



RIP-WATCH

ANALYSIS OF THE REGIONAL DIMENSIONS OF INVESTMENT IN RESEARCH

CASE STUDY REGIONAL REPORT: SICILY (ITALY)

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Case Study Regional Report on the Regional Dimensions of Investment in Research

OBJECTIVE

The main objective of this regional case study report is to provide a better understanding of the structural techno-economic characteristics of the analysed European region, to present the key factors conducive to increased investment in R&D and to identify key R&D policy challenges the region is facing.

BACKGROUND

In partnership with DG Research, the Institute of Prospective Technological Studies of the Joint Research Centre (JRC-IPTS) has been implementing a watching brief on policy developments aimed at promoting both private and public investment in R&D (RIP-WATCH). A stated aim of this policy watch activity is to take stock of developments aimed at increasing investments in R&D in the European regions.

In the design phase of the activity, a typology of the European regions was produced. A balanced mix of twenty regions was selected from each of the nine identified regional types representing fifteen member states of the European Union.

COVERED REGIONS

Phase 1		Phase 2	
1. Andalusia (ES)	2. Catalonia (ES)	11. Bavaria (DE)	12. Corsica (FR)
3. Carinthia (AT)	4. Crete (EL)	13. Emilia-Romagna (IT)	14. Etelä-Suomi (FI)
5. Dél-Dunántúl (HU)	6. Jihozápad (CZ)	15. Balearic Islands (ES)	16. Lorraine (FR)
7. Norte (PT)	8. Sicily (IT)	17. Midi-Pyrénées (FR)	18. Saxony (DE)
9. Styria (AT)	10. Wielkopolskie (PL)	19. Scotland (UK)	20. Västsverige (SE)

THE REPORTS

The regional reports are structured according to the following two interrelated dimensions of regional techno-economic systems:

- **Regional knowledge base**, including the research, technological development and innovation (RTDI) infrastructure, human resources, RTDI efforts and outcomes and knowledge transmission mechanisms in the region
- **Regional economic structure**, including the productive structure, regional clusters and networks, international position and financial capacities and instruments

Each report examines these dimensions from two points of view: their current state as reflected in a selected set of regional indicators and their policy context (i.e. policy framework, actors, objectives and instruments).

In addition to the regional case study reports, a **synthesis report** will be produced that combines and interprets the information contained in the case study reports, presents the strengths and weaknesses of the regions covered and the factors that determined the trajectories of development of their R&D and innovation capacities, and discusses the main R&D and innovation challenges identified.

JRC-IPTS launched the first phase of the activity in June 2006 with the contribution of the ERAWATCH Network. The work has been undertaken between June and December 2006 by a project team led by LOGOTECH S.A. (EL) with the participation of iDeTra (ES), IKU Innovation Research Centre (HU), Institute of Fundamental Technological Sciences of the Polish Academy of Sciences (PL); Instituto de Estudos Sociais e Economicos (PT), Joanneum Research

InTeReg (AT), Nomisma (IT), Poznan University of Economics (PL), Technology Centre of the Czech Academy of Sciences (CZ), The Bigger Splash (ES) and Transdanubian Institute of Centre of Regional Studies of Hungarian Academy of Sciences (HU).

A first set of ten regional case study reports is now available on the ERAWATCH web-site at <http://cordis.europa.eu/erawatch/index.cfm?fuseaction=intService.home>

The second phase of the activity was launched in December 2006. A second set of ten regional case study reports and a synthesis report are expected to be available on the ERAWATCH web-site by October 2007.

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Abbreviations

MC	Management Committee
PM	Project Management
ToR	Terms of Reference
ANBERD	Analytical Business Enterprise Research and Development Database
BERD	Expenditure on R&D in the Business Enterprise Sector
EPO	European Patent Office
GBAORD	Government Budget Appropriations or Outlays for R&D
GDP	Gross Domestic Product
GERD	Gross Domestic Expenditure on R&D
GUF	General University Funds
HERD	Expenditure on R&D in Higher Education Sector
ISIC	International Standard Industrial Classification
IPTS	Institute of Prospective Studies, Seville, Spain
NACE	Statistical Classification of Economic Activities in the European Community
N.E.C	Not Elsewhere Classified
PPP	Purchasing Power Parity

1 Introduction

With a population of 5 017 212 inhabitants (31.12.2005) Sicily is the fourth most populous Italian region, and with a surface area of 25 710 km² is the largest island in the Mediterranean Sea. Sicily is the largest Italian region when taken together with Ustica, Pantelleria and the archipelagos of the Aeolian, Aegadean and Pelagian Islands.



The Region's average population density is 195.14 inhabitants per km² (192.39 in Southern Italy, 194.97 in Italy as a whole), but there are some differences between the inland and coastal zones, with the coasts being more densely populated.

On the whole, the Sicilian population is younger than the overall Italian population: in 2004 16.4% of the population was younger than 15 years (compared to 14.12% in Italy). The old age index (i.e. the percentage ratio between the population older than 65 and younger than 14 years) was 107.83% in 2004 (137.84% in Italy). The dependence index (i.e. the percentage ratio between people younger than 14 years plus those older than 65 years and people aged between 15 and 64 years) is higher in Sicily than in Italy (51.73% vs 50.57%). The replacement index is 92.74% in Sicily and 72.55% in Italy.

Because of its position in the middle of the Mediterranean Sea (only three kilometres from continental Europe and 130 kilometres from Africa) the Region is at the heart of geopolitical interests. The history of Sicily shows traces of foreign domination and cultures which have left their mark on both culture and architecture (50% of national cultural assets are to be found in Sicily).

Since National Unification, Sicily and Southern Italy have been regarded as areas lagging behind in development, raising much-discussed socio-economic questions at national level. Sicily's GDP per capita as a percentage of the EU average is only 72.3% (2003), while the Italian average is 106.6%.

The regional economy is mainly based on small enterprises. In 2001 96.8% of the local production units had fewer than 10 employees (100% had fewer than 200 employees).

The services sector is the most important in the regional economy and in 2005 it accounted for 79% of the total added value (68% in Italy). The industry sector (in the strict sense) contributed 10% to the total regional added value (whereas in Italy, industry's share is 24%). In the same

year, the construction sector accounted for 6% of the total added value both in Sicily and in Italy.

Finally, the agriculture, forestry and fishing sector contributed 5% to the regional added value (2% being the national average). Thanks to a favourable climate, the agricultural sector is witnessing growing specialisation of its products both in quantity and in quality (wine production, in particular).

The Sicilian regional GERD was €682m in 2004, 4.5% of the Italian total. The university sector accounted for 60% of total regional R&D expenditure (33% at national level), followed by the business enterprise sector (25% in Sicily, 48% in Italy), by public institutions (14% in Sicily, 18% in Italy) and, finally, by the private non-profit sector (1% in Sicily, the same as the national average).

In terms of human resources (personnel employed in the R&D sector) Sicily in 2004 accounted for 5% of the national total, corresponding in absolute terms to 8 166 individuals, mostly employed in the Sicilian universities (64%).

2 Regional Knowledge Base

2.1 Description of the regional knowledge base

2.1.1 Knowledge creation capacity

Sicily is placed **second among the southern Italian regions in terms of the extent of its public scientific resources**: 309 scientific institutions, of which 270 are university institutes and departments, the largest accumulation of academic structures in the whole *Mezzogiorno*, mainly concentrated in the metropolitan centres of Palermo, Messina and Catania (Annex, Table 1)¹. The personnel in public research services establishments amounted to 438 units (1 033 in Campania, the first region in the Mezzogiorno; 369 in Puglia, the third): 213 are researchers and 225 are technicians (Table 2).

The three Universities (Catania, Palermo and Messina) carry out almost all the activities and investments in the R&D sector, while the production system plays a marginal role. This fact is confirmed by the low level of private investment in R&D: the most recent survey provided by the National Institute of Statistics referred to 2004 levels and indicated that only 25% of total R&D expenditure (Italy 48%) and 20% of total R&D personnel (Italy 41%) come from the business enterprise sector (Tables 3 and 4). **In recent years the business sector shares have increased**, respectively, from 21% (expenditure) and 12% (personnel) in 2002. This is regarded as a positive sign in a region like Sicily, where the weight of the public sector is considered, in general, to be too large.

The high concentration of academic resources (first in Southern Italy) reflects the large number of academic staff, 4 827 units in 2004 comprising full and associate professors and researchers (Table 5). As far as the number of doctorates awarded is concerned, Sicily is in second place in Southern Italy (after Campania), with 7.3% of the national total (Table 6). The number of enrolled students is nearly 200 000 and **the Sicilian enrolment rate (36.0%) is lower than the national and Southern Italian averages** (Table 7). Nearly 21% of the total enrolled students are engaged in science and engineering programmes and this percentage has been quite stable since 2000 (Table 8). Around 38% of the total academic staff in Sicily's higher education institutes (HEIs) were involved in awarding science and engineering degrees; Sicily counts for 8% of the total national academic staff involved in awarding science and engineering degrees (Table 9).

According to the analyses conducted in drawing up the Regional Innovation Strategy (approved by the Regional Government in 2003), **nearly 50% of the graduates from Sicilian universities had problems in finding a job**; at the same time, Sicilian firms encountered difficulties in hiring qualified personnel. This means: a) the HE system is not in line with labour market requirements; b) there are insufficient accompanying measures for graduates. In terms of competitiveness, the Sicilian universities show a negative trend, with declining enrolments compared to the northern universities². The three universities are quite similar in terms of resources, students, courses offered, personnel and graduates (Messina is a little smaller than the others³).

The Sicilian universities' research budget amounted to €364m in 2000 (36% of total university expenditure), decreasing from the previous year; 0.55% of the GDP; 64% of total R&D expenditure. In Lombardia this budget amounted to €448m, in Campania to €376m (Table 10). According to the evaluations made for the Regional Innovation Strategy, exploitation of research results in economic terms is substantially lacking; there is a clear separation between research and innovation, with the first prevailing over the second.

¹ The national Operational Programme for Research 2000–2006 is the only source providing comparable data on regional knowledge infrastructures.

² The Attractiveness Index for Sicily was -0.3 in the Academic Year 1998/99 and -9.5 in 2002/2003 (source: Regional Document for the Cohesion Policy 2007–2013).

³ In terms of teaching staff, for example, Palermo had 1 917 units in 2002, Catania 1 580 and Messina 1 385.

The performance of the different universities can be measured through:

1. the number of research projects financed by the Ministry of Research;
2. the number of scientific publications;
3. their impact factors;
4. the number of patents.

As far as the first indicator is concerned, Sicily is not very competitive within the national framework (Palermo, in particular, with only 68 approved projects from 298 applications, 22.8%. The national percentage is 31%; for Catania this percentage is 22.6%).

As far as the number of publications is concerned, Catania appears to be the best performer on the Island, and this is confirmed by the analysis of the Impact Factors (Table 11).

The production of patents shows Catania to be in a good position within the national context (17 at the beginning of the 1990s, more than the Polytechnic in Milan), while Palermo and Messina lag substantially behind (only 2).

Thanks to Catania's performance, in 2002 Sicily was the leading region in the Mezzogiorno in terms of the number of patents (EPO) per million inhabitants: 12 (11 in Campania, 10 in Puglia). The national average was 83 (Table 12, a and b). Patenting activity is mainly concentrated in the electricity field.

The regional network of scientific structures includes:

- The CNR (National Research Council) centres (Palermo and Catania);
- The university departments (Palermo, Catania, Messina);
- Research centres and private laboratories:
 - the local ENEA establishments;
 - Sinergie Tecnologiche in Sicilia (SINTESI);
 - Centro per la Ricerca Elettronica in Sicilia (CRES);
 - Consorzio di Ricerca Filiera Lattiero Casearia;
 - Consorzio Catania Ricerche;
 - Istituto Regionale Vite e Vino;
 - Istituto Sperimentale di Cerealicoltura.

The Sicilian research institutes' research budget amounted to €25.5m (1998), nearly one third that of the leading region in Southern Italy (Campania) (Table 13). As for the universities, the geographical distribution of scientific knowledge is concentrated around three centres: Palermo, Catania and Messina.

The Regional Innovation Strategy notes that **the research teams are mostly oriented towards basic research** and therefore have few contacts with industry in general and with Sicilian industry in particular (small firms, traditional sectors). In the cases where there have been contracts with industry, the companies involved are generally "big names" and located everywhere in Italy. Different surveys (e.g. RITTS Sicily, 1996) highlight the **weak relations between many Sicilian companies and the research organisations**.

The analysis performed under the Regional Innovation Strategy reveals that the Sicilian research institutions' research fields generally follow the universities' disciplines and thus are not oriented towards applied research and engineering. However, some of the work done in electronics in Catania and in biology and space in Palermo may be considered to be emerging.

According to the Regional Innovation Strategy, **Sicily appears to be a very closed system**: it is the only region in Southern Italy where collaboration with external research centres is highly sporadic. Another problem is the continuous decline in capacities. The financial resources are decreasing, recruitment and replacement of equipment are almost at a standstill.

The presence of foreign capital in the Southern Italian regions is generally very weak: only 8.9% of the total (1.5% in Sicily) (Table 14). An exception is constituted by STMicroelectronics based in what is referred to as Etna Valley. ST Microelectronics started its production unit in

Catania in 1987; in 2000 nearly 200 firms worked within the ST system and nearly 22 multinational enterprises were based in the Valley. ST in Catania has engaged in long-standing collaboration with nearby universities, bringing together industry with academic research. ST collaborates with the University of Catania, the CNR and other institutions. The sectors involved are microelectronics and telecommunications. The district's global turnover is nearly €310m.

In 1987 ST and the University of Catania set up one of the major R&D labs in Europe; in 1990 ST, the University of Catania and the Consorzio Catania Ricerche set up SuperLab. The main site is spread over 140 000 m² and houses "M5", one of the world's most advanced production centres for memory products. Nearby, another new state-of-the-art wafer fab for memory products is nearing completion. Known as "M6", it will have a total floor space of 75 000 m², of which 10 500 m² will be dedicated to clean room areas.

Etna Valley is regarded at regional and national levels as a positive example of public-private collaboration. The new scheme of Technology Districts was inspired by this effective practice (with benefits for ST, the University and the local economy). Catania now hosts a Technology District for Microelectronics.

2.1.2 Knowledge diffusion capacity of the region

Except for the information reported in the Regional Innovation Strategy, very few statistics exist on the Region's knowledge-diffusion capacity.

The main structures in this field are:

- Parco Scientifico e Tecnologico della Sicilia (PSTS) (see below);
- Business Innovation Centre (BIC) SICILIA, with three incubators: Catania, with 19 hosted companies, Messina and Termini Imerese (under construction);
- APRE desk, non-profit association whose aim is to promote Italian participation in EC research programmes.

The rationale for creating a science park in Sicily was to set up a regional interface between the Sicilian actors and the Government. **The Science and Technology Park of Sicily** (PSTS <http://www.pstsicilia.org/>) is a joint-stock consortium company born from the association of research centres and of companies operating in different sectors of the Sicilian economy since 1991. Thanks to teamwork with the Universities of Palermo, Catania and Messina and to extensive knowledge of the local territory, the Park strives to act as an instrument for small and medium enterprises (SMEs) that helps facilitate their growth and increases their visibility and competitiveness in international markets. The PSTS's goals and priorities are: relationships with universities, enterprise development, raising the technological level of local enterprises, developing innovative research activities, attracting new investments (high-tech enterprises), and promoting an economic system based on knowledge and quality. Its main areas of interest include: agri-food production, advanced biology and its applications, conservation, exploitation and use of cultural and environmental resources, Information and Communication Technologies (ICT), analysis and monitoring of environmental risk, new technologies for production activities, and transport. The company's capital (€ 13 427 879) is held mainly by the Regional Government (88%). Human resources include 57 units (39 full time equivalents): 80% with degrees (10 with a PhD), 10 involved in management and 47 researchers.

Science and Technology Park of Sicily Investments (2002–2006)

25 research and innovation projects	€28m
3 training for research projects	€1.6m
8 higher education projects	€2.1

Spin-off activities are almost totally absent in the region. However, under the **SpinLAB Project** promoted by the University of Catania and Sviluppo Italia, an incubator for new ICT firms was recently set up, building on the potential of the Catania research system (University + ST, see above). Only Messina has activated its industrial liaison office, but with limited resources (1.5 full-time units).

Sicily is also the leader of one of the Technological Competence Centres promoted by the Ministry of University and Research in the transport sector⁴.

2.1.3 Knowledge absorption capacity of the region

As far as human resources are concerned, data on participation in lifelong learning activities show, on the one hand, Sicily consistently lagging behind the national average (Chart *Regional performance compared to national average*, Section 2.3) and, on the other, a positive trend since 1999 (Table 15).

The Sicilian share of human resources in S&T (11.3% of total population) is lower than the national level (14.7%, Table 16) but is gradually increasing. The situation in terms of human resources in S&T (as % of economically active population) is similar (the level in Sicily is lower than in Italy, but increasing, Table 17).

The emphasis on development of human capital as a means for increasing economic competitiveness is contained in the most recent regional (and national) programming documents (in particular those linked to the European Social Fund), and **is now producing some initial results** in terms of the share of the population involved in such initiatives.

2.2 Policy context

2.2.1 Policy framework and actors

The Italian innovation system consists of a large number of entities and is also very fragmented. **R&D and innovation policies are largely formulated at national level, where the main priorities are identified.** Consultation with stakeholders occurs on a regular basis both at national and regional levels, and there is a trend towards increasing stakeholder involvement in the process. The institutions and organisations that determine and shape the R&D and innovation system in Italy can be grouped into the following categories:

1) *Government and legislative bodies.* The central institutional point of reference for Italy's innovation system lies in three ministries:

- The Ministry of Education, University and Research, which is in charge of determining R&D and higher education policy, development plans for universities and scientific institutions, as well as promotion of scientific and technological research and forging international ties, especially in consultation with representative bodies of other EU Member States. This Ministry also supervises a large number of research organisations.
- The Ministry of Productive Activities (now Ministry for Economic Development), which promotes strategic industrial research and also oversees the research carried out by specialised agencies.
- The Ministry for Innovation and Technology – established in 2001 – which is in charge of stimulating, coordinating and directing government actions related to developing ICT in the country.

Other ministries involved in R&D and innovation include the Ministry of Environment and the Ministry of Health.

2) *Universities and Knowledge Institutes (R&D and education bodies).* The Italian University system consists of 77 Universities located throughout the country. In recent decades the number of Italian university students has increased rapidly, but Italy still lags behind EU

⁴ The Ministry of University and Research (MUR) launched a call to promote the creation of Technological Competence Centres (TCCs) in Objective 1 Regions (Campania, Puglia, Basilicata, Calabria, Sicily and Sardinia). The TCCs will be set up to promote the technical and scientific development of companies, particularly SMEs, and will reflect each region's economic characteristics and specialisation. TCCs will specialise in one of the following areas: agri-industrial, environmental risk management and prevention, advanced technologies & ICT, advanced biology and transport.

Groupings of non-profit, public-private organisations are eligible to participate, including enterprises, chambers of commerce, universities, research centres, science and technology parks and already existing competence centres. The total cost of each centre is expected to range between €5m and €10m.

countries as far as the percentage of the population holding a higher education qualification is concerned. An important weakness emphasised by various studies⁵ is that the Italian system is self-referential and has no real or systematic links to the needs of society and the business world.

3) *Public Innovation Agencies/Organisations*, such as the Italian Patent Office in charge of regulating Industrial Property Rights issues; the Institute for Industrial Promotion, a Development Agency controlled by the Ministry of Productive Activities; Sviluppo Italia, the national agency for enterprise and inward investment development, and Agitec, a service agency designed to help businesses make investments in innovative technology.

4) *Private sector organisations and entrepreneurship promotion*, including the main Italian associations such as Confindustria (leading organisation representing the manufacturing and service industries) and others.

5) *Industrial research centres and innovation intermediaries*, such as the Technology Districts, recently promoted by the Ministry of Research together with the Regional Governments, and the Science and Technology Parks. The Association of Italian Science and Technology Parks (APSTI), founded in 1989, now has 29 parks distributed throughout the country.

6) *Financial system*, made up of the Italian Business Angels Network (IBAN), the Italian Venture Capital and Private Equity Association (AIFI) and a series of private banks and financial intermediaries that offer funding to finance R&D and innovative projects.

At subnational level, the Italian Regions⁶ have gained increasing administrative autonomy on research and innovation policy formulation within their territories as a result of the country's devolution process. Since 1999 the entire Italian institutional framework has undergone a substantial overhaul. A new legal framework for governance has been created, and new criteria for allocating administrative responsibilities between the state and the regions have been established. **The new Title V of the Italian Constitution reorganises the entire system of relations between ordinary national law and regional law, and shifts responsibilities that previously belonged to the State to the current legislative authority of the Regions.** Scientific and technical research and support for innovation in the productive sectors constitute one of the issues covered by current legislation. In matters of ongoing legislation, the legislative authority belongs to the Regions, except for the determination of fundamental principles, which is reserved for the legislation of the State.

In order to overcome the operational problems due to (a possible) overlap of competences, in 2003 the Regional Governments and the Ministry of Research agreed to a division of labour within the Structural Funds framework.

National competences:

- exploitation of scientific results
- networking within the scientific system
- research projects to strengthen the scientific network

Regional competences:

- research-enterprise interfaces
- promotion of innovation within SMEs

In 2001, following a request from the European Commission concerning implementation of the Structural Funds, **the Italian regions started developing their own innovation and industrial support programmes**, which, in general, are spelled out in regional innovation plans. The regional innovation plans presented by the regions first have to be agreed with the relevant ministries to make sure the regional initiatives are in line with the national R&D guidelines and policy. At present many regions (including Sicily) have developed their own plans for R&D and innovation.

⁵ European Trend Chart on Innovation, *Annual Innovation Policy Trends and Appraisal Report*, Italy 2004–2005.

⁶ In Italy there are 20 regions (15 ordinary regions, 5 special statute regions, Sicily, Sardinia, Valle d'Aosta, Trentino Alto Adige, Friuli-Venezia-Giulia) and 2 self-governing provinces.

In recent years the role of regional policies has increased, especially in less-favoured areas, mainly in terms of support for innovation and technology transfer initiatives. **In Sicily, the research and innovation policies are implemented by the Regional Industry Department together with the Programming Department** in charge of defining and implementing the Structural Funds programming process (at present the main source of funding for R&D and innovation activities).

2.2.2 Policy objectives and instruments

The objectives set by the **National Government** for R&D and innovation matters are clearly stated in two main documents: *the Science and Technology Policy Guidelines (2003–2006)* and *the National Research Plan (2005–2007)*, prepared by the Ministry of Education, University and Research (MIUR) and approved by the Inter-Ministerial Committee for Economic Planning – CIPE.

The 2003–2006 S&T Guidelines provide a precise framework of priorities for national research in order to improve Italy's overall position and develop excellence in the most promising and added-value technological areas. Specific emphasis has been placed on the following macro-areas: instrumental mechanics, informatics and telecommunications, energy, environment, transport, agri-food, health and cultural heritage.

The National Research Plan for 2005–2007 builds on the S&T Guidelines (2003–2006) and provides for three main strategic lines of action: 1) reinforcing Italy's scientific base, striving for excellence, merit, internationalisation, economic growth and harnessing human capital; 2) strengthening the technological level of the Italian production system to maintain competitiveness, focusing on 10 strategic industrial research programmes, also involving universities and research centres; 3) supporting active participation in EU programmes and in international agreements.

The main developments the Italian Government has recently achieved as far as R&D and innovation policy are concerned can be summarised under the following headings:

a) *Mapping national competences and harnessing regional expertise.* This heading covers three main actions: creating the Technology Districts, establishing public-private laboratories and setting up Technology Platforms.

b) *Supporting the development of Information and Communication Technologies (ICT).* In order to foster the adoption of ICT by enterprises (especially SMEs), the second action plan for ICT innovation in enterprises was launched on 10 March 2005. The plan's main objectives are to increase innovation in the 'made in Italy' sectors through the use of ICT to improve competitiveness and to implement a policy of support for development of selected high-tech sectors; improve the functioning of the Italian business system, so as to transform it into a fertile environment for research, technological development and innovation; facilitate technology transfer from public research centres to enterprises.

c) *New financing opportunities.* On 19.02.2004 the European Investment Bank (EIB) and the Ministry of Research signed a framework agreement to finance research projects of high economic value under favourable financial conditions. The collaboration between the two entities focuses *inter alia* on analysis of investment needs for new spin-offs from universities and public research centres, and financing opportunities for incubators of innovative enterprises or for research programmes proposed by universities and public research centres.

In addition, Italy's plan to relaunch the European Lisbon Strategy (2005), *PICO*, indicates what the Italian Government intends to do to improve the country's economic and social structures in order to stimulate growth and employment. It covers two areas of action: general measures aimed at the economic system as a whole, and specific projects that will increase the Italian economy's productivity and competitiveness.

The general measures include:

- establishing a regulatory framework which favours investment, innovation and growth by drastically reducing the quantity of existing regulation and improving its quality in order to lighten the regulatory and administrative burden on companies and citizens;

- improving the regulatory framework governing the operations of small firms and production districts aimed at increasing awareness of the importance of digital technologies and how they can be used in process and product innovation; promoting a new balance between job flexibility and security; protecting patents, increasing exports and investments outside Italy;
- leveraging the country's human capital through more effective organisation of general and higher education and professional training.

The main specific R&D projects included in the Plan refer to:

- completion of the Galileo project to set up a European-wide satellite navigation network;
- participation in the European EGNOS and SESAME air traffic control projects;
- development of IT platforms to support healthcare, develop tourism, and improve information mobility, as well as local and public database management;
- implement 12 strategic research programmes;
- establish 12 joint public-private laboratories to develop research in Southern Italy.

The funds allocated for R&D amount to €9.3 billion.

Italy's serious socio-economic development imbalances (north-south) and the structural industrial crises affecting certain regions of the country (including Sicily) still justify the allocation of **Structural Funds**. Within this context, the Italian Government and the European Commission approved the Community Support Frameworks (CSFs) for 2000–2006 covering Objective 1 areas. Two main schemes are defined for Objective 1 Regions: the National Operational Programme (PON – multiregional programme) and the Regional Operational Programme (POR – regional programme). **Regional authorities manage implementation of the POR scheme**, while the PON is managed by the Central Government. POR schemes are presently under development in seven Italian regions covered by Objective 1. Each POR comprises six major action lines: the third action line is devoted to human resources and R&D, the fourth action line is aimed at local development systems and includes measures to sustain local SMEs and the research and innovation system.

In addition, many Framework Programme Agreements have been signed with the Mezzogiorno Regions, which provide for allocation of some €370 million aimed at Information Society development in these territories.

To facilitate and accelerate the development of the information society at regional level, the Department for Public Administration and the Department for Innovation and Technologies established **20 Regional Competence Centres** (starting in 2002) to develop e-government and the information society⁷.

The Regional Innovation Strategy (RIS) drawn up by the Sicilian Regional Government states that the **Region has given priority to a bottom-up approach for its regional innovation policy**. This means that there are **no clear sectoral orientations**, but the strategy makes for development of a methodology able to interpret the SMEs' innovation needs and accelerate and strengthen the links among the different actors. This takes into account the fact that the strengthening of research potential in sectoral terms is one of the objectives of the Research PON, which is implemented at national level.

The Regional Innovation Strategy in Sicily aims to:

- improve the economic environment conditions for enterprises;
- promote and improve the absorption of technologies by existing enterprises in all sectors of the regional economy;
- sustain the processes of specialisation with the economic production base;
- support initiatives to exploit regional knowledge through creating innovative enterprises;
- promote upskilling of human capital.

⁷ The Regional Competence Centres encompass organisational and management aspects of e-Government, development of skills and competences, institutional changes and other elements contributing to service innovation.

2.2.2.1 *Improve innovation and R&D governance*

The definition of a Regional Innovation Strategy, required by Structural Funds regulations in order to allow spending of ERDF and ESF resources devoted to research and innovation, **constituted a key step at regional level.**

The Regional Government carried out the planning exercise **in close collaboration with the Ministry of Research** in order to avoid overlaps between regional and national aims. The region's socio-economic representatives were involved in fixing objectives and defining the relative importance of the different actions (see table at end of section).

2.2.2.2 *Creation of an innovation- and entrepreneur-friendly environment*

At **regional level**, the strategy aims to reinforce the **regional system of interfaces** for innovation, on the one hand stimulating the entry of new facilitators able to identify the latent requirements of the different types of enterprises, and, on the other, redefining the roles of the existing organisations.

This has led to the following measures:

- Development of a system of interfaces aimed at disseminating innovation to SMEs.
- Expansion of existing laboratories.
- Requalification of existing incubators, in cooperation with the Universities and Sviluppo Italia.

At **national level**, the National Operational Programme for Research 2000–2006 (ERDF + ESF) Priority 2 aims to **strengthen and open up facilities** for science and advanced training. The objective is to promote linkages between science, technology and the marketplace by creating and strengthening centres of excellence, disseminating and enhancing new technologies, establishing networks and developing the information society.

2.2.2.3 *Development of human capital*

As previously mentioned, this is a key priority both at regional and national level.

In particular, through the ESF, **Sicily** has applied an approach that involves issuing "**training vouchers**", complemented by **awareness-raising actions** (aimed at seeking employees for the Liaison Offices) and **training for R&D personnel** (research projects, services to promote innovation, tutors, etc.).

Furthermore, generalised training initiatives to **promote entrepreneurship**, directed at students and researchers, have been included in the Regional Strategy.

The public budget for these actions amounts to nearly €24m for the 2000–2006 period.

In addition, through its National Operational Programme for Research, the **Ministry of Research** has allocated €727m for **development of high-level human resources** in the Objective 1 Regions.

2.2.2.4 *Networking, location and clustering measures*

In order to strengthen the national production system and also to enhance the regions' competitiveness, the **Central Government and the Regions** are jointly promoting **Technology Districts** in key sectors. The Technology Districts are considered to have been an important milestone in implementation of the Italian Government's innovation policy over the past three years. The establishment of innovative networks and clusters of technology-intensive companies within Technology Districts was a critical element in the Ministry of Research's 2002 strategy that aimed to replicate the successful experience of Industrial Districts by supporting the development of territorial entities that are systemically grouped and focused on technology-intensive products and services. The Technology Districts should facilitate cooperation between scientific and technological players and companies in competitive research projects.

Twenty-four Technology Districts have been promoted so far in key strategic areas. Three of them are based in Sicily: microelectronics (Etna Valley), naval transportation (Messina, Palermo, Siracusa e Trapani) and sustainable bio-agro and fishery (Catania, Ragusa, Siracusa e Trapani)⁸.

At **regional level**, Sicily has taken the approach of promoting "**circles of knowledge**", an action that supports the creation of groups, which, through periodic meetings with relevant local stakeholders, seek to stimulate the creation of a more favourable environment for cooperation, exchanges, and the development of relationships between the participants.

2.2.2.5 Knowledge- and technology transfer to enterprises

In addition to the circles of knowledge described above, the **Regional Government** opted to set up/reinforce **Industrial Liaison Offices** (there is only one such ILO at the moment). Nearly €3m of public funds were allocated for this purpose during the 2000–2006 period.

On the other hand, the **National Operational Programme for Local Development** is much more active in this field, providing **integrated aid packages**. After an analysis of companies' business plans, a coherent aid package will be granted, covering investment in equipment, research and development, innovation, guaranteed access to credit and staff training.

The Programme's total budget is €4 420m.

2.2.2.6 Research collaboration between public research organisations and private sector

Besides the Technology Districts, at **regional level** the Sicilian Government has proposed financing for **research projects involving participation in national/European research programmes** as well as the realisation of **innovation and technology transfer projects promoted jointly by suppliers and users of technology and innovation**. This is the most important objective under the Regional Strategy (the proposed financial allocation in % terms is shown below) and the Regional Operational Programme 2000–2006 provides public resources of nearly €47m for this objective.

2.2.2.7 Support for public research

Support for public research mainly comes from **national level** through different instruments:

- *PRIN, Research Programmes of National Interest*, specific research projects funded annually by the Ministry of Research and undertaken by Italian universities.
- *FOE, Fund for the Ordinary Financing of Public Research Bodies*, allocated annually amongst the bodies and institutions financed by the Ministry of Research.
- *FIRB, Fund for Basic Research Investments* managed by the Ministry of Research.
- *FISR, Special Integrative Fund for Research*: finances specific actions of strategic interest to different public administrations managed by the Ministry of Economy and Finance.

At **regional level**, **expansion of the existing infrastructures and laboratories** is a key objective (among others) as it absorbs nearly €37m of public resources for the 2000–2006 period.

2.2.2.8 Financial R&D measures for private sector

The **Sicilian Government** has dedicated considerable effort to this objective, also in terms of "innovative measures" (not only traditional incentives). Besides support for research projects, the Strategy proposes:

⁸ <http://www.ricercaitaliana.it/distretti.htm>

- establishment of **pre-seed funds** in order to overcome one of the major obstacles to the development of innovative enterprises (and one of the greatest weaknesses of the regional financial system);
- **support for patenting**, through providing incentives for patenting and know-how commercialisation.

At national level:

- *FAR, Fund for Research Facility*, managed by the Ministry of Research, provides financial incentives for research programmes carried out by industry;
- *FIT, Fund for Technological Innovation*, managed by the Ministry of Productive Activities to finance research activities linked to technological innovation.

Priority 1 *Research and Development in Industry and Strategic Sectors* of the National Operational Programme for Research 2000–2006 provides support for **scientific and technological development** in companies and research and innovation bodies (nearly €1 141m).

The relative importance (in terms of budget %) of the different objectives and actions at regional level are:

Strengthening the innovation capabilities of the Sicilian economic fabric: 81.54%

Objectives	Actions	%
PROMOTE INNOVATION WITHIN EXISTING SMES	Circles of knowledge	2.00 %
	Research projects, innovation and technology transfer for SMEs	70.72%
	Training	2.67 %
STRENGTHEN THE SYSTEM OF INTERFACES FOR INNOVATION	Development of the system of interfaces	5.01 %
	Expansion of existing laboratories	19.60 %

Supporting exploitation of regional knowledge and creation of new high-tech enterprises: 18.46 %

Objectives	Actions	%
FAVOUR THE CREATION OF HIGH-TECH ENTERPRISES	Training initiatives to promote entrepreneurship	4.42 %
	Creation of pre-seed funds	29.50%
	Reinforcement (requalification) of incubators	14.75 %
SUPPORT EXPLOITATION OF REGIONAL KNOWLEDGE	Marketing of research	10.32 %
	Creation/Reinforcement of ILOs	17.40%
	Patenting support	23.60%

Exhibit 1: RTDI policy mix affecting the region

Policy Areas ⁹	Policy objectives and instruments at National* level affecting the Region	Policy objectives and instruments at Regional* level
Improving innovation and R&D governance		Regional Innovation Strategy: the definition of a RIS required by Structural Funds rules in order to spend resources devoted to research and innovation
Creating an innovation- and entrepreneur-friendly environment	PON Research, in particular through its priority <i>Strengthening and opening up facilities for science and advanced training</i>	Interfaces Incubators Laboratories
Developing human capital	PON Research, in particular through its priority <i>Development of high-level human resources</i>	Training
Networking, location and clustering measures	Technology Districts	Circles of knowledge
Knowledge and technology transfer to enterprises	PON Local Development, aid packages covering investment in equipment, research and development, innovation, guaranteeing access to credit and staff training	Circles of knowledge ILOs
Research collaboration of public research organisations with private sector	Technology Districts	Research projects
Support for public research	PRIN Research Programmes of National Interest FOE Fund for the Ordinary Financing of Public Research Bodies FIRB Fund for Basic Research Investments FISR Special Integrative Fund for Research	Research projects
Financial R&D measures for private sector	PON Research, <i>Priority 1: Research and development in industry and strategic sectors</i> FAR Fund for Research Facility FIT Fund for Technological Innovation	Research projects Patenting Pre-seed fund

2.3 Conclusions

Sicily's backwardness in the national context is shown in the chart below: almost all of the regional indicators are below the national average, except for those concerning HERD and R&D personnel in HEIs, both related to the high concentration of academic resources

⁹ Compilation from typologies described in the bibliographies of reports such as: Boekholt, P. et al (2001), *An international review of methods to measure the relative effectiveness of technology policy instruments*, Technopolis B.V., Amsterdam.

Soete, L. et al (2002), *Benchmarking National Research Policies: The impact of RTD on Competitiveness and Employment (IRCE)*, A STRATA-ETAN Expert Group Report, DG Research, European Commission, Brussels;

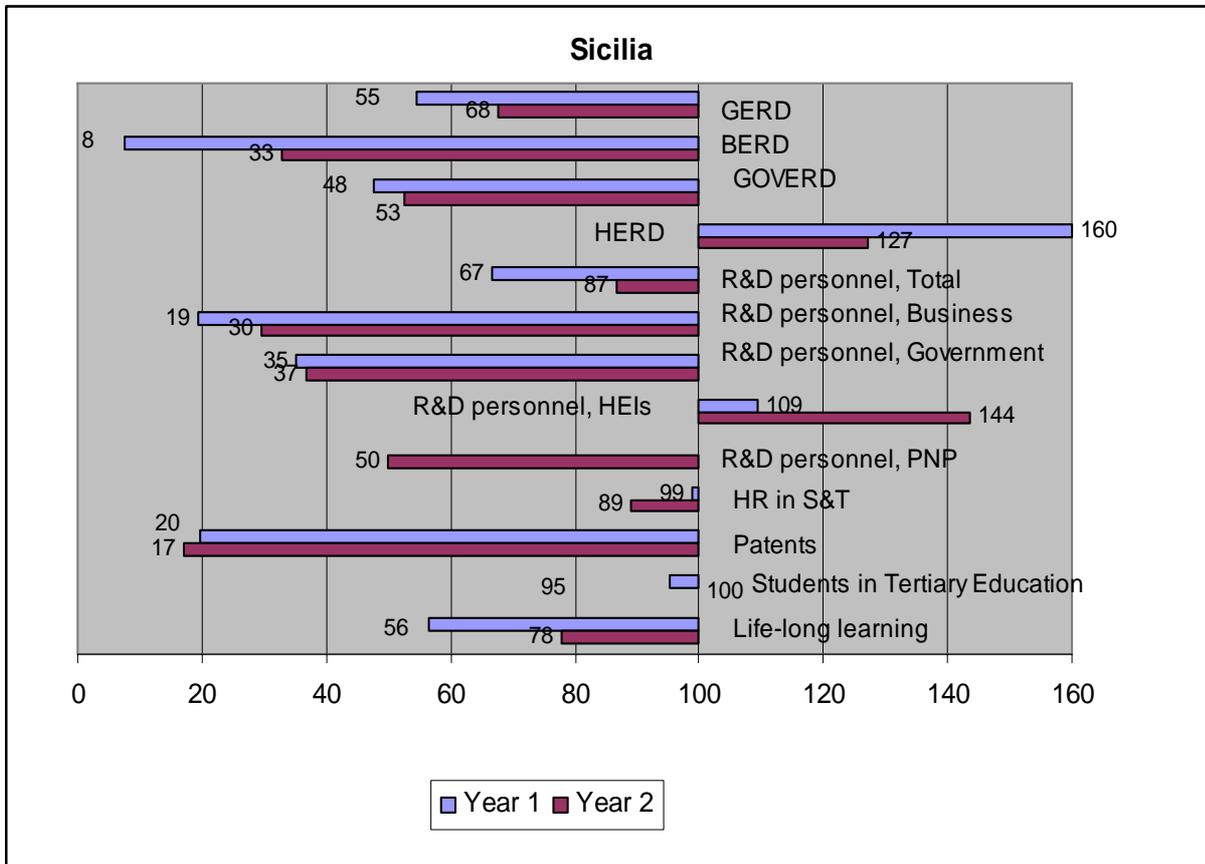
Guy, K. and Nauwelaers, C (2003), "Benchmarking STI Policies in Europe: In Search of Good Practice", *The IPTS Report*, Vol. 71, February, IPTS, Seville.

European Commission (2003), *Raising EU R&D Intensity: Improving the Effectiveness of the Mix of Public Support Mechanisms for Private Sector Research and Development*, Report to the European Commission by an Independent Expert Group, Brussels.

Also TrendChart has developed its own policy mix taxonomy.

mentioned above. Healthy signs can be seen in regional trends, which tend to be positive for almost all of the problematic elements analysed, apart from patent applications at the EPO per million inhabitants.

Regional performance compared to national average¹⁰



In its Regional Innovation Strategy, the Regional Government highlighted the general and specific problems affecting its R&D and innovation system. The most relevant are:

- presence of a large number of players, but insufficient links and coordination between them;
- the needs of industry and the market are not correctly addressed by the public research system, which is often self-referential and has no real or systematic correlation to the needs of society and the business world;
- public operators are not inclined to adopt a strategic management approach to R&D (no evaluation undertaken);
- limited use of venture capital in research spin-offs or risk capital (Tables 18, 19) to promote the start-up of new businesses (in contrast, extensive use of traditional incentives);
- production system based on a large number of small enterprises, with great difficulties for interaction with the supply side.

The Regional Strategy seeks to overcome these problems, in accordance with programmes operating at national level. In contrast to the situation in the past, the new strategy tends to focus more on relations (e.g. interfaces) than on the single actors, even if this new approach is still ponderous in the regional context.

¹⁰ Year 1 corresponds to 1995 except for Lifelong learning (1999); Year 2 corresponds to 2003 except for Human Resources in S&T and Lifelong Learning (2004).

The experience of the Technology Districts (and the previous experience in Etna Valley) seems to be positive in this respect, as it aims at linking local demand and supply (including that of ST), integrate regional potential (capacity to mobilise the relevant local actors) with national efforts (also in terms of resources).

3 Regional economic structure

3.1 Description of the economic structure

3.1.1 The characteristics of the productive structure of the region's economy

In the period 1999–2004, Sicily registered an average annual growth rate of 1.9% – higher than the rates for Southern Italy (+1.5%) and Italy as whole (1.3%) – thereby showing **a clear recovery in the main socio-economic parameters** (productivity, jobs, legality), however not enough to bridge the development gaps that still persist between Sicily and the rest of Italy.

The main benchmarks set by the European Councils of Lisbon and Gothenburg for 2010 are therefore still far from being achieved, with the demand for employment from the productive and institutional system qualitatively and quantitatively modest and a fairly small proportion of activities linked to the knowledge economy.

In 2003 Sicily's regional **GDP** accounted for 6.1% of Italian GDP and 24.3% of Southern Italian output. During the most recently reported period (1999–2003), Sicily achieved an average annual growth rate (2.2%) that is comparatively better than those recorded in Italy as a whole and in Southern Italy (Table 20). The Region is reducing its gap in per-capita GDP – this grew 9.7% in 1999–2003 (compared to 8.9% in Southern Italy and 4.4% in Italy as a whole). This growth is confirmed by an increase in domestic final consumption, which is still below the overall Italian level, but higher than in Southern Italy, and by the reduction in net imports, which have kept on decreasing (-4.7% in the last year), but still maintaining stock figures at very high values (19.8%).

In the period 1999–2004 there were also positive variations in **added value** (an average increase of 2% annually), mainly due to the contributions of the agricultural sector, compared with the lower Italian and Southern Italian performances (both at +1.6%).

The level of **labour productivity** has remained nearly unchanged since the beginning of the 1990s, reflecting the annual average growth rate for the whole economy of 1%, in line with the national and southern levels. In 2004 labour productivity in Sicily amounted to 92.4% of the national average and 104.7% of the Mezzogiorno level.

In the 1990–2003 period **gross fixed investments** in GDP went down, contracting by over 6 percentage points.

Within the national context, Sicily's **infrastructural backwardness** (Italy = 100, Sicily = 84.2) has remained substantially unchanged over the past several years. When compared to the data for Southern Italy, Sicily comes out ahead (Mezzogiorno = 100, Sicily = 111). This issue is of key importance for the Sicilian economy, **since the infrastructural endowment is considered vital for the competitiveness of the entrepreneurial system**.

The entrepreneurial fabric in Sicily is growing slower than in Italy. From 1991 to 2001 it grew by 17.2% (6.5% less than the national figure), and this was also the case for the long-term dynamics of employment. Another key aspect of the Sicilian entrepreneurial fabric is **the higher rate of enterprise failure** (9.2% versus 7.9% in Italy), which indicates the difficulties for survival and growth within the Island's entrepreneurial fabric. In structural terms, **the role of small enterprises is predominant**; the share of employees belonging to enterprises with less than 50 employees is 15%.

The **economic structure in Sicily differs substantially** from that in Italy's northern and central regions. The region's two key features are the importance of agriculture and the strong presence of the traditional tertiary sector (Tables 21, 22). Sicilian industry is highly

concentrated in a few sectors. In general, local industry is dominated by the traditional sectors: food, but also textiles/clothing and wooden furniture sectors. Tourism is still one of the regional economy's leading sectors. In the 1995–2004 period tourist arrivals grew by 44% and tourist stays by 39%.

Data related to technological innovation carried out in Sicilian firms reflect the **backwardness of regional firms** in comparison with the Italian average (Table 23). Various factors can explain this situation:

- a strong dependence on external commissions and the consequent necessity for product diversification, making it impossible to exploit the advantages of specialisation;
- the overcapitalisation of enterprises and, consequently, a preference for interventions concerning processes rather than products;
- a strong dependence on extra-regional suppliers for new technologies;
- a strong concentration of company functions in the hands of the entrepreneur, also as far as innovation is concerned;
- commercial difficulties in the distribution of new products;
- a lack of tools for the gathering and processing information.

As far as information and communication technologies (ICT) are concerned, the Sicilian percentage of IT expenditure as a share of regional added value accounts for 3.5% of the national IT market. Sicily invests only 1% of the regional added value in technological capital, indicating a weak penetration of IT within productive elements. In 2003–2004 there was a recovery in the growth of regional IT enterprises.

3.1.2 Systemic characteristics of the region

Specific studies focused on networking and interactions between local actors in Italy refer particularly to the Industrial Districts. In Sicily there are only **two Industrial Districts** recognised by the National Institute of Statistics (156 is the total number for Italy): Sinagra and Custonaci. One specialises in the manufacture of household goods; the other in the textile and clothing sector (Tables 24, 25).

As shown in Table 26, the two districts present different levels of performance in terms of employment: one (Sinagra) shows signs of evident decline, the other (Custonaci) presents good results both in terms of industry and service employment growth.

Sicily has promoted different initiatives in order to strengthen the relations among different actors at local level: the **Integrated Territorial Projects** (similar to Territorial Pacts) are interesting examples of such initiatives, supported by the Regional Government but designed and implemented at local level (with Structural Funds support).

Recently, 23 productive districts were recognised by the Regional Government (Department for Cooperation, Commerce, Handicraft), including 3 600 enterprises¹¹.

3.1.3 The regional economy in the international context

Sicilian industry is traditionally linked to regional and national markets in Italy, but is rarely present in foreign markets (Tables 27, 28). As far as the internationalisation of Sicilian industry is concerned, recent years have witnessed favourable developments. In 2005 exports from Sicily represented 2.5% of the general flow of Italian exports and 21.6% of exports from Southern Italy. In the 2000–2005 period, Sicilian exports increased at a rate consistent with overall national exports (+4.9% for Sicily, +6% for Southern Italy, and +4.9% for Italy).

But this trend has not managed to overcome the effects of deteriorating commercial exchanges in Sicily in general. The normalised total in 2005 was negative and deteriorating in absolute values by comparison with preceding years, underlining a relative decline in regional commercial performance. A positive aspect was that the Sicilian share of exports of high or

¹¹ <http://www.regione.sicilia.it/cooperazione/distretti/homedistretti.html>

increasing productivity products in GDP increased more than the Italian and Southern Italian shares.

Making **direct investments abroad remains a difficult option** for Sicilian firms, as shown by the figures (-0.03% from Sicily, 0.15% from the South and 1.15% from Italy). As for inward investment, an analysis of the foreign flows (FDI) towards the region during recent years also shows a strong lag (higher than the Southern average).

3.1.4 The local financial market

At the end of 2003, 66 credit institutions operated in Sicily (there were 71 at the end of 2001).

An important feature of the financial market in Southern Italy is **the different cost of money**. In 2002 there was a gap between the interest rates applied in Sicily and the national average of around 2 percentage points for short-term operations and 1 percentage point for medium-/long-term operations (>18 months).

Ordinary credit is the most common solution to the financial needs of Sicilian SMEs (in general they are undercapitalised). No investors specialised in early stage financing operate in Sicily.

3.2 Policy context

3.2.1 Governance structure and actors

The governance structure for regional development is similar to that presented in the previous chapter. In Sicily, the **Programming Department** (headed by the Regional President) is in charge of general programming activity; this means, in particular, drawing up the Regional Development Plan and all programming concerning Structural Funds.

The Programming Department cooperates with the other sectoral Departments in defining the specific sectoral objectives and projects in close coordination with the relevant national authorities (in general, the Ministry of Economy and, since 2006, the Ministry for Economic Development).

Sicily's Regional Departments deal with Agriculture, Cultural Heritage, Finance, Cooperation, Social Policies, Industry, Public Works, Labour and Training, Health, Environment, Tourism and Communications.

3.2.2 Policy objectives and instruments

In recent years, the regional development strategy has **focused on the overall development context** and on what are known as its "**immobile resources**" (natural, cultural resources and large network infrastructures). Nearly 2/3 of the public resources have been devoted to developing the general context, while 1/3 has gone on direct support for the productive and social systems.

Transport has been a primary focus, followed by **environmental infrastructure and services**.

The main regionally managed policy instrument for stimulating Sicily's economic development is the Regional Operational Programme financed by the Structural Funds. The 2000–2006 programme comprises six priorities:

Priority 1: Natural resources: Support focuses on improving water resources, soil and coastline protection, upgrading natural areas, waste processing, improving the environmental information system and energy management (renewable resources and distribution networks, in particular for methane gas).

Priority 2: Cultural resources: Support devoted to enhancing the region's cultural resources as a factor contributing to its economic and social development (actions to promote artistic and archaeological heritage and support for companies providing cultural services).

Priority 3: Human resources: Measures are closely linked to the Commission's recommendations and the National Action Plan in the context of the European Strategy for Employment. Research and technological innovation measures are also planned.

Priority 4: Local development systems: Promoting local production systems (in particular Industrial Districts and export systems) and new companies (especially businesses headed by women or young people), supporting demand for qualified services, improving tourist facilities (particularly in historic centres) and upgrading human resources.

Priority 5: Cities: Enhancing the role of cities in their territorial context with a view to stepping up the competitiveness and social potential of urban zones and improving the quality of life (especially in outlying districts and run-down historic centres). A measure to promote urban rail transport is also planned.

Priority 6: Networks and service hubs: Support focuses on transport, with a view to ensuring accessibility, effectiveness and quality (remedying in particular the lack of road and rail facilities and airports) and a balanced combination of transport modes while respecting the environment. Another aim is to speed up the transition to the information society in public administrations and the production base. Actions to internationalise the regional economy are also planned.

As already stated, special emphasis is placed on **Integrated Territorial Programmes**, aimed at upgrading local potential through development of synergies.

A total of €8 460m has been assigned to this Regional Programme. In terms of resources allocated, the most important axis is the one devoted to local development (including incentives for regional SMEs), accounting for €2 749m, followed by the measures regarding natural resources with a budget of €2 022m.

The infrastructural priorities receive €898m through the Regional Programme, but this objective is also supported by other instruments, such as the Framework Programme Agreements between the Region and the national authorities.

The 2000–2006 implementation period was marked by **great difficulties regarding the capacity to spend the allocated resources during the required time frame**. For this reason, and in order to avoid losing funding resources, the Regional Government included in the Programme projects known as "**coherent projects**", i.e. projects that had already been activated and included only for financial purposes (to increase the spending). This meant, in some cases, a weaker coherence between the original objectives and the practical results. Another weakness is the **excessive fragmentation** of the regional strategies (too many measures, and measures that are too widely dispersed).

On the other hand, there was a strong push towards **building up the regional governance capacity for public policies**, which required important cultural efforts by all the regional institutional and socio-economic actors and which produced positive results in terms of horizontal and vertical relations.

The new Sicilian General Development Strategy¹² for 2007–2013 is closely linked to the Lisbon and Gothenburg objectives, as required by the new regulations concerning the Structural Funds (the main financial source for the future). It is a common opinion that Sicily cannot adequately pursue its development trajectories focused only on external mechanisms for growth. A key element in the development strategy is to better exploit **Sicily's geo-economic position** within the Mediterranean area, which presents an important opportunity for developing different economic activities. The Mediterranean "option" requires a varied and multi-sectoral approach (particularly in the areas of logistics, training and energy) as well as efficient governance of the process.

The main policy objectives for the next programming period (2007–2013) are in line with the previous programming period priorities, including¹³:

a) *strengthening the local attraction factors;*

b) *creating and spreading the knowledge society*, much more important for the new period thanks to the Lisbon Strategy;

¹² So far, only a strategic document concerning the overall objectives for regional development for the 2007–2013 period has been issued by the Regional Government. The new Operational Programme is still being drawn up.

¹³ The priorities for the new period have already been announced, but without ranking their relative importance or specifying how they will be implemented.

c) *achieving better conditions for employment and social cohesion.*

For the first objective (**strengthening the local attraction factors**), the Regional Government intends to:

- strengthen the transport system;
- reinforce the synergies between environmental protection and economic growth;
- improve the energy system;
- upgrade the regional health services.

For the second objective (**knowledge society**), the Regional Government will promote:

- synergies between research, enterprises and markets;
- concentration of R&D activities;
- getting the best out of human capital;
- internationalisation of regional R&D;
- more private investments in this field;
- greater integration between R&D policies;
- reduction in red tape;
- diffusion of technological platforms;
- establishment of research laboratories;
- diffusion of the information society;
- diffusion and reinforcement of entrepreneurship.

In addition, the Region attaches great strategic importance to the process of economic and cultural internationalisation, as is borne out by the regional programming guidelines for implementation of the 2000–2006 Sicilian POR.

For the third objective (**achieving better conditions for employment and social cohesion**), the Regional Government seeks to:

- open up the labour market and support permanent employment of higher numbers of persons in this market;
- increase labour market flexibility, by increasing labour force adaptability;
- upgrade the education and training system.

As stated above, the Community Support Framework for 2000–2006 is the main funding source of policy instruments for Sicily. Among the instruments managed at national level, the *National Operational Programme for Local Development* is one of the most important in terms of resources (€4 457m). It comprises three types of intervention:

- *Productive investment*: Traditional incentives for productive investment, taking into consideration the regions' choice of territories and sectors. Support will also be provided for initiatives aimed at preventing or reducing the environmental impact of economic activities. Measures are also planned for major investment projects, subject to an ad hoc evaluation procedure.
- *Integrated aid packages*: After an analysis of company business plans, a coherent aid package will be granted, covering investment in equipment, research and development, innovation, guaranteed access to credit and staff training.
- *Training*: Measures will finance training and professional qualification as a supplement to the integrated aid packages.

The *National Operational Programme for Education and Training*, with a budget of €830m, supports:

- Initiatives to improve the quality of teaching and the operation of schools through innovative training of both students and teachers. The emphasis is on improved management of

schools and increased use of computer technology. Integration of schools with their surrounding area is a high priority.

- New technologies to support teaching methods. Resources will be allocated to modernise and upgrade schools and their technological and computer equipment.
- Measures aimed at reducing the numbers of students leaving school early and at rehabilitating those who have already abandoned school.
- Infrastructure supporting educational and social inclusion.
- Improved training to facilitate the entry of young people into the labour market by funding specific courses leading to qualifications in emerging sectors such as the environment and Information Society.
- Lifelong Learning in order to facilitate the entry and re-entry into the labour market of young people and adults whose educational qualifications are poor or who are unemployed.
- Measures aimed at helping women make sound choices in terms of education/training, facilitating their entry or re-entry into the labour market by providing them with guidance and assisting them in acquiring a set of skills which will help reduce the present gender imbalance in the Region.

The *Operational Programme "Security for the Development of the Mezzogiorno"* has great importance in the Southern Italian context, also for economic development. Two priorities have been established, with a total budget of €1 226m:

- Development and technological adaptation of security information and communication systems in order to guarantee economic and civil liberties by monitoring the urban, suburban and provincial fabric and by providing adequate infrastructures and technologies for the institutions that combat crime, in particular crime aimed at business activities.
- Promotion and support of legality, with campaigns to raise public awareness of legality and restore public confidence in institutions. Training and assistance will be provided to reduce the causes of social deviance and defend a culture of legality and work by offering concrete measures to break the hold of crime. Still another aim is the acquisition of infrastructures and advanced technologies for effective control of the European Union's southern borders and to reduce illegal immigration.

In addition to the Cohesion Policy co-financed by the Structural Funds, another relevant policy instrument is the previously mentioned *PICO, Plan for Innovation, Growth and Employment*, which includes a wide range of initiatives all focused on economic development. The Plan indicates what the Italian Government intends to do to improve the country's economic and social organisational structure in order to stimulate growth and employment. The main general measures (in addition to those mentioned in the previous chapter) comprise:

- further deregulation of supply in the service sector, in line with directives and decisions being finalised at European level; freer expression of the market in those sectors identified by the antitrust and sector authorities, and liberalisation of prices within the economy as a whole; more effective legislation in line with Community rules so as to prevent fraud, and to prevent counterfeiting so as to reduce the distortion which this generates in the operation of markets;
- improved performance by the Italian public administration and reduction in its cost, based on the Code for Digital Administration (already approved) and the Public Connectivity System (currently being implemented);
- development, or completion, of infrastructure networks to foster domestic, inter-European and international connections, with a particular commitment to implementing the "motorways of the sea";
- incisive implementation of the European Cohesion Policy aimed at reducing economic disparities between areas within the European Union, paying particular attention to Southern Italy;

- more effective incorporation of environmental protection requirements into production processes.

For the overall 2005–2008 period, the Italian budget has provided more than €46 billion to relaunch the Lisbon strategy in accordance with the agreements reached at European level. This is broken down in the following table:

Funds allocated (€bn)

	Until 2005	For 2006–2008	New PICO funds	Partial total
1. Free choice area	0.6	0.2	1.3	2.1
2. R&D	4.3	0.9	4.1	9.3
3. Human capital	1.0	0.2	0.4	1.6
4. Infrastructures	23.6	2.5	5.2	31.4
5. Environment	0.4	---	1.7	2.1
Total	29.9	3.8	12.7	46.4

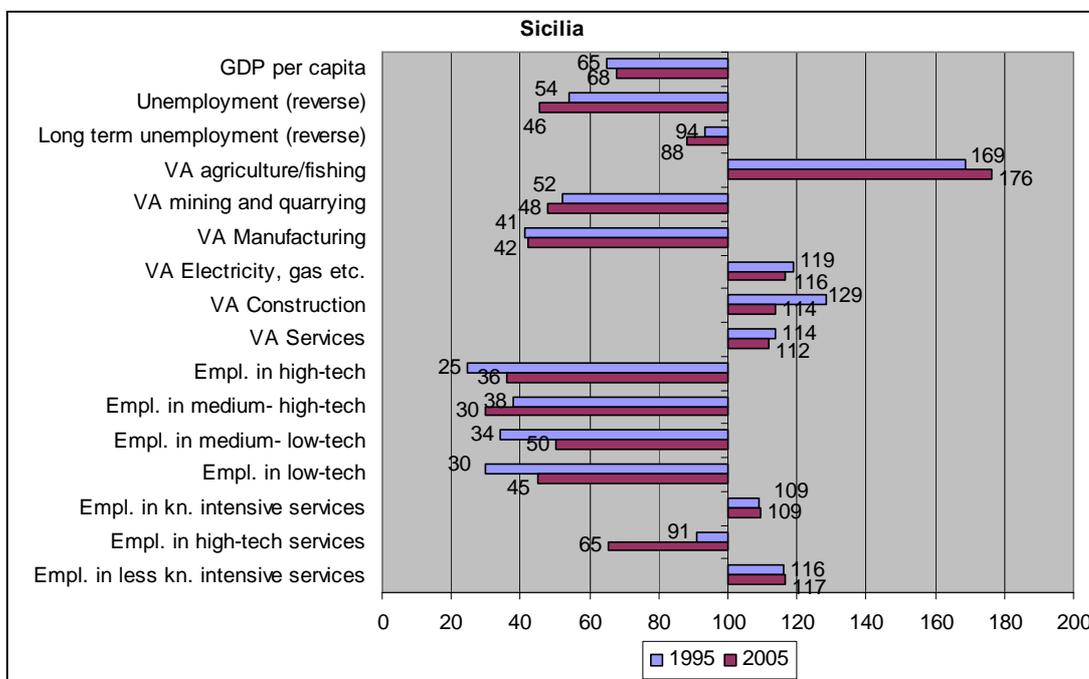
Exhibit 2: Effects of policies complementary to RTDI instruments on R&D and innovation capacity of the region

Policy Areas	Policies complementary to RTDI instruments affecting policy area*	Effects on R&D and innovation capacity of the region
Improving innovation and R&D governance	<i>Regional:</i> programming processes (linked to Structural Funds in particular)	The new programming processes provide an occasion to reflect on past experience in order to plan future developments in a concerted way (public-private, regional-national)
	<i>National:</i> drawing up and monitoring PICO	As does the regional programming, the national formulation of PICO also impacts on organisation of the R&D sector
Creating an innovation- and entrepreneurship-friendly environment	<i>Regional</i> ➤ strengthening local attraction factors ➤ reinforcing entrepreneurship ➤ Integrated Territorial Programmes (local development in general)	The assumption is to improve externalities to help SMEs operate more effectively and efficiently
	<i>National</i> ➤ deregulation in the service sector ➤ upgrading the public administration ➤ promoting the diffusion of digital technologies	The regulatory framework is of key importance, and the National Government in particular is working to reduce external burdens affecting the economic actors
Developing human capital	<i>Regional and National</i> Achieving better conditions in terms of employment and social cohesion (upgrade labour market and education and training systems). This is an important chapter within all the programming periods, both at regional and national levels	More effective education and training systems More transparent (and, in some cases, flexible) labour markets
Networking, location and clustering measures	<i>Regional:</i> Integrated Territorial Programmes	Improve the linkages between the different actors at local level

Knowledge and technology transfer to enterprises	<i>Regional and National</i> A large amount of funds (mainly incentives) provided to SMEs through Structural Funds (NOP Local Development and Priority 4 of ROP)	Increased investments in process innovation (less in product)
Research collaboration of public research organisations with private sector	<i>Regional:</i> Measures concerning human resources within SMEs (including the entrepreneur)	More "receptive" firms
	<i>National:</i> Provision of consultancy services to SMEs to facilitate collaboration (NOP Local Development)	Easier exchanges between the two actors
Support for public research	<i>Regional and National</i> ➤ strengthening local attraction factors ➤ territorial marketing (in R&D sector)	A more attractive region in terms of FDI in the R&D field
Financial R&D measures for private sector	<i>Regional:</i> Introduction/diffusion of Venture Capital at regional level	SMEs' awareness increased
	<i>National:</i> Reorganisation/simplification of incentive systems	More focused interventions and a clearer picture in terms of tools/beneficiaries

3.3 Conclusions

Regional performance compared to national average¹⁴



The above figure shows the structural differences between Sicily and Italy, which are mainly linked to an over-represented agricultural sector and a limited (and even declining) manufacturing system. Employment in knowledge-intensive services is relatively higher in Sicily than in Italy as a whole, and this is also the case for employment in less knowledge-intensive services, while employment in high-tech services is under-represented (and decreasing).

In terms of economic performance, Sicily suffers from a low GDP per capita and a high unemployment rate (compared to the national average), particularly youth and female unemployment.

Sicily benefits from a wide range of economic development policies implemented by both the Italian National Government and the Sicilian Regional Government, and often supported by the Structural Funds. This well-endowed framework (particularly in terms of financial incentives) has produced positive results in terms of economic recovery, even if Sicily continues to remain a region lagging behind, according to various criteria.

In the near future the constraints imposed by the Stability Pact will reduce the level of public intervention funding available to the Region; against this backdrop the National Government is: a) reorganising the incentive system in order to make it more effective and efficient; and b) promoting extensive deregulation in the service sector.

There is a very positive relationship between economic development policies and the R&D framework. The economic development policies focus on two important elements, taking into account the particular characteristics of the Sicilian industrial fabric and the economic environment in general: the first is the quality (more than the density) of the economic environment in terms of externalities (services, in particular, but also infrastructures); the second is the demand side, represented by many small and often isolated units, which, besides

¹⁴ GDP data 1995–2003; Unemployment data 1995–2001; VA data 1995–2003.

incentives, require (and receive) support in terms of information, technical assistance, guidance and training.

There is room for improvement in the coherence and coordination between the direction of economic development policies and R&D policies, though not necessarily within the regional territory, where the possible synergies between the two are monitored by the Regional Government. The improvement of linkages between regional and national decision-making processes is more critical and the risks of overlaps and contradictions are evident.

4 Conclusions

4.1 Assessment of the RIS

The Sicilian Regional Innovation Strategy (RIS) covers **a large number of structures, especially in the area of knowledge-creation capacity**, which are supported by public funds. **The needs of industry and the market are not adequately addressed by the public research system**, which is self-referential and has no real or systematic links to the needs of society and the business world, while **collaboration with external research centres is sporadic**. Public operators are not inclined to adopt a strategic management approach toward R&D or to carry out monitoring and evaluation.

The **knowledge-diffusion capacity is mainly focused on infrastructure** (i.e. establishment of incubators) **rather than on services**. The knowledge-absorption capacity is improving, even if starting from a very low level (even in the Southern Italian context).

The regional production system is based on a large number of SMEs. Most Sicilian SMEs are not interested in innovation, as they have very low levels of market perception and their only interest is survival over the short term, with no medium-to-long-term strategy.

Another small part of the Sicilian SME fabric is comprised of companies with R&D activities that are not formalised. Their innovation activities are mainly oriented towards improving existing production processes, most often in order to reduce production costs. Very few companies have stable R&D activities and consider innovation to be a tool for increasing competitiveness.

Furthermore, **the individualistic approach of the different actors**, reflected in a weak system of relationships and centralisation of management, remains the key feature of the Sicilian industrial fabric. The result is that there are **insufficient links and coordination between the main players**, i.e. universities, public research centres and industry, thus making it difficult to develop positive synergies between research and business.

Catania and Etna Valley are an exception in this particular landscape: this case is considered a positive example of public-private collaboration at both regional and national levels, and the new experience of the Technology Districts was inspired by this effective practice. Catania now hosts a Technology District for Microelectronics.

Exhibit 3: Matching of knowledge and economic specialisation

Knowledge production in the region	Related economic sectors	Specialisation of the Region's economy	Conclusions
Electronics and microelectronics	Automotive Communications Computer & Peripherals Security & Smartcard	Microelectronics	Strong links within the Etna Valley boundaries. Knowledge production has generated locally positive territorial externalities
Agri-food	Agriculture, Agri-food, Fishing	Agri-food	High potential in terms of R&D market: numerous firms, some are dynamic (wine). No evaluation of results produced by regional knowledge-production system
ICT	All	Traditional manufacturing	Wide horizontal potential and large public support (national + regional) for its diffusion

The **Regional Government's administrative autonomy in formulating research and innovation policy at regional level is quite high**. Since 1999 a new legal framework for governance has been developed: scientific and technical research and support for innovation for the productive sectors is a key issue in current legislation. This means that legislative authority belongs to the Region, except in cases where determination of fundamental principles is reserved to State legislation. In practice, the risk of overlapping authority is high.

It is **difficult to obtain a clear view of Sicily's knowledge specialisation at regional level** because of the lack of statistics on activities carried out by regional structures on the one hand, and, on the other, because of the choice made by the Regional Government not to define, as mentioned in the RIS, "clear sectoral orientations" in terms of innovation policy. In general terms, it seems clear that **microelectronics and agri-food are quite important** in the regional framework: the first due to the relevance of the Catania centre; the second because of the number of research structures operating in the specific sectors (milk, wine, cereals, etc.). ICT is attracting growing interest, due to the importance assigned to this sector at EU and national levels in view of its potential to improve economic competitiveness.

The general impression is that **the Sicilian knowledge-creation system**, apart from the Catania case, **only partially serves regional players** and, at the same time, has also very limited links with the national or international economy.

In **the Catania case**, by contrast, **the role of the local knowledge-creation system** (the University of Catania, in particular) **has been very important** in terms of establishing a favourable environment for ST as well as exploiting its links with multinationals in order to promote local development projects.

Exhibit 4: Strengths and weaknesses of the regional innovation system

	Strengths	Weaknesses
<i>Knowledge-creation capacity</i>	<ul style="list-style-type: none"> ➤ Large infrastructure ➤ Good patenting activity (Catania) ➤ Etna Valley as effective case 	<ul style="list-style-type: none"> ➤ Self-referential ➤ Weak external linkages ➤ Large role of public sector ➤ No monitoring/evaluation
<i>Knowledge-diffusion capacity</i>	<ul style="list-style-type: none"> ➤ Presence of a Science Park and incubators 	<ul style="list-style-type: none"> ➤ Too much emphasis on infrastructural aspects ➤ Limited spin-off activities (Catania is investing in them) ➤ Low regional financing competences
<i>Knowledge-absorption capacity</i>	<ul style="list-style-type: none"> ➤ Positive trends (Lifelong Learning, active population with higher education, human resources in S&T) 	<ul style="list-style-type: none"> ➤ Low rate of enrolment (universities)
<i>Interactions of main actors</i>	<ul style="list-style-type: none"> ➤ Active role of multinational companies such as ST Microsystems (Catania) 	<ul style="list-style-type: none"> ➤ Difficulties in matching supply and demand ➤ Some overlapping of Central-Regional Government authority
<i>RTDI governance capacity</i>	<ul style="list-style-type: none"> ➤ Adoption of a more strategic approach (Regional Strategy) 	<ul style="list-style-type: none"> ➤ Monitoring/evaluation not applied ➤ Division of Central/Regional Government authority not very clear

4.2 Assessment of policies

Sicily benefits from a wide range of opportunities in terms of RTDI-related policies implemented by both the National and Regional Governments. "Old schemes" focused on incentives for individual players are gradually being replaced by measures to develop relationships or raise awareness of the importance of stronger linkages between supply and demand. **Some degree of overlap between national and regional levels exists**, even if the dialogue between the relevant Ministries and the Regional Authorities is becoming more and more structured.

There are quite **positive relationships between economic development policies and the R&D framework**, even if there is room for improving the coherence between the two.

Financial resources available for public R&D expenditures have been gradually decreasing: since 2003 some instruments targeted on companies (e.g. FAR and FIT funds, typical national tools) have not been adequately re-financed through national funds, thus leaving a large share of business demand unsatisfied.

In terms of governance capacities, **the Region has faced an intense process of analysis, confrontation** (with the relevant socio-economic actors) **and reorganisation** (still in progress), **which led to the preparation of the first Regional Innovation Strategy**.

Finally, within the Region there is a **lack of evaluation** to sustain the policy-making process, thus indicating a clear need to improve innovation policy analysis and evaluation skills.

4.3 Challenges and trends of the knowledge economy

The main challenges for Sicily are:

- *Awareness-raising within the entrepreneurial system (small firms, not interested in innovation)*. Sicilian firms must, first of all, acquire an awareness of the importance of innovation as part of competitiveness strategy. Therefore, these firms need to be the focus of an action supporting medium-to-long-term planning, providing technology and market information, prior to absorption of innovation.
- *Making the research system more conscious of SME needs (self-referential system, financed through public funding)*. It is important to encourage research institutions to open up to cooperation with industry, promoting and supporting joint projects for systematic links with companies that may need technology.
- *Interfaces (weak supply-demand linkages)*. Interface structures must be strengthened, developing the supply of services and promoting their use by firms. It should be emphasised that:
 - Most of the instruments already exist, but there are problems with their operation.
 - The role of interface structures needs to be driven by demand; in Sicily strategy has to be based on upgrading demand capacities to absorb the services.
 - Interface organisations must disseminate the most suitable supply of technology services and know-how (also provided by other regions or States) and facilitate their use by Sicilian SMEs.
- *Concentration of resources (dispersed system, too many measures)*. Public policies should be conducted under a "poles-of-excellence" approach (setting up priorities and objectives, concentration of resources, international benchmarking).
- *Local clustering, such as Technology Districts (positive example of local initiatives based on local resources, such as MLNs, Universities, etc.)*. The Integrated Territorial Programmes have striven to build up the basic networking resources (social capital); R&D policy should build on this base.
- *Spin-offs and new innovative firms (weak activity at present)*. It is important to stimulate and support research spin-offs and new high-tech companies (in order to support diversification of the traditional regional industrial fabric).

- *Financing innovation.* There is a need for adequate financial support for new companies or innovation projects, with particular reference to venture capital. This again is a major cultural problem (small firms, closed system, no local operators) that requires intense efforts and a high level of professional support.
- *Monitoring and evaluation (both absent).* Monitoring and evaluation procedures should accompany the entire policy-making process in order to first improve the governance capacity (through a periodic revision of the structure "objectives-strategy-instruments-actors") and then obtain results.

Exhibit 5: Identification of policy challenges

Policy challenge	Corroborating indicator	Inducement mechanisms	Effective approaches
Awareness-raising of the entrepreneurial system	<ul style="list-style-type: none"> • Small firms • No interest in innovation (innovative firms) • Weak external relations (exports) 	<ul style="list-style-type: none"> • Circles of knowledge • Training • Mobility of personnel 	Mobility of personnel schemes (university-SMEs) have proved to be quite effective. Circles of knowledge not implemented yet
A research system more conscious of SME needs	<ul style="list-style-type: none"> • High share of public funding • Self-referential attitude 	<ul style="list-style-type: none"> • ILOs • Technology Districts • Regional Innovation Strategy • Financing mechanisms (projects rather than entities) 	Adoption of financing mechanisms facilitating the establishment of linkages between supply and demand seems to be an initial positive step towards closer relations
Interfaces	<ul style="list-style-type: none"> • The instruments exist • Weak supply-demand linkages 	<ul style="list-style-type: none"> • ILOs and other interfaces • Support participation in EU programmes (APRE) 	No effective approach in terms of matching SMEs' needs/most adequate sources
Concentration of resources	<ul style="list-style-type: none"> • Dispersed system • Too many measures 	<ul style="list-style-type: none"> • Regional Innovation Strategy 	Work in progress. Difficulties in applying the concept of "pole of excellence" (= selection)
Local clustering, such as Technology Districts	<ul style="list-style-type: none"> • Relative success of Etna Valley 	<ul style="list-style-type: none"> • Technology Districts 	Technology Districts have proved to be effective
Spin-offs and new innovative firms	<ul style="list-style-type: none"> • Traditional sectors • Few spin-offs 	<ul style="list-style-type: none"> • Incubators (national + regional joint initiative) • Innovation Centres 	Positive experience in Catania: intensive work at university level (guidance for students etc.) and cooperation with multinationals based in Sicily
Finance for innovation	<ul style="list-style-type: none"> • Low diffusion of new financial tools 	<ul style="list-style-type: none"> • Creation of specific funds (pre-seed) 	Work in progress. Very difficult task due to cultural barriers (small, closed firms)
Monitoring and Evaluation	<ul style="list-style-type: none"> • Both absent 	<ul style="list-style-type: none"> • Regional Innovation Strategy as starting point. Monitoring and evaluation as tools for its revision 	No significant experiences regarding the specific challenge. RIS as positive starting point for the overall process

Annexes

Annex 1: Definition of policy mix typology

- **Improve innovation and R&D governance capacity:** Technical assistance type funding used by public authorities, regional agencies and public-private partnerships in developing and improving policies and strategies in support of R&D investments and innovation. This could include changes in the organisation of decision making, national and regional foresight, measures for improvement of evaluation etc.
- **Creation of an innovation and entrepreneurial friendly environment:** This category covers a wide range of actions which seek to improve the overall environment in which enterprises, universities and research organisations innovate. In this category the following measures are included:
 - Promotion of an entrepreneurial and innovation culture in the private sector by undertaking awareness initiatives and by changing regulations and disincentives which discourage entrepreneurship;
 - Regulation and initiatives addressing the intellectual property rights either by improving legislation in cases of commercialisation of public or collaborative research or by covering protection costs.
 - Direct or indirect support of spin-offs and New Technology Based Firms (NTBFs). Direct support includes public financial schemes such as pre-seed and first stage capital, while indirect measures include funding of incubators, training related to entrepreneurship, etc.
- **Development of human capital:** This category includes measures aiming at the upgrading of human resources in R&D and innovation related activities, such as supporting science and technology graduates to follow research and innovation-oriented careers; training of researchers in enterprises or research centres; intra- and international mobility of scientists; curriculum development in higher education aimed at developing science and technology; orientated under- and post-graduate courses etc.
- **Networking, co-location and clustering measures:** Policies under this category focus on remedying deficiencies in innovation systems by promoting cooperation, networking and interaction. Measures promoting co-location of industrial and scientific organisations (e.g. innovation poles), funding for clusters infrastructure and activities with technological and innovation orientation and support of innovation networking (e.g. information exchange clubs) are some of possible interventions under this category.
- **Knowledge and technology transfer to industry:** This category includes policies supporting directly or indirectly knowledge and technology transfer from universities and public research organisations and commercialisation of public research results. Direct support includes aid schemes for utilising technology-related services or for implementing technology transfer projects from public or private sector to the private sector. Indirect policies include development of infrastructures facilitating technology transfer such as technology parks, innovation centres, university liaison and transfer offices, etc.

- **Research collaboration of public research organisations with private sector:** Measures supporting collaborative research projects and development of common (for use by private and public sector) research infrastructures are included.
- **Support of public research:** Measures under this category include:
 - public investments in research infrastructure and direct funding of public R&D e.g. setting up new infrastructures, or supporting centres of excellence.
 - grants for R&D projects implemented in Universities and other Public Research Organisations.
 - regulatory changes and incentives for universities and other public research organisations which encourage the commercialisation of research results and collaboration with industry.
- **Financial R&D measures for the private sector:** Two main categories of measures are included:
 - **Direct and indirect financial R&D measures for the private sector:** Direct measures include direct public funding of R&D in the private sector e.g. grants, conditional loans etc. Indirect measures include tax incentives for firms to undertake R&D activities.
 - **Catalytic Financial R&D Measures for the private sector:** Includes instruments facilitating the access of R&D performers to external private sector sources of finance. Typical measures of this type are measures encouraging the use of *risk capital* (e.g. venture capital funds) for both R&D and innovation related activities and the *loan and equity guarantee measures*.

Annex 2: Description of key indicators used in the summary graphs

Period of coverage: Two period are used i.e. 1995 and 2004 or the closest possible years

Index: Country=100

Source: Eurostat, 2006

Summary Graph 1: Key indicators on Regions knowledge base development in comparison to Country

1. Total intramural R&D expenditure as a percentage of GDP
 - GERD
 - BERD
 - GOVERD
 - HERD
 - PNPERD
2. R&D personnel as a percentage of total employment
 - All sectors
 - Business
 - Government
 - Higher education
 - Private non-profit
3. Human Resources in S&T as a percentage of labour force
4. Patent applications at EPO per million inhabitants
5. Students in tertiary education (ISCED 5+6) per thousand inhabitants.
6. Life Long Learning: Participation of adults aged 25-64 in education and training as a percentage of population

Summary Graph 2: Key indicators on Regions economic structure and development

1. GDP per capita at current market prices.
2. Long-term unemployment rate (on total unemployment).
3. Unemployment rate (%).
4. Value-added at basic prices (EUR million): Share (%) of sectors to total.
 - Agriculture/ fishing
 - Mining and quarrying
 - Manufacturing
 - Electricity, gas and water supply
 - Construction
 - Services (excl. extra-territorial organizations and bodies)
5. Annual data on employment in technology and knowledge-intensive sectors at the regional level : Percentage of total employment
 - High technology manufacturing: NACE Rev. 1.1 codes 30, 32 and 33
 - Medium high technology manufacturing: NACE Rev. 1.1 codes 24, 29, 31, 34 and 35
 - Medium low technology: NACE Rev. 1.1 codes 23 and 25 to 28
 - Low-technology: NACE Rev. 1.1 codes 15 to 22 and 36 to 37
 - Total knowledge-intensive services: NACE Rev. 1.1 codes 61, 62, 64 to 67, 70 to 74, 80, 85 and 92
 - Knowledge-intensive high-technology services: NACE Rev. 1.1 codes 64, 72, 73
 - Total less-knowledge-intensive services: NACE Rev. 1.1 codes 50, 51, 52, 55, 60, 63, 75, 90, 91, 93, 95 and 99

Annex 3: Tables and Figures

Table 1. Number of Public Research Services Establishments (Public research institutes), 1998

SICILY	No	Public funding (M€)
CNR	26	2.46
INEA	2	-
INFN (*)	2	14.93
INFM	2	3.41
OSSERVATORI ASTRON.	4	4.03
REGION	3	0.69
TOTAL	39	

	No
Campania	48
Puglia	34
Sardegna	22
Abruzzo e Molise	10
Calabria	13
Basilicata	14

(*) INFN 1997

Source: Multiregional Objective 1 Programme "Research" 2000-2006

Table 2. Number of R&D personnel in Public Research Services Establishments (1998)

SICILY	Researchers	Technicians	Total
CNR	135	108	243
INEA	3	0	3
INFN (*)	43	83	126
INFM	0	0	0
OSSERVATORI ASTRON	25	33	58
REGION	7	1	8
TOTAL	213	225	438

	Total
Campania	1033
Puglia	368
Sardegna	195
Abruzzo e Molise	79
Calabria	85
Basilicata	173

(*) INFN 1997

Source: Multiregional Objective 1 Programme "Research" 2000-2006

Table 3. R&D personnel by institutional sector (2004)

REGIONS	Absolute values					%				
	Public Institutions	Private non-profit Institutions	Enterprises	Universities	Total	Public Institutions	Private non-profit Institutions	Enterprises	Universities	Total
Piemonte	1,208.0	280.0	13,505.6	3,287.0	18,280.6	3.7	8.2	20.0	5.4	11.1
Valle d'Aosta	27.0	45.0	95.3	28.0	195.3	0.1	1.3	0.1	-	0.1
Lombardia	2,463.0	1,397.0	18,456.9	7,090.0	29,406.9	7.6	40.9	27.3	11.7	17.9
Provincia autonoma di Trento	817.0	40.0	348.0	559.0	1,764.0	2.5	1.2	0.5	0.9	1.1
Provincia autonoma di Bolzano	113.0	119.0	412.5	87.0	731.5	0.3	3.5	0.6	0.1	0.4
Veneto	1,142.0	269.0	4,274.5	3,840.0	9,525.5	3.5	7.9	6.3	6.3	5.8
Friuli-Venezia Giulia	572.0	47.0	1,658.0	1,918.0	4,195.0	1.8	1.4	2.5	3.2	2.6
Liguria	857.0	45.0	2,470.0	1,477.0	4,849.0	2.6	1.3	3.7	2.4	3.0
Emilia-Romagna	1,567.0	198.0	8,255.9	5,405.0	15,425.9	4.8	5.8	12.2	8.9	9.4
Toscana	2,073.0	85.0	3,092.4	5,433.0	10,683.4	6.4	2.5	4.6	9.0	6.5
Umbria	161.0	11.0	487.8	1,706.0	2,365.8	0.5	0.3	0.7	2.8	1.4
Marche	210.0	20.0	1,140.3	1,362.0	2,732.3	0.6	0.6	1.7	2.2	1.7
Lazio	15,330.0	524.0	5,550.9	8,665.0	30,069.9	47.5	15.3	8.2	14.5	18.3
Abruzzo	504.0	21.0	1,486.6	1,391.0	3,402.6	1.6	0.6	2.2	2.3	2.1
Molise	68.0	-	29.4	251.0	348.4	0.2	-	-	0.4	0.2
Campania	2,037.0	136.0	3,176.9	6,247.0	11,596.9	6.3	4.0	4.7	10.3	7.1
Puglia	943.0	88.0	1,038.5	3,329.0	5,398.5	2.9	2.6	1.5	5.5	3.3
Basilicata	131.0	3.0	199.9	375.0	708.9	0.4	0.1	0.3	0.6	0.4
Calabria	296.0	7.0	63.5	1,175.0	1,541.5	0.9	0.2	0.1	1.9	0.9
Sicilia	1,247.0	75.0	1,595.8	5,248.0	8,165.8	3.8	2.2	2.4	8.6	5.0
Sardegna	635.0	2.0	180.6	1,821.0	2,638.6	2.0	0.1	0.3	3.0	1.6
ITALIA	32,401.0	3,412.0	67,519.3	60,694.1	164,026.4	100.0	100.0	100.0	100.0	100.0
<i>Nord-ovest</i>	<i>4,555.0</i>	<i>1,767.0</i>	<i>34,527.8</i>	<i>11,882.0</i>	<i>52,731.8</i>	<i>14.1</i>	<i>51.7</i>	<i>51.1</i>	<i>19.6</i>	<i>32.1</i>
<i>Nord-est</i>	<i>4,211.0</i>	<i>673.0</i>	<i>14,948.9</i>	<i>11,809.0</i>	<i>31,641.9</i>	<i>13.0</i>	<i>19.7</i>	<i>22.1</i>	<i>19.5</i>	<i>19.3</i>
<i>Centro</i>	<i>17,774.0</i>	<i>640.0</i>	<i>10,271.4</i>	<i>17,166.0</i>	<i>45,851.4</i>	<i>54.8</i>	<i>18.8</i>	<i>15.2</i>	<i>28.3</i>	<i>28.0</i>
<i>Mezzogiorno</i>	<i>5,861.0</i>	<i>332.0</i>	<i>7,771.2</i>	<i>19,837.0</i>	<i>33,801.2</i>	<i>18.1</i>	<i>9.8</i>	<i>11.5</i>	<i>32.6</i>	<i>20.6</i>

Source: Istat

Table 4. R&D expenditure by institutional sector (2004)

REGIONS	Absolute values					%				
	Public Institutions	Private non-profit Institutions	Enterprises	Universities	Total	Public Institutions	Private non-profit Institutions	Enterprises	Universities	Total
Piemonte	88,994	16,623	1,476,232	313,429	1,895,278	3.3	7.1	20.2	6.3	12.4
Valle d'Aosta	1,096	1,896	8,294	1,841	13,127	-	0.8	0.1	-	0.1
Lombardia	222,433	130,561	2,273,319	608,061	3,234,374	8.2	56.1	31.2	12.2	21.2
Provincia autonoma di Trento	66,457	3,320	26,052	50,782	146,611	2.4	1.4	0.4	1.0	1.0
Provincia autonoma di Bolzano	13,143	6,497	35,324	12,128	67,092	0.5	2.8	0.5	0.2	0.4
Veneto	90,042	5,343	365,374	378,593	839,352	3.3	2.3	5.0	7.6	5.5
Friuli-Venezia Giulia	53,178	1,837	165,949	146,839	367,803	2.0	0.8	2.3	2.9	2.4
Liguria	88,253	2,312	247,693	149,498	487,756	3.2	1.0	3.4	3.0	3.2
Emilia-Romagna	116,104	8,107	810,486	437,134	1,371,831	4.3	3.5	11.1	8.7	9.0
Toscana	169,585	3,829	322,835	542,407	1,038,656	6.2	1.6	4.4	10.8	6.8
Umbria	14,352	514	29,623	108,152	152,641	0.5	0.2	0.4	2.2	1.0
Marche	12,762	559	95,937	81,927	191,185	0.5	0.2	1.3	1.6	1.3
Lazio	1,361,812	26,322	646,623	638,895	2,673,652	50.0	11.3	8.9	12.8	17.5
Abruzzo	39,144	675	115,467	109,131	264,417	1.4	0.3	1.6	2.2	1.7
Molise	3,591	7	3,219	17,262	24,079	0.1	-	-	0.3	0.2
Campania	154,433	10,925	364,124	497,520	1,027,002	5.7	4.7	5.0	9.9	6.7
Puglia	63,122	8,134	96,796	235,197	403,249	2.3	3.5	1.3	4.7	2.6
Basilicata	10,320	83	19,440	25,813	55,656	0.4	-	0.3	0.5	0.4
Calabria	16,285	170	7,057	94,118	117,630	0.6	0.1	0.1	1.9	0.8
Sicilia	94,291	4,922	172,456	409,914	681,583	3.5	2.1	2.4	8.2	4.5
Sardegna	42,234	70	10,550	145,870	198,724	1.6	-	0.1	2.9	1.3
ITALIA	2,721,631	232,706	7,292,850	5,004,511	15,251,698	100.0	100.0	100.0	100.0	100.0
<i>Nord-ovest</i>	<i>400,776</i>	<i>151,392</i>	<i>4,005,538</i>	<i>1,072,829</i>	<i>5,630,535</i>	<i>14.7</i>	<i>65.1</i>	<i>54.9</i>	<i>21.4</i>	<i>36.9</i>
<i>Nord-est</i>	<i>338,924</i>	<i>25,104</i>	<i>1,403,185</i>	<i>1,025,476</i>	<i>2,792,689</i>	<i>12.5</i>	<i>10.8</i>	<i>19.2</i>	<i>20.5</i>	<i>18.3</i>
<i>Centro</i>	<i>1,558,511</i>	<i>31,224</i>	<i>1,095,018</i>	<i>1,371,381</i>	<i>4,056,134</i>	<i>57.3</i>	<i>13.4</i>	<i>15.0</i>	<i>27.4</i>	<i>26.6</i>
<i>Mezzogiorno</i>	<i>423,420</i>	<i>24,986</i>	<i>789,109</i>	<i>1,534,825</i>	<i>2,772,340</i>	<i>15.5</i>	<i>10.7</i>	<i>10.9</i>	<i>30.7</i>	<i>18.2</i>

Source: Istat

Table 5. Number of academic staff in HEIs

2002			
Ordinary Professors	Associated Professors	Researchers	Total
1364	1584	1934	4882
2003			
			Total
			4766
2004			
			Total
			4827

Source: Multiregional Objective 1 Programme "Research" 2000-2006 (2002); Ministry of Research (2003,2004)

Table 6. Number of doctorates awarded in the region

academic year 1998/1999			
No of doctorates awarded	% Italy	No of doctors	% Italy
344	7.3	252	7.2

	No of doctorates awarded	% Italy	No of doctors	% Italy
Piemonte		5.2		5.5
Lombardia		10.7		15.3
Trentino AA		0.8		1.0
Veneto		6.3		6.6
Friuli		4.2		2.4
Liguria		3.1		3.6
Emilia Romagna		6.4		10.8
Toscana		8.2		17.1
Umbria		2.1		2.3
Marche		2.0		2.1
Lazio		9.2		5.3
Abruzzo		1.9		2.2
Molise		0.4		0.2
Campania		28.0		11.8
Puglia		4.4		3.7
Basilicata		0.4		0.5
Calabria		2.5		0.7
Sardegna		1.9		1.8

Source: Ministry of University and Research

Table 7. Number of enrolled students

Years			
2000-01	166,526		
2001-02	177,214		
2002-03	187,399		
2003-04	197,014		
2004-05	198,169		
Rate of enrolment (1) academic year 2003-2004			
Years	Males	Females	Total
Sicily	30.7	41.4	36.0
North	30.5	38.0	34.2
Centre	41.1	52.6	46.7
South	33.0	45.1	39.0
Italy	33.5	43.7	38.5

(1) Enrolled at university per 100 youngsters aged 15-29 years.

Source: Regional Statistical Service – Elaboration from ISTAT data - MIUR_URST

Table 8. Total number of enrolled students in science and engineering programmes

Years	
2000-01	35,587
2001-02	38,474
2002-03	38,009
2003-04	41,018
2004-05	42,276

Source: Regional Statistical Service – Elaboration from ISTAT data - MIUR_URST

Table 9. Number of higher education institutes awarding science and engineering degrees

2002
Number of academic staff in HEIs awarding science and engineering degrees
1846
% of academic staff in HEIs awarding science and engineering degrees/total academic staff in HEIs (Sicily)
37.8
% of academic staff in HEIs awarding science and engineering degrees in Sicily/academic staff in HEIs awarding science and engineering degrees in Italy
7.8

Source: Multiregional Objective 1 Programme "Research" 2000-2006

Table 10. Size of research budget of universities

current prices € (.000)		
2002	2001	2000
379,453	405,440	364,302
in % of GDP		
2002	2001	2000
0.53	0.58	0.55
in % of total R&D expenditure		
2002	2001	2000
64.90	67.30	64.10
in % of total University expenditure		
2002	2001	2000
46.90	43.50	36.20

	current prices € (.000)	in % of GDP 2000	in % of total R&D expenditure
Lombardia	447,976	1.3	16.0
Campania	375,645	0.5	50.1
Italy	3,865,136	0.3	31.0

Source: Ministry of University and Research, *L'Università in cifre 2005*

Table 11. Percentage of citations by scientific field

Science Citation Index edition	Palermo	% Palermo/Italy	Messina	% Messina/Italy	Catania	% Catania/Italy	Sicily	Italy
1993	380	1.8	218	1.0	542	2.5	1140	21602
1994	416	1.8	231	1.0	552	2.4	1199	23480
1995	443	1.8	284	1.1	588	2.3	1315	25272
1996	558	2.0	391	1.4	692	2.5	1641	27823
1997	529	1.8	313	1.1	605	2.1	1447	28762

<i>Impact Factor, University of PALERMO</i>						
Palermo	N. *	N. IF **	Media IF	Max IF	Somma IF	
1993	284	281	1.93	27.07	540.98	
1994	301	301	1.85	22.41	556.58	
1995	327	320	1.88	22.41	601.47	
1996	400	391	1.86	27.07	725.58	
1997	381	368	2.12	21.91	780.67	

<i>Impact Factor, University of MESSINA</i>					
Messina	N. *	N. IF **	Media IF	Max IF	Somma IF
	20				
1993	4	191	1.79	17.49	341.56
	21				
1994	6	215	1.78	22.41	383.03
	23				
1995	6	232	1.72	7.39	398.95
	33				
1996	0	322	1.8	22.41	578.64
	26				
1997	7	263	1.77	8.2	465.27

<i>Impact Factor, University of CATANIA</i>						
Catania	N. *	N. IF **	Media IF	Max IF	Somma IF	
1993	443	439	2.02	28.54	885.99	
1994	459	452	1.85	22.41	835.17	
1995	488	475	2.1	27.07	995.24	
1996	578	563	2.09	28.54	1188.96	
1997	456	421	1.99	22.41	837.98	

* N. of publications (*article, letter, editorial, editorial material, note, review, excluding discussion and meeting abstract, correction, reprint, and biographical item*).

** N. of publications with IF >= 0 (JCR-1995)

Source: *Regional Innovation Strategy*

Table 12. Number of patent applications (by industrial field and technology intensity i.e. IPC)

a) No of patents (EPO)/million inhabitants								
	1995	1996	1997	1998	1999	2000	2001	2002
Piemonte	84	100	90	112	128	115	122	134
Valle D'Aosta	21	6	3	21	33	94	91	104
Lombardia	103	123	139	135	156	175	169	178
Trentino- Alto Adige	35	41	46	52	56	84	60	80
Veneto	72	77	89	95	114	116	125	129
Friuli- Venezia Giulia	79	99	109	98	122	99	102	105
Liguria	36	40	49	50	60	62	60	59
Emilia Romagna	104		136	144	162	188	190	196
Toscana	36	39	48	44	57	61	75	78
Umbria	23	21	34	25	30	40	28	35
Marche	33	40	32	58	53	69	64	75
Lazio	33	37	43	51	41	47	49	44
Abruzzo	23	58	41	57	46	49	47	42
Molise	8	3	4	11	3	8	21	3
Campania	4	8	6	8	10	11	12	11
Puglia	5	6	8	8	11	9	11	10
Basilicata	8	12	13	17	18	10	13	9
Calabria	1	7	1	5	4	5	8	7
Sicilia	9	6	7	12	11	11	11	12
Sardegna	7	5	6	12	9	10	10	9
- Nord-ovest	90	107	114	118	137	146	144	152
- Nord-est	82	91	105	110	128	138	141	147
- Centro	33	37	42	48	47	54	58	58
- Centro-Nord	70	81	90	95	107	116	117	123
- Mezzogiorno	7	10	8	12	12	12	13	12
Italia	47	55	60	65	73	79	80	83

Source: Statistics for public policies (ISTAT)

b) Patent applications to the EPO by priority year at the regional level by IPC sections and classes										
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
<i>a</i> Section A - Human necessities	3.5413	3.6307	4.3973	3.6901	8.6778	9.2796	5.7929	7.9073	4.8347	4.611
<i>b</i> Section B - Performing operations; transporting	8.3265	4.8262	2.7391	4.4168	5.0087	4.0442	6.3646	3.6664	5.0452	6.1015
<i>c</i> Section C - Chemistry; metallurgy	3.7357	0.9406	0.6357	0.661	6.4253	2.0641	4.3535	4.5174	4.2181	0.6912
<i>d</i> Section D - Textiles; paper	0.0989	0.1774	0.054	0.0728	0.0698	0.1559	0.0425	0.0627	0.0535	0.0624
<i>e</i> Section E – Fixed constructions	1.1874	2.1875	2.1396	1.747	6.0886	5.3301	4.6398	1.2537	2.1586	1.1028
<i>f</i> Section F - Mechanical engineering; lighting; heating; weapons; blasting	0.3147	0.911	2.1809	2.2591	1.4082	4.3432	1.2315	1.8866	4.5372	2.0674
<i>g</i> Section G - Physics	6.9469	5.81	7.6954	6.9687	4.6576	7.3458	14.5912	13.2148	18.4728	8.2402
<i>h</i> Section H - Electricity	28.649	27.9943	8.3764	15.3606	27.0916	24.4352	17.3506	21.8097	19.3381	16.6514

Source: Eurostat

Table 13. Size of research budget of research institutes

€ (millions)
1998
25.5

	€ (millions)
	1998
Campania	71.0
Puglia	30.0
Sardegna	23.5
Abruzzo	e
Molise	17.9
Calabria	3.5
Basilicata	11.6

Source: Multiregional Objective 1 Programme "Research" 2000-2006

Table 14. Number of foreign- owned companies in the region (e.g. multinational corporations)

	dominant control		other		total	
	n	%	n	%	n	%
<i>South Italy</i>	212	8.4	52	12	264	8.9
Campania	98	3.9	16	3.7	114	3.9
Puglia	35	1.4	11	2.5	46	1.6
Basilicata	10	0.4	9	2.1	19	0.6
Calabria	7	0.3	2	0.5	9	0.3
Sicilia	33	1.3	10	2.3	43	1.5
Sardegna	29	1.1	4	0.9	33	1.1
Total Italy	2523	100	432	100	2955	100

Source: Multiregional Objective 1 Programme "Research" 2000-2006

Table 15. Life Long Learning: Participation of adults aged 25-64 in education and training (1000)

	1999	2000	2001	2002	2003	2004
Participation in life-long learning	21.7	67	89.1	88.2	88.4	134.8
No participation in life-long learning	628.9	1899.9	2538.4	2540.7	2541.4	2481.2
No answer	1954.5	653				22.1
Total	2605.2	2620	2627.6	2628.9	2629.9	2638.1

Source: Eurostat

Table 16. Human resources in S&T as percentage of total population in the Region

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Italy	10	10.2	10.6	10.9	10.7	11.4	12.2	12.8	13.2	13.6	14.5	14.7
Sicilia	8.2	8.4	8.8	9.2	9	9.3	9.8	10.3	10.9	10.6	10.8	11.3

Source: Eurostat

**Table 17. Human resources in S&T as percentage of Economically active population
HRST categories as a percentage of labour force**

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Italy	24.8	25.5	26.3	26.9	26.4	27.8	29.8	31.1	31.7	32.2	34.1	34.9
Sicilia	24.6	25.2	26.8	27.6	26.3	26.9	27.9	29	30.5	29.9	30.4	32.2

Source: Eurostat

Table 18. Venture capital investments - expansion and replacement (As percentage of GDP)

	1999	2000	2001	2002	2003	2004
Piemonte	0.039	0.030	0.018	0.000	0.034	0.082
Valle D'Aosta	0.000	0.000	0.000	0.000	0.000	0.000
Lombardia	0.057	0.204	0.080	0.190	0.080	0.034
Trentino - Alto Adige	0.000	0.000	0.069	0.000	0.036	0.001
Veneto	0.013	0.075	0.010	0.053	0.033	0.057
Friuli - Venezia Giulia	0.181	0.085	0.110	0.391	0.203	0.075
Liguria	0.045	0.042	0.039	0.143	0.007	0.001
Emilia - Romagna	0.032	0.162	0.198	0.056	0.109	0.142
Toscana	0.044	0.081	0.075	0.013	0.011	0.015
Umbria	0.000	0.004	0.010	0.011	0.033	0.000
Marche	0.001	0.041	0.206	0.003	0.004	0.006
Lazio	0.018	0.081	0.015	0.088	0.019	0.018
Abruzzo	0.003	0.004	0.001	0.001	0.024	0.006
Molise	0.000	0.005	0.001	0.000	0.000	0.000
Campania	0.007	0.018	0.022	0.000	0.007	0.019
Puglia	0.014	0.012	0.003	0.000	0.001	0.002
Basilicata	0.015	0.000	0.000	0.000	0.096	0.000
Calabria	0.046	0.003	0.003	0.000	0.000	0.009
Sicilia	0.013	0.033	0.018	0.000	0.000	0.007
Sardegna	0.091	0.010	0.008	0.059	0.001	0.000
- Nord-ovest	0.050	0.141	0.059	0.134	0.060	0.044
- Nord-est	0.037	0.103	0.100	0.085	0.081	0.086
- Centro	0.023	0.071	0.058	0.048	0.015	0.014
- Centro-Nord	0.039	0.110	0.071	0.096	0.054	0.048
- Mezzogiorno	0.021	0.016	0.012	0.005	0.007	0.008
Italy	0.039	0.095	0.073	0.080	0.055	0.040

Source: Statistics for public policies (ISTAT)

Table 19. Venture capital investments - early stage (As a percentage of GDP)

	1999	2000	2001	2002	2003	2004
Piemonte	0.010	0.013	0.001	0.001	0.000	0.001
Valle D'Aosta	0.000	0.000	0.000	0.000	0.000	0.000
Lombardia	0.018	0.112	0.015	0.010	0.007	0.001
Trentino - Alto Adige	0.000	0.000	0.040	0.000	0.000	0.004
Veneto	0.003	0.020	0.005	0.002	0.000	0.000
Friuli - Venezia Giulia	0.047	0.012	0.007	0.027	0.025	0.007
Liguria	0.000	0.000	0.000	0.000	0.013	0.000
Emilia - Romagna	0.013	0.023	0.010	0.008	0.003	0.000
Toscana	0.006	0.027	0.007	0.006	0.003	0.001
Umbria	0.000	0.053	0.001	0.000	0.000	0.000
Marche	0.003	0.002	0.001	0.000	0.001	0.001
Lazio	0.009	0.054	0.003	0.003	0.001	0.001
Abruzzo	0.006	0.000	0.001	0.000	0.002	0.000
Molise	0.063	0.017	0.000	0.000	0.000	0.000
Campania	0.004	0.009	0.000	0.000	0.009	0.000
Puglia	0.007	0.008	0.000	0.000	0.000	0.000
Basilicata	0.000	0.015	0.000	0.000	0.000	0.000
Calabria	0.003	0.004	0.004	0.000	0.000	0.000
Sicilia	0.024	0.009	0.000	0.000	0.000	0.000
Sardegna	0.009	0.008	0.002	0.011	0.002	0.000
- Nord-ovest	0.014	0.074	0.010	0.007	0.005	0.001
- Nord-est	0.011	0.018	0.010	0.007	0.004	0.001
- Centro	0.007	0.039	0.004	0.003	0.002	0.001
- Centro-Nord	0.011	0.048	0.008	0.006	0.004	0.001
- Mezzogiorno	0.011	0.008	0.001	0.001	0.003	0.000
Italy	0.014	0.042	0.024	0.005	0.005	0.002

Source: Statistics for public policies (ISTAT)

**Table 20. Regional gross domestic product per capita
Euro per inhabitant in percentage of the EU average**

	1995	1996	1997	1998	1999	2000	2001	2002	2003
Italy	97.6	107.1	107.9	106.6	105.3	104	105.1	105.2	106.6
Sicilia	63.3	69.5	70.5	69.5	68.2	67.8	69.1	69.3	72.3

Source: Eurostat

Table 21. Number of companies in region by type of activity (NACE)

	1991	2001
Agriculture, hunting, forestry and fishing	1828	2301
Mining and quarrying	320	392
Manufacturing	26919	28507
Electricity, gas and water supply	528	512
Construction	16709	27300
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	110448	103529
Hotels and restaurants	11334	13503
Transport, storage and communication	7745	10065
Financial intermediation	5099	6267
Other service activities	48680	71622
Total	229610	263998

Source: ISTAT

Table 22. Size distribution of companies in region by type of activity (NACE)

2001	0-9	10-19	20-49	50-249	250 and over	Total
Agriculture, hunting, forestry and fishing	2074	149	51	26	1	2301
Mining and quarrying	327	44	19	2	0	392
Manufacturing	26538	1247	524	181	17	28507
Electricity, gas and water supply	350	56	61	41	4	512
Construction	25874	985	353	86	2	27300
Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods	101863	1245	335	81	5	103529
Hotels and restaurants	13016	299	138	50	0	13503
Transport, storage and communication	9138	530	236	136	25	10065
Financial intermediation	5809	318	82	56	2	6267
Other service activities	70455	659	340	147	21	71622
Total	255444	5532	2139	806	77	263998

Source: ISTAT

**Table 23. Number or percentage of innovative companies in region
Enterprises innovating in-house, 1998-2000 (% of total)**

Piemonte	33.4
Valle D'Aosta	33.4
Lombardia	33.8
Trentino - Alto Adige	32.3
Veneto	32.3
Friuli - Venezia Giulia	32.3
Liguria	33.4
Emilia - Romagna	37.8
Toscana	31.5
Umbria	31.5
Marche	31.5
Lazio	22.9
Abruzzo	22.1
Molise	22.1
Campania	18.3
Puglia	23.9
Basilicata	23.9
Calabria	23.9
Sicilia	17
Sardegna	17
Italy	30.9

Source: FILAS

Table 24. Number of companies in each identified regional industrial cluster

Sinagra	284
Customaci	592

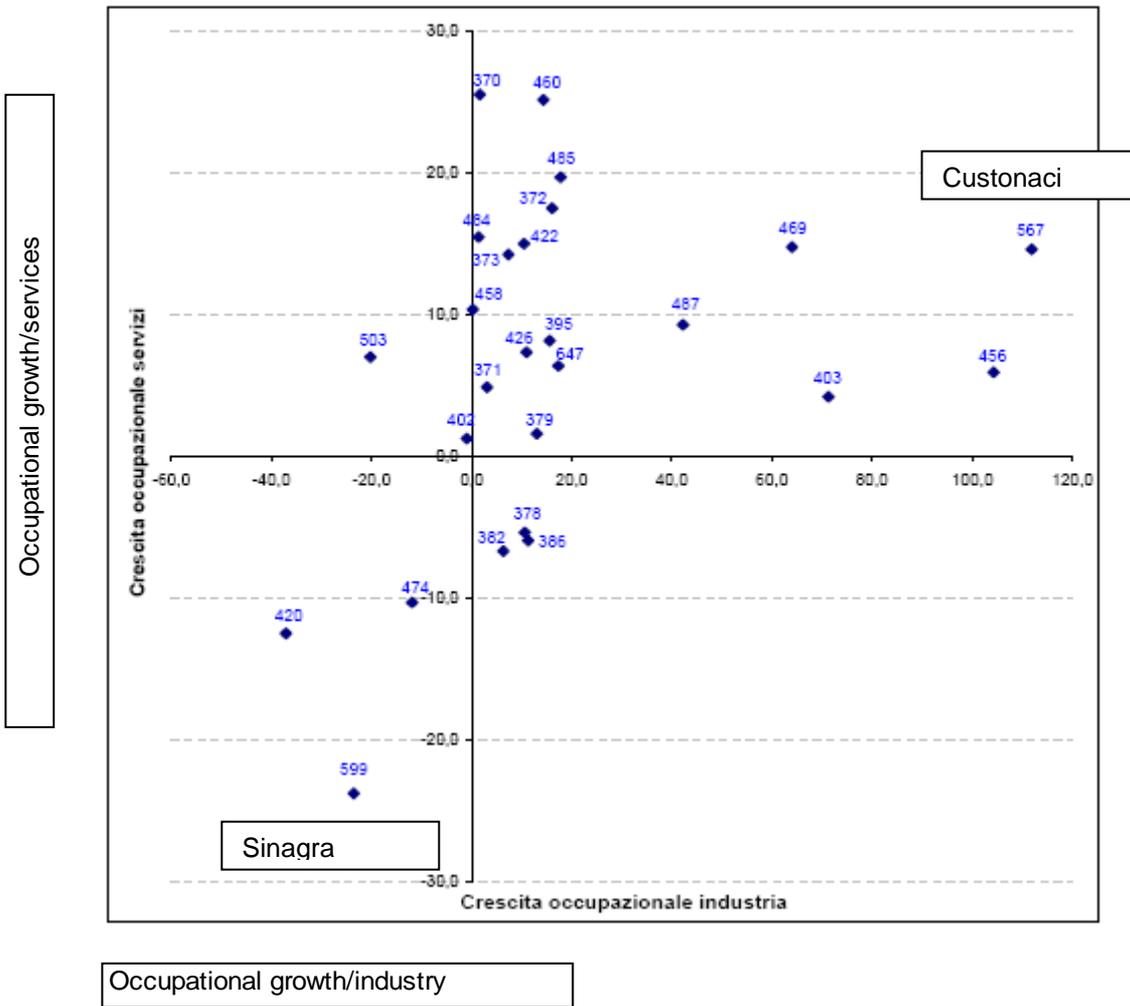
Source: ISTAT

Table 25. Size distribution of companies in each regional industrial cluster (volume of production, number of employees etc)

number of employees	
Sinagra	649
Customaci	1955

Source: ISTAT

Table 26. Stage of cluster's life cycle (i.e. embryonic, mature, declining, re-emerging)



Source: ISTAT

Table 27. Export of goods (value) in % of regional GDP

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Piemonte	25.6	24.2	22.8	24.9	25.3	24.5	23.1	23.1	25.4	28.0	33.2	30.9	30.1	29.0	27.3	29.6	29.5	28.1	27.6	27.6
Valle D'Aosta	5.1	3.0	3.9	4.9	6.3	5.2	4.8	6.0	9.1	9.0	14.7	10.3	8.4	9.8	9.6	12.8	12.0	10.9	11.2	12.9
Lombardia	25.4	22.2	21.6	22.8	24.2	23.0	21.7	22.2	25.6	27.6	31.3	29.6	29.3	28.8	28.0	31.0	31.7	29.7	29.2	29.2
Trentino Alto Adige	13.7	11.9	12.3	12.0	11.7	11.9	11.6	12.8	13.7	15.8	18.9	16.2	16.4	16.2	16.4	17.1	17.1	16.4	16.6	16.8
Veneto	24.2	21.8	21.2	21.0	22.2	21.9	20.5	20.9	25.6	28.5	31.8	31.1	31.2	31.3	32.1	35.0	35.8	35.4	32.9	33.2
Friuli Venezia Giulia	21.9	19.6	19.9	19.8	19.8	20.4	19.1	18.7	25.1	26.2	29.0	28.2	28.9	32.9	29.8	33.1	32.8	30.6	26.9	30.9
Liguria	14.5	11.2	9.7	10.0	9.5	9.0	8.0	8.2	10.4	11.6	11.2	10.7	10.7	8.8	8.4	9.9	10.9	9.6	9.2	8.9
Emilia Romagna	22.0	19.6	18.9	19.1	20.0	18.9	18.0	17.5	22.0	23.9	26.9	26.3	27.0	27.5	27.0	29.1	29.5	28.8	27.9	29.5
Toscana	24.3	20.8	20.0	18.5	19.8	18.3	17.1	17.3	20.9	23.5	25.8	25.3	25.5	24.4	23.6	27.2	27.1	25.5	23.5	24.1
Umbria	9.7	8.9	8.2	8.0	8.4	7.4	7.4	6.9	9.6	10.9	14.1	13.2	13.2	13.0	12.5	14.1	13.7	14.3	13.5	13.9
Marche	16.2	14.4	14.4	14.2	14.7	14.4	14.2	14.2	18.1	21.4	24.0	23.3	25.1	25.1	22.4	25.1	26.7	26.4	26.3	25.6
Lazio	7.0	5.9	5.7	5.6	6.6	6.4	5.7	5.6	7.0	7.0	7.1	7.5	8.0	8.2	8.7	10.1	9.0	9.1	7.9	7.8
Abruzzo	8.7	8.5	9.2	9.5	10.5	10.7	9.9	8.4	10.0	12.9	19.9	18.8	20.3	21.4	19.0	23.3	23.6	23.2	22.0	24.4
Molise	3.4	2.4	2.0	2.1	2.7	3.2	2.8	3.6	5.0	6.4	9.3	9.5	10.3	10.2	10.0	9.7	10.1	10.0	9.2	9.1
Campania	7.6	6.3	6.0	5.3	5.4	5.1	5.1	5.4	6.4	7.4	8.5	8.2	8.5	9.4	9.0	10.2	10.5	9.5	8.0	8.0
Puglia	11.0	9.3	7.8	7.4	7.5	7.3	6.5	6.2	8.1	8.7	10.7	9.7	9.9	10.0	9.7	10.9	10.9	9.7	9.3	10.2
Basilicata	1.9	1.7	1.7	3.3	3.1	2.6	2.6	2.9	3.9	4.7	6.2	6.0	5.1	11.7	13.3	12.6	13.4	16.4	16.3	13.2
Calabria	1.4	1.3	1.2	1.2	1.0	0.8	0.8	0.9	1.1	0.9	0.9	1.1	0.9	1.0	0.9	1.2	1.1	1.0	1.1	1.2
Sicilia	9.6	5.7	5.1	4.9	5.3	5.1	4.5	4.3	3.7	4.3	5.2	5.0	5.7	5.7	5.5	8.1	7.5	6.8	6.6	7.0
Sardegna	13.3	8.7	7.7	6.6	6.6	6.6	5.8	5.3	7.3	6.5	7.0	6.6	7.7	6.4	6.5	9.8	8.6	7.7	8.5	9.5
<i>Nord-ovest</i>	24.2	21.5	20.6	22.0	23.0	21.9	20.6	20.9	24.0	26.0	29.8	28.0	27.6	26.8	25.9	28.5	29.0	27.2	26.7	26.7
<i>Nord-est</i>	22.1	19.8	19.3	19.2	20.1	19.6	18.5	18.5	23.0	25.2	28.4	27.5	27.9	28.5	28.3	30.8	31.2	30.4	28.7	29.9
<i>Centro</i>	14.1	12.1	11.6	11.0	12.0	11.3	10.5	10.4	12.9	14.3	15.7	15.6	16.2	15.9	15.5	17.8	17.4	16.8	15.5	15.5
<i>Centro-Nord</i>	20.8	18.4	17.7	18.2	19.2	18.3	17.2	17.3	20.6	22.6	25.5	24.5	24.6	24.3	23.7	26.2	26.4	25.3	24.2	24.5
<i>Mezzogiorno</i>	8.5	6.4	5.9	5.6	5.8	5.6	5.2	5.0	5.9	6.6	8.2	7.7	8.2	8.6	8.3	10.1	9.9	9.2	8.7	9.1
Italia	18.4	16.1	15.3	15.2	16.1	15.4	14.6	14.5	17.0	18.6	21.3	20.4	20.6	20.5	19.9	22.3	22.4	21.3	20.3	21.0

Source: Statistics for public policies (ISTAT)

Table 28. Export of high/increasing productivity products (% of total export)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Piemonte	41.2	40.5	39.9	40.0	42.4	40.9	39.4	39.3	38.6	39.7	38.4	37.7	38.7
Valle D'Aosta	22.6	27.2	54.6	51.0	51.2	43.1	18.6	25.3	27.1	28.0	30.2	18.7	24.2
Lombardia	32.1	32.0	31.8	31.7	32.0	31.4	31.5	32.0	34.0	35.9	36.3	35.7	34.9
Trentino Alto Adige	23.7	23.8	26.6	26.6	27.7	25.1	23.1	23.1	23.6	23.6	22.6	23.3	22.2
Veneto	15.8	16.2	16.6	16.8	17.0	18.4	18.2	18.7	20.1	21.7	19.9	21.8	21.1
Friuli Venezia Giulia	14.2	13.7	23.6	18.7	19.4	20.1	18.9	26.8	23.3	27.7	22.9	24.1	19.3
Liguria	32.4	31.1	29.8	28.6	28.7	31.2	33.7	30.3	30.8	35.8	38.9	34.4	34.0
Emilia Romagna	19.8	18.8	18.9	19.5	20.4	20.7	21.7	22.1	22.3	23.1	23.2	23.7	23.9
Toscana	9.9	11.3	11.6	13.1	12.9	13.5	13.4	14.4	15.1	14.8	16.5	18.0	18.4
Umbria	13.7	14.5	15.1	14.0	11.7	12.6	14.2	15.3	15.2	13.6	13.7	13.7	13.3
Marche	5.8	5.9	6.4	9.4	7.2	6.7	8.0	8.7	8.3	9.1	10.1	11.5	12.0
Lazio	63.3	66.4	66.5	66.2	64.9	67.7	68.9	71.0	72.1	73.7	68.9	70.9	66.7
Abruzzo	55.7	46.7	37.0	44.9	56.5	53.4	52.6	53.1	44.9	48.4	46.7	45.8	45.9
Molise	36.6	31.1	25.4	18.3	26.7	26.2	25.2	23.7	21.3	23.8	22.8	23.6	16.7
Campania	45.0	45.4	32.0	35.5	36.9	33.4	36.0	43.2	44.5	44.9	45.9	40.9	36.8
Puglia	12.6	12.3	10.8	11.6	14.0	13.3	11.2	17.9	21.8	20.9	18.5	17.1	17.5
Basilicata	37.4	48.0	36.8	48.5	44.5	55.8	53.3	77.3	78.0	65.0	67.7	67.8	66.0
Calabria	20.1	23.9	37.6	28.6	27.5	21.7	26.9	23.1	30.1	20.3	25.6	27.4	25.0
Sicilia	26.0	27.7	25.6	31.7	38.2	35.4	34.9	38.1	33.7	30.0	28.0	32.3	30.5
Sardegna	21.5	18.4	16.6	24.3	25.8	20.9	22.6	26.6	19.5	14.3	15.7	15.1	15.4
- Nord-ovest	34.8	34.4	34.1	34.0	35.1	34.3	33.8	34.0	35.2	36.9	37.0	36.2	35.9
- Nord-est	17.7	17.4	18.8	18.6	19.2	19.8	19.9	21.2	21.5	23.0	21.6	22.8	22.1
- Centro	23.7	25.1	25.5	25.2	23.1	24.7	25.7	27.6	29.4	29.9	28.3	30.5	28.8
- Centro-Nord	27.6	27.6	27.6	27.4	27.9	27.8	27.7	28.4	29.3	30.7	30.0	30.4	29.7
- Mezzogiorno	31.9	31.0	24.5	29.2	34.1	32.0	32.2	38.3	37.0	35.3	35.1	34.6	32.7
Italia	28.1	28.1	27.4	27.6	28.5	28.2	28.1	29.5	30.1	31.2	30.5	30.8	30.0

Source: Statistics for public policies (ISTAT)

