Regional Innovation Monitor

Regional Innovation Report (Lombardy)

To the European Commission
Enterprise and Industry Directorate-General
Directorate D – Industrial Innovation and Mobility Industries

Andrea Ciffolilli

Luca Rossi

Ismeri Europa
PREFACE

The Regional Innovation Monitor (RIM)\(^1\) is an initiative of the European Commission’s Directorate General for Enterprise and Industry, which has the objective to describe and analyse innovation policy trends across EU regions. RIM analysis is based on methodologies developed in the context of the INNO-Policy Trendchart which covers innovation policies at national level as part of the PRO INNO Europe initiative.

The overarching objective of this project is to enhance the competitiveness of European regions through increasing the effectiveness of their innovation policies and strategies. The specific objective of the RIM is to enhance the scope and quality of policy assessment by providing policy-makers, other innovation stakeholders with the analytical framework and tools for evaluating the strengths and weaknesses of regional policies and regional innovation systems.

RIM covers EU-20 Member States: Austria, Belgium, Bulgaria, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Ireland, Italy, the Netherlands, Poland, Portugal, Romania, Slovakia, Spain, Sweden and the United Kingdom.

This means that RIM will not concentrate on Member States where the Nomenclature of territorial units for statistics NUTS 1 and 2 levels are identical with the entire country (Estonia, Latvia, and Lithuania), Malta which only has NUTS 3 regions, Slovenia which has a national innovation policy or Cyprus and Luxembourg which are countries without NUTS regions.

The main aim of 50 regional reports is to provide a description and analysis of contemporary developments of regional innovation policy, taking into account the specific context of the region as well as general trends. All regional innovation reports are produced in a standardised way using a common methodological and conceptual framework, in order to allow for horizontal analysis, with a view to preparing the Annual EU Regional Innovation Monitor reports.

European Commission official responsible for the project is Alberto Licciardello (Alberto.LICCIARDELLO@ec.europa.eu).

The present report was prepared by Andrea Ciffolilli (ciffolilli@ismerieuropa.com) in cooperation with Luca Rossi. The contents and views expressed in this report do not necessarily reflect the opinions or policies of the Member States or the European Commission.

Copyright of the document belongs to the European Commission. Neither the European Commission, nor any person acting on its behalf, may be held responsible for the use to which information contained in this document may be put, or for any errors which, despite careful preparation and checking, may appear.

\(^1\) http://www.rim-europa.eu
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>i</td>
</tr>
<tr>
<td>1. Main Trends and Challenges in the Regional Innovation System</td>
<td>1</td>
</tr>
<tr>
<td>1.1 Recent trends in regional economic performance</td>
<td>1</td>
</tr>
<tr>
<td>1.2 Recent trends in regional innovation performance</td>
<td>2</td>
</tr>
<tr>
<td>1.3 Identified challenges</td>
<td>4</td>
</tr>
<tr>
<td>2. Innovation Policy Governance</td>
<td>6</td>
</tr>
<tr>
<td>2.1 Degree of institutional autonomy</td>
<td>6</td>
</tr>
<tr>
<td>2.2 Institutional-set up, co-ordination and implementation mechanisms</td>
<td>6</td>
</tr>
<tr>
<td>2.3 Availability and use of policy intelligence tools</td>
<td>10</td>
</tr>
<tr>
<td>2.4 Key challenges and opportunities</td>
<td>11</td>
</tr>
<tr>
<td>3. Innovation Policy Instruments and Orientations</td>
<td>13</td>
</tr>
<tr>
<td>3.1 The regional innovation policy mix</td>
<td>13</td>
</tr>
<tr>
<td>3.2 Appraisal of regional innovation policies</td>
<td>22</td>
</tr>
<tr>
<td>3.3 Good practice case</td>
<td>24</td>
</tr>
<tr>
<td>3.4 Portfolio of innovation support measures</td>
<td>25</td>
</tr>
<tr>
<td>3.5 Towards smart specialisation policies</td>
<td>27</td>
</tr>
<tr>
<td>3.6 Possible future orientations and opportunities</td>
<td>28</td>
</tr>
</tbody>
</table>
Appendices

Appendix A Bibliography ............................................................................................................. 30
Appendix B Stakeholders consulted .......................................................................................... 31
Appendix C RIM Repository information .................................................................................. 32
Appendix D Explanation of factors of Innovation Performance, Governance and Policy ............... 33
Appendix E Statistical data ........................................................................................................ 36
Appendix F RIM survey responses .......................................................................................... 37

Figures

Figure 1-1 Economic and innovation performance indicators for Lombardy .................. 4
Figure 2-1 Governance, policy, and innovation performance factors for Lombardy .... 11

Tables

Table 3-1 Existing regional innovation support measures......................................................... 16
Executive Summary

1. Introduction: Main recent trends in the Regional Innovation System

Lombardy is one of the most important economic centres of the EU. The GDP per head is among the highest in Europe and the world (138.9 relative to the EU27 in 2007) but economic growth was not quite satisfactory in the last decade and GDP growth was considerably below the EU (1.11% on average in 1995-2008). Such sluggish performance has been mostly driven by employment gains while productivity per hour worked was low. This is linked to sector specialisation and the prevalence of low-tech small enterprises. Nonetheless, the business density is remarkable and the manufacturing sector particularly strong. These, together with a sizeable and very open market which is attractive for FDI (also due to the infrastructures’ endowment and Milan’s international role as a financial centre), are amongst the key regional assets. The capacity of the research actors to produce quality output and the ability of a segment of local SMEs to generate innovation is strong and so is the capacity to market it. An relatively low and decreasing expenditure for R&D (from 1.2% of GDP in 1995 to 1.16% in 2006), a limited investment on higher education, a scarce cooperation between science and industry and, more generally, the public and private sides of the RTDI sector hamper the possibility of fully seizing the potential of the innovation system.

2. Major innovation challenges and policy responses

Challenge 1: Need for strengthening and extending the base of innovative firms (SMEs and medium enterprises)

Lombardy is characterized by structurally low private and public R&D investments, in comparison with other advanced areas in Europe and worldwide. This is mostly determined by the prevailing low-tech specializations. In the last 15 years, R&D investments experienced a decreasing trend due to a structural change brought about by the flight and/or delocalization of large enterprises in certain sectors which represented the bulk of the regional R&D expenditure (e.g. chemicals, pharmaceuticals, aeronautics and electronics). The negative impact of the structural change on RTDI was in part compensated by the growing importance of medium enterprises (e.g. in mechanics, pharmaceuticals, house and personal goods) and by a lively process of creation of innovative small firms (e.g. in biotech). Applying the most effective instruments to support the creation and growth of innovative enterprises, and their transformation into knowledge based medium firms, is a critical challenge for the Lombard system. The current policy mix deals with this challenge by means of aid schemes for research and innovation in enterprises, innovation financing and human capital development initiatives. An increasing focus on measures with a strong leverage capacity would be particularly important given the scarcity of public resources. This is the case, for example, of the SEED fund which can be considered effective insofar as take up and beneficiary opinions are concerned, despite the international economic crisis. In relation to this challenge, more can be probably done to identify key innovation needs (financing, competences) of medium enterprises and the best solution for these. There is not strong evaluation-based evidence of outcomes and impacts of the existing initiatives. However, some positive indirect evidence is provided by national evaluations of similar schemes.
Challenge 2: Need for a wider diffusion of innovation culture among small firms

Despite the presence of a strong segment of innovative SMEs, the innovation culture and the propensity to invest in RTDI is still weak among the majority of small firms. These have a low propensity to adopt emerging technologies while innovation is still incremental and the interaction with research and TT centres is limited. In a context of increasingly global competition, a growth model based on incremental innovation seems hardly sustainable while facilitating the adoption of emerging technologies is important, especially in the perspective of pursuing a smart specialization strategy. The policy mix deals in part with this challenge by funding the diffusion of innovative technologies, as well as of products and services through innovation vouchers, and by supporting business looking to register patents etc. Nonetheless, the multiple initiatives put forward by various units and DGs can be streamlined while a more widespread effort of awareness raising on the advantages of investing in innovation would be probably beneficial. Policy makers seem to be content with the existing mix; however, evaluation-based evidence on performance is very scarce which makes it hard to fully appraise the appropriateness of the regional action.

Challenge 3: Improving cooperation propensity between (and within) science and industry and further exploit the opportunities of public-private partnerships

There is a disjuncture between science and industry and a low cooperation propensity among firms. Furthermore, despite Lombardy is an active player of high level international networks (e.g. FP7, European Institute of Innovation and Technology) and several international and interregional RTDI agreements are in place, regional actors mostly tend to follow a self-sufficient approach to research and innovation, rather than pursuing shared objectives. A challenge consists in stimulating cooperation and synergies on these three fronts: between science and industry, among firms, and between regional RTDI actors and international networks. The policy mix addresses this issue by financing joint research, scientific cooperation, also with other regional actors, and in general by focusing on the linkages between science and industry (e.g. technological districts and poles, meta-districts, DRIADE etc.). More effort is needed in effectively following up the launched partnerships with road maps and joint medium-long term plans that should accompany any agreement, if the full opportunities of these are to be exploited and the autarchic approach to RTDI is to be overcome.

3. Innovation policy governance

Lombardy has full autonomy in RDTI policy since the 2001 constitutional reform which established shared competences between the Italian Regions and the central government in this as well as other policy areas. The reform, together with the almost simultaneous introduction of the Lisbon Strategy at the EU level, had a strong impact, both strategic and financial, on the regional approach to RDTI policy. There are mechanisms in place to ensure horizontal and vertical coordination of regional RTDI policy. These mainly consist of formal agreements with the central government (e.g. APQ with the MIUR), with other regions (e.g. the framework agreement with Sardinia) or with other regional stakeholders (e.g. the framework agreement with the CCIAA or with the Universities). Besides, there are informal consultative arrangements (thematic working tables) which allow to gather stakeholders to identify emerging issues, discuss and shape initiatives and help guiding policy.

A specific management unit (Struttura Università e Ricerca), under the responsibility of the Region’s Presidency manages university and research interventions and is supposed to have a coordination role over the entire range of regional RTDI policies. Innovation support initiatives are implemented by (sectoral) Directorates General. Both the University and Research Unit and the DGs are supported by public owned companies such as CESTEC (centre for technological development, energy and
competitiveness), Finlombarda and the Higher Institute for Research, Statistics and Training (formerly, IReR).

In their work, regional policy makers are supported by policy intelligence tools such as foresight exercises and benchmarking studies. Foresights have been used since the definition of the first RDTI strategy and are regularly updated even if for internal use and hence not publicly available. Analysis of policy performance based on evaluation of outcomes and impacts is still very scarce. The few evaluations carried out at a regional level do not provide substantial evidence on outcomes, impacts and added value of interventions. The challenge is hence diffusing an evaluation culture, which is not mere collection of monitoring data, and hence provides policy officials with robust tools for decision making and governing innovation support initiatives. Indirect evidence on performance can be inferred on the basis of monitoring data and financial/physical progress of initiatives as well as on analyses conducted at national level which provide some information on the added value of instruments applied also at the regional level.

Despite the existing coordination mechanisms and due to the complexity of the system and the wide variety of the innovation policy initiatives, there is still room for improving governance and hence the policy effectiveness and efficiency. The main governance challenge is to strengthen the systemic integration of policy design and implementation, especially as regards research and university on the one hand and innovation policy on the other.

4. Conclusions: future actions and opportunities for innovation policy

In order to ensure effectiveness of RTDI policy, Lombardy must improve the coherence between available resources, chosen strategies, and initiatives. Furthermore, given the tight budget, the Region needs to further concentrate resources on priority areas of intervention and on the most effective instruments. The large variety of existing initiatives could be possibly streamlined and a limited set of the best instruments applied in each policy area. These should be hopefully managed under a single direction rather than fragmented among a number of DGs and units. The set-up of a regional innovation agency that catalyses these competences and deals with both research and innovation policy might be a solution. Rationalisation of objectives and instruments cannot be achieved without an integrated and advanced monitoring and evaluation system which can enable a real time control of performance and reveal what kind of measures and policies provide the best returns and what arrangements work more effectively. An integrated dashboard (i.e. “cruscotto”) is used by other regions to this purpose and its development in Lombardy is highly recommendable. In addition to this, a detailed, high level independent evaluation of the past RTDI initiatives (those which are relevant insofar as they are still employed) and of the new initiatives introduced in the current programming period is necessary to understand what the current policy performance is and what the possible future directions for action are.
1. Main Trends and Challenges in the Regional Innovation System

1.1 Recent trends in regional economic performance

Lombardy provides a fundamental contribution to the generation of the Italian domestic product. Between 1995 and 2007, the regional GDP of Lombardy was on average 21% of the Italian GDP. The regional share of national exports is even higher (28.3% in 2008). This is a measure of the regional competitiveness and indicates the regional capacity to penetrate world markets, especially in the manufacturing sector. Lombardy is also the most attractive Italian region in terms of FDI (it receives approximately 2/3 of the capital flows (Bank of Italy, 2009) thanks to its business density, the presence of the Milan stock exchange but also its relatively skilled labour.

During the last fifteen years, the GDP growth performance of Lombardy has not been particularly brilliant (1.11% in 1995-2008) and has been roughly in line with the Italian growth (1.27%). Nonetheless, Lombardy is still doing better than other regional economies which are comparable in terms of size and role in their national systems. There are only a few regions in the world that have higher per capita GDP e.g. the States of California and Massachusetts in the U.S., Greater London and Ile de France in the EU (BAK Basel Economics, 2007). The brighter performance of these regions is mainly determined by the growth of some innovative sectors and/or agglomeration of high value added financial activities. The level of per capita GDP in Lombardy increased from €27,524.9 in 2000 to €32,896.6 in 2006 and, in real terms (PPS 2000), from €29,244.8 to €29,843.4. In comparison with the EU27 average, the regional GDP per head decreased from 144.4 in 2000 to 138.9 in 2006 (EU27=100). In the same period, GDP growth was permanently lower than the European average and, for example in 2007, the growth rate was 1.7% in the region and 3.1% in Europe.

The employment rate experienced a constant increase in the last decade. It was 49.8% in 2000 and 52.7% in 2008 (relative to total population) while, as a consequence of the global economic crisis, it declined in 2009 (51.6%). The largest employment growth took place in the Lombard service sector. Lombardy’s pattern of growth is roughly in line with the European trend. Relative to the EU27, the Lombard employment rate was 98.3 in 2009 while the female employment rate still lags behind and is far from the Lisbon objective of 60%. The unemployment rate has been substantially below the EU and the Italian level. It decreased from 4.4% in 2000 to 3.7% in 2008, albeit this percentage reduction was lower than the change in EU27 unemployment. Relative to the European average the Lombard GDP per employee decreased from 143.8 in 2000 to 130.7 in 2006. Labour productivity growth has been very low in Italy in the last fifteen years and the output per hour worked is lower than European average in both Italy and Lombardy. The annual average labour productivity increase between 2000 and 2006 was approximately 1.6% in Lombardy and this slight growth was determined by the good results of a limited number of advanced services. The poor productivity performance might be due to a variety of reasons, including: labour-capital substitution (labour became cheaper with the introduction of more flexible contracts and labour intensive activities grow at the expense of high value manufacturing), less capital intensity per hour worked, limited number of high skilled and educated human capital. Moreover, there are problems of productivity measure, for example due to the size of the grey economy. The growth in Lombardy and in the rest of Italy during the last decade was hence the consequence of an increase in

In order to properly assess the attractiveness of Lombardy for foreign investments, it is worth noting that while international capital flows are growing worldwide, Italy is becoming increasingly marginal as a destination area. In 2008, total FDI fell from $40b to $17b in Italy (UNCTAD 2009).
employment rather than a productivity improvement as in other dynamic European regions (e.g. Greater London).

The Lombard economic structure is strongly oriented towards manufacturing. Industry produced 33.5% of regional value added in 2008 while in Italy the average weight of industry was 27% GVA. Despite this feature, there was also in Lombardy a moderate increase in the share of services (from 63.3% in 2000 to 65% in 2008) and a simultaneous decrease of the industry share (from 35.1% in 2000 to 33.5% in 2008). The financial service sector registered the most positive growth in the period. Gross fixed capital investments are higher than the European average and have been growing over the years (from 114.3 in 2000 to 136.9 in 2004, EU27=100).

From 2008, the Lombard economy started showing the signs of the world recession with a negative growth rate (-0.9% in 2008 and -4.1% in 2009 - DPEFR4 estimates) and an employment reduction, in line with the national performance. Manufacturing and financial services are the most crisis sensitive sectors. As past recessions have shown, fixed capital formation and exports are likely to decrease more in Lombardy than in the rest of the country. Due to the crisis, world exports are expected to shrink more than production and this will hit especially exporting oriented regions.

At the same time, the demographic dynamics continues to be positive. In the last fifteen years, thanks to immigration and a moderate improvement of the fertility rate, Lombardy has experienced a demographic growth larger than other EU regions and also a change in the composition of the labour force.

In sum, Lombardy is one of the most important economic centres of the EU with a long history of growth led by industry. Among the key drivers of growth it is worth mentioning a considerable business density, particularly strong in relation to manufacturing, a very diversified economy, a sizeable and open market which is attractive for FDI also due to the presence of highly developed transport and business infrastructures, its international role as a financial centre etc. The regional specialization, dominated by low-growth sectors is the main constraint to economic growth. The productivity per hour worked is relatively low while growth is mostly driven by employment gains. In general, all immaterial factors of attraction are weak in comparison with the most dynamic world regions. While the openness and the strong export capacity are positive traits, they may also sharpen vulnerability to external shocks in times of crisis as the current one and hence are amongst the key factors influencing current as well as future trends.

1.2 Recent trends in regional innovation performance

The role of Lombardy in relation to national RTDI effort is central. About 21.5% of the total Italian R&D investments are concentrated in this region, even though this share has fallen since mid-1990s (it was 24.3% in 1996).

During the last decade, regional R&D expenditure (GERD) relative to GDP has decreased from 1.2% in 1995 to 1.16% in 2006. R&D personnel relative to total employment increased from 1% in 1995 to 1.23% in 2006. In comparison with the European average, Lombardy is behind both in terms of R&D expenditure and R&D employees which are equal respectively to 1.83% of GDP and 1.44% of total employment in the EU27. The Lombard private R&D expenditure as a share of the total (GERD) is the highest in the Italian panorama (over 75% against a national

---

3 The GVA share of the financial intermediation and real estate sector increased from 26.4 in 2000 to 29.3 in 2007.
4 Regional Economic and Financial Plan [Documento di Programmazione Economica e Finanziaria Regionale or DPRFR].
5 ISAE (2009) estimates a 18.5% fall in Lombard regional export.
average of 50%). The private R&D expenditure was concentrated, fifteen years ago, in electric and electronic equipment, pharmaceutical and chemical products. Over the intervening period, large enterprises have abandoned these sectors (Malerba and Cusumano, 2005). and hence, the continuing leadership of Lombardy, amongst Italian regions, in terms of private R&D, seems to reflect an increased R&D propensity among regional SMEs (e.g. in the biotech sector) and a growing role of medium enterprises (<500 employees) in mechanics, house and personal goods, chemicals and pharmaceuticals (Mediobanca and Unioncamere, 2003). In relation to innovation financing the regional environment has improved greatly. Approximately ¾ of the total number of Italian operators belonging to the national private equity and venture capital association (AIFI) are located in the region. Moreover, several public venture capital funds managed by Finlombarda have been set up (see section 3).

In relation to the RDTI output, Lombardy performs well if we look at the scientific quality of the publications (IReR, 2009b) and at the capacity to access European funding. Patenting activity is stronger than the European average but relatively weak in comparison with other European advanced areas. Relative to the EU27, the number of EPO patent applications (per 1,000 inhabitants) increased from 143.6 in 2000 to 149.6 in 2006. EPO high-tech patent applications (per 1,000 inhabitants) are approximately in line with the European average but they decreased compared to mid 1990s (it was 134.5 relative to the EU27 in 1995). It must be highlighted that the number of patent applications is an incomplete indicator of innovation capacity since it fails to capture incremental innovation carried out by micro-enterprises and SMEs, which is one of the strengths of the Italian northern regions. An idea of the extent to which patent data underestimate innovative capacity of small firms may be provided by the number SMEs innovating in-house as a percentage of all SMEs (it was 0.73 in the region and 0.55 in the EU27 in 2004) and by the region’s technology balance of payments (payments for production ready technologies and know how). This was mostly positive in recent years (€672m in 2007), indicating that Lombardy acquires patents and trademarks from abroad and, at the same time, succeeds in exporting advanced technology services (e.g. R&D services, technical and engineering studies, patent fees, expert and technicians (Bank of Italy, 2009). The economic crisis has affected the region’s technology balance of payments, which became negative in the last two years.

The level of public-private cooperation in research and innovation is still relatively weak, with only around 2% of the funded EU RTD Framework Programme projects proposed jointly by universities (or research centres) and firms (Verganti et al., 2005). The CIS statistics support this view, and suggest regional firms mostly innovate by acquiring consultancy services, or thanks to the services provided by intermediate actors such as chambers of commerce or associations of producers.

The following figure presents a selected set of indicators of economic and innovation performance relative to the EU27 average. As discussed, GDP per capita in PPP is higher than EU average while the growth performance is weaker. Unemployment is substantially lower than the average level for Europe overall, however the change in the (impressively low) unemployment rate was not as strong as the improvement recorded for the EU overall, in the period 2004-2007. The indicator on patents and the indicators for product/process innovators are above the EU27 average. In all

---

6 Over 4,000 projects have been financed as part of Community research programmes in the period 1986-2008 (CORDIS data 2009).

7 Normalised scores within a 0 (lowest) to 1 (highest) range.

8 See also the regional statistical yearbook [ASR Lombarda – Annuario Statistico Regionale]; available at: http://www.asr-lombardia.it/ASR/ricerca-scientifica-e-tecnologica/bilancia-tecnologica/regioni-italiane/tavole/10042/

9 SMEs introducing product or process innovations as a percentage of all SMEs (CIS data).
other fields (tertiary education, government and business R&D expenditure, higher education R&D expenditure as well as in relation to marketing/organisational innovation), Lombardy is below the EU average.

Figure 1.1 Economic and innovation performance indicators for Lombardy

<table>
<thead>
<tr>
<th>Economic Performance Indicators</th>
<th>Performance and change relative to EU</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP per capita (PPP)</td>
<td></td>
</tr>
<tr>
<td>GDP per capita growth</td>
<td></td>
</tr>
<tr>
<td>Unemployment rate</td>
<td></td>
</tr>
<tr>
<td>Change in unemployment rate</td>
<td></td>
</tr>
<tr>
<td>Innovation Performance Indicators</td>
<td></td>
</tr>
<tr>
<td>Tertiary education</td>
<td></td>
</tr>
<tr>
<td>Government R&amp;D expenditure</td>
<td></td>
</tr>
<tr>
<td>Non-R&amp;D innovation exp.</td>
<td></td>
</tr>
<tr>
<td>Patents per million population</td>
<td></td>
</tr>
<tr>
<td>Business R&amp;D expenditure</td>
<td></td>
</tr>
<tr>
<td>Higher education R&amp;D expenditure</td>
<td></td>
</tr>
<tr>
<td>Marketing/organisational innovators</td>
<td></td>
</tr>
<tr>
<td>Product/process innovators</td>
<td></td>
</tr>
</tbody>
</table>

Source: Eurostat.

1.3 Identified challenges

The regional innovation system's strengths are twofold: a history of successful research and technological innovation, as demonstrated for example by the positive technology balance of payment as well as by patent statistics; and a segment of highly innovative SMEs as indicated for instance by CIS data. At the same time, there are barriers to innovation performance such as: a scarce expenditure for RTDI, even if the private share of total expenditure is relatively high compared with the other Italian regions, an insufficient investment on higher education despite a relatively low proportion of people with tertiary education. Moreover, the scarce cooperation between science and industry and, more generally, the public and private sides of the Lombard RTDI sector hampers the possibility of fully seizing the potential of the system. These strengths and weaknesses can be discussed as potential and interrelated challenges for the region.

Challenge 1: Need for strengthening and extending the base of innovative firms (SMEs and medium enterprises)

Lombardy is characterized by structurally low private and public R&D investments, in comparison with other advanced areas in Europe and worldwide, due to the prevailing low-tech specializations. In the last 15 years, R&D investments experienced a decreasing trend as a consequence of a structural change brought about by the flight and/or delocalization of large enterprises, which represented the bulk of the regional R&D expenditure in certain sectors (e.g., chemicals, pharmaceuticals, aeronautics and electronics), and the privatizations of public companies in the energy sector as well as in telecommunications. The negative impact the structural change on RTDI was in part compensated by the growing importance of medium enterprises (e.g., in mechanics, pharmaceuticals, house and personal goods) and by a lively process of

---

10 The following challenges are based on the preceding analyses and reflect the views of the authors.
creation of innovative small firms (e.g. in biotech). Applying the most effective instruments to support the creation and growth of innovative enterprises, and facilitating their development into knowledge based medium firms, is a critical challenge for the Lombard system.

**Challenge 2: Need for a wider diffusion of innovation culture, especially among small firms**

Despite the presence of a strong segment of innovative small firms, the innovation culture and the propensity to invest in RTDI is still weak among the majority of SMEs. For instance, the frequency of organizational and marketing innovation among SMEs is below the European average. Small firms have a low propensity to adopt emerging technologies while innovation is still incremental and the interaction with research and TF centres is limited. It is possible that in certain sectors, these centres have little to offer and perhaps that the innovative SMEs are getting all the stimulation and support they need from peer learning and technical consultancies. However, in a context of increasingly global market integration and competition, a growth model based on incremental and marginal innovation seems hardly sustainable in the medium/long term while facilitating the adoption of emerging technologies on the widest possible scale is important, especially in the perspective of pursuing a smart specialization strategy (see paragraph 3.5).

**Challenge 3: Improving cooperation propensity between (and within) science and industry and further exploit the opportunities provided by public-private partnerships**

There is a disjuncture between science and industry, as also indicated by the low rate of cooperation in EU-funded projects. Such lack of interaction may prevent from reaping the synergies between the two components and thereby realising the full potential of the innovation system. Besides, there is low cooperation propensity among firms as shown, for example, by the number of innovative SMEs cooperating with others. This is a barrier to the achievement of a critical mass and seizing economies of scale and scope, even within the same value chain. Furthermore, despite Lombardy is an active player of high level international networks (e.g. FP7, European Institute of Innovation and Technology) and several international RTDI agreements are in place, regional actors (firms and research centres) tend to mostly follow a self-sufficient approach to research and innovation, rather than pursuing shared objectives. This is certainly related also to the lack of a shared medium-long term strategy that should accompany partnership agreements.

Hence, a challenge consists in stimulating cooperation and synergies on these three fronts: between science and industry, among firms, and finally, between regional RTDI actors and international networks. This challenge is clearly linked in part to the previous one, which concerns the diffusion of innovation culture: facilitating the diffusion of innovation culture will produce positive results on cooperation. At the same time, it deserves separate attention by the policy maker.

---

11 The fracture between science and industry is in part reflected in the governance of RTDI policy since university and research, on the one hand, and innovation initiatives, on the other, are in fact designed and implemented separately, even though coordination mechanisms exist (see paragraph § 2.2 for more information).
2. Innovation Policy Governance

2.1 Degree of institutional autonomy

Italian regions have had full autonomy in RDTI policy since the 2001 constitutional reform, which established shared competences in this as well as other policy areas. This reform, together with the almost simultaneous introduction of the Lisbon Strategy at the EU level, had a strong impact, both strategic and financial, on the regional approach to RDTI policy. Strategically, research and innovation gained a central role in regional policy; from a financial point of view, resources allocated to this policy area increased during the last decade. Despite the presence of coordination mechanisms (e.g. the State-Regions Conference) and the use of specific instruments (e.g. Accordi di Programma Quadro [APQs], which are Framework Programme Agreements, see section 2.2 for more information on these), the shared competences between national and regional authorities may lead to overlapping of interventions. This is actually the case in the southern regions where national resources are substantial. The over laps concern all areas of RTDI policy, but especially industrial research, innovation and technology transfer, while basic and long-term research as well as university education are dealt with by the national government. The risk of duplication is much less in the northern regions such as Lombardy, which receive very limited resources from the centre.

Budgetary autonomy is generally in line with legal autonomy. In 2009, Lombardy regional funding accounted for more than 80% of the total publicly-funded R&D carried out in the region (2009). In general, in the Northern and Central regions, from 1995 onwards, there was significant growth in expenditure for economic development (including innovation) financed by the sub-central government (regional and sub-regional administrations), which experienced an increase in available resources as a result of the increased autonomy. In Lombardy, the annual average growth of sub-national expenditure for development was 1.7% in 2000-2007; a period characterised by a decrease of general government expenditure -0.6% in Lombardy, -4.7% in Italy (DG Regio, 2010).

The regional competences, relating to research and innovation, comprise the following types of activities: support to industrial research and pre-competitive development projects characterised by a high degree of innovation in key thematic areas; support to human capital development by financing advanced education and training schemes in cooperation with the universities and research centres; strengthening research and technology infrastructures in key scientific areas; support to interregional partnerships and strategic alliances on technological and scientific themes requiring a critical mass of resources and complementary competences; attraction of science and technology assets and strengthening of local endowments.

2.2 Institutional-set up, co-ordination and implementation mechanisms

Design of innovation strategy and policy: actors, tools, roles

The Lombardy Regional administration (Regione Lombardia) plays a central role in designing and implementing regional innovation strategy and policy. The Region facilitates the interactions between industrial, financial and research systems as well as between these, the public sector and the citizens.
As highlighted by the 2003 Strategic Document for Research and Innovation, following the above mentioned 2001 Constitutional Reform, the Region has introduced new initiatives and mechanisms for the governance of innovation.

In 2001, a first Framework Programme Agreement13 on RTDI was signed with the Ministry of Industry to define and coordinate regional and national interventions. Between 2001 and 2004 several initiatives were launched including: pan-regional groups such as the Forum for Research and Innovation and the Lombard States General for Research and Development, to discuss the issues relevant to this policy area; the Meta-districts14 governance system; a Scientific-Technical Committee on technological innovation which is a supporting body internal to the administration etc. Furthermore, existing groups such as the Table of Chancellors of the Lombardy universities, the so-called Pact for Development15, the table of Lombardy chambers of commerce etc. started to draw attention and regularly discuss RTDI policy.

The first RTDI plan was defined in Lombardy in 2004 and identified a precise short-, medium- and long-term regional strategy. This has been reviewed several times over the years. There are also parallel initiatives aimed at strengthening the governance (e.g. the QUESTIO16 information tool on research and technology transfer centres).

Currently, university and research policy on the one hand, and innovation policy on the other are managed separately.

A Secretariat of the President of the Region has political power over RTDI policy and there is a specific management structure (Struttura Università e Ricerca) with a coordination role over the entire range of regional RTDI policies and which manages directly university and research interventions.

Innovation support initiatives are implemented by sectoral Directorates General. Among those, the DG for industry, crafts and cooperation plays a prominent role.

The “Struttura Università e Ricerca” and the DGs are supported by publicly-owned companies such as CESTEC (centre for technological development, energy and competitiveness), Finlombarda and the Higher Institute for Research, Statistics and Training (formerly, IReR). These organisations provide the administrative and technical support – and analytical services – involved in the delivery of regional research and innovation policy. There is no specific regional agency with competences in RTDI policy.

CESTEC focuses on firms. This centre carries out, coherently with the Region’s initiatives, medium-long term actions (innovation advisory services, promotion of eco-
innovation etc.) aimed at increasing the competitiveness of specific economic sectors and of the general productive system. Finlombarda directly manages financing schemes and provides technical assistance on economic-financial issues to the public, in relation to the realisation of public investments, and to the business sector. The Higher Institute for Research, Statistics and Training carries out studies aimed at policy planning, collects statistics and provides training.

The Regional Economic and Financial Planning Document (DPEFR), published annually and covering a two years period, provides policy guidelines on research, innovation and technology transfer in coherence with the Regional Development Programme (PRS 2005) and the regional law on productive activities (L.R. 1/2007) which is aimed at promoting competitiveness of firms and territory and sets objectives and instruments of the regional action. The law deals with human capital development, research and innovation, entrepreneurship, districts and other issues such as crisis management, internationalisation, territorial competitiveness, sustainability, economic system governance. It also states that the guidelines for the implementation of actions specified in the DPEFR are defined on the basis of annual short-term fluctuations and impact evaluations of measures carried out. In defining the DPEFR actions, the Region consults with the so called “development pact” table.

**Co-ordination and implementation mechanisms**

The law 1/2007 specifies several relevant principles underlying the regional horizontal and multi-level coordination mechanisms. According to this law, policy can be delivered by the Region either directly, by identifying instruments, beneficiaries and evaluation criteria, or indirectly.

Indirect delivery involves the regional administration contracting with a third party or parties to administer a particular innovation support measure. This kind of outsourcing entails signing specific agreements with other regional actors such as local (sub-regional) governments, Chambers of Commerce, Industry, Crafts and Agriculture (CCIAA), the universities and the research system, the bank foundations, the business associations etc. or with national actors. The agreements with other regional actors confer a series of administrative and management functions to the signing parties and must be in line with local government programming, where present and relevant. For instance framework agreements have been signed with academia to develop university poles in key scientific and technological areas. In 2006, an agreement was signed with the Chamber of Commerce to support innovation in micro enterprises as well as SMEs and to promote entrepreneurship in the service sector. The Region can also join autonomous initiatives (development plans for competitiveness) designed by local governments and other regional actors (CCIAA), universities, bank foundations etc.

In conclusion there is a broad network of organisations that contribute to delivering innovation policy in Lombardy. Beside the regional administration and the mentioned intermediaries, the banks also play an important role since they co-finance projects and are particularly attentive to performance indicators, taking charge in this way of control activities which otherwise should be carried out by the public administration. For this reason, some studies highlight the similarity between the role of banks in Lombardy and the role played by the Swedish National Agency for Industrial Development – Nutek (Ministry for Economic Development – DPS, 2009).

Horizontal co-ordination mechanisms between regional actors also include the implementation of joint policy intelligence initiatives. For instance an impact evaluation study of the impacts of regional RTDI measures was funded by the OP Public Procurement 2003-2006 to guide the programming 2007-2013. This study, concluded in 2008 has involved the Regional administration, Finlombarda, Cestec, the Lombard Scientific and Technological Poles, the Provinces of Milan and Como, IFOM, the Bergamo Technological Innovation Pole, the Como Centre of Excellence, the Innovation Polytechnic, regional firms etc. (see section 2.3 below).
In relation to co-ordination between regional and national actors (e.g. The Ministry of Education, Universities and Research [Ministero dell’Istruzione, dell’Università e della Ricerca, MIUR] or the Ministry of Economic Development [Ministero dello Sviluppo Economico or MSE]), Framework Programme Agreements (APQ) are the actual operational instruments used to agree on a common regional RTDI intervention programme which pulls together national and regional resources and allows to focus national initiatives on priorities identified by (and agreed with) the region.

For instance, a framework agreement between the Region and the Ministry for Education, University and Research (MIUR) was signed on 17 January 2011. This is aimed at strengthening the existing technological districts operating in biotech, ICT and new materials, which were set up in 2003 with the signature of protocols of agreement between the Region and the Ministry. Furthermore, it aims at supporting industrial research and innovation in agro-industry, aerospace, sustainable building industry, automotive, energy and renewable sources. The agreement allocates EUR 120.65 million to these initiatives in 2011-2013. Financial resources are approximately 50% national and 50% of regional origin. The actions foreseen in the agreement are organised along three axes: enhancement of competitiveness of Lombardy firms, strengthening the innovation culture of regional industry and horizontal support initiatives. The actual projects will include support for the creation of innovative firms, the promotion of the industrial application of research results, financial engineering initiatives etc. The project should also involve other public, private, mixed and not for profit actors which can have a role and contribute both to policy design and implementation. Other specific agreements exist between the Region and National research actors such as the National Research Council. For instance a recent agreement aims at setting up a “green photonics” facility in 2011 which should use also the existing infrastructures. Several other agreements exist on specific research fields.

In relation to inter-regional co-ordination, framework agreements are used as well to agree on common programmes focusing on scientific and technological sectors that are relevant for several territories. These common programmes may allow the signatory parties to benefit from synergies, economies of scale and scope and to exchange good practices. For instance, an agreement focusing on biotech and ICT was signed between Lombardy and Sardinia in 2010. On the basis of this, the regions jointly promote projects of scientific and technological cooperation involving firms and research centres located in their territories. Furthermore, strategic partnerships on scientific and technological issues have been launched with other regions such as Languedoc-Roussillon, Nuevo Leon, Baden-Württemberg, Massachusetts, Queensland etc.

As regards cross-border co-ordination mechanisms, the Region participates in the Italy-Switzerland cooperation programme, which is also aimed at promoting competitiveness. The regional administration’s DG Green Systems and Landscape is the programme’s Managing Authority (MA). The DG is jointly responsible with the other regional administrations (Piedmont, Aosta Valley, Autonomous Province of Bolzano, Swiss Canton). The Alpine Space transnational cooperation programme is also relevant for Lombardy research and innovation policy; in this case the MA is the Government Office of the Land Salzburg. There is a Programme Committee composed of representatives of all Partner States at national and regional level, as well as representatives of the European Commission. National contact points (Regional DG Territory and Urban Planning) secure a link between the transnational and national/regional level in programme implementation. Each Partner State is represented by one national coordinator who is a member of the national delegation of the Programme Committee. Besides the above coordination at transnational level, the Partner States ensure that the different stakeholders in their territory are appropriately informed and involved in the programme implementation. National committees may be set up for this purpose. Furthermore transnational Task Forces may be established to deal with specific thematic and strategic fields (e.g.
environmentally sustainable development) in relation to preparation of calls for project proposals.

2.3 Availability and use of policy intelligence tools

Officials report that evidence-based methods are used in regional policy making reasonably frequently. Since 2004, the Region measures the performance of the research and innovation system by means of a regional innovation scoreboard. This draws upon the European Innovation Scoreboard (EIS) experience and is used to compare the performance of Lombardy with that of other Italian and European regions. The scoreboard is based on 17 quantitative indicators which can be grouped in indicators of innovation capacity (resources, output, results) and enabling factors (e.g. context). Beside these, the Region uses the quantitative indicators defined in relation to the ROP FESR 2007-13 aiming at measuring the output, results and impacts17 of the Axis 1 (innovation and knowledge economy) of the programme.

Evaluations, which are compulsory under the Structural Funds, (mid-term in 2000-2006 and ex-ante in 2007-2013) do not focus primarily on RTDI, but usually have a wider scope. They are normally carried out by external experts in cooperation with the Region and its intermediaries, or autonomously by the Region itself, and are used to both inform policy decisions and adjust policy objectives or measures. These studies do not provide substantial additional evidence to that emerging from the monitoring system or the ROP indicators (see § 3.2 for more information on appraisal).

As regards foresight exercises, a study named RISE (Research, Innovation, Economic Development) was commissioned from IReR by the regional administration in January 2002 in order to provide a robust empirical basis for the preparation of the RTDI strategy and to facilitate the engagement of the most relevant players. This study aimed at assessing the attractiveness of key technology areas (Advanced materials, ICT, Biotechnologies, Energy technologies, Nanotechnologies) and the feasibility of developing these technologies, given the region’s scientific and productive capacities, to boost the medium-long term development of the local industry. Besides the regional government, representatives of local firms participated in the study, which covered a 10-year horizon18.

Other pilot and sector-specific initiatives have been carried out and shaped the regional strategy over the years. For instance the 2004 “FOur MOtors Foresight” project was sponsored and funded by the European Commission (through the STRATA programme, DG Research). It was carried out in the metal product and machinery district of Lecco (Roveda, Vecchiato and Vercesi, 2004) and was recently updated. A second foresight exercise was launched in 2005 for the industrial district of Lecco, with the aim of identifying the emerging technologies that might have a disruptive impact on the local manufacturing system and of designing appropriate R&D initiatives. Other foresight exercises have been recently carried out to help guide the strategy but are not available externally.

A factor (or principal component) analysis was carried out to identify the main distinctive features of governance, innovation policy and performance and was built

---

17 For instance, in relation to impacts, the indicators used in the ROP are the share of R&D and ICT investments over total capital formation and the share of new R&D employees with respect to total new employment creation.

18 For more information see JRC: http://forlearn.jrc.ec.europa.eu/guide/7_cases/italian.htm
on the basis of a survey conducted among regional officials in summer 2010, as part of the RIM project\textsuperscript{19}.

The governance factors consolidate information on autonomy (degree of independence in designing a formalised and binding strategy and the effectiveness of regional policy), presence of top-down policy design and delivery, coordination mechanisms, relevance of structural funds etc. Lombardy’s scores for coordination mechanisms and autonomy factors are both higher than the EU27 average.

The policy factors consolidate information on the existing innovation policy mix. All of them have higher than average scores. Especially, the ‘HR, creation & growth innovators’ factor (which combines human capital development with policy aimed at creation and growth of innovative firms) and ‘Public innovation policies’ factor (policies for public sector innovation, for open innovation, public procurement, and theme based policies aiming at societal goals) show considerably high scores.

The innovation performance factors summarise information on quality of input, output etc. The ‘Public knowledge’ factor reflects the importance of government expenditure and the share of highly educated people within the population. This factor’s score is below average while the ‘Innovative entrepreneurship’ factor (identifying regions where a large share of all SME’s are innovators) and the ‘Technological innovation’ factor (refers to patent generating business R&D) show higher than average scores.

Figure 2-1 Governance, policy, and innovation performance factors for Lombardy

Source: RIM survey.

\textbf{2.4 Key challenges and opportunities}

As discussed above, there are mechanisms in place to ensure horizontal and vertical coordination of regional RTDI policy. These mainly consist of formal agreements, or APQs, with the central government (e.g. the 2011 APQ with MIUR), with other regions (e.g. the APQ with Sardinia) or with other regional stakeholders (e.g. the framework agreement with the CCIAA or with the Universities). In addition, there are informal

\textsuperscript{19}The qualitative information provided on governance issues was then used to develop a typology of regions by key governance factors by first grouping the qualitative data into key factor using factor analysis and then applying cluster analysis on these key factor scores.
consultative arrangements (e.g. working groups and committees) that allow stakeholders to work together to identify and debate emerging issues, which help to inform and shape policy.

Despite these various coordination efforts and due to the complexity of the system and the wide variety of existing initiatives, there is room for improving RTDI governance and hence the effectiveness and efficiency of research and innovation policy. The main challenge of the Lombard system is to strengthen the systemic integration of policy design and implementation especially as regards research and university policy on the one hand and innovation policy on the other.

Currently, the former is under the responsibility of the Region’s presidency, while the latter is managed by specific DGs (e.g. Industry), depending on the particular issue or field of intervention.

The presidency, and in particular the University and Research Unit, is in charge of general coordination, however a disjunction still exists with the Directorates General which have actual administrative power over a wide set of instruments. Following the last elections, and for the first time, a regional President’s Secretary was appointed with specific responsibility for research and innovation policy also in order to overcome the separation between political responsibility and administrative power.

Unfortunately, the opportunities promised by this appointment have yet to be fully exploited, and moreover a substantial reduction in available public funding has magnified the reluctance of the various policy actors to give up their individual interests. More integration in RTDI policy is needed and this would certainly facilitate increased cooperation between public and private actors, which is one of the most important and unresolved issue affecting the Lombardy regional innovation system.

A further challenge relates to evaluation of innovation policy. As highlighted in § 2.3 and, in more detail in § 3.2, the great majority of evaluations carried out at a regional level are rather broad in scope and do not provide policy makers with substantial additional intelligence on research and innovation beyond what can be surmised automatically from the regional innovation monitoring system. The challenge is hence developing an evaluation culture that goes beyond the collection and reporting of monitoring data in order to explain the connection between policy interventions and regional outcomes, and hence provide policy officials with robust tools for decision making and governing innovation support initiatives.
3. Innovation Policy Instruments and Orientations

3.1 The regional innovation policy mix

During the 1990s, due to the lack of a regional strategy, innovation support interventions were mostly “horizontal” in Lombardy, without a clear concentration of the available resources on a set of priorities. Following the 2001 constitutional reform, which introduced shared competences between the central and the regional governments, a regional RTDI strategy was developed and the need to introduce actions focused on specific areas of intervention started to emerge. In fact, a “technology push” approach to regional innovation policy accompanied by a growing attention to clusters was adopted in 2004. The regional strategy drew upon central government policy experience and was focused on strengthening research supply in selected technological fields (e.g. biotech, advanced materials, ICT). Moreover, the participation of the most important stakeholders (universities, research centres and firms) was promoted and an intervention model based on meta-districts (sectorial clusters which may include organisations not necessarily located in the same geographical area) was introduced. For example a meta-district of design has been identified, which links traditional areas of industrial specialisation (that use design as a competitive resource) with the places where knowledge on design is generated (e.g. universities and research centres)\(^\text{20}\). Due to the relative scarcity of resources and scientific competences on a regional scale, the “technology push” approach, which needs a critical mass in order to be effective, was soon found to be unsustainable. From 2005 onwards, a “demand pull” strategy prevailed and the policy has become much more focused at identifying and then addressing the key weaknesses of the regional system. Hence, the Region has started to define the RTDI strategy following a structured and innovative approach based on foresight, benchmarking and technology assessments. Beside the key needs of the territory, a particular attention was also given to cooperation with other regional research systems and to the attraction of strategic assets and investments.

Currently, the innovation policy mix is focused on research and technology support measures, which is where the great majority of the regional expenditure is concentrated. Support for the development of human resources or for the creation and growth of innovative enterprises is much more limited, albeit still important. The innovation policy categories of governance as well as markets and innovation culture are also tackled but residually (IReR, 2009b).

The regional administration is actively implementing four broad types of research and technology measures, which are: support for the upgrading and expansion of the region’s more strategic research infrastructure\(^\text{21}\); support for collaborative applied research involving universities and businesses\(^\text{22}\); support for proprietary research and...

---

\(\text{20}\) This cluster is characterised by a cognitive dimension and has its central node in Milan which is where Made in Italy products gain visibility and the main communication processes take place through exhibitions etc. Moreover, Milan is where the main cultural changes and trends relevant to design are caught, thanks to various intangible resources, history, tradition, tourism etc.

\(\text{21}\) Centres of research excellence are strengthened in the fields of zoo technics, agro-industry, health and new materials (€55m). Moreover, €4.5m was allocated for the creation of the European Nano-medicine Centre, starting from 2009 for three years.

\(\text{22}\) Scientific cooperation projects are financed in the sectors of agro-food, energy and environment, health and advanced manufacturing (over €12.6m); universities and research centres are, together with international partners, the beneficiaries of this initiative. As regards science and technology cooperation, the 2010 agreement with Sardinia is focused on biotech and ICT and promotes joint projects involving firms and research centres located in these territories; research centres and SMEs are the target groups (€3m). Within this category, the Framework Agreements with the university system (July and October 2009) allocated approximately €75m to international research projects involving universities and firms, initiatives for patent portfolio valorisation as well as to initiatives supporting education and training abroad of young researchers. RTDI projects aiming at developing new products, processes and services are...
technology development through an innovation vouchers scheme23; and support for businesses looking to register patents24. The MIUR agreement has permitted Lombardy to double the volume of regional investment annually in collaborative research25. Lastly, the regional administration maintains several strategic agreements – interregional and international - with (e.g. Sardinia) to take advantage of particular opportunities/synergies in biotech, and which amounts to around €5m for the years 2010–2011.

In relation to human capital development, the principal areas of activity are: support for researcher training and PhD grants, in co-operation with the MIUR, the NRC and the universities26. Human capital development is also supported through PhD courses and high-level training in cooperation with several universities and research centres, locally and internationally. The mentioned Framework agreements with the university system, in addition to international research projects and other technology diffusion initiatives, support young researchers. The Region promotes the creation and growth of innovative enterprises (gazelles, start-ups and spin-offs), in the form of finance. Several financial engineering instruments exist to promote the creation and growth of innovative enterprises: SEED27, NEXT28, Made in Lombardy29, FRIM30, JEREMIE ERDF31 are funds managed by Finlombarda. Moreover soft loans are granted, with a particular emphasis on young people and women (€20m in financed (€14.2m – 2008 tender) in the five meta-district areas: biotech, new materials, ICT, fashion and design. RTDI projects aiming at developing new products, processes and services are financed (€14.2m – 2008 tender) in the five meta-district areas: biotech, new materials, ICT, fashion and design.

23 By means of vouchers for innovation, the Region finances the purchase of R&D services and the costs of staff development by micro enterprises and SMEs (€10m, 70% from EU Cohesion Policy). In particular it finances: consultancy services in relation to technology, energy and the environment, work safety and health, economic-financial check ups; job insertion of master’s graduates, researchers, temporary managers in firms; master’s degrees.

24 For example, patenting activity is encouraged also through specific measures that help local micro, small and medium enterprises and research centres to file Italian, European and/or other international patents (€3m in 2010).

25 In total, the agreement allocates €120m (€61.65m from the Region) to various types of RTDI projects and high level education and training initiatives in the period 2011-2013. €25m are allotted to RTDI investments in key priority fields (i.e. aerospace, sustainable building industry, automotive, energy and renewable sources) and €50m (MIUR resources) to industrial research and pre-competitive development projects, and the creation of new high-tech firms. Within this agreement, the existing technological districts (biotech, ICT and new materials, agro-food) are also supported.

26 The agreement with MIUR allocates €15m for human capital development and applied research projects carried out by universities and firms (Dote Ricercatori – research fellowships; Dote Ricerca Applicata – grant for applied research). The €40m agreement with the National Research Council and the €6m agreement with the Milan Polytechnic, the Catholic University and the Pavia University also go in this direction by financing PhD courses and contracts for young researchers. Furthermore, an agreement was signed with the U.S. National Institute of Health (NIH) which funds a 3-year scholarship for a researcher to be employed at the end of the period in one of the Lombardy research centres, which participate in the programme.

27 The SEED fund was launched in 2007 and is managed by Finlombarda. It promotes creation and growth of new innovative enterprises. The fund focus on set up and initial stages of development as well as on product experimentation.

28 The NEXT fund can directly be used to support SMEs in their early stages of development or invest indirectly with other partners in other venture capital funds. Within the framework agreement with the MIUR, €2m are allocated to NEXT II venture capital fund.

29 The Made in Lombardy fund finances investment programmes for competitive development, research, innovation and modernisation to be completed within two years from the concession of the loan. The fund can count on €500m (€400m from BNL – BNP Paribas group– and Artigiancassa and €100m from Finlombarda). There is also a €35m regional guarantee which draws from the ERDF resources 2007-13.

30 The FRIM fund (rotation fund for entrepreneurship) draws from ERDF resources. It aims at supporting through loans micro enterprises and SMEs that carry out product and process innovation and in the investments related to the industrial application of the research findings.

31 The JEREMIE ERDF initiative confers financial resources to credit consortia which can guarantee bank loans for RTDI investments carried out by micro enterprises and SMEs (€20m in
Entrepreneurial innovation is supported also through the programme agreement between the Region and the CCIAA (launched in 2006 and renewed in 2009).

In relation to governance & horizontal research and innovation policies, various initiatives such as foresight studies, the regional innovation scoreboard, planning, analytical and intelligence tools (such as those discussed above - see section 2.3) are carried out. Networking initiatives such as PRISMA and QUESTIO are funded. The DRIADE programme supports aggregations of micro enterprises and SMEs (from the crafts sector) that are part of districts or meta-districts (action Artemide) and industrial micro enterprises and SMEs (Dafne). Moreover, it finances related initiatives of technical assistance and systemic actions.

In relation to markets and innovation culture, several initiatives have been launched as part of the ROP ERDF 2007-13. The creation of new markets is supported by funding the diffusion of innovative technologies, products and services. SMEs' Projects of process innovation and/or aiming at improving the organisation of services (ICT applications, intelligent identification systems for product traceability, logistics innovation etc.) are supported (€10m). The call on “innovation and energy efficiency” promotes the replacement of equipment or purchase of new technologically advanced machinery by micro enterprises and SMEs with the purpose of reducing energy consumption as well as environmental impacts and promoting energy efficiency (€145m in 2010). The TREND project finances Energy check-ups in micro enterprises and SMEs aimed at assessing the consumption and identifying appropriate action plans to increase efficiency (€2.5m).

32 The main beneficiaries of funding are new individuals and families business and/or incorporated businesses formed as a company and registered in the Register of Companies, group practices and professional societies established not earlier than 12 months from the date of application.

33 The renewal concerns the period 2010-2015 (€66m, €35.115m from the Region), in very broad terms it aims at strengthening the competitiveness of the regional economic system (e.g. by supporting process innovation in the distribution system), increasing the territorial attraction and facilitating the development of micro-enterprises and crafts.

34 PRISMA (innovation practices for administrative simplification) is a web community of practice which promotes networking between public and private actors that are directly involved in the simplification processes introduced by the regional law n.1 (2 February 2007 which concerns the procedures of launch, implementation, transformation and termination of productive activities).

35 The framework agreement with MIUR has allocated €0.65m to this project.

36 Digital conversion of television broadcasting carried out by local broadcasting SMEs are financed (€5m), experimental development in the fields of energy efficiency (€15m) and cultural heritage (€3m) is also financed.
<table>
<thead>
<tr>
<th>Title</th>
<th>Duration</th>
<th>Policy priorities</th>
<th>Budget</th>
<th>Organisation responsible</th>
<th>More information</th>
</tr>
</thead>
</table>
| International research projects, patent portfolio valorisation, education and training abroad of young researchers financed as part of the framework agreement with the university system | 2009-2012   | 2.1 Research organisations  
2.2 Science-Industry linkages  
3.1. S&T education  
3.2 Research personnel | €79m    | Region | http://www.regione.lombardia.it/cs/Satellite?c=Redazionale_P&childpagename=Regione%2FDetail&cid=121334802770&page=rgnwrapper  
http://www.regione.lombardia.it/cs/Satellite?c=Avviso&childpagename=Regione%2FWrapperAvvisiLayout&cid=1213375322201&p=121337532221&pagename=rgnwrapper|
| Centres of research excellence (zootechnics, agro-industry, health and new materials) | 2000-2012   | 2.1 Research organisations | €55m | Region | n/a |
| European Nano-medicine Centre                                       | 2009-2013   | 2.1 Research organisations | €6.6m | Region | http://www.programpianzionecomunitaria.regione.lombardia.it/shared/curl/198/775/SEO5_31-01-2011.pdf |
| Support to patenting activity in micro enterprises and SMEs          | 2010-2011   | 2.2 Science-Industry linkages  
5.3 Intellectual property protection and standards | €3m | Region | http://www.regione.lombardia.it/cs/Satellite?c=Attivita&childpagename=Imprime%2FWrapperBandiLayout&cid=121334802690&p=121334802690&packedargs=locale=1194454819565&tipologia=Agevolazioni&page=mprsWrapper&tipologia |
<p>| Scientific cooperation projects in agro-food, health, advanced manufacturing, energy and environment | 2009-2012   | 2.2 Science-Industry linkages | €12.8m | Region | <a href="http://www.regione.lombardia.it/cs/Satellite?c=Attivita&amp;childpagename=Regione%2FWrapperBandiLayout&amp;cid=1213349534684&amp;p=1213349534684&amp;pagename=rgnwrapper">http://www.regione.lombardia.it/cs/Satellite?c=Attivita&amp;childpagename=Regione%2FWrapperBandiLayout&amp;cid=1213349534684&amp;p=1213349534684&amp;pagename=rgnwrapper</a> |</p>
<table>
<thead>
<tr>
<th>Region</th>
<th>Year(s)</th>
<th>Type</th>
<th>Details</th>
<th>Cost</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sardinia</td>
<td>2010-2011</td>
<td>2.1</td>
<td>Research organisations</td>
<td>€3m (€2m from Sardinia)</td>
<td><a href="http://www.regione.lombardia.it/cs/Satellite?c=Attivita&amp;childpagename=Regione%2FWrapperBandiLavout&amp;cid=1213401911888&amp;p=1213401611888&amp;pageename=RGNWrapper">Link</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
<td>Science-Industry linkages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIUR</td>
<td>2010-2013</td>
<td>2.1</td>
<td>Research organisations</td>
<td>€90m (€49m from MIUR)</td>
<td><a href="http://www.regione.lombardia.it/cs/Satellite?c=Attivita&amp;childpagename=Regione%2FWrapperBandiLavout&amp;cid=1213401911888&amp;p=1213401611888&amp;pageename=RGNWrapper">Link</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
<td>Science-Industry linkages</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.3</td>
<td>Direct state aid measures in support of (business) research</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIUR</td>
<td>2010-2013</td>
<td>2.2</td>
<td>Science-Industry linkages</td>
<td>€17m (€10m from MIUR)</td>
<td><a href="http://www.regione.lombardia.it/cs/Satellite?c=Attivita&amp;childpagename=Regione%2FWrapperBandiLavout&amp;cid=1213401911888&amp;p=1213401611888&amp;pageename=RGNWrapper">Link</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.1</td>
<td>Support to sectoral innovation projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.3</td>
<td>Support to start-ups and access to finance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MIUR</td>
<td>2010-2013</td>
<td>3.2</td>
<td>Research personnel</td>
<td>€13m</td>
<td><a href="http://www.regione.lombardia.it/cs/Satellite?c=Attivita&amp;childpagename=Regione%2FWrapperBandiLavout&amp;cid=1213401911888&amp;p=1213401611888&amp;pageename=RGNWrapper">Link</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.2</td>
<td>Science-Industry linkages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EU</td>
<td>2008-2009</td>
<td>2.3</td>
<td>Direct state aid measures in support of (business) research</td>
<td>€64.2m (50 from EU)</td>
<td><a href="http://ec.europa.eu/regional_policy/funds/feder/index_en.htm">Link</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.1</td>
<td>Support to sectoral innovation projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.2</td>
<td>Support to entrepreneurial innovation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCIAA</td>
<td>2010</td>
<td>3.3</td>
<td>Skills development and recruitment</td>
<td>€3m (€1.5 CCIAA)</td>
<td><a href="http://www.regione.lombardia.it/cs/Satellite?c=Attivita&amp;childpagename=Imprese%2FWrapperBandiLavout&amp;cid=1213401911888&amp;p=1213401611888&amp;pageename=RGNWrapper">Link</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>4.2</td>
<td>Support to entrepreneurial</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**S&T Cooperation with Sardinia on biotech and ICT (as part of a framework agreement between the two regions)**

**Technological districts and support to RTDI investments in key fields (aerospace, sustainable building industry, automotive, energy and renewable sources (financed as part of the framework agreement with MIUR)**

**Creation of new high tech firms and innovative projects firms (financed as part of the framework agreement with MIUR)**

**Human capital development and applied research projects carried out by universities and firms (Dote Ricercatori; Dote Ricerca Applicata - financed as part of the framework agreement with MIUR)**

**RTDI projects in meta-districts (biotech, ICT, new material fashion & design)**

**Vouchers for RTDI services and human capital development in SMEs (as part of the programme agreement with CCIAA – chambers of commerce, industry and crafts**
<table>
<thead>
<tr>
<th>Project Description</th>
<th>Duration</th>
<th>Objectives</th>
<th>Budget</th>
<th>Region</th>
<th>URL</th>
</tr>
</thead>
</table>
| Stimulation of PhDs and contracts for young researchers (as part of the framework agreement with the National Research Council) | 2006-2012         | 3.1. S&T education  
3.2 Research personnel                                                             | €40m (€20m CNR)  | Region - CNR | http://www.mindinitaly.cnr.it/                                     |
| Stimulation of PhDs and contracts for young researchers (as part of the agreement with the Milan Polytechnic, the Catholic University and the Pavia University) | 2006-2010         | 3.1. S&T education  
3.2 Research personnel                                                             | €3m (€1.5 Milan Polytechnic, the Catholic University and the Pavia University) | Region | n/a                                                     |
| Scholarships and support to insertion in Lombard research centres (as part of the agreement with the U.S. National Institute of Health - NIH) | 2008 e 2010 (2 call) | 3.2 Research personnel                                                                 | €0,03m | Region | http://www.regione.lombardia.it/cs/Satellite?c=Attivita&childpagename=Regione%2FWrapperBandiLayout&cid=1213477264928&p=1213477264928&packedargs=locale=1194453885284%26menu-to-render=1213477264928%26tipologia=Progetti&pagename=RGNWrapper&tipologia=Progetti  |
| Soft loans for new youth and women entrepreneurship                                   | 2009              | 4.3. Support to start-ups and access to finance                                | €20m    | Region | n/a                                                     |
| Innovative projects in the fields of energy and environment, agro-food, health, advanced manufacturing | 2009-2013         | 4.1 Support to sectoral innovation programmes  
4.2 Support to entrepreneurial innovation  
3.3 Skills development and training                                                   | €52m   | Region | http://www.regione.lombardia.it/cs/Satellite?c=Attivita&childpagename=Regione%2FWrapperBandiLayout&cid=1213293874528&p=1213293874528&pagename=RGNWrapper&tipologia=Progetti  |
<table>
<thead>
<tr>
<th>Fund</th>
<th>Phase</th>
<th>Support Areas</th>
<th>Amount</th>
<th>Region/Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEED Fund</td>
<td>Since 2008</td>
<td>4.3 Support to start-ups and access to finance</td>
<td>€10m</td>
<td>Finlombarda <a href="http://www.finlombarda.it/acm-online/Home/Attivita/IBandieleIniziatve/Imprese%2Finpresa/FondoSeed.html">http://www.finlombarda.it/acm-online/Home/Attivita/IBandieleIniziatve/Imprese%2Finpresa/FondoSeed.html</a></td>
</tr>
<tr>
<td>NEXT Fund</td>
<td>Since 2004</td>
<td>4.3 Support to start-ups and access to finance</td>
<td>€12m</td>
<td>Finlombarda <a href="http://www.finlombardaasgr.it/on-muti/Home/Attivitaefondi/Next.html">http://www.finlombardaasgr.it/on-muti/Home/Attivitaefondi/Next.html</a></td>
</tr>
</tbody>
</table>
| Made in Lombardy     | 2007-2013 | 4.1 Support to sectoral innovation programmes  
|                      |       | 4.2 Support to entrepreneurial innovation  
|                      |       | 4.3 Support to start-ups and access to finance  
|                      |       | 1.3 Horizontal programmes / measures | €100m (€500m total) | Finlombarda [http://www.finlombarda.it/acm-online/Home/articolo11009033.html](http://www.finlombarda.it/acm-online/Home/articolo11009033.html) |
| FRIM Fund            | 2007-2013 | 4.3 Support to start-ups and access to finance  
|                      |       | 5.2 Support to the creation of new markets  
|                      |       | 2.3 Direct state aid measures in support of (business) research | €35m              | Region-Finlombarda [http://www.finlombarda.it/acm-online/Home/Attivita/IBandieleIniziatve/Impreseindustriali/Frim.html](http://www.finlombarda.it/acm-online/Home/Attivita/IBandieleIniziatve/Impreseindustriali/Frim.html) |
| JEREMIE ERDF         | 2007-2013 | 4.3 Support to start-ups and access to finance  
|                      |       | 2.3 Direct state aid measures in support of (business) research  
<p>|                      |       | 1.3 Horizontal programmes / measures | €20m              | Region-Finlombarda <a href="http://www.regione.lombardia.it/cg/Satellite/C=Redazionale_P&amp;childpagename=Regione%2FDetail&amp;cid=121327795344&amp;pagename=RGNWrapper">http://www.regione.lombardia.it/cg/Satellite/C=Redazionale_P&amp;childpagename=Regione%2FDetail&amp;cid=121327795344&amp;pagename=RGNWrapper</a> |</p>
<table>
<thead>
<tr>
<th>PRISMA (innovation practices for administrative simplification – web community)</th>
<th>2007-2013</th>
<th>5.1 Measures in support of innovation culture</th>
<th>€0.9m</th>
<th>Region – CESTEC</th>
<th><a href="http://prisma.cestec.eu/progetto">http://prisma.cestec.eu/progetto</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>QUESTIO (Quality Evaluation in Science and Technology for Innovation Opportunity)</td>
<td>2004-2013</td>
<td>5.1 Measures in support of innovation culture</td>
<td>€1m (€0.45m as part of the agreement with MIUR)</td>
<td>Region – IReR</td>
<td><a href="http://www.questio.it/">http://www.questio.it/</a></td>
</tr>
<tr>
<td>DRIADE (experimental production systems) – support to aggregations of micro enterprises and SMEs that are part of districts or meta-districts in the crafts sector (Artemide) and in the industry sector (Dafne).</td>
<td>2007-2013</td>
<td>1.3 Horizontal programmes / measures</td>
<td>€14.8m</td>
<td>Region – Central Government</td>
<td><a href="http://www.regione.lombardia.it/cs/Satellite?c=Attivita&amp;childpagename=HomeSPRL%2FWrapperBandi%2FLayout&amp;cid=121366802262&amp;p=121366802262&amp;packedargs=locale%3D1194453881584%26menu-to-render%3D1213901212544%26tipologia%3DAgevolazioni&amp;pagename=HMSPRILWrapper&amp;tipologia=Agevolazioni">http://www.regione.lombardia.it/cs/Satellite?c=Attivita&amp;childpagename=HomeSPRL%2FWrapperBandi%2FLayout&amp;cid=121366802262&amp;p=121366802262&amp;packedargs=locale%3D1194453881584%26menu-to-render%3D1213901212544%26tipologia%3DAgevolazioni&amp;pagename=HMSPRILWrapper&amp;tipologia=Agevolazioni</a></td>
</tr>
<tr>
<td>Technological innovation programmes in local broadcasting SMEs</td>
<td>2007-2013</td>
<td>4.1 Support to sectoral innovation programmes</td>
<td>€5m</td>
<td>Region</td>
<td>n/a</td>
</tr>
<tr>
<td>Industrial research and experimental development in SMEs in the field of energy efficiency</td>
<td>2007-2013</td>
<td>2.3 Direct state aid measures in support of (business) research 4.1 Support to sectoral innovation programmes</td>
<td>€15m</td>
<td>Region</td>
<td>n/a</td>
</tr>
<tr>
<td>Industrial research and experimental development in SMEs in the field of cultural heritage</td>
<td>2007-2013</td>
<td>2.3 Direct state aid measures in support of (business) research 4.1 Support to sectoral innovation programmes</td>
<td>€3m</td>
<td>Region</td>
<td>n/a</td>
</tr>
<tr>
<td>Process / organisational innovation in</td>
<td>2007-2013</td>
<td>1.3 Horizontal programmes / measures</td>
<td>€10m</td>
<td>Region</td>
<td>n/a</td>
</tr>
<tr>
<td>SMEs</td>
<td>measures</td>
<td>2010</td>
<td>5.1 Measures in support of innovation culture</td>
<td>€145m</td>
<td>Region</td>
</tr>
<tr>
<td>---------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>------------</td>
<td>-----------------------------------------------</td>
<td>-------</td>
<td>--------</td>
</tr>
<tr>
<td>Promotion of innovation and energy efficiency in micro enterprises and SMEs (replacement / upgrading of machinery and equipment)</td>
<td>4.2 Support to entrepreneurial innovation</td>
<td></td>
<td>4.2 Support to entrepreneurial innovation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TREND – Tecnologia e innovazione per il Risparmio e l'efficienza ENergetica Diffusa</td>
<td>5.1 Measures in support of innovation culture</td>
<td>2009-2012</td>
<td>5.1 Measures in support of innovation culture</td>
<td>€7.5m</td>
<td>Region</td>
</tr>
<tr>
<td>Measures to support innovation in and the development of micro enterprises and SMEs (as part of the programme agreement with CCIAA – chambers of commerce, industry and crafts sector)</td>
<td>4.1 Support to sectoral innovation programmes</td>
<td>2010-2015</td>
<td>4.1 Support to sectoral innovation programmes</td>
<td>€33.12m (€66m total)</td>
<td>Region</td>
</tr>
<tr>
<td></td>
<td>5.1 Measures in support of innovation culture</td>
<td></td>
<td>5.1 Measures in support of innovation culture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: RIM Survey.
3.2 Appraisal of regional innovation policies

The regional evaluation culture is still not strongly developed in Italy, and Lombardy is no exception to this claim. Therefore, existing evidence of outcomes and impacts of existing measures is scarce. However, it must be noted that, as stakeholders declare, evaluations are often carried out by the internal evaluation units for internal use. This is the case, for example, with the reports to the regional council (“Relazioni al Consiglio”), which provide an assessment of the initiatives undertaken. Sometimes, internal exercises are not easily available not only to the public but also to potentially interested actors inside the PA.

External evaluations are carried out in relation to the implementation of the ROPs. These are in most cases very “traditional”, meaning that they synthesise monitoring data on progress of initiatives without providing robust analyses on outcomes and impacts (apart from a general discussion of the extent indicators identified ex ante have been met). Furthermore, the quality of the set of outcome and impact indicators chosen during the programming phase is debatable. Rigorous evaluations and studies carried out by university researchers, the Bank of Italy etc. are more common at a national level and they usually focus on a certain instrument (e.g. RTDI incentives) rather than on a territory.

For all these reasons, even though according to the regional stakeholders the effectiveness of innovation policy can be considered positive, the actual evaluation-based evidence is limited and even when it exists it rarely attempts to assess the added value of an intervention by applying counterfactual approaches or a mix of tools appropriate to deal with the complexity of RTDI effects. As a consequence, it is not straightforward, if at all possible, to appraise the extent to which the current policy mix is adequate given the challenges identified and to assess to what extent trends in indicators can be attributed to the support measures. Several studies are envisaged and this may render the task more easy in the future, also as the on-going interim evaluation goes ahead. Currently in order to answer the question we need to rely on indirect evidence of performance.

Indirect sources of evidence of the effectiveness of regional innovation policy are: reports on programmes’ implementation, (still) partial results of evaluations of measures co-financed by the EU Cohesion Policy, regional analyses focuses on the past (which may be relevant when they deal with instruments still in use), national academic studies concerning instruments similar to those used in the region (e.g. R&D grants and loans).

An internal evaluation of the impacts of RDTI policy in Lombardy was carried out in 2008 on the basis of interviews with officials, centres of excellence and beneficiaries. It focused on a sample of initiatives carried out in 2001-2004. Some of the instruments considered in the analysis are still relevant (e.g. the NEXT fund; the loans for industrial research and technological innovation projects - law 46/82) and the evaluation includes a study on indicators for impact evaluation of RDTI policy. As follow up to this evaluation, there is an (on-going) initiative aiming at applying the identified set of indicators. The evaluation provides some information on effects of industrial research schemes (e.g. increase in productivity of firms and access to new markets, increase in the share of R&D staff, growth in firm’s size) and on weaknesses highlighted by beneficiaries (e.g. scarcity of available resources, discontinuity in financial support, red tape, low capacity of the administration to assess and take into account the innovation degree of project proposals as a criterion for funding).

---

37 Study funded by the OP Public Procurement 2007-2009 and carried out by the Region, Finlombarda and INVITALIA (National Agency for the attraction of investments). As follow up to this evaluation, there is an (ongoing) initiative aiming at applying and validating the identified system of impact indicators.
Looking at Annual Implementation Report 2009 (AIR approved 8 June 2010) of the ROP ERDF, the procedural progress (tenders, selection of beneficiaries etc.) of the initiatives geared towards innovation is considered satisfactory since all actions were launched. In particular in relation to the funds for innovation (e.g. Jeremie, Made in Lombardy, FRIM), research projects in the fields of energy efficiency and cultural heritage, process and organisational innovation schemes, progress was good. As regards the FRIM ERDF fund, 42 projects of investment were activated. Other initiatives such as TREND and the support to research and TT centres operating in key sectors found it more difficult to take off. From a financial point of view, nearly 50% of available ERDF resources (€210.9m) were allocated to innovation and approximately 35% of these were committed when the AIR was published. The consequences of the recession on the propensity of firms to invest and the upward pressure on interest rates are the most important obstacles to progress highlighted in the AIR. The evaluation of the OP ERDF 2007-13 is currently being carried out. The annual evaluation report (updated June 2009) provides the same information on procedural, financial and physical progress available from the AIR. As regards effectiveness, the evaluation still does not provide any information. Moreover, as it is obvious, there is no available information in the AIR and the ROP evaluations on the regional innovation measures that are not part of the programme co-financed by EU Cohesion Policy. Since the Region manages many other innovation policies, as evidenced in the discussion of the policy mix, the little evaluation-based evidence, that is available, covers only a limited portion of the mix.

As previously mentioned the focus of the Lombard RDTI policy has progressively changed in the last decade (moving towards a demand pull approach) while the financial relevance of RTDI initiatives has increased considerably. However, there is still a certain degree of continuity between the set of initiatives employed in the past programming period and those currently used. Nonetheless, also the completed evaluation of the ROP 2000-2006 does not go beyond a desk analysis of documents and some interviews with stakeholders such as the economic and social partners. Hence it adds little value added to the monitoring data on RTDI.

Academic studies conducted at a national rather than regional level may provide indirect evidence on the effectiveness of RTDI initiatives undertaken in Lombardy. Counterfactual approaches which use econometric analysis are employed mostly ex ante and ex post to assess the effects of RTDI aid schemes (Potì and Cerulli, 2010); (De Blasio, Fantino and Pellegrini, 2010); (Merito, Giannangeli and Bonaccorsi, 2007); (Bronzini and de Blasio, 2006). Typically, these rely on large databases of balance sheet indicators and are commonly not circumscribed to ERDF funding but analyse instruments financed by several sources including national and regional resources. The evidence on performance highlights the mainly positive effects of grants and loans at firm level (increased turnover, employment and productivity), and also on the investment continuity and on the networking of firms with knowledge producers. These interventions often support firms which carry out innovation activities for the first time. Thanks to the support, innovation then becomes endogenous to the businesses and goes on without further support. Such results can be considered encouraging for all the existing regional measures consisting of direct state aid measures and in general support to innovation in enterprises (sectoral innovation programmes, entrepreneurial innovation, start-ups and access to finance).

The real challenges in relation to the appraisal of innovation policy in Lombardy (as well as in the other Italian regions) are: first of all strengthening evaluation culture and practice at a regional level; second, filling the gaps that exist in the evidence available on performance by evaluating innovation poles, technological districts, knowledge transfer schemes, horizontal policies, human capital development initiatives etc. which receive significant resources but whose effects are not systematically assessed.

To conclude, while it is not possible to make any kind of definitive statement about the region’s policy mix or the effectiveness of any of its individual innovation programmes, one can make several observations. Officials at the regional administration state that
they are broadly content with the region’s portfolio of innovation policies. There are no obvious gaps in the mix, inasmuch as the regional administration is able to fund measures across the policy spectrum, even though, probably, more can be done to identify key innovation needs of medium enterprises and the best solution for these.

The gradual strengthening of demand side policies is to be welcomed. However, total investment might be said to be rather light in relative terms and tightening of finances is problematic.

The AIR shows the various programmes and projects are being implemented reasonably efficiently. The ROP evaluations show a similarly business-like approach to innovation. The one substantive internal evaluation of RTDI measures found strongly positive impacts on the productivity of participating businesses as suggests this part of the portfolio is being effective and there were several challenges posed as regards the operation of the schemes (which are being acted upon). Moreover, national econometric evaluations of RTDI measures confirm the additionality of such industrial assistance, with improved productivity and competitiveness. It seems reasonable to assume the same will hold for Lombardy. Notwithstanding these positive remarks, the weak evaluation culture and the lack of a dashboard to proactively monitor interventions does mean that regional politicians and administrators have no robust view of their policy measures performance, and few feedback loops for learning what mix/balance works best and why.

3.3 Good practice case

The Lombardy SEED Fund facilitates the creation and growth of innovative enterprises in the region (those with legal premises and at least an operational branch in the territory) by providing favourable loans to support internal business-development projects. The Fund is managed by Finlombarda and is notable for its financial terms (e.g. no security of guarantee required; easy borrowing terms; auto-certification; a single repayment after 36 months). The measure has been launched in 2008, with a €10m of public investment from the Region. The initial objective was to commit the entire amount in 2-3 years and support about 70-100 start-ups. The global economic crisis, which burst when the measure was launched, had certainly a negative impact on take up and slowed the progress of the initiative. Currently, approximately 50% of the total available resources have been committed and less than €4m have been disbursed.

The SEED Fund was selected for case study based on the recommendations of several regional stakeholders who see the Fund as being an example of good practice, a view that is reinforced by its popularity amongst beneficiaries and its wider reputation in the EU. The authorities have been asked to present to other regions on several occasions, in light of the strategic importance of these kinds of schemes and the novelty of the Lombardy approach.

The potential beneficiaries of SEED are micro enterprises and SMEs. In particular beneficiaries can be: (a) any entrepreneur who is willing to commit to establishing a legal enterprise within 3 months of a loan offer; (b) any spinoff part owned by a university and less than 2 years old; (c) any other enterprise, so long as it is 6 months old or less.

The Fund supports innovation projects specifically. The fund is open to all businesses except large firms and it addresses all sectors of economic activity. There are priority sectors however for which a certain share of resources is reserved. The 2008 tender earmarked, for the first 180 days from the opening of the applications, 30% of the available resources for firms active in the environment, energy, food or health sectors. A further 30% was made available to firms in these priority sectors and which proposed development projects in any one of several targeted application / technology fields (ICT, biotech, advanced materials). In particular, the call for tenders identified for each priority sector a specific list of relevant fields of application. The evaluation criteria of the expert panel include: technical and managerial capacity (coherence
between project specifications and technical competences, previous experiences etc.); project quality (coherence between estimated costs and project objectives, identification and management of risks, degree of sectorial innovation, time to market etc.), economic and financial sustainability (return on investment, analysis of financial statement and of sensitivity, credit scoring etc.).

The value of the individual business development programmes must be between €30k and €150k. The reimbursable expenditures include: technical consultancy services concerning development, prototyping, experimentation and test of the product/service; raw materials needed in these activities; acquisition of trademarks, patents, licenses and know-how; consultancy services and fees concerning the registration of marks and patents; building works, plant engineering, project expenses and costs for direction of works; new machinery and equipment; adjustment/upgrading of new or existent machinery and equipment; integrated management systems (software and hardware); staff employed in the development of the innovative project; stocks.

The main rationale to launch this measure was to encourage entrepreneurial risk taking and support the very early stages of development when the validity of a product/service is still to be proved. Worldwide the number of new firms as % of the most dynamic enterprises (e.g. the Fortune list) is constantly growing over time and hence supporting the creation and growth of new dynamic companies is of utmost importance for the prospects of the economy. The SEED fund, introduced in 2007-2008, fills a gap in the mix of regional instruments available which include: scouting services and Ingenio at a pre-seed/seed stage (introduced between 2004 and 2006) and the Next fund (introduced in 2004) together with various initiatives to assist patenting during the phase of sustained growth.

Finlombarda and the Region conceived the initiative after having considered the outcome of several studies and surveys such as the Community Innovation Survey or Eurobarometer, which have highlighted repeatedly that one of the main obstacles to innovation is the availability and cost of access to finance. The eligibility criteria, the rules for granting and repaying the loan, and the price are amongst the innovative features of the SEED Fund. The Fund uses the EURIBOR 6 months interest rate plus a 1% spread as its reference when fixing the interest rated for individual loans. The beneficiaries can reimburse the loan with a single repayment after 36 months. Thanks to this, company’s resources which are so important in the early stages of the innovation programme are not drained. No guarantee is required and the loan is granted ahead of the planned investments, upon submission of a simple auto-certification. The loan can be used as security to borrow further money from the company’s bank, for example, which produces a financial leverage effect by encouraging borrowing from banks (the threshold is 3 times the value of the loan). Finally, if the beneficiaries find themselves in financial straits, the loan may become a free grant (maximum 50% of the loan in case of winding-up and maximum 100% in case of bankruptcy). The loan is subordinate to any bank debt secured against it, which is to say the bank gets paid before the Fund (which gets paid before the shareholders).

3.4 Portofolio of innovation support measures

Beside the measures and initiatives designed and implemented by the regional authorities, national and European policies must be considered in order to grasp the full influence of public policy on regional innovation.

At a national level, the Ministry of Education, University and Research (MIUR) and Ministry of Economic Development (MSE) grant funding to support both public and private research.

38 It is worth mentioning that, to a lesser extent, the Ministry of the Environment (MATTM) and the Ministry of Health also promote research initiatives in their competence fields.
MIUR manages a Fund for Industrial Research-FAR which supports the initiatives foreseen in the National Research Programme (NRP). The NRP sets out the general objectives and procedures for implementing RTDI national policy, identifies the national growth perspectives and the strategic scientific and technological areas. The programme identifies the following priority sectors for research: Environment, Transport, Energy, Agro-Food, Health, ICT, Advanced Materials, Nanotechnology, Biotechnology and Cultural Heritage. The NRP funds collaborative research projects involving businesses, universities and public research bodies, as well as industrial research in SMEs, and also finances the creation of start-ups / spin-offs (of public and private origin). During the period 2003-2008, FAR funded 96 projects in Lombardy and disbursed approximately €225.4m, which amounts to around 35M a year.

MSE manages the Fund for Technological Innovation (Law 46/1982), which supports innovation projects in firms aiming at the industrial application of research results. During the period 2003-2008, FIT funded 198 projects with Lombardy companies, investing about €260.3m or 40M a year.

Among the initiatives managed by MSE, the Projects of Industrial Innovation (PII) are the main measures of “Industry 2015”, the industrial policy programme launched in 2006 by the Italian Government. The PIIIs identify specific technological and industrial objectives and promote the development of innovative products and services in five key technological areas: Energy efficiency; Sustainable mobility; Life sciences; New technologies for the Made in Italy; and Cultural heritage. A new system of business incentives (“Regime Omnibus”) was defined for implementing PII. This system allows companies to choose the typology of financial support. The eligible activities range from industrial research and experimental development to the definition of prototypes and demonstration plants. The budget for 2007-2009 was more than €1b; according to the available information, in 2008, 49 projects were financed in Lombardy in the area of sustainable mobility (approximately €22.6m).

The Law 808/85 promotes industrial research and technological development in aerospace and defence. During the period 2003-2008, 21 projects were funded by MSE (€179.5M) or around 30M a year.

The national R&D Tax Credit is one of the largest innovation measures available to businesses within the region, which in this case was introduced throughout Italy by the Financial Law 2007. This initiative is also managed by MSE. Approximately €239.2m were allocated to Lombardy as part of this policy in 2008, which is an order of magnitude greater than FAR, FIT or PII.

As regards public research, the Research Programmes of Relevant National Interest (PRIN) are the main national support measures. These promote "bottom-up" research projects carried out by interregional networks of universities and other public organisations. In 2008, the Lombard universities coordinated 137 research projects carried out jointly with other public organisations. The value of these projects varies considerably between a few thousand euro and a few hundred thousand. A ready-to-use national database of PRIN does not exist and a project-level analysis (one by one) would need to be carried out in order to estimate the amount of resources that are invested in a certain region.

Another important national measure is the Basic Research Integrative Fund (FIRB) aimed at supporting universities and research organisations which collaborate with companies. This finances laboratories operated through a partnership of government and one or more private sector companies, and supports research agenda of national
technology platforms. FIRB also supports “mission-oriented” joint-research projects carried out by networks of universities.

At a European level, the EU Seventh RTD Framework Programme (FP7) and the Community Innovation Programme (CIP) are important instruments. Moreover the EU Cohesion Policy also provides an important input to regional innovation.

As of May 2008, 1,806 Italian FP7 participants had secured EC contracts valued at around €523m (approximately 9% of the total FP7 commitment at that point). Lombardy and Latium are the Italian regional leaders in terms of numbers of participants, participations and CEC income. As of May 2008, 20.7% of the total number of Italian participants is in Lombardy; their projects represent 23.8% of total resources.

In relation to EU Cohesion Policy, €101.2m have been allocated to innovation in Lombardy in 2007-2013, 48.0% of the total available ERDF resources (€210.9m).

### 3.5 Towards smart specialisation policies

There is no explicit debate on smart specialisation among policy makers in Lombardy, but rather on the need for increasingly focusing on key sectors and on pivotal scientific and technological areas (European Commission, 2009). Nonetheless, the approach taken in Lombardy since 2005 actually goes towards supporting smart specialisation policies, at least to a certain extent. The switch of the regional strategy from a technology push towards a demand pull approach stemmed from the need to optimise the use of relatively scarce public resources by identifying bottom up, and then addressing, the key weaknesses of the regional system.

Currently, the new strategy that is being finalised identifies key application fields within the priority sectors for innovation policy such as health technologies and biotech, ICT and materials, aerospace, automotive, agro-food, sustainable building industry, energy etc. Focusing on those will encourage bringing to light and strengthening market niches in which the region may exploit global competitive advantages. The “light approach” of the Lombard policy maker to innovation governance, as a facilitator whose mission is to help “market forces to function”, encourages the bottom-up identification of the most promising key enabling technologies and applications which it is profitable to invest in.

The working groups and the public-private partnership working tables that are involved in the development of the regional innovation strategy contribute to support an “entrepreneurial process of discovery”. Moreover, this is facilitated by clustering initiatives (e.g. DRIADE, measures for R&D cooperation, Technological Districts and RTDI projects in meta-districts) and more general interventions aimed at strengthening science-industry linkages, such as those envisaged as part of the framework agreements with the MIUR, the university system, the CCIAA, etc.

The assessment of the current strengths and weaknesses of Lombardy in any given sector or technology is a fundamental feature of the regional approach to innovation policy. Several specific studies exist on these aspects: those carried out as part of the

---

39 Thematic networks of science and industry that come together in regular meetings to develop a common strategic research agenda in key fields (medical research, telecom etc.). They have been established by the MIUR (starting from 2007), drawing from the experience of the EPT-European Technology Platforms.

40 This estimate is taken from policy paper on innovation produced by the “Expert evaluation network delivering policy analysis on the performance of cohesion policy 2007-2013”. The calculation is based on a selection of categories of expenditure (FOI codes). A broad definition of innovation is adopted, corresponding to that included in the third edition of the Oslo Manual. An innovation is, therefore, the implementation of a new or significantly improved product (good or service) or process, a new marketing method, or a new organisational method. For more information see: Ismeri Europa (2010) “Policy paper on innovation”, Expert Evaluation Network.
definition of the regional innovation strategy and the various foresight exercises, systematically carried out to update the strategy.

Making a move from a prevailing business competitive approach based on incremental innovation thorough learning by doing, using, interacting etc. and purchase of new machinery towards an innovation approach based on the widespread adoption of emerging technologies among firms, including SMEs in traditional sectors, requires developing new competences and introducing a different innovation culture in small companies. The policy mix deals with this issue, for example through the initiatives for human capital development financed as part of the framework agreements with the university system and the MIUR (e.g. “Dote Ricercatori e Ricerca”, training abroad of young researchers, support for PhDs and employment of young researchers in firms etc.) and other interventions such as the financing of innovative projects (e.g. in the fields of energy and environment, agro-food, health, advanced manufacturing) which promote skill development and recruitment also attempt to identify complementary investment which are functional to smart specialisation. Besides, the mentioned initiatives consisting of mentoring and advisory services for new entrepreneurship are meant to encourage the development IP-based businesses as well as the clustering initiatives aim at supporting the development of high tech start-ups.

Finally, as highlighted in the discussion of the policy mix, there are initiatives that contribute to identify the general-purpose technologies and their application in the major economic sectors in the region. This is the case, for instance, of the actions aiming at strengthening networking and cooperation with the centres of excellence in other territories. It is worth mentioning: the agreement with the U.S. National Institute of Health – NIH; the strategic partnerships on scientific and technological issues that have been launched with Languedoc–Roussillon, Nuevo Leon, Baden-Württemberg, Massachusetts, Queensland etc. These are important for the regional actors that can agree with leading partners on robust research roadmaps, and benefit from economies of scale and scope in carrying out joint initiatives which may lead to the development of key enabling technologies and the identification of key application fields. These co-operations have also an important role as they provide a useful benchmarking for the activities carried out by local actors.

As regards co-ordination of smart specialisation policies, the considerations expressed in § 2.4 remain valid and, again, strengthening the systemic integration of research and innovation policy design and implementation is the main governance challenge.

3.6 Possible future orientations and opportunities

In a context of increasingly scarce public resources and in presence of a risk of flight / loss of important actors of the RTDI system, already weakened by the restructuring and delocalization of the large enterprises in the last 15 years, an innovation policy approach based on light interventions (i.e. the PA accompanies market dynamics and supports the existing formal and informal relations as well as the generation of new synergies and project ideas) is likely to become ineffective if not properly updated. First of all, this means more integration between actions and more coherence between strategies, initiatives and available resources. This was not always the case in recent years when actions not in line with the soft policy approach (substantial direct investments) were undertaken for political choices (e.g. Nerviano Medical Sciences).

The Region needs to make precise and coherent choices and further concentrate resources on priority areas of intervention and on the most effective instruments. The large variety of existing initiatives could be possibly streamlined and a limited set of

---

41 This affected large enterprises and multinationals mainly active in the following sectors: chemicals and pharmaceuticals, electronics, aeronautics etc.

42 This is the largest pharmaceutical R&D facility in Italy and one of the largest oncology-focused, integrated discovery and development companies in Europe.
the best instruments applied in each policy area (e.g. research and technologies, enterprises, market and innovation culture). Furthermore, these should be hopefully managed under a single direction rather than fragmented among a number of DGs and units that sometimes find it difficult to act in a coordinated way. The set-up of a regional innovation agency that catalyses these competences and deals with both research and innovation policy might be a solution.

Rationalization of objectives and instruments cannot be achieved without an integrated and advanced monitoring and evaluation system which can enable a real time control of performance and reveal what kind of measures and policies provide the best returns and what arrangements work more effectively. An integrated dashboard (i.e. “cruscotto”) is used by other regions to this purpose and its development in Lombardy is highly recommendable. In addition to this, a detailed, high level independent evaluation of the past RTDI initiatives (those which are relevant insofar as they are still employed) and of the new initiatives introduced in the current programming period is necessary to understand what the current policy performance is and what the possible future directions for action are.

Finally, in relation to the existing mix, it is worth mentioning that while the Region firmly participates in European and international high level RTDI networks, according to experts and stakeholders, it fails to fully seize the opportunities of partnerships. On the contrary a mostly autarchic approach is pursued of making things at home. A long-term strategy that facilitates the exploitation of partnerships would be desirable. Obviously this, in order to work, needs to be implemented in presence of control tools and of single coordinating subject as explained above.
Appendix A Bibliography

1. BAK Basel Economics (2007), International Benchmarking Database
2. Bank of Italy (2009), Bilancia dei pagamenti e posizione patrimoniale all’estero
6. European Commission (2009), Knowledge Economists Policy Brief n° 9, June
7. Invitalia (2008), Studio di impatto delle politiche attuate da Regione Lombardia in materia di R&I, Rapporto finale: risultati dell’indagine e ipotesi di indicatori d’impatto
8. IReR (2009a), Aggiornamento dello scoreboard regionale dell’innovazione, Rapporto finale di ricerca
9. IReR (2009b), Lombardia 2010, Società, governo e sviluppo del sistema lombardo, Guerini e Associati, Milan
10. ISAE (2009), Le previsioni per l’economia italiana, Roma, luglio
15. Ministry for Economic Development - DPS (2009), Improving regional research and innovation policies
17. UNCTAD (2009), World Investment Report 2009, Bruxelles
18. Verganti R. et al. (2005), Studio della domanda e dei bisogni di servizi a supporto dell’innovazione, Rapporto di Ricerca, Camera di Commercio, Milan
Appendix B Stakeholders consulted

1. Armando De Crinito, Director of the University and Research Unit, Regione Lombardia (10 02 2011).
2. Antonio Santangelo, Manager of QUESTIO, Archidata (10 02 2011).
3. Alberto Silvani, Administrative Director, University of Milan (23 03 2011).
4. Cristina Colombo, Director of the Operational Unit on Competitiveness, DG Industry, Regione Lombardia (01 04 2011).
5. Fabio Ciocca, Manager of financing instruments, Finlombarda (15 04 2011).
Appendix C RIM Repository information
Baseline regional profile

- ITALIA
- NORD-OVEST
- Region Lombardy
- NUTS Code ITC4

Regional Profile

Introduction

About 10 million people live in Lombardy (16.2% of the national population; 2% of the European Union population). The capital is Milan. One-sixth of Italy's population lives in Lombardy and about one fifth of Italy's GDP is produced in this region, making it the most populous and richest region in the country.

Repository

Support measures

- Vouchers for services in research and development and enhancement of human capital for promoting technological innovation of micro, small and medium enterprises in Lombardy
- New entrepreneurship
- Innovative projects in the fields of energy-environment, food, health and advanced manufacturing
- Supporting processes of patenting of micro, small and medium enterprises in Lombardy
- Call “Innovation and Energy Efficiency" for the allocation of grants for the purchase of machinery
- Funding for SMEs in Lombardy enterprises for innovation

Policy documents

- Regional Operative Programme ERDF 2007-13 Lombardy
- Regional Implementation Program (PAR)
- Regional Law No 1/2007, Competitive tools for businesses in Lombard territory

Organisations

- Fondazione Politecnico
- CESTEC
- FINLOMBARDIA
Economy

Lombardy is the most industrialised region of Italy. In 2008 the Lombardy region produced 20.7% of Italian GDP, regional exports represent 28.3% of the national total. On its territory are concentrated over 15.6% of the enterprises operating in Italy. During the period 2000/08 the regional average Gross Domestic Product (GDP) was €282,209m with a growth rate of 4.0%, compared with 3.5% of the national average. The GDP per capita during the same period was €33,648, second only to the Aosta Valley and close to the index of the most developed western European countries.

According to ISTAT data, in 2008 the region has 822,579 enterprises: 11.4% related to industry, 14.6% to construction and 74% to service sectors. Looking at employment by sector, slightly over 60% is concentrated in services (29% in trade, transport, hotels, and 32% in other services), 29% in industry and the remaining 9% in construction. The unemployment rate is among the lowest in Italy, in 2008 it amounted to 3.7% (against a national average of 6.7%), of which 34.6% were long-term unemployed.

Is significant the presence of companies of knowledge-intensive services targeting enterprise information and communication technology, R&D, engineering, design and styling, organizational and management consulting, market research and advertising. In Lombardy the companies involved in R&D are about 1,610 and in computer science 21,500.

The value of agro-industrial production of Lombardy, is approximately €12b, covering a market share of more than 15% of the national total and 1.8% of the UE total. This value represents approximately 3.7% of regional GDP, but the percentage rises to 10.6% when taking into account the margins of trade and transport. Agricultural production and food processing activities take place in more than 70,000 manufacturing facilities, involving about 226,000 workers, of which more than 150,000 permanent employees (4.2% of the work units in Lombardy). Lombardy has 40 European certifications in the wine sector (20 doc/docg and 15 IGT) and ranks fourth in the Italian regional ranking.

Economic development has fostered the growth of tertiary in all its spheres, from trade credit and insurance services to production. The spatial distribution of producer services highlights the role of Milan in "Quaternary" or advanced services.

Research, Development & Innovation

The Lombard production system is characterised by a very heterogeneous profile of manufacturing and services, with a good focus on innovation and a strong opening to international markets. The Lombard system of innovation appears, overall, as an example of excellence within the Italian panorama. The position of Lombardy, compared to other regions, is aligned with European trends and objectives, specifically with the indications of Lisbon European Council on the industrial composition of expenditure. In Lombardy, in fact, is concentrated around 1/3 of the Italian expenditure in R&D by firms and private spending that amounts about 85% of the entire regional expenditure in R&D.

Lombardy is also the second Italian region, after Lazio, in terms of number of employees in R&D (17.9% of total national employees), reaching a significant value even in the total population. The levels of employment in industrial activity and high and medium technology-intensive services in
knowledge and technology are high (5.1% of total employment). Even the university system of research, very broad and articulated, represents a distinctive strength in the region.

Today there are approximately 500 centres that provide innovation services for companies, of which 200 aimed at research and technology transfer. The range and abundance of these subjects, although they constitute an absolute wealth, requires the development of processes of accreditation of their most qualified and progressive specialisation.

The weaknesses of the regional innovation system are tied primarily to the specialisation manufacturing that is oriented towards the production of low-intensity R&D, small and medium size businesses. These characteristics, together with the crisis of big business, as manifested by closing plants and advanced research centres or deep restructuring of companies (chemical, electronics, aeronautics) and relocation of multinational companies (especially in the pharmaceutical and electronics), have not promoted the full development of a market for innovation-intensive services.

**Governance**

The Action Plan of the Lombardy region aims at the establishment of a new model of regional governance. The reference institutional actors are expected to consciously contribute to the Plan development according to their specific role and expertise. The Region Lombardy is the institution in charge for defining and addressing the regional policies. Provinces are the territorial bodies with the aim to plan the spatial policies. As a result, planning and support of bilateralism are the key elements of the regional Action Plan aiming to sustain the adoption of programming policies shared within the region and their implementation.

Subsidiarity is used as an extraordinary innovation in terms of the administration in Lombardy has led to positive changes. This multilevel model is based on practicality and functionality, according to non-traditional tools of a highly centralized power, a network system in which all levels of government together to formulate, propose to implement policies and to monitor results, stating that the government controls and for ensuring compliance with the rules for its own functioning. From '95 Lombardy has bet on the double dimension of subsidiarity: the horizontal, which revolutionised the whole system of social services, health, vocational training and school, and the vertical, which allowed the devolution of powers to provinces and communes, and joint responsibility of other stakeholders.

**Policy**

In the development of the regional innovation policies, Lombardy has focused on crosscutting policies, and in particular on technology transfer (with the activation of regional centres of excellence for about €15m), training of researchers (for about €15m) on the Information Society (with operations for €170m). This has also been accompanied by (1) the activation of measures mainly oriented to direct financial assistance to businesses and (2) a prompt deployment of "cluster" governance mechanisms to activate the dialogue with stakeholders in the system and promptly address some priority issues. More recently they have tested some innovative financial instruments (e.g. voucher aids) and some projects have been activated for the implementation of various tools to support the R&I planning.
As a central objective of its current programme, the Lombardy Region identifies the competitiveness strengthening of the regional economy. To achieve this the main contribution comes from aspects related to the promotion of innovation and success of the knowledge economy, complemented by action in support of regional competitiveness and sustainable development. In particular, we have identified four priority areas: Innovation and Knowledge Economy, Energy, Sustainable Mobility, Protection and Enhancement of Cultural and Natural Heritage.

The innovation policy thus provides a strategic tool of intervention and are divided into two levels of policies: policies on cross-acting mechanisms for the creation and circulation of knowledge and innovation, portfolio policies are translated into actions times to deliver an integrated package of interventions on all sectors / technology areas of the Region. In particular:

- Policy focus selectively focused on technological/sectoral excellence and based on large projects so as to promote additionality and specificity of the Tool Kit. They are aimed at achieving excellence in research and industry.
- Multi-sectoral policies oriented to the diffusion of innovation across industries, entrepreneurial creativity and the maintenance of biodiversity. They are therefore designed to promote connections between different fields in order to maintain the richness of the areas in which the region and allow the recombination of innovations.

Support measure

- [ITALIA](#)
- [NORD-OVEST](#)
- Region Lombardia
- NUTS Code ITC4

Support Measure

Title of measure

Vouchers for services in research and development and enhancement of human capital for promoting technological innovation of micro, small and medium enterprises in Lombardy

Full title

Voucher per servizi in ricerca e sviluppo e valorizzazione del capitale umano per favorire processi di innovazione tecnologica delle micro, piccole e medie imprese lombarde

Duration

From: 2008
To: 2011

Policy objectives

- 2.3.1. Direct support of business R&D (grants and loans)
- 3.2.1. Recruitment of researchers (e.g. fiscal incentives)
3.2.2. Career development (e.g. long-term contracts for university researchers)

Presentation of the measure

The objective of the measure is to encourage the development of SMEs in innovation and enable SMEs in Lombardy to acquire expert advice in several areas of innovation. The initiative includes the allocation of vouchers to micro, small and medium-sized enterprises for the purchase of consulting services or to support the costs of staff development. The measure allows interventions in support of:

- technological innovation, understood in the broad sense of the word;
- conscious and rational use of energy sources and environmental protection;
- innovation in workers health and safety;
- viability assessments;
- support the enhancement of human capital.

Keywords

- Small and medium-sized enterprises
- Innovation vouchers

Budget, source and type of funding

Currency: EUR

Source of funding 2010
National public funds
Regional public funds 3,000,000
EU Structural funds  7,000,000
Private funds
Other
Form of funding provided

- Grants

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

It is too early to judge the success of the measure (e.g results of first call for proposals still not known).

Evidence of outcomes based on evaluation and other evidence

There is not available information yet
Do's and Don'ts

Make sure that the eligibility of the entire region does not result in dispersion of resources through the development of a selectivity concept that concentrates only in the relationship between strong and weak areas. Identify the local "excellence" (a university department, business innovative technology park, etc.) and define with them a set of pilot projects including the transfer of results to the marginal areas of region to be used as show cases at mid-term.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

No

Support measure

- ITALIA
- NORD-OVEST
- Region Lombardia
- NUTS Code ITC4

Support Measure

Title of measure
New entrepreneurship

Full title
Nuova imprenditorialità

Duration

From: 2009
To: 2010

Policy objectives

- 4.3.1. Support to innovative start ups incl Gazelles
- 5.1.1. Support to the creation of favourable innovation climate (e.g. awareness campaigns)
- 3.2.2. Career development (e.g. long-term contracts for university researchers)
Presentation of the measure

The Lombardy Region promotes the new youth and women entrepreneurship through the provision of soft loans. The main beneficiaries of funding are: new individuals and families business and/or incorporated businesses formed as a company and registered in the Register of Companies, group practices and professional societies established from no more than 12 months from the date of application. Companies operating in manufacturing and services are admitted to the benefits. The investment must be made in Lombardy.

Eligible costs:

- costs for technical and engineering adjustments of the main office;
- acquisition of new and used equipment;
- costs related to start the franchise business;
- costs for planning and implementation of a corporate website;
- rental of business main office, purchase of vehicles strictly necessary for the performance of the production cycle (excluding the means to engage in road haulage), new or used;
- licensing of economic exploitation, industrial patents, software.

Keywords

- Gazelles
- Start-ups/spin-offs

Budget, source and type of funding

Currency: **EUR**

**Source of funding** 2009
National public funds
Regional public funds 20,000,000
EU Structural funds
Private funds
Other

Form of funding provided

- Subsidised loans (including interest allowances)

Policy learning

**Extent to which the measure can be considered as a success and worthy of policy learning**

There has been a positive response by beneficiaries to the measure (e.g. over-subscribed in terms of requested versus available budget) but it is too early to judge results or impact

**Evidence of outcomes based on evaluation and other evidence**
There is not available information yet

**Do's and Don'ts**

Strengthen cooperation between businesses and between businesses and public institutions research/higher education, with the goal of creating teams of excellence regional and trans. Promote exchanges of experiences for learning on policies between the regions and strengthen the diffusion of good practices. Encourage the use of new financial instruments for innovation, involving the financial system in the sharing of risk assumed by performing SMEs intensive research. Provide core technical evaluation/selection of projects and institutionalise procedures for monitoring and evaluation.

**This measure is recommended as an example of regional good practice to policy-makers from other regions:**

No

**Support measure**

- **ITALIA**
- **NORD-OVEST**
- Region Lombardia
- NUTS Code ITC4

---

**Support Measure**

**Title of measure**

Innovative projects in the fields of energy-environment, food, health and advanced manufacturing

**Full title**

Progetti innovativi nei settori energia-ambiente, agroalimentare, salute e manifatturiero avanzato

**Duration**

From: 2009
To: 2011

**Policy objectives**

- 2.3.1. Direct support of business R&D (grants and loans)
• 4.1.1. Support to sectoral innovation in manufacturing
• 4.2.2. Support to organisational innovation incl e-business
• 2.2.2. Knowledge Transfer

Presentation of the measure

The aim of the measure is the competitiveness growth of the production system by promoting research processes, applied research in collaboration with companies and research centres, experimental development and technological innovation. The measure is aimed at private sector and provides a budget of €20m. The objective of this measure is:

• promoting research processes, with particular attention to human capital;
• promoting applied research, technological innovation and technology transfer even through collaboration between public and private research centres, universities and enterprises;

promoting the pre-competitive or experimental development and innovative organization. Research projects should be directed to initiatives intended to develop innovative content/methods/procedures; initiatives intended to adapt and integrate innovative results produced in previous experiences; initiatives intended to compare skills and innovative approaches.

Keywords

• Science-industry cooperation
• Eco-innovation

Budget, source and type of funding

Source of funding 2009
National public funds
Regional public funds 5,000,000
EU Structural funds 15,000,000
Private funds
Other

Form of funding provided

• Grants
• Subsidised loans (including interest allowances)

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

There has been a positive response by beneficiaries to the measure (e.g. over-subscribed in terms of requested versus available budget) but it is too early to judge results or impact

Evidence of outcomes based on evaluation and other evidence
There is not available information yet

**Do's and Don'ts**

It is essential that the Region define a strategy for Research, Innovation and Society. Define (if not already done) and strengthen an institutional partnership "targeted" with local government authorities and with the Ministry of Research and consolidate a specific social-economic partnership. Identify the local "excellence" (a university department, business innovative technology park, etc.) and define with them a set of pilot projects including the transfer of results to the marginal areas of region to be used as show cases at mid-term. Introduce specific projects for the dissemination of research results funded with the structural funds, and encourage to transform these projects results into market.

**This measure is recommended as an example of regional good practice to policy-makers from other regions:**

No

**Support measure**

- **ITALIA**
- **NORD-OVEST**
- Region Lombardia
- NUTS Code ITC4

**Support Measure**

**Title of measure**

Supporting processes of patenting of micro, small and medium enterprises in Lombardy

**Full title**

Sostegno ai processi di brevettazione delle micro, piccole e medie imprese lombarde

**Duration**

From: 2010
To: 2010

Policy objectives
5.3.2. Consultancy and financial incentives to the use of IPR
2.3.1. Direct support of business R&D (grants and loans)

Presentation of the measure

With this measure the Lombardy Region aims to promote and support the processes for obtaining Italian patent, European patent and/or other international patents by the micro, small and medium enterprises in Lombardy in order to maintain a high level of scientific and technological development of the productive system in Region.

The main beneficiaries are micro, small and medium enterprises and private research centres, provided that they are established in the form of micro, small or medium enterprise and established in Lombardy.

Shall be eligible all expenses incurred in the procedures for applying for an Italian, European and/or other international patents. In particular:

- direct costs incurred in respect of EPO or of similar offices in countries not party to the European Patent Convention;
- advice from professional firms or professionals in the sector;
- translation costs for the nationalisation of a European and/or international patent;
- cost of internal staff devoted to handling of the patent.

The total funding provided by the call is €3m Euros.

Keywords

- Small and medium-sized enterprises
- Intellectual property rights

Budget, source and type of funding

Currency: EUR

Source of funding 2010
National public funds
Regional public funds 3,000,000
EU Structural funds
Private funds
Other
Form of funding provided

- Grants

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning
It is too early to judge the success of the measure (e.g. results of first call for proposals still not known).

**Evidence of outcomes based on evaluation and other evidence**

There is not available information yet

**Do's and Don'ts**

Promote exchanges of experiences for learning on policies between the regions and strengthen the diffusion of good practices. Introduce tools (technical assistance, for example) to increase participation of regional actors to other kind of opportunities (e.g. Framework Programme). Promote the opening, the cross-border and regional initiatives and transnational cooperation to strengthen the capacity of research and Innovation.

**This measure is recommended as an example of regional good practice to policy-makers from other regions:**

No

**Support measure**

- ITALIA
- NORD-OVEST
- Region Lombardia
- NUTS Code ITC4

**Support Measure**

Title of measure

Call “Innovation and Energy Efficiency" for the allocation of grants for the purchase of machinery

**Full title**

Bando "Innovazione ed efficienza energetica" per l'assegnazione di contributi per l'acquisto di macchinari

**Duration**
From: 2010  
To: 2010

Policy objectives

- 1.3.2. Horizontal measures in support of financing

Presentation of the measure

The call provides for the allocation of grants to micro and small enterprises for the purchase of machinery/equipment/new appliances, technologically advanced; their use, through a reduction in enterprises specific energy consumption and the promotion of more high standards of energy efficiency, could produce reductive effects of the impact of production on the environment. Beneficiaries are micro and small enterprises with at least one employee with a contract of employment. There are two measures:

- energy efficiency-substitution; investments for replacement of machinery/equipment/appliances that must still be in operation at the local unit of the company, the opening date of the call. The contribution is 50% of eligible costs, up to a maximum of €15,000;
- innovation - new purchase: investments for purchase of machinery/equipment/new appliances. The contribution is equal to 30% of eligible costs up to a maximum of €10,000.

Keywords

- Research infrastructure
- Eco-innovation

Budget, source and type of funding

Currency: EUR

Source of funding 2010
National public funds 20,000,000
Regional public funds 125,000,000
EU Structural funds
Private funds
Other

Form of funding provided

- Other

Policy learning

Extent to which the measure can be considered as a success and worthy of policy learning

It is too early to judge the success of the measure (e.g results of first call for proposals still not known).
Evidence of outcomes based on evaluation and other evidence

There is not available information

Do's and Don'ts

Reviewing the whole system of regional incentives to businesses, finalising innovation. Encourage the use of new financial instruments for innovation, involving the financial system in the sharing of risk assumed by performing SMEs intensive research. Strengthen cooperation between businesses and between businesses and public institutions research / higher education, with the goal of creating teams of excellence regional and trans.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

No

Support measure

- ITALIA
- NORD-OVEST
- Region Lombardia
- NUTS Code ITC4

Support Measure

Title of measure
Funding for SMEs in Lombardy enterprises for innovation

Full title
Finanziamenti alle imprese Pmi della Lombardia per innovazione

Duration

From: 2007
To: 2010

Policy objectives
Presentation of the measure

The measure provides funding to SME companies in Lombardy for innovation and for the realization of processes of technical innovation, organization and management, in order to strengthen skills and capabilities of their human capital and, simultaneously, enable adequate financial instruments in the management of innovation processes.

The initiative has two types of measures.

Innovation projects:

- products and/or services development, with outstanding innovation;
- introduction of innovative production processes compared to the existing production process;
- introduction of new organizational, management and control models, strongly focused on the use of ICT.
- contributions to international patent applications, assistance and technological consultancy:
  - support for an international patent;
  - assistance and advice for technology and computerisation.

The contribution is free grant by 50% of eligible expenses up to a maximum of €7,000 to apply for a patent, and €14,000 for the demand for more patents.

Keywords

- Early stage-financing
- Entrepreneurship

Budget, source and type of funding

Currency: EUR

Source of funding 2007
National public funds
Regional public funds 11,000,000
EU Structural funds
Private funds
Other

Form of funding provided

- Grants

Policy learning
Extent to which the measure can be considered as a success and worthy of policy learning

There has been a positive response by beneficiaries to the measure (e.g. over-subscribed in terms of requested versus available budget) but it is too early to judge results or impact

Evidence of outcomes based on evaluation and other evidence

There is not available information

Do's and Don'ts

It is essential that the Region define a strategy for Research, Innovation and Society. Define (if not already done) and strengthen an institutional partnership "targeted" with local government authorities and with the Ministry of Research and consolidate a specific social-economic partnership. Identify the local "excellence" (a university department, business innovative technology park, etc.) and define with them a set of pilot projects including the transfer of results to the marginal areas of region to be used as show cases at mid-term. Introduce specific projects for the dissemination of research results funded with the structural funds, and encourage to transform these projects results into market.

This measure is recommended as an example of regional good practice to policy-makers from other regions:

No

Policy document

- ITALIA
- NORD-OVEST
- Region Lombardia
- NUTS Code ITC4

Policy Document

Regional Operative Programme ERDF 2007-13 Lombardy
The Regional Operational Programme (ROP) Lombardy, funded by the European Regional Development Fund (ERDF) under the regional competitiveness and employment objective, is the main multi-annual programming document.

It is structured according to strategic priorities and objectives that the Region intends to pursue in 2007-2013. The pursued aims are to strengthen the competitiveness and dynamism of regional economy and to improve the social, economic and territorial cohesion within the Region.

The guidelines of the ROP provide tools and interventions capable of responding to global challenges and developing the conditions in order to compare with other international economies.

In particular, the mission of ROP Competitiveness is the strengthening of the regional actions related to environmental issues and territorial cohesion. The program identifies four key areas of intervention, plus one dedicated to technical assistance:

- Innovation and knowledge economy;
- Energy;
- Sustainable mobility; and
- Protection and enhancement of natural heritage and culture.

Year of publication

2007

Link to website

Link: [http://www.regione.lombardia.it](http://www.regione.lombardia.it)

Policy document

- **ITALIA**
- **NORD-OVEST**
- Region Lombardia
- NUTS Code ITC4
The Regional Implementation Programme (PAR) is the tool to provide detailed rules for implementing the strategy and allow verification of consistency and effectiveness from the Department Development and Cohesion Policies. This document defines the framework of the strategy, objectives to be achieved, the lines of action and regional activities, the details of the technical content of the co-financing operations, the eligible costs, administrative, technical and financial procedures, outlines ways of governance, implementation and financial planning for the entire program.

There are two mixed priority themes, in addition to technical assistance:

- to strengthen networks and services, mobility and security for sustainable development (€526.5m) by concentrating resources from FAS into infrastructures operations. The program allocates over 62% of resources to infrastructure for mobility and to ensure security in an integrated way.

- to improve competitiveness through knowledge development and welfare (€300m) through investment in human capital, research, social welfare and cultural heritage.

Year of publication
2008

Link to website

Link: http://www.regione.lombardia.it ...
Policy Document

Regional Law No 1/2007, Competitive tools for businesses in Lombard territory

Legge Regionale 2 febbraio 2007, N. 1 Strumenti di competitività per le imprese e per il territorio della Lombardia

Content

It's the most recent law of the Lombardy Region for productive activities. It consists of 8 items, which promote the competitive growth of Lombard productive system and social and territorial context, in a manner consistent with EU guidelines and regional legislation on labour market, vocational training and education.

The specific purposes of the document are:

- enhancement of human capital;
- research and technological innovation;
- growth and development of enterprises;
- internationalisation;
- business crisis; and
- administrative simplification.

In addition to the review of financial support to companies, the law works on the front of the simplification of procedures. They are dedicated to simplifying two of the eight articles of the new law, under which the State aims to recover business at least one billion euros per year in lower administrative costs.

Year of publication

2007

Link to website

Link: http://www.industria.regione.l...

Organisation

- ITALIA
- NORD-OVEST
- Region Lombardia
- NUTS Code ITC4
Organisation

Fondazione Politecnico

Link: http://www.fondazionepolitecnico.it

Piazza Leonardo da Vinci, 32
Milan,
20133

Mission

Fondazione Politecnico di Milano is a responsive and operational instrument set up by the Polytechnic of Milan and by major Founder Members to contribute to economic and cultural growth, in order to favour innovation in business and provide incentives for competitiveness at international level, as well as to drive the creation and dissemination of new knowledge and its transfer to industry and to the tertiary sector.

Activities

Fondazione Politecnico di Milano promotes and supports the activity of the Polytechnic of Milan, by favouring collaborative projects between the Polytechnic and enterprise & public administration that aim to transfer the technological and scientific innovation resulting from academic study to enterprise & PA. The research areas of the Polytechnic of Milan, to which the Foundation refers and on which the economic community can draw to transform scientific innovation into industrial applications, are the following:

- Aeronautics and space; Biotechnologies and health;
- Chemistry, materials and nanotechnologies;
- Constructions, infrastructures and the countryside;
- Cultural heritage; Energy; Environment;
- Industrial products and processes;
- Information society technologies; Mathematics;
- People, enterprise and governance;
- Physics; and
- Transport.

The main activities can be organized into three cardinal points:

- support for the creation of new, high-technology enterprise;
- implementation of cooperative projects at European level;
- construction of the Science and Technology Park at the Bovisa campus in Milan.
Mission

Cestec is a Centre for Technological Development, Energy and Competitiveness. The organisation has been operating for 30 years to spread the culture of innovation, to activate internationalisation channels and to promote the responsible use of energy and the environment.

Cestec is a company wholly owned by Lombardy Region and work in full harmony with regional government action, to support the work of small and medium Lombard enterprises with different services and projects.

Activities

Cestec promotes medium to long-term interventions aimed at increasing the competitiveness of industry and the overall production system. The organisation is also active in energy efficiency, alternative energy sources and in the proper management of existing thermal power plants.

Innovation-oriented activities are:

- bringing enterprises closer to technological development and innovation issues;
- creating a system where different actors (enterprises, universities, research centres, institutions) participate actively in the implementation of innovative processes;
- improving and strengthening the innovative potential of companies providing technology transfer services;
- stimulating the diffusion of technological progress with interventions aimed at the birth and growth of business networks; and
- promoting the competitiveness of industrial clusters, networks and various forms of enterprise aggregation.
In the context of internalisation, the main activities are:

- technical assistance to internationalisation initiatives;
- planning of initiatives for the internationalisation of SMEs through the establishment/management of regional calls (Law Feb. 2, 2007, 1); and
- identification of the Region's priority issues.

Activities of Community Initiatives planning:

- transfer of technological and productive know-how and adherence to European and/or international network and/or platforms;
- accompaniment of the Region and Lombardy businesses on European subsidised projects (facilities and contributions provided by EU programs);
- selection of priorities and the actions of European programs that are consistent with the strategic themes of regional planning with regard to competitiveness and energy;
- Activation of national and international partnerships aimed at participation in European calls; and
- support the national contact point of the "Alpine Space Programme 2007-2013".

**Organisation**

- **ITALIA NORD-OVEST**
- Region Lombardia
- NUTS Code ITC4

---

**FINLOMBARDA**

FINLOMBARDA Spa

Link: [http://www.finlombarda.it](http://www.finlombarda.it)

piazza Belgioioso 2

Milan,

20121

Mission

Finlombarda Spa is a public company, totally participated by the Lombardy Region, whose institutional task is to support regional policies for the economic and social development of the Lombardy territory, through financial and management tools and initiatives.
Through the structuring and activation of evolved financing instruments, it shows the Regional actions guidelines, both in the economic and financial fields, a technical contribution of high qualification, as a financial intermediary specialised in two fundamental development areas of the Lombardy economic and social system, that is the companies and infrastructures sectors.

Its special role of "territorial financial operator" is well represented by both the organization of financial initiatives for SMEs, and the carrying out of projects concerning infrastructures and public services.

Activities

Finlombarda historically operates as a regional advisor for new facilitating tools design.

The company is the subject manager and the concessionaire of many financial instruments for business facilitation. It conducts activities of preliminary investigation, management and administration of financial intervention.

Finlombarda provides advisory services and technical assistance to the government for new policies definition and implementation, for industrial development programs and for Research and Development (R&D) incentives.

Finlombarda is an in-house agency of the Lombardy Region and contributes to the achievement of economic and financial planning through a consolidated regional activity in the framework of communitary programs and projects aim to:

- support of Lombardy Region in identifying, developing and implementing programs and projects funded by the European Union;
- direct participation in project opportunities offered by EU calls for proposals and the management of projects eligible for funding; and
- participation to international networks to strengthen its international role as an actor credited in the areas of innovative finance for companies and infrastructure.
Appendix D Explanation of factors of Innovation Performance, Governance and Policy

D.1 Innovation Performance Factors

After having normalised all indicators to a common range of 0 to 1, a factor analysis or principle component analysis has been used to identify the main patterns, reducing the eight indicators into three main factors or components of innovation performance. The resulting factors can also be seen as composite or summary indicators.

<table>
<thead>
<tr>
<th>Innovation performance factors</th>
<th>Innovative entrepreneurship</th>
<th>Technological innovation</th>
<th>Public knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-technological innovators</td>
<td>0.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technological innovators</td>
<td>0.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Higher education R&amp;D</td>
<td>0.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-R&amp;D innovation expenditure</td>
<td>-0.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business R&amp;D</td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patents</td>
<td>0.71</td>
<td></td>
<td>0.89</td>
</tr>
<tr>
<td>Government R&amp;D</td>
<td></td>
<td></td>
<td>0.64</td>
</tr>
<tr>
<td>Tertiary educated</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The first factor can be labelled as ‘Innovators or Innovative entrepreneurship’. It is mostly based on a high score on the share of both non-technological innovators (those introducing market- and or organisational innovations) as well as technological innovators (product and or process innovations) among SME’s in the region. This factor therefore identifies those regions where a large share of all SME’s are innovators.

The second factor is labelled ‘Technological innovation’ because it mostly refers to patent generating business R&D with relative low score on non-R&D innovation expenditures as share of their turnover. In regions where this factor shows a high score, technology generating firms are well represented.

The third factor is labelled ‘Public knowledge’. This component of innovation performance is based on the co-location of R&D expenditures at government research institutes and to a lesser extent on the share of population with tertiary education.

D.2 Governance Factors

The first distinctive governance characteristic is labelled ‘Autonomy’. For regions where the regional innovation strategy is politically binding and containing fixed targets, we also find the highest degree of both general institutional autonomy as well as autonomy regarding innovation policy. In essence, formalisation contributes to the autonomy factor and autonomy is associated with an assessment of innovation policy as effective.

The second distinctive characteristic is named: ‘Relying on Structural Funds’. It is based on the similarity in the answers regarding the strategic relevance and significance in terms of funding of EU Structural Funds for regional innovation policy. At the same time these regions report a low level of cooperation with other regions and the innovation system can be characterised as more public-driven.
A third distinctive factor is made up of the similar answers to the two other questions on coordination, namely the existence of vertical and horizontal coordination mechanisms. Finally, a fourth factor is labelled ‘Central, top-down’ because they combine a centralised policy delivery and top-down approach in policy design.

<table>
<thead>
<tr>
<th>Governance Factors</th>
<th>Autonomy</th>
<th>Relying on Structural Funds</th>
<th>Coordination mechanisms</th>
<th>Central, top-down</th>
</tr>
</thead>
<tbody>
<tr>
<td>- How formally binding is the regional innovation strategy document on the regional public authorities?</td>
<td>.84</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- The general degree of institutional autonomy of the regional authorities in the region</td>
<td>.73</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- To what degree is priority setting, design and monitoring of innovation policy subject to the design and of formalisation of the general set-up of institutions tasked with the development of innovation policy in your region (1=informal, 3= formal)</td>
<td>.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Degree of institutional autonomy of regional authorities in your region with regard to the design and implementation of regional innovation policies</td>
<td>.68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- How effective is the regional governance process?</td>
<td>.58</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- The relevance of the EU Structural Funds for regional innovation policy, for strategy development</td>
<td></td>
<td>.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- The significance of the EU Structural Funds for regional innovation policy, in terms of funding</td>
<td></td>
<td>.70</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Inter-regional co-ordination projects and mechanisms (e.g. co-operation between agencies in different regions)</td>
<td></td>
<td>-.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Characterise the regional innovation system according to key drivers of innovative activities (1=private, 2=different, 3=public)</td>
<td></td>
<td>.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Horizontal coordination projects and mechanisms between regional players (e.g. inter-departmental working groups, council or multi-sector platforms)</td>
<td></td>
<td></td>
<td>.80</td>
<td></td>
</tr>
<tr>
<td>- Vertical co-ordination projects and mechanisms between local, regional, national and European authorities involved in designing or implementing innovation policy</td>
<td></td>
<td></td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td>- Regional system of policy delivery is centralised (3), mixed (2), or de-centralised (1)</td>
<td></td>
<td></td>
<td>.81</td>
<td></td>
</tr>
<tr>
<td>- Design of regional innovation policies follows a top-down approach ( as opposed to bottom-up)</td>
<td></td>
<td></td>
<td>.80</td>
<td></td>
</tr>
</tbody>
</table>

D.3 Policy Factors

The first distinctive factor regarding the innovation policies is labelled ‘Public innovation policies’. OA high contribution to this factor comes from the survey.
questions regarding: policies for public sector innovation, for open innovation, public procurement, and theme based policies aiming at societal goals.

The second policy factor is labelled: ‘Demand & service innovation policy’ because of the co-existence of demand-side policies and service innovation policies.

The third policy factor is named: ‘Cluster & S-I partnership policy’ since it is based on the frequent combination of Cluster policies and policies promoting new forms of public-private-partnerships for Science-Industry (S-I) co-operation and in addition the implementation of eco-innovation policies contributes to this factor.

The fourth factor is labelled ‘Research supply policy’ because it is based on the positive answers to the question on supporting research efforts (the supply side), in combination with an opposite negative answer to the question on ‘market and innovation culture (which is more on the demand side).

‘Policy making support’ is the name we have given to the fifth policy, similar to the main indicator. The last policy factor is ‘HR, creation & growth innovators’ which combines human capital development with policy aimed at creation and growth of innovative firms.

<table>
<thead>
<tr>
<th>Innovation Policy factors</th>
<th>Public innovatio n policies</th>
<th>Demand &amp; service innovatio n policy</th>
<th>Cluster &amp; S-I partnership policy</th>
<th>Research supply policy</th>
<th>Policy making support</th>
<th>HR, creation &amp; growth innovators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Policies for public sector innovation</td>
<td>.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policies for open innovation</td>
<td>.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public procurement policies</td>
<td>.64</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Theme-based policies aimed at broader societal goals</td>
<td>.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand-side policies</td>
<td>.79</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policies for innovation in services</td>
<td>.50</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support for the internationalisation of innovation policy.</td>
<td>.47</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cluster policies</td>
<td>.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Policies promoting new forms of public-private-partnerships for science-industry co-operation</td>
<td>.61</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eco-innovation policies</td>
<td></td>
<td></td>
<td></td>
<td>.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation related tax policies</td>
<td></td>
<td></td>
<td></td>
<td>.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support research efforts</td>
<td></td>
<td></td>
<td></td>
<td>.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market and innovation culture policies</td>
<td></td>
<td></td>
<td></td>
<td>-.62</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support to policy making and horizontal policies</td>
<td></td>
<td></td>
<td></td>
<td>-.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support human capital development</td>
<td></td>
<td></td>
<td></td>
<td>.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support creation and growth of innovative enterprises</td>
<td></td>
<td></td>
<td></td>
<td>.67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Appendix E Statistical data

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Lombardia (2000)</th>
<th>Lombardia (2008 or most recent)</th>
<th>EU 27 (2008 or most recent)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Per Capita GDP (in Current EUR)</strong></td>
<td>27,524.9</td>
<td>32,896.6 (2006)</td>
<td>25,131.9</td>
</tr>
<tr>
<td><strong>Growth of Regional per Capita GDP (in %)</strong></td>
<td>6.2</td>
<td>2.4 (2006)</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Unemployment Rate (in %)</strong></td>
<td>4.4</td>
<td>3.7</td>
<td>7</td>
</tr>
<tr>
<td><strong>Gross Expenditure on R&amp;D (GERD; in current EUR)</strong></td>
<td>2,792.5</td>
<td>3,345 (2005)</td>
<td>237,000.2</td>
</tr>
<tr>
<td><strong>Share of Business Expenditure on R&amp;D in GERD (in %)</strong></td>
<td>74</td>
<td>71.8 (2005)</td>
<td>63.9</td>
</tr>
<tr>
<td><strong>Share of Population Involved in Life-long Learning (in %)</strong></td>
<td>3.44</td>
<td>5.95</td>
<td>9.34</td>
</tr>
<tr>
<td><strong>Non-R&amp;D innovation expenditures of all enterprises as a percentage of turnover (normalised scores within a 0 (lowest) to 1 (highest) range)</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>0.41 (2006)</td>
</tr>
</tbody>
</table>

Source: Eurostat and Community Innovation Survey
Appendix F RIM survey responses
<table>
<thead>
<tr>
<th>Lombardia (ITC4)</th>
<th>Average</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please indicate the governance level that is most important for the design and implementation of innovation policy in the region (1 = regional level, 2 = national level, 3 = sub-regional level)</td>
<td>1</td>
<td>1.52</td>
</tr>
<tr>
<td>Please assess the general degree of institutional autonomy of the regional authorities in the region (1 = regional authority is an administrative appointee of the national government, 2 = regional authority including elected council but no legislative powers and no or minor tax raising powers, 3 = federated entity with legislative power in some but not all fields, limited or no tax raising powers)</td>
<td>3</td>
<td>2.11</td>
</tr>
<tr>
<td>Please assess the degree of institutional autonomy of regional authorities in your region with regard to the design and implementation of regional innovation policies (1 = very low, 2 = low, 3 = average, 4 = high, 5 = very high)</td>
<td>4</td>
<td>3.10</td>
</tr>
<tr>
<td>The degree of regional innovation policies follows a (1 = bottom-up approach, 2 = input from both sides, 3 = top-down approach, 4 = strong top-down approach)</td>
<td>2</td>
<td>2.25</td>
</tr>
<tr>
<td>To what degree is priority setting, design and monitoring of innovation policy subject to the design and formalisation of the general set-up of institutions tasked with the development of innovation policy in your region (1 = informal, 2 = mixed, 3 = formal)</td>
<td>2</td>
<td>2.19</td>
</tr>
<tr>
<td>Is there a regional innovation strategy in the form of a published document (1 = yes, 2 = no)</td>
<td>1</td>
<td>1.54</td>
</tr>
<tr>
<td>How formally binding is this document on the regional public authorities? (1 = an own initiative document of a non-public body or partnership with no binding constraints on regional authorities, 2 = a ‘pact’ signed by a broad-based public-private partnership, 3 = a politically binding policy containing fixed targets)</td>
<td>3</td>
<td>2.21</td>
</tr>
<tr>
<td>Please indicate if there are horizontal coordination projects and mechanisms between regional players (e.g. inter-departmental working groups, council or platforms with actors from different sectors): (1 = not yet very developed, 2 = somewhat developed, 3 = quite well developed)</td>
<td>3</td>
<td>2.26</td>
</tr>
<tr>
<td>Please indicate if there are inter-regional co-ordination projects and mechanisms (e.g. co-operation between agencies in different regions) (1 = not yet very developed, 2 = somewhat developed, 3 = quite well developed)</td>
<td>3</td>
<td>1.88</td>
</tr>
<tr>
<td>Please indicate if there are vertical co-ordination projects and mechanisms between local, regional, national and European authorities involved in designing or implementing innovation policy (1 = not yet very developed, 2 = somewhat developed, 3 = quite well developed)</td>
<td>3</td>
<td>2.02</td>
</tr>
<tr>
<td>Please characterise the regional innovation system according to key drivers of innovative activities (1 = private-driven, 2 = mixed, 3 = public-driven)</td>
<td>2</td>
<td>2.26</td>
</tr>
<tr>
<td>Please indicate if the regional system of policy delivery is centralised or de-centralised (1 = rather decentralised, 2 = mixed, 3 = rather centralised)</td>
<td>2</td>
<td>2.47</td>
</tr>
<tr>
<td>Please indicate the significance of the EU Structural Funds for regional innovation policy, in terms of funding (1 = &lt;10%, 2 = 11-24%, 3 = 25-49%, 4 = 50-75%, 5 = &gt;75%)</td>
<td>2</td>
<td>2.06</td>
</tr>
<tr>
<td>Please indicate the relevance of the EU Structural Funds for regional innovation policy, for strategy development (1 = very low, 2 = low, 3 = average, 4 = high, 5 = very high)</td>
<td>3</td>
<td>3.27</td>
</tr>
<tr>
<td>Is there a specific Structural Funds' regional operational programme for the region (1 = yes, 2 = no)</td>
<td>1</td>
<td>1.10</td>
</tr>
<tr>
<td>If 1, is this Structural Funds ROP administered at the regional level (1 = yes, 2 = no)</td>
<td>1</td>
<td>1.12</td>
</tr>
<tr>
<td>Involvement of the Region in Hot Innovation / RTDI Policy Topics (0 = none, 1 = planned, 2 = implemented)</td>
<td>2</td>
<td>1.09</td>
</tr>
<tr>
<td>Support for the internationalisation of innovation policy.</td>
<td>2</td>
<td>1.28</td>
</tr>
<tr>
<td>Cluster policies</td>
<td>2</td>
<td>1.21</td>
</tr>
<tr>
<td>Policies promoting new forms of public-private-partnerships for science-industry co-operation</td>
<td>2</td>
<td>0.68</td>
</tr>
<tr>
<td>Policies for open innovation</td>
<td>2</td>
<td>0.55</td>
</tr>
<tr>
<td>Demand-side policies</td>
<td>2</td>
<td>0.77</td>
</tr>
<tr>
<td>Policies for innovation in services</td>
<td>2</td>
<td>0.64</td>
</tr>
<tr>
<td>Policies for public sector innovation</td>
<td>2</td>
<td>0.59</td>
</tr>
<tr>
<td>Public procurement policies</td>
<td>0</td>
<td>0.27</td>
</tr>
<tr>
<td>Innovation related tax policies</td>
<td>2</td>
<td>0.80</td>
</tr>
<tr>
<td>Eco-innovation policies</td>
<td>2</td>
<td>0.72</td>
</tr>
<tr>
<td>Theme-based policies aimed at broader societal goals</td>
<td>2</td>
<td>0.72</td>
</tr>
<tr>
<td>Priorities on which regional innovation policy is most strongly focused (1 = very low, 2 = low, 3 = average, 4 = high, 5 = very high)</td>
<td>3</td>
<td>2.84</td>
</tr>
</tbody>
</table>