 funding cycle.

Strategy

The strategic objective of the regional OP for innovation of SMEs mirrors the one of the Regional Innovation System. The main goal of the OP Apulia ERDF 2007-2013²¹ was to favour the convergence of the region in terms of growth and employment and its sustainability in the long term. The initial total financial resources amounted to 5.2 million EUR which became EUR 4.2 after reprogramming in 2011²². Since the beginning of the programming period, promoting research and innovation was at the core of the programme's strategy. The main strategic objective of the policy mix was therefore to support regional structural change towards high value added production and foster research and innovation (in particular by promoting the collaboration between firms and research institutions), which were seen as a means to promote such a change. The ultimate goal was to improve the capacity of regional manufacturing SMEs to face the pressures of global competitiveness and ultimately increase export capacity.

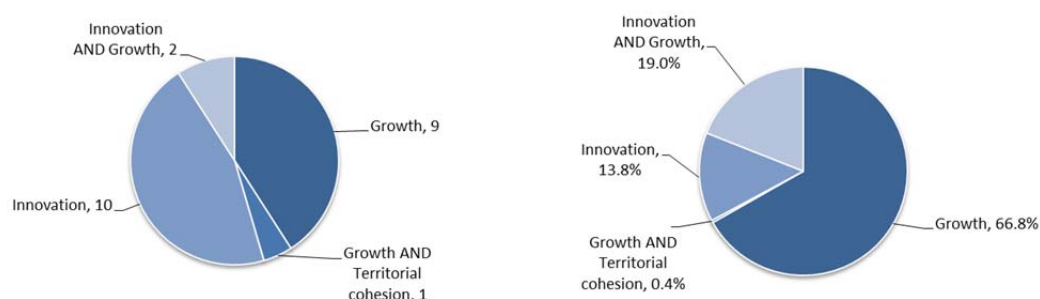
The total amount of funds allocated to SMEs was EUR 1,102 million (becoming 1,097 after reprogramming) for competitiveness of productive systems and employment and EUR 253.33 million for promotion and diffusion of R&D for firms' competitiveness (which became 581 million after reprogramming).

Instruments overview

22 instruments of the OP under analysis either explicitly targeted SMEs or were generically addressed to regional firms, but with the majority of beneficiaries actually being SMEs.²³ They accounted for a total of EUR 662.5 million of committed public funds.

The distribution of instruments between those devoted to innovation and those targeting growth is balanced in terms of instruments number, but more resources were actually devoted to the latter. This is reflected in the distribution of funds across different typologies of instruments. Those aimed at "Business creation and development" and "Generic access to finance" account for more than 75% of the total paid amount. This rough breakdown seems at odds with the focus of innovation that was set at strategic level. Indeed a more in-depth analysis on the available data confirms that the ambitions of the OP with reference to innovation were partially sacrificed during the implementation phase, as it shall be showed.

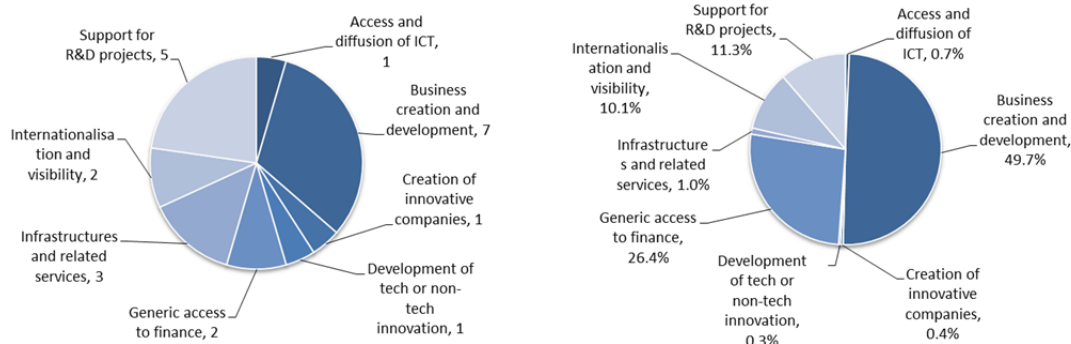
Fig.3 Overview of policy instruments by general objective and type of instrument (number-left side- and amount paid right side)



²¹ The Operational Programme ERDF Apulia 2007-2013 was adopted with Commission Decision (CE) n. C/2007/5726 of 20.11.2007 and further modified with Commission Decision C(2011) 9029 of 1.12.2011 and Decision C(2014)9373 of 4 December 2014 (European Commission 2007, 2011c, 2014b).

²² Initially, the EU co-financing rate was 50% for all policy instruments. As a result of the reprogramming exercise the co-financing rate became 62.4%.

²³ It is worth mentioning that a sizeable share of funds of the ERDF OP is addressed to large enterprises, also (but not necessarily) in collaboration with SMEs. The impact of policy instruments specifically addressing large enterprises on SMEs, which are mainly suppliers in the supply chain, is a relevant aspect to better understand the drivers of change for SMEs. It is worth exploring the issues in other studies, for example within the context of the parallel study on WP4.

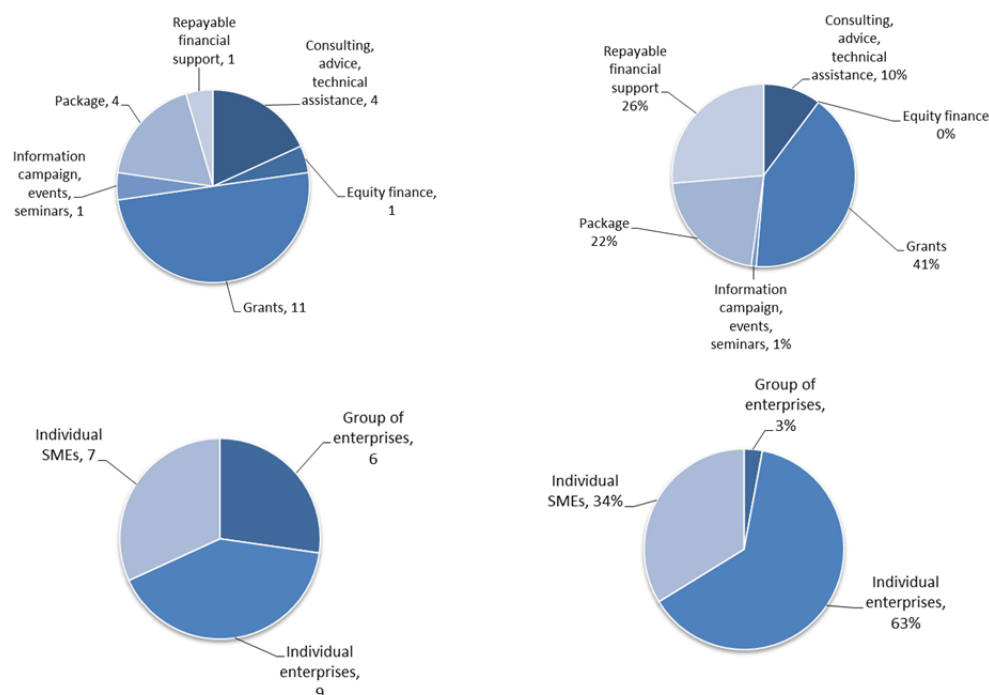


Source: Author's processing of Annual Implementation Report, Pugliasviluppo, Innovapuglia and Confidi data

For what concerns the instruments' target beneficiaries, despite the original intention of implementing bodies to promote collaboration among firms and between firms and research institutes, in terms of the number of instruments individual beneficiaries constituted the prevalent target. In the face of less than encouraging feedback from SMEs²⁴, the Managing Authority preferred to stick to more traditional schemes of support to individual firms, which highlights the flexibility of implementation, but also the firm demand-driven approach that characterised the implementation process.

In addition, more traditional instruments (e.g. grants) were the prevalent ones, although in some cases they were delivered in the form of integrated facility packages, combining funds from different priority axes and lines of activity to support investment plans including a broad range of components such as R&D, ICT, environmental sustainability.

Fig.4 Overview of the policy instruments by mode of delivery and target beneficiary (number-left side- and amount paid -right side)



Source: Author's processing of AIR, Pugliasviluppo, Innovapuglia and Confidi data

²⁴ The negative experience of some instruments launched at the beginning of the programming period designed for collaborative projects and which actually recorded a low response rate, led to adjusting the procedures to the request to build networks and collaboration, by including it as an award and not an eligibility criterion in the selection procedure.

Thenceforth the analysis will concentrate on the most significant instruments, listed in the table in the Annex, which in total represent 88% of the total amount committed and 85% of the total amount of public resources paid out.

The rationale of the implementation appears differentiated. In the majority of cases it addressed a specific market failure, usually related to the reduction of investment costs for specific kinds of investment or service (RDI, ICT, consulting) or beneficiaries (disadvantaged persons, start-ups). In the case of RDI, for example, three main barriers were addressed: (i) high initial investment costs (ii) lack of internal competence and (iii) lack of coordination of territorial actors (public and private, in particular)²⁵.

For many instruments absorbing a significant share of funds, however, the rationale was rather to address more far-reaching system failures, typically constraints in access to credit. In such cases, it was considered crucial to reduce the risk of credit providers to facilitate access to credit, not only to increase private investments but mostly to support working capital and cash rebalancing.

In addition, it is worth noticing that two instruments stimulated innovation processes by means of demand-side tools, namely Living Labs and Pre-commercial procurement²⁶. They are considered innovative tools that draw from best practices at an EU level and are in line with the principles of smart specialisation and social innovation, and were implemented in the last phase of the programming period as experimentations. In this sense their rather limited initial allocation is justified, and in the case of Living Labs, it actually was increased after they were positively welcomed by targeted SMEs in the piloting phase.

This fully-fledged 'catalogue' of policy instruments customised to the size of the target beneficiaries and their capacity to invest was partly justified, on the one hand, in the light of the significant amount of financial resources involved and, on the other, the need to cope with a fragmented productive system that called for policy instruments specifically designed to meet the precise development needs of a broad range of SME categories. However, it also reflects a certain fragmentation of action and poor concentration of resources. While smaller allocations of funds are justified for piloting flagship projects, such as the Living Labs, it is less so for more standard actions such as the implementation of a marketing plan.

A user-oriented approach

A key factor to interpret the evolution of the policy implementation under analysis, as well as its successes and failures in pursuing growth by the way of innovation, is the clear client-oriented approach followed by regional agencies.

In many aspects this turned to be a winning model. For example, public presentations were systematically carried out every four months before the call is launched, according to a paradigm which is said to have evolved from a 'consultation for listening' to a 'consultation for co- designing', and in this way it was possible to fine-tune and tailor the call specifications to the specific needs highlighted by potential beneficiaries.

The capacity of the implementation bodies to engage in a dialogue with potential beneficiaries is well recognised by stakeholders and beneficiaries, and also benefits from the specific skills and the background of their staff in the field of innovation and industrial promotion. In some selected cases, the relationship with the beneficiaries extends beyond mere administrative issues and includes technical and scientific support.

Overall, the role of the implementing agency ensured quite a smooth implementation process with efficiency gains during the programming period, even for the less selective instruments for which the selection process could be more cumbersome, with a generalised sharp reduction in the length of the selection processes.²⁷ The beneficiaries interviewed reported that regional support instruments were more efficient than similar instruments implemented at the national level. In addition, it is reasonable to ascribe to the user-oriented approach of the implementing bodies also the good participation rate in the open calls for tender.

On the other hand, to some extent the role of implementing bodies reflects more the customer satisfaction orientation of a spending agency involved in funds absorption rather than a strategic role with a result-orientation directed towards structural change. This approach was likely to be a major determinant of the specific evolution of the policy implementation, that experienced a noteworthy change after 2009. The financial crisis was the main consideration influencing this reprogramming of the Operational Programme.

²⁵ The available literature supports the arguments that those are the key barriers to R&D for Italian SMEs and for Apulia in particular (see for example D'Aurizio and Marinucci (2013) Bugamelli e Pagano (2004) e di Fabiani et al. (2005) pointing to the these as the major barriers as perceived by the firms, and Florio, Pellegrin and Sirtori (2014) exploring the role of territorial governance structure for the latter).

²⁶ The former consists of the creation of an "open ecosystem" whereby the users actively take part in researching and testing innovative solutions, which have been developed through the use of ICT. The latter refers to the support of new and innovative products and services in domains where there is a demand by public administration and bodies (such as in Ambient Assisted Living and e-Accessibility) which is however still in an early stage of specification and which cannot be translated into a procurement process.

²⁷ By way of an example, on average the selection process for the instruments of Axis I lasts 90 days, for some of the less crowded calls it takes 45 days, compared with an initially longer time.

As a reaction to the economic hurdles of the crisis, more emphasis was put on addressing social inclusion and employment safeguarding, especially in those actions aimed at promoting growth in firms. With reference to the specific measures undertaken in policy instruments addressing SMEs, reprogramming included:

- Strengthening measures addressing access to credit and supporting enterprises in facing the credit crunch (by introducing a further financial engineering instrument in 2013 and increasing the allocation of the three existing ones);
- Adjusting the legislative framework for grant aid schemes in order to significantly relax the selection criteria on aid schemes, in particular by revising the admissibility of financial criteria reflecting the emerging macroeconomic situation.

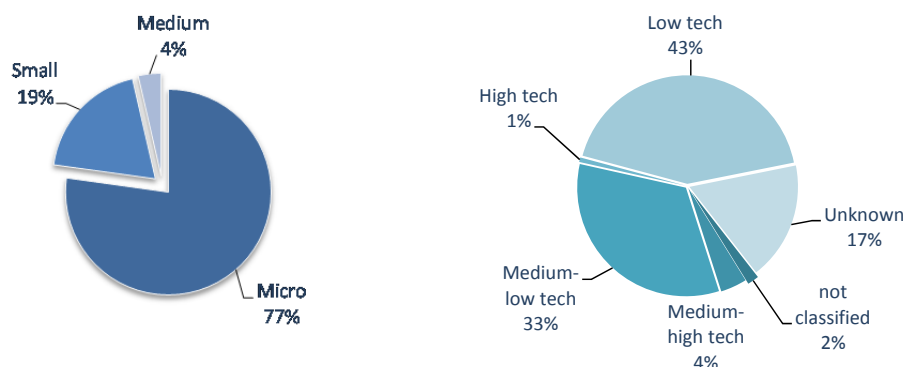
The implementing bodies showed to be considerably flexible and efficient in recognizing and reacting to the harsh effects that the financial crisis brought about. However, this also entailed a deviation from the original strategy of the OP for what concerns SME innovation, which is visible when analysing more in detail the characteristics of the instruments and beneficiaries of the ERDF sources devoted to support SMEs.

The underutilization of promising instruments

As already noted, public resources earmarked for innovation instruments were considerably less than those devoted to growth. The choice of implementing bodies to give more space to measures aiming supporting SMEs' competitiveness rather than their innovation, also as a reaction to the economic downturn, appears clearer looking at the characteristics of assisted SMEs.

Overall the ERDF assisted around 9,000 SMEs, with a prevalence of micro enterprises and low and medium-low tech sectors²⁸. The former one accounted for nearly 80% of beneficiaries, whereas the latter ones for 43%. High-tech and Medium-high tech are only 5% of the companies (keeping into account that for 17% of assisted SME the technological intensity is unknown, and 2% are not classified).

Fig.5 Assisted beneficiaries by size and technological intensity



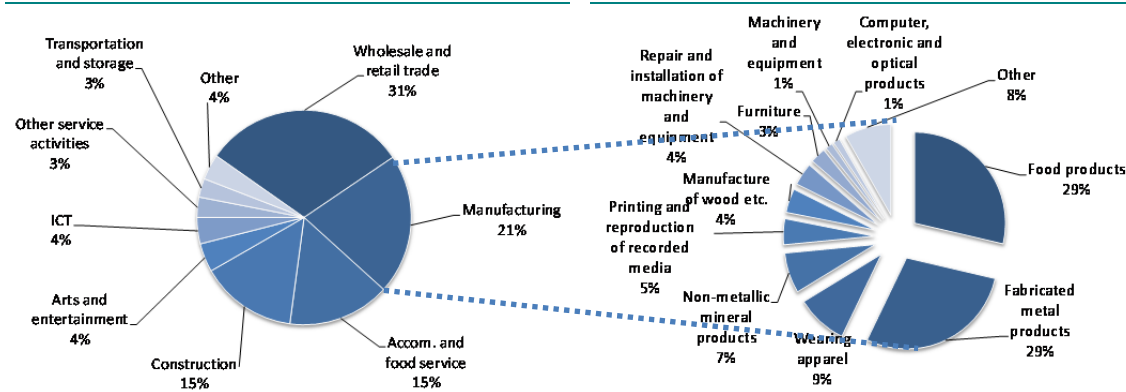
Note: Information available for 7,086 SMEs: sectorial disaggregation (NACE 2 digit) is missing for the remainder

Source: Author's processing of available lists of beneficiaries

The analysis at sector level confirms that the largest share of targeted sectors were not the export-oriented and innovative ones.

²⁸ This figure is an approximation and it is obtained by summing all the beneficiaries for which list of beneficiaries are collected (8,547), and considering that, by one side, beneficiaries of the measure for which no data have been collected are to be summed up and, by the other, the same beneficiary is counted more than once if benefitting by more than one instrument.

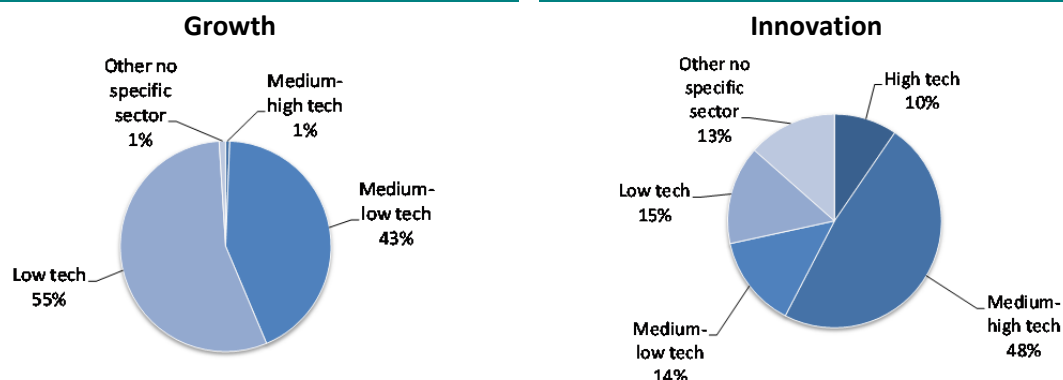
Fig. 6 Assisted beneficiaries, breakdown by total and manufacturing sectors



Source: Author's processing of available lists of beneficiaries

In particular, there is a concentration in the retail trade and construction sectors and a rather limited share of beneficiaries in the manufacturing sectors which, on the contrary, one would have expected to be among the key beneficiaries in the perspective of enhancing global export capacity.

Fig. 7 Assisted beneficiaries by technology- intensity and objective



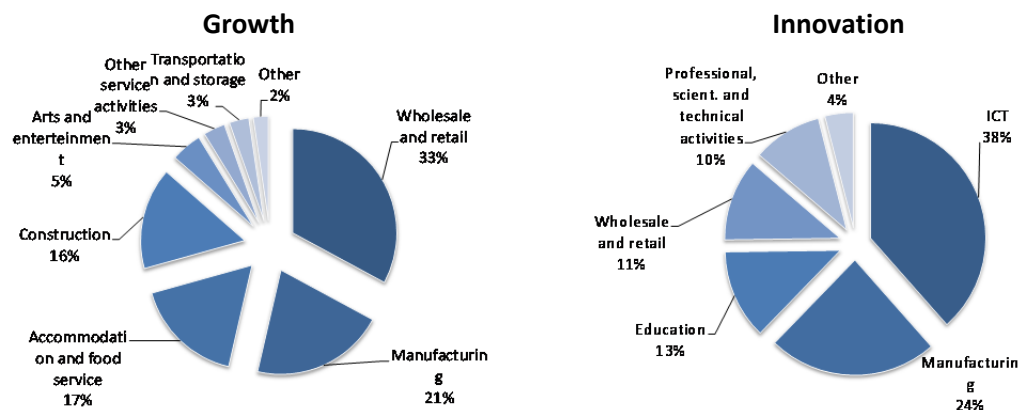
Note: For policy instruments addressing growth information is available for 6,586 SMEs (86.3% of the total) while for policy instruments targeting innovation information is available for 630 (54.4% of the total). Sectoral disaggregation (NACE 2 digit) is missing for the remainder

Source: Author's processing of available lists of beneficiaries

When distinguishing by objectives pursued there is an evident divide between measures addressing growth and those addressing innovation²⁹, with the latter benefitting more high and medium-high tech sectors. Although there is a relevant share of beneficiary of instruments targeting innovation for which the necessary sectoral information is not available, and this can affect the actual breakdown of technological intensity, interviews with beneficiaries and their representatives confirm that this divide is actually in place.

²⁹ Including those marked with 'innovation and growth', which are the most selective of the 'growth' measures, such as the integrated facility packages

Fig. 8 Assisted beneficiaries, breakdown by sector and type of instrument



Source: Author's processing of available lists of beneficiaries

This is also confirmed by the analysis at the sectorial level. While instruments addressing growth have a less focused sectorial breakdown and show a concentration in the retail trade and in construction instruments addressing innovation have a more focused target and with a prevalence of sectors where innovative and best performing firms are concentrated (such as ICT and scientific activities). Instruments addressing innovation, which have been more selective, seem also to have supported firms in sectors that are more in line with the ambition of accompanying structural change in the region.

Another insight on the appropriateness of instruments with a focus on innovation is also provided by the observation of the investments generated by the different instruments. 73% of the committed funds were grants for investments in SMEs. According to data on selected projects (only a share of them are actually completed), SMEs measures led to a total of 4,732 investment operations generating a total amount of 1,406 million Euro. This figure refers to ex-ante estimations made by the applicants; however some evidence on the state of implementation reveals that for integrated facility packages (i.e. more selective measures targeting innovation leaders) the final investments were actually higher than what was declared in the application form, since additional components were made necessary during the course of the implementation. In contrast, more generic measures such as the grant for aid to micro and small enterprises, has 2,382 completed projects, which generated a total of 331 million Euro, thus an average investment amount of 139,000 Euro, slightly less than the average amount estimated ex-ante (this can also be due to the fact that completed projects are for smaller scale investments and not necessarily to the fact that actual investments were less than what was estimated ex-ante).

More selective instruments show the highest average amount of investment, and actually financed far-reaching investment plans including the purchase of innovative machinery and equipment, buildings (to host the new equipment), R&D and consulting services. The scale and strategic relevance of the investments supported are such that, as confirmed by interviewees, they actually made the difference in the SMEs supported in that they were able to start new production lines, enlarge their client portfolio and improve their productivity.

There is a vast consensus among policy makers and beneficiaries that the direct support to SMEs provided by the OP was able to influence investment decisions in firms positively. There is agreement that, especially in periods of severe global economic downturn and financial constraints, the availability of non-repayable funds provided a crucial incentive to private investment by reducing the gap between the cost of financial capital and the expected rate of return on investment. This gap is larger in the case of R&D activities, which are characterised by higher uncertainty in relation to the timing and magnitude of the return on investment, as reflected by the higher aid intensity³⁰ granted to R&D activities³¹. The system of aid intensity in fact is expected to fill in the mentioned gap and is modulated in order to favour more risky but promising category of activities. In particular, case histories reveal that more than influencing the decision in itself (whether to invest or not), the availability of public funds in the form of non-repayable aid had a triggering effect in terms of anticipating or upscaling the investment decisions which were however already within the firm's strategic priorities³².

³⁰ This is defined by the ratio between the aid amount and the total cost incurred by beneficiaries.

³¹ by way of example, aid intensity in the integrated facility schemes was 75% for industrial research against 20-40% for fixed assets

³² This consideration is in line with evidence from the literature. In particular, D'Aurizio and Marinucci (2013) using data on the annual firm survey of the Bank of Italy for the period 2008:2010 found that public funds are only marginally used by the most dynamic Italian firms carrying out R&D activities and, when this occurs, this does not influence the decision but rather the intensity of the R&D investment. The message of the study is however more positive for firms in Southern Italy, for

Still, the choice of implementation bodies to devote a greater extent of the available resources to a generic support of local firms, heavily affected by the crisis, limited the scope for initiatives more focused on innovation.

which public funds have a relevant triggering effect supporting investment decisions that would have not occurred in the absence of the public funds. In the case of Apulia, beneficiaries interviewed would have possibly made the investments anyhow, but this would have taken a longer decision making period (which also means a longer time to market for R&D investments).

5. Concluding remarks

The Smart Specialization strategy constitutes a possible strategic reconciliation between the cohesion objectives intrinsically embedded in the European regional policies with their increasing emphasis on innovation as a driver of growth. Focusing on a limited set of economic areas in which regions can “hope to excel”, supporting innovation, stimulating private sector investment, fully involving stakeholders, and implementing evidence-based policies to be effectively monitored, lagging behind regions are expected to be able to seek successfully economic growth through innovation.

The actual viability of this synthesis between potentially conflicting purposes has yet to be tested. In this context, the evidence of the policies pursued by Apulia region over the last years provides interesting insights.

On the one hand, the available data suggests that to carry out a regional innovation policy in a lagging behind region, with some areas of potential excellence, is possible. Instruments devoted to innovation actually managed to reach their suitable target. Integrated facility instruments, being among the most sophisticated tools adopted to channel ERDF resources towards investments in innovation, involved the greatest investment volumes, which entails a greater probability to achieve the critical mass needed for the investment to really “make the difference”. The proximity of local implementing bodies with beneficiaries, in addition, enabled them to follow the investments and tailor the instruments to the needs of local relevant actors.

On the other hand, the closeness between the implementing agency and local firms probably favored an excessive acquiescence of the former when the economic downturn hardly hit the local firms’ financial conditions. The weight of the policy shifted to a greater extent towards instruments of generic support to firms and to credit guarantees, that were tied to a lesser extent to innovation and to the areas of the local industrial fabric showing greater chances to reach a relatively high level of innovation.

In this regard, it is worth noticing that although the ERDF measures supporting SMEs in Apulia over the period 2007-2013 provided a relatively large amount of funds (the total programmed funds account for approximately 20% of the total OP) their capacity to actually influence regional structural dynamics should not be overestimated: if divided by the total number of regional SMEs, ERDF accounts for approximately EUR 3,300 for each SME over the entire period, which means EUR 471 per year.

While it is reasonable to think that if strategically concentrated and addressed those funds can actually make a difference for a selected number of beneficiary SMEs targeting well-identified barriers to growth and market failures, there is quite a limited scope in using the ERDF to cope with more systemic failures such as credit crunches in a period of crisis. In this perspective, regional bodies managing the funds failed to exploit at best the resources of ERDFs, and *de facto* partially deviated from the principles of the Smart Specialization, showing that the proximity between implementing agencies and firms (which is a rather suitable condition for a local-based approach to innovation) also entails the risk of the former ones to adopt excessively the short termism that (can) characterize the latter ones.

Annex. I. Key policy instruments

Full name	Description	Logic of intervention	Objective	Mode of delivery	Committed at 12.14 (EUR ml)	Nr. of benefic.
Aid for investment in research by SMEs	Support programmes for research and innovation promoted by SMEs, in order to increase innovative activities and regional production both in traditional manufacturing sectors and in innovative sectors.	Supporting R&D investments by reducing the risk related to the uncertainty of pre-competitive R&D	Innovation	Grants	44.9	139
Aid to consulting services for the technological innovation of SMEs	Support is given to SMEs for the acquisition of specialised consulting services to strengthen their technological development and innovation activities.	Improving innovative capacity in SMEs	Innovation	Grants	11.2	246
Regional partnership for innovation	Aiming to promote the creation of public-private partnerships for research and innovation in line with smart specialisation strategies.	Supporting investment in R&D by promoting cooperation among enterprises and with research centres	Innovation	Grants	26	153
Aid to SMEs for access and use of ICT in productive and management operations	The objective is to increase innovation in all economic and productive sectors of the region. Two calls "Aid for the diffusion of ICT technologies in SMEs' networks" supported the implementation of ICT solutions in enterprises, through the diffusion of SAAS.	Supporting the adoption of digital solutions in networks of SMEs	Innovation	Grants	10.8	183
Living Labs	The Policy instrument supports the creation of living labs, aiming to favour constant interaction between demand, technology development and supply. In particular, the region promotes experimentation projects in the ICT living labs, where researchers, enterprises and groups of citizens exchange ideas and knowledge, plan together and experiment with innovative technological solutions.	Supporting the link between demand and supply of industrial research and innovation; promoting social innovation by reducing the risks related to the uncertainty of pre-competitive R&D	Innovation	Package	21.9	204
Integrated Facility Packages implemented by medium-sized enterprises and consortia of SMEs	These packages finance the realisation of investments aimed at increasing productive innovation in selected sectors. The Policy instrument finances the purchase of machinery, consulting services for innovation in the context of internationalisation, marketing, participation in fairs and ethical certification SA8000.	Supporting industrial investments, especially in innovation	Innovation and Growth	Package	94.1	52
Aid to investment by micro and small enterprises	Supports the creation and development of micro and small enterprises. The Policy instrument was delivered through an open call. Examples of projects comprise the financing of the purchase of machinery, computer systems, buildings, construction work for enterprises (water, electrical, heating systems).	Supporting industrial investments, especially for micro enterprises with poor access to credit	Growth	Grants	119.5	3,311
Credit guarantees	This Policy instrument favours access to credit by Apulia's enterprises. A guarantee fund was set up for the benefit of enterprises seeking bank credit. Intermediate bodies (Consortia or Cooperative companies) disburse resources. The fund was used particularly to finance material and immaterial investments, but also to address financial disequilibria or favour company recapitalisation.	Limited access to credit	Growth	Repayable financial support	100	3,830
Qualification of the tourism offer	This Policy instrument grants aid to enterprises in the tourism sector, as a contribution to initial investments carried out by SMEs. The aid is not delivered through calls, but on a continuous basis upon request by potential beneficiaries.	Supporting investments in the tourism sector	Growth	Grants	39.1	244

Aid to medium-sized firms and consortia of SMEs for Integrated investment programmes in the Tourism sector	Involves Integrated Facility Packages aimed at improving the tourism offer in Apulia. The Policy instrument aims to implement an integrated set of investments in order to improve the regional tourism offer.	Supporting investments in the tourism sector	Growth	Pack-age	64.9	36
Aid to small enterprises for Integrated Facility Packages	Supports the enlargement, development and innovation of SMEs, by financing industrial investment packages to increase the production of goods and services, integrated with investments for R&D and the purchase of services. Eligible material investments consist of the realization of new productive units, the enlargement of existing units, diversification of production, and changes in production processes.	Supporting industrial investments, especially in innovation	Innovation and Growth	Pack-age	51.6	37

Source: Author's processing of programming documents and public calls.

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