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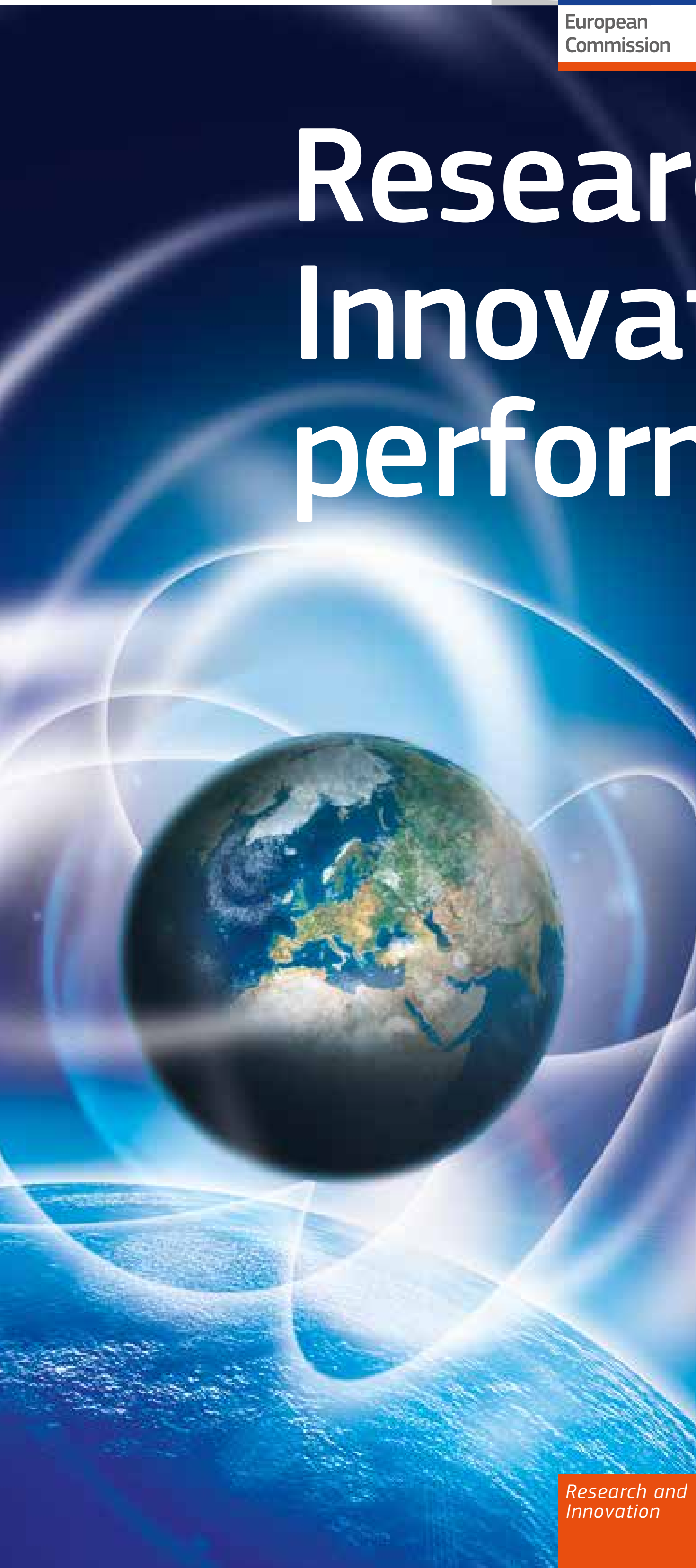

Research and Innovation performance in

Italy

Country Profile

2014

Research and Innovation

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Italy

The challenge of structural change for a more knowledge-intensive economy

Summary: Performance in research and innovation

The indicators in the table below present a synthesis of research and innovation performance in Italy. They relate knowledge investment and input to performance and economic output throughout the innovation cycle. They show thematic strengths in key technologies and also the high-tech and medium-tech contribution to the trade balance. The indicator on excellence in science and technology takes into consideration the quality of scientific production as well as technological development. The Innovation Output Indicator covers technological innovation, skills in knowledge-intensive activities, the competitiveness of knowledge-intensive goods and services, and the innovativeness of fast-growing enterprises, focusing on innovation output. The indicator on knowledge-intensity of the economy focuses on the economy's sectoral composition and specialisation and shows the evolution of the weight of knowledge-intensive sectors and products.

Key indicators of research and innovation performance			
R&D intensity		***Excellence in S&T***[1]	
2012: **1.27 %**	(EU: 2.07 %; US: 2.79 %)	2012: **36.5**	(EU: 47.8; US: 58.1)
2007-2012: **+1.5 %**	(EU: 2.4 %; US: 1.2 %)	2007-2012: **-0.5 %**	(EU: +2.9 %; US: -0.2)
Innovation Output Indicator		***Knowledge-intensity of the economy***[2]	
2012: **84.3**	(EU: 101.6)	2012: **37.2**	(EU: 51.2; US: 59.9)
		2007-2012: **+0.9 %**	(EU: +1.0 %; US: +0.5 %)
Areas of marked S&T specialisations:		***HT + MT contribution to the trade balance***	
Automobiles, food and agriculture, ICT, biotechnology, and new production technologies		2012: **4.8 %**	(EU: 4.23 %; US: 1.02 %)
		2007-2012: **+2.5 %**	(EU: +4.8 %; US: -32.3 %)

Italy's share of GDP devoted to R&D activities has increased moderately over the last ten years, reaching 1.27 % in 2012. Nevertheless, both public and private R&D intensities remain a long way from those of its competitors at the technology frontier, thus undermining progress made towards a more efficient research system, and missing the opportunity for the country to move away from specialisation in low-technology-intensive products. Therefore, Italy should commit to increasing R&D intensity and improving business framework conditions for innovation and economic structural changes.

The Italian R&I system is still suffering from structural weaknesses, such as a low proportion of people with tertiary education and insufficient orientation of the education system towards technology-intensive specialisations. Recent budget cuts have made this situation worse: the number of university professors has fallen across all departments, while the Italian system is no longer able to retain national researchers or attract foreign ones. At the same time, Italy's business environment is stifled by complex bureaucratic procedures. This causes significant delays which have a very negative impact on innovation, in particular, when market advantages are considered. In addition, the low availability of venture capital, and the difficult commercialisation of results are further obstacles to innovation. For all of these reasons, Italy remains a moderate innovator.

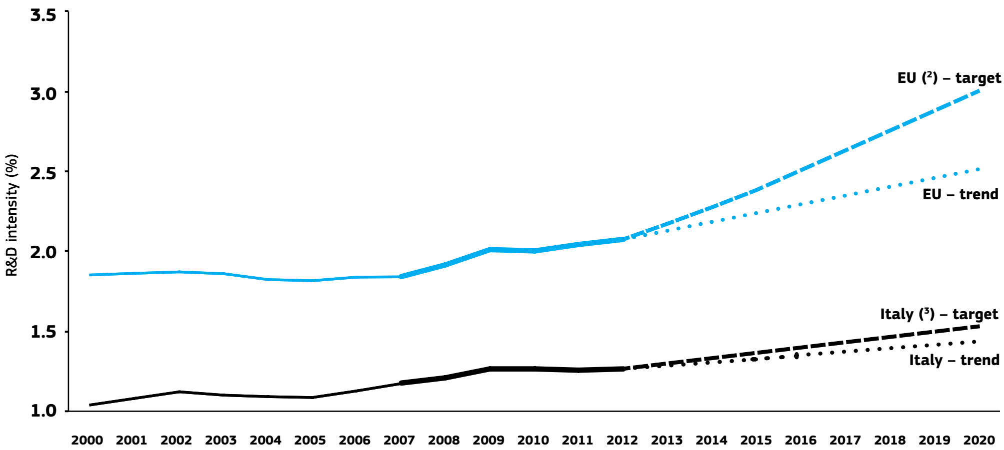
However, positive trends were registered between 2007 and 2012 in both the knowledge-intensity of the economy and the contribution of high-tech and medium-tech products to the trade balance. Moreover, the innovativeness of small and medium-sized enterprises (SMEs) and the excellent quality of scientific outputs remain two important strengths within Italy's R&I system. This clearly indicates that the country has huge innovation potential which simply needs additional support to be fully exploited.

[1] Composite indicator that includes PCT per population, ERC grants per public R&D, top universities and research institutes per GERD and highly cited publications per total publications.

[2] Composite indicator that includes R&D, skills, sectoral specialization, international specialization and internationalization sub-indicators.

Investing in knowledge

Italy – R&D intensity projections: 2000–2020 (1)



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: DG Research and Innovation, Eurostat, Member State
Notes: (1) The R&D intensity projections based on trends are derived from the average annual growth in R&D intensity for 2007–2012.
(2) EU: The projection is based on the R&D intensity target of 3.0 % for 2020.
(3) IT: The projection is based on a tentative R&D intensity target of 1.53 % for 2020.

In 2012, Italy's R&D intensity was 1.27 %, which represents a very small improvement compared to 2011, when the share was 1.25 %. However, this slight growth is due in part to the fall in GDP registered in the same period (-1.9 %). Thus, the country's R&D intensity remains a long way from the 1.53 % share of GDP set as the national target for 2020. In order to reach this target, which is already lacking in ambition as regards the country's potential and challenges, Italy needs to invest more in R&D activities. Both public-sector and private-sector expenditure on R&D grew in the period 2000-2012, but at a modest rate and still below the EU average. The difference between Italy's R&D intensity and the EU average (2.07 %) is mainly due to a lower business R&D. Indeed, business R&D intensity in Italy was 0.69 % in 2012, as opposed to the EU average of 1.31 %. Nevertheless, public-sector R&D intensity also remains at a lower level than the EU average (0.54 % instead of 0.74 %).

The low level of business R&D intensity is mainly linked to the structural composition of the Italian economy, which has a modest share of high-tech industries in total manufacturing, and is dominated by small and micro firms. In Italy, around 4.1 million of the 4.5 million firms have between one and nine employees. Those companies, often characterised by a family ownership structure, do not usually carry out R&D because they are unable to attract financial resources or highly skilled human capital. As regards public R&D investments, resources allocated to the higher education system appear inadequate. The 2013 budget for universities was about 20 % lower than in 2008, and the amount of resources for competitive funding has been reduced drastically in recent years. These budget cuts have also resulted in falling numbers of university staff: between 2006 and 2012 alone, the number of full and associate professors fell by 22 %.

On the other hand, Italy has been actively participating in the EU's Seventh Framework Programme. To date, Italian R&D institutions have received almost EUR 3.3 billion in EU contribution, making it the fourth most active country in FP7 projects. Structural Funds are another important source of funding for R&I activities. Of the EUR 27.9 billion of Structural Funds allocated to Italy over the 2007-2013 programming period, around EUR 6 billion (21.7 % of the total) relate to RTDI[3]. However, in spite of the crucial role these funds could play in the development and catching up of some regions, Italy has been unable to spend all those resources, preventing the country from taking full advantage of this important financial support.

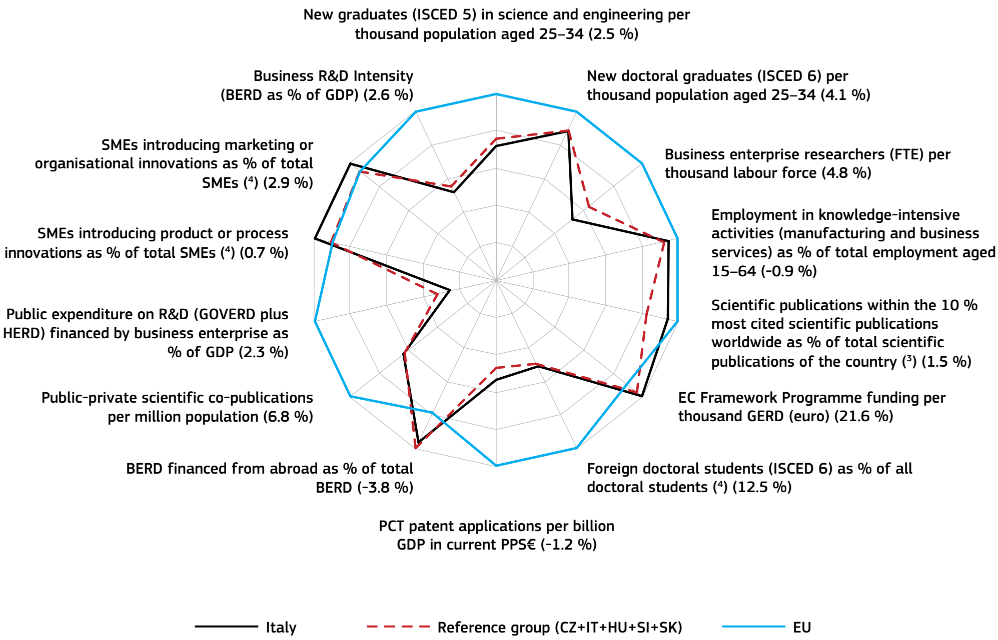
[3] RTDI includes the following sectors: (01) RTD activities in research centres, (02) RTD infrastructures and centres of competence, (03) Technology transfer and improvement of cooperation of networks, (04) Assistance to RTD, particularly in SMEs (and RTD services in research centres), (06) Assistance to SMEs for the promotion of environmentally friendly products and processes, (07) Investment in firms directly linked to research and innovation, (09) Other methods to stimulate research and innovation and entrepreneurship in SMEs, and (74) Developing human potential in the field of research and innovation.

An effective research and innovation system building on the European Research Area

The graph below illustrates the strengths and weaknesses of the Italian R&I system. Reading clockwise, the graph provides information on human resources, scientific production, technology valorisation, and innovation. Average annual growth rates from 2007 to the latest available year are given in brackets.

Italy, 2012 (1)

In brackets: average annual growth for Italy, 2007–2012 (2)



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: DG Research and Innovation, Eurostat, OECD, Science-Metrix/Scopus (Elsevier), Innovation Union Scoreboard
Notes: (1) The values refer to 2012 or to the latest available year.
(2) Growth rates which do not refer to 2007–2012 refer to growth between the earliest available year and the latest available year for which comparable data are available over the period 2007–2012.
(3) Fractional counting method.
(4) EU does not include EL.

The innovative attitude of its SMEs appears to be an emerging strength in the Italian R&I system. Italy scores above the EU average for both SMEs introducing marketing and organisational innovations, and those bringing in product and process innovations. Moreover, the overall quality of scientific publications is quite high, as is shown by the growing share of top publications. Nevertheless, the Italian system still suffers from a lack of skilled human capital and an unsatisfactory level of public-private collaboration.

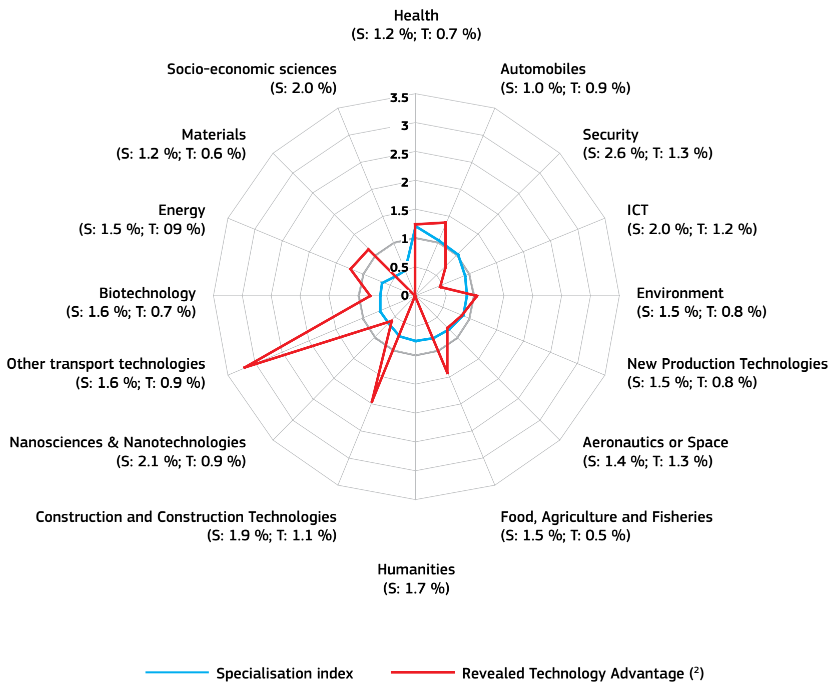
Although the number of new graduates in science and engineering and new doctoral graduates increased between 2007 and 2012, Italy is still a long way from the EU average. This may also be related to the generally low share of citizens with higher education qualifications, which is a traditional weakness of the Italian system: in 2012, the proportion of people aged 30-34 years with tertiary education qualification was only 21.7 % (EU-28: 35.7 %). Furthermore, there is still a relatively high share of Italian researchers working in other EU countries and a relatively low share of non-national researchers in Italy. This alarming brain drain may become a further barrier to efforts to shift Italy's economy towards more knowledge-intensive and innovative activities.

Public-private collaboration is also much lower than the EU average. Public expenditure on R&D financed by business enterprises represents only 0.013 % of GDP (EU: 0.052 %). Moreover, both the public-private scientific co-publications per million population and the number of business researchers per thousand of the labour force in Italy are well below EU average. Public-private cooperation often occurs on an ad-hoc basis in the absence of well-developed networks and formal structures (i.e. knowledge-transfer offices) which could act as intermediaries between the public research sector and businesses.

Italy's scientific and technological strengths

The graph below illustrates the areas, based on the Framework Programme thematic priorities, where Italy shows scientific and technological specialisations. Both the specialisation index (SI, based on the number of publications) and the revealed technological advantage (RTA, based on the number of patents) measure the country's scientific (SI) and technological (RTA) capacity compared to that at the world level. For each specialisation field it provides information on the growth rate in the number of publications and patents.

Italy – S&T National Specialisation (1) in thematic priorities, 2000–2010
in brackets: growth rate in number of publications (3) (S) and in number of patents (4) (T)



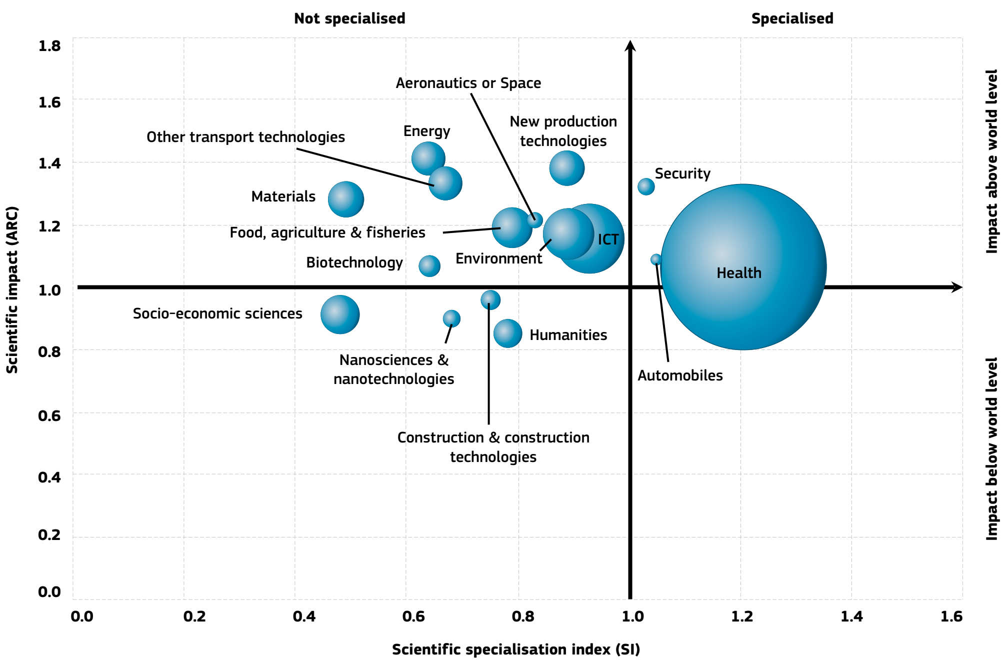
Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Science-Metrix Canada; Bocconi University, Italy
Notes: (1) Values over 1 show specialisation; values under 1 show a lack of specialisation.
(2) The Revealed Technology Advantage (RTA) is calculated based on the data corresponding to the WIPO-PCT number of patent applications by country of inventors. For the thematic priorities with fewer than 5 patent applications over 2000–2010, the RTA is not taken into account. Patent applications in 'Aeronautics or Space' refer only to 'Aeronautics' data.
(3) The growth rate index of the publications (S) refers to the periods 2000–2004 and 2005–2009.
(4) The growth rate in number of patents (T) refers to the periods 2000–2002 and 2003–2006.

In June 2013, the Italian National Agency for the Evaluation of University System and Research (ANVUR) published a report highlighting the fact that overall the share of Italian publications is growing faster than the EU average, and that the country's share of top publications (those receiving the top ten citations in each field) is above the world average. Thus, Italy's productivity output for both universities and public research organisations ranks among the best-performing countries.

However, scientific specialisation in Italy presents a large and diversified science base which only partially corresponds to the technological dynamics. S&T activities show substantial scientific specialisation in the health, automobile, and security sectors, although only the first two sectors reveal a technological advantage. On the other hand, Italy's technology production is strongly specialised in the field of other transport technologies, which attracts the highest share of patents, as well as in construction technologies, food, agriculture and fisheries, energy, and materials. These relative strengths in patenting reflect the weight of the traditional sectors and do not have a corresponding scientific specialisation.

There is room for improvement in matching Italy's science base to the needs of its industrial structure. However, translating the relative strengths in scientific publication into economic activities and revealed technology advantages requires stronger collaboration between public and private R&D actors, more investments and favourable market conditions. To foster this collaboration, the Ministry of Education, University and Research (MIUR) launched a competitive call for new technological clusters and carried out the first mapping of regional sectoral specialisation. Among the eight clusters selected, some follow Italian co-specialisations (aerospace, new production technologies, green chemistry, and life sciences), while others have been created in areas where there remains an important mismatch between science and technological development (food and agriculture, transport technologies, and smart communities). Those clusters may deploy their potential for structural change towards more knowledge-intensive activities by injecting knowledge into both existing and new industrial and services sectors.

Italy – Positional analysis of publications in Scopus (specialisation versus impact), 2000–2010



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Science-Metrix Canada, based on Scopus
Note: Scientific specialisation includes 2000–2010 data; the impact is calculated for publications of 2000–2006, citation window 2007–2009.

The graph above illustrates the positional analysis of Italian publications showing the country's situation in terms of scientific specialisation and scientific impact over the period 2000-2010. The scientific production of the country is reflected by the size of bubbles, which corresponds to the share of scientific publications from a science field in the country's total publications.

While the country is only specialised in the health, security, and automobiles sectors, the scientific impact of publications in all sectors (apart from socio-economic sciences and humanities, nanosciences and construction) is above the world level. This aspect is confirmation that the quality of science is an important strength in the Italian R&D system, although the commercialisation of scientific results and the collaboration between academia and industry remain difficult. In the ICT sector, for example, the quality of scientific publishing is extremely good and the sector is close to the scientific specialisation, but there is no revealed technology advantage in that field.

Policies and reforms for research and innovation

In March 2013, the MIUR launched Horizon 2020 Italia (HIT2020), a strategic document aimed at boosting the Italian R&I system by implementing the Europe 2020 strategy while, at the same time, focusing on specific national challenges. The new National Research Programme 2014-2020, which was presented to the Italian Council of Ministers in January 2014, is based on this strategy. For the first time, this programme will run for seven years (previously it was a three-year programme) in line with European policies. It acknowledges the obstacles that have made the development of a research policy in Italy difficult, and proposes an array of actions dedicated to removing those obstacles while making the best use of the positive characteristics within the existing production structure. In particular, it assigns strategic value to public-private partnerships and knowledge transfer to improve Italy's competitiveness, and focuses specifically on the importance of creating good working conditions to retain Italian researchers and attract foreign ones.

Important steps have already been taken in the direction of a more open and competitive research system, in line with the objectives of the European Research Area. In 2013, for the first time, 13.5 % of institutional funding was distributed on the basis of the results of the Quality Evaluation for Research carried out by ANVUR. This share of institutional funding, based on quality criteria, is expected to further increase to 16 % in 2014, 18 % in 2015 and 20 % in 2016. At the same time, international peer review for evaluating open calls for proposals has been introduced into the system, and its use is now widespread. Furthermore, a national system for the scientific certification of professorship candidature has been set up to guarantee transparent and merit-based recruitment, while the regulation introducing the reform of the Italian doctoral training system was adopted in February 2013. This regulation will be implemented in the academic year 2014-2015 with a view to creating attractive and competitive doctoral schools in Italy, especially for foreign students. However, the low level of institutional funding, along with a constant decline in competitive project funding, and the lack of career opportunities in universities could reduce the positive effects of those reforms significantly. Moreover, the Italian system is still suffering from high fragmentation which sometimes leads to duplications and inefficiencies.

Several measures have also been developed to foster Italy's innovation capacity and public-private collaboration. In addition to defining the eight technological clusters, the first mapping of regional sectoral specialisations, which will contribute to the design of smart specialisation strategies, was finalised in 2013. Furthermore, new legal frameworks have been devised for innovative start-ups and actions have been undertaken to simplify access to finance for SMEs. Nevertheless, implementation for some of these policy measures is still lacking and the administrative burden on businesses remains high. At the same time, fiscal credit or tax incentives remain inadequate.

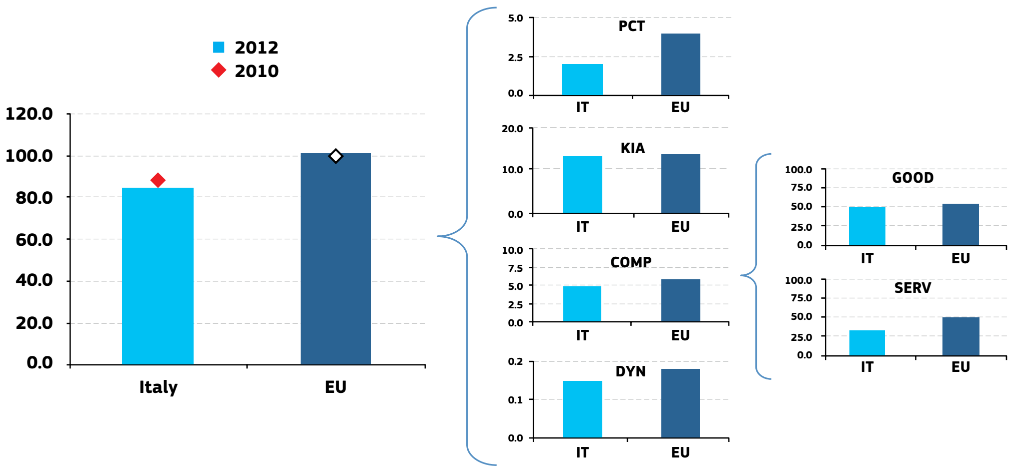
MIUR and MISE (the Ministry of Economic Development) are jointly responsible for the National Operational Programme for Research and Competitiveness 2007-2013 (PONREC), which is the main instrument for implementing R&I policies in the four convergence regions, namely Calabria, Campania, Puglia and Sicilia. This programme focuses on three main priorities: (i) supporting structural changes and scientific and technological improvement for a transition towards a knowledge economy; (ii) improving the innovative context for the development of competitiveness; and (iii) technical support and coaching. The PONREC has joined the Cohesion Action Plan, which was launched in November 2011 to overcome delays in using the Structural Funds, transferring part of its own funding there. In August 2013, the Italian authorities announced the creation of a public agency for territorial cohesion which is expected to become operational in autumn 2014. This agency should ensure the efficient management of Structural Funds – an objective which is still far from being reached – and support local governments running national and European projects.

Innovation Output Indicator

The Innovation Output Indicator, launched by the European Commission in 2013, was developed at the request of the European Council to benchmark national innovation policies and to monitor the EU's performance against its main trading partners. It measures the extent to which ideas stemming from innovative sectors are capable of reaching the market, providing better jobs and making Europe more competitive. The indicator on innovation focuses on four policy axes: growth via technology – (patents); jobs (knowledge-intensive employment); long-term global competitiveness (trade in mid/high-tech commodities); and future business opportunities (jobs in innovative fast-growing firms).

The graph below enables a comprehensive comparison of Italy's position regarding the indicator's different components.

Italy – Innovation Output Indicator



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Eurostat, OECD, Innovation Union Scoreboard 2014, DG JRC
Notes: All data refer to 2012 except PCT data, which refer to 2010.
PCT = Number of PCT patent applications per billion GDP, PPS.
KIA = Employment in knowledge-intensive activities in business industries as % of total employment.
DYN = Innovativeness of high-growth enterprises (employment-weighted average).
COMP = Combination of sub-components GOOD and SERV, using equal weights.
GOOD = High-tech and medium-high-tech products exports as % total exports. EU value refers to EU-28 average (extra-EU = 59.7 %).
SERV = Knowledge-intensive services exports as % of total service exports. EU value refers to EU-28 average (extra-EU = 56 %).

The Innovation Union Scoreboard 2014 considers Italy as a 'moderate innovator' since its innovation performance remains below the EU-27 average. This seems to be in line with the Innovation Output Indicator results in the graph above, where Italy is a medium-low performer with scores below the EU average in all components. The country comes closest to the EU average in employment in knowledge-intensive activities as a % of total employment. Overall, Italy's performance declined in the period 2010-2012.

Its low performance in patenting is partly explained by the country's economic structure, which comprises a high number of small and micro enterprises, in which patenting activities are more difficult because of economies of scale and scope and less capacity to attract venture capital. Moreover, despite Italy's specialisation in some technology-intensive sectors such as machinery, automotive and aerospace, the patent-intensive ICT sector is smaller than in other large economies, while sectors like textiles and footwear, which tend to have low patenting activities, are relatively more important than in other EU countries.

Italy also performs worse than the EU average in the innovativeness of fast-growing innovative firms. This is the result of a high share of low-tech manufacturing companies, transport, and administrative and support activities among the fast-growing enterprises.

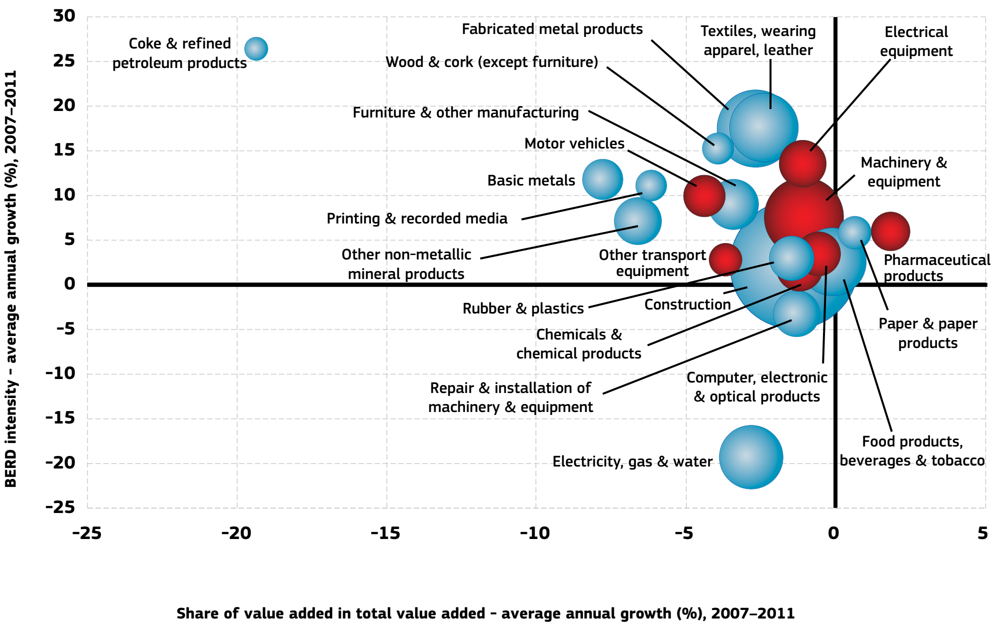
Italy is the second largest exporter of machinery in the EU, after Germany. However, it is also an important exporter of low-tech goods, such as textiles and shoes. As a result, it has a slightly below EU average share of medium/high-tech goods in total goods exports. The Italian economy is also characterised by a low share of knowledge-intensive services exports. This is partly explained by the huge weight of the tourism sector which, together with business travel, represents 40 % of all services exports in Italy, and is classified as non-KIS. In contrast, exports of software, classified as KIS, remain relatively low.

In addition to the above-mentioned aspects, the disparity between regions in terms of innovation performance remains an issue for the country. The most innovative Italian regions are Piemonte, Emilia Romagna, Friuli Venezia Giulia and Lombardia, which are all located in the northern part of the country. Unfortunately, the serious inefficiency registered in the use of Structural Funds, along with the negative effect of the economic crisis, are further widening these territorial imbalances.

Upgrading the manufacturing sector through research and technologies

The graph below illustrates the upgrading of knowledge in different manufacturing industries for the period 2007-2011. The position on the horizontal axis illustrates the changing weight of each industry sector in value added over the period. The general trend to the left-hand side reflects the decline in manufacturing in the overall economy. The sectors above the x-axis are those where research intensity has increased over time. The size of the bubble represents the sector share (in value added) in manufacturing (for all sectors presented on the graph). The red sectors are high-tech or medium-high-tech sectors.

Italy – Share of value added versus BERD intensity: average annual growth, 2007–2011



Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Eurostat
Note: (1) High-tech and medium-high-tech sectors (NACE Rev. 2 – two-digit level) are shown in red.

The shares in total Italian value added of nearly all manufacturing sectors declined between 2007 and 2011. This evolution reflects both the shift towards a more service-oriented economy, similar to that observed at EU level, and the higher competition of emerging economies in traditional sectors experienced by the country in recent years.

In spite of this de-industrialisation process, manufacturing still carries an important weight in the Italian economy and is mainly concentrated in low and medium-low technology sectors (i.e. construction, fabricated metal products, textiles, and clothes). However, Italy maintains a strategic position in some high-tech sectors, like machinery, automotive, and space. The graph shows the country's diversified industrial structure, where a wide range of industries account for a relatively small share of the Italian economy. This reflects a lack of specialisation in the Italian economy.

Between 2007 and 2011, the growth in business research intensity was moderate but concerned all manufacturing sectors except electricity, gas and water. The highest growth rate in BERD intensity was registered in traditional sectors like coke and refined petroleum products (which, on the other hand, saw a drastic reduction in their share of value added), fabricated metal products, textiles, and wood and cork. During the same period, all high-tech and medium-high-tech sectors also increased their business research intensity, in particular electrical equipment, machinery, and motor vehicles. In spite of those positive trends, the Italian economic system still suffers from insufficient R&D intensity in its knowledge-intensive industries.

Key indicators for Italy

ITALY	2000	2005	2006	2007	2008	2009	2010	2011	2012	Average annual growth 2007–2012 (1) (%)	EU average (2)	Rank within EU
ENABLERS												
Investment in knowledge												
New doctoral graduates (ISCED 6) per thousand population aged 25–34	0.45	1.14	1.23	1.32	1.60	:	:	1.56	1.62	4.1	*1.81*	17
Performance in mathematics of 15-year-old students: mean score (PISA study)	:	:	462	:	:	483	:	:	485	23.6 (3)	495 (4)	17 (4)
Business enterprise expenditure on R&D (BERD) as % of GDP	0.52	0.55	0.55	0.61	0.65	0.67	0.68	0.68	*0.69*	*2.6*	1.31	17
Public expenditure on R&D (GOVERD + HERD) as % of GDP	0.52	0.52 (5)	0.54	0.52	0.52	0.55	0.54	0.53	*0.54*	*0.5*	*0.74*	17
Venture capital as % of GDP	0.25	0.15	0.23	0.18	0.21	0.09	0.06	0.08	0.07	-16.6	0.29 (6)	15 (6)
S&T excellence and cooperation												
Composite indicator on research excellence	:	:	:	37.5	:	:	:	:	36.5	-0.5	47.8	11
Scientific publications within the 10% most cited scientific publications worldwide as % of total scientific publications of the country	:	9.6	9.8	10.1	10.3	10.4	:	:	:	1.5	11.0	13
International scientific co-publications per million population	:	347	372	412	431	457	483	511	532	5.2	343	19
Public–private scientific co-publications per million population	:	:	:	26	26	29	32	33	:	6.8	53	14
FIRM ACTIVITIES AND IMPACT												
Innovation contributing to international competitiveness												
PCT patent applications per billion GDP in current PPS (EUR)	1.4	2.1	2.3	2.2	2.1	2.1	2.1	:	:	-1.2	3.9	13
License and patent revenues from abroad as % of GDP	0.05	0.06	0.06	0.05	0.17	0.18	0.18	0.18	0.20	33.4	0.59	14
Community trademark (CTM) applications per million population	75	89	107	122	122	122	133	133	133	1.7	152	15
Community design (CD) applications per million population	:	29	28	28	29	29	30	31	29	0.7	29	10
Sales of new-to-market and new-to-firm innovations as % of turnover	:	:	9.1	:	11.8	:	14.9	:	:	12.3	14.4	8
Knowledge-intensive services exports as % total service exports	:	21.6	23.7	23.9	27.3	24.7	28.4	27.5	:	3.6	45.3	19
Contribution of high-tech and medium-tech products to the trade balance as % of total exports plus imports of products	2.10	3.31	4.49	4.36	5.04	4.14	4.02	4.82	:	-	4.23 (7)	5
Growth of total factor productivity (total economy): 2007 = 100	100	99	100	100	99	95	97	97	95	-5 (8)	97	16
Factors for structural change and addressing societal challenges												
Composite indicator on structural change	:	:	:	35.6	:	:	:	:	37.2	0.9	51.2	22
Employment in knowledge-intensive activities (manufacturing and business services) as % of total employment aged 15–64	:	:	:	:	13.6	13.5	13.7	13.4	13.2	-0.9	13.9	15
SMEs introducing product or process innovations as % of SMEs	:	:	33.0	:	36.9	:	37.4	:	:	0.7	33.8	12
Environment-related technologies: patent applications to the EPO per billion GDP in current PPS (EUR)	0.14	0.19	0.20	0.22	0.24	0.24	:	:	:	4.3	0.44	10
Health-related technologies: patent applications to the EPO per billion GDP in current PPS (EUR)	0.41	0.45	0.42	0.37	0.38	0.35	:	:	:	-1.9	0.53	12
EUROPE 2020 OBJECTIVES FOR GROWTH, JOBS AND SOCIETAL CHALLENGES												
Employment rate of the population aged 20–64 (%)	57.4	61.6	62.5	62.8	63.0	61.7	61.1	61.2	61.0	-0.6	68.4	25
R&D intensity (GERD as % of GDP)	1.04	1.09	1.13	1.17	1.21	1.26	1.26	1.25	*1.27*	*1.5*	*2.07*	18
Greenhouse gas emissions: 1990 = 100	107	112	110	108	105	96	97	95	:	-13 (9)	83	18 (10)
Share of renewable energy in gross final energy consumption (%)	:	5.1	5.5	5.5	6.9	8.6	9.8	11.5	:	20.2	13.0	17
Share of population aged 30–34 who have successfully completed tertiary education (%)	11.6	17.0	17.7	18.6	19.2	19.0	19.8	20.3	21.7	3.1	35.7	28
Share of population aged 18–24 with at most lower secondary education and not in further education or training (%)	25.1	22.3	20.6	19.7	19.7	19.2	18.8	18.2	17.6	-2.2	12.7	25 (10)
Share of population at risk of poverty or social exclusion (%)	:	25.0	25.9	26.0	25.3	24.7	24.5	28.2	29.9	2.8	24.8	21 (10)

Source: DG Research and Innovation – Unit for the Analysis and Monitoring of National Research Policies
Data: Eurostat, DG JRC – Ispra, DG ECFIN, OECD, Science Metrix / Scopus (Elsevier), Innovation Union Scoreboard
Notes: (1) Average annual growth refers to growth between the earliest available year and the latest available year for which compatible data are available over the period 2007–2012.
(2) EU average for the latest available year.
(3) The value is the difference between 2012 and 2006.
(4) PISA (Programme for Internatonal Student Assessment) score for EU does not include CY and MT. These Member States were not included in the EU ranking.
(5) Break in series between 2005 and the previous years.
(6) Venture capital: EU does not include EE, HR, CY, LV, LT, MT, SI and SK. These Member States were not included in the EU ranking.
(7) EU is the weighted average of the values for the Member States.
(8) The value is the difference between 2012 and 2007.
(9) The value is the difference between 2011 and 2007. A negative value means lower emissions.
(10) The values for this indicator were ranked from lowest to highest.
(11) Values in italics are estimated or provisional.

2014 Country-specific recommendation on R&I adopted by the Council in July 2014

"Implement a growth-friendly fiscal adjustment [...] preserving growth-enhancing spending like R&D, innovation, education and essential infrastructure projects. [...] Ensure that public funding better rewards the quality of higher education and research."

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