

## ITALY

### Hot STI issues

- Improving the framework conditions for innovation.
- Strengthening the human resource base for innovation.
- Improving the co-ordination of STI policy across government and between the central government and the regions.

**General features of the STI system:** To put the economy on a sustainable growth path based on sound macroeconomic fundamentals, the Italian government has embarked since 2011 on a substantial process of fiscal consolidation and structural reform. Innovation will be crucial for boosting competitiveness and sustainable growth in the longer term. Although many indicators point to a modest level of STI activity, attention is being given to increasing it. In 2010 GERD was just 1.26% of GDP, about half of the OECD average, and more in line with the R&D intensity of emerging economies. The business sector performs only around half of GERD, a low share for an advanced economy. At 0.66% of GDP BERD lags behind the OECD average (Panel 1<sup>(d)</sup>), with business sector innovation performance varying across firms and regions. In fact, a segment of innovative firms, including flexible SMEs, coexists with many non-innovative firms operating at low levels of productivity. Moreover, much R&D and innovation capacity is concentrated in northern and central regions of the country. The low share of industry-financed public R&D (1<sup>(o)</sup>) is indicative of weak industry-science linkages. Venture capital is in short supply (1<sup>(h)</sup>) and the patenting rate of young firms is low (1<sup>(f)</sup>). In general, Italy tends to perform better on indicators of non-R&D-based innovation (for example, it leads in Community designs). A very low share of the population has completed tertiary education (1<sup>(s)</sup>) in spite of a significant increase since 1999. In line with its GERD, Italy has few

researchers by international standards. Participation in international networks is quite strong, however: 41% of scientific articles and 13% of PCT patent applications were produced with international collaboration (1<sup>(q)(r)</sup>). Internet subscriptions are close to the median (1<sup>(k)(l)</sup>) and e-government readiness is relatively low (1<sup>(n)</sup>).

**Recent changes in STI expenditures:** GERD has recorded annual growth of about 2.7% over the second half of the last decade. In 2009, industry funded 44% of GERD, government accounted for 42%, and 9% was funded from abroad. With a budget of USD 2.5 billion (2010-11), the Fund for the Promotion of Research (FAR) contributed significantly to increasing public funding for business firms, universities and PRIs.

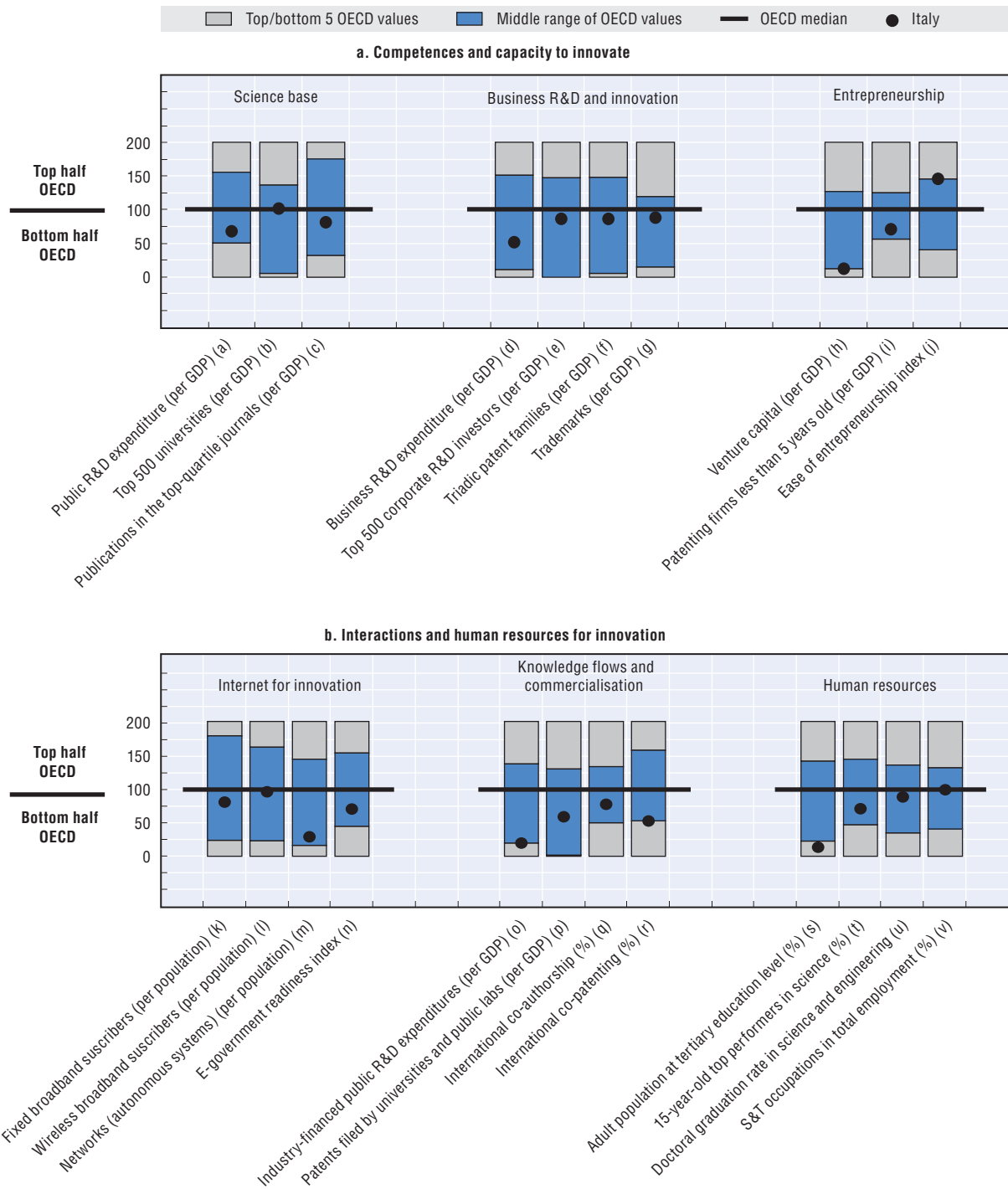
**Overall STI strategy:** The National Research Plan (2011-13) aims to promote research by strengthening business sector co-operation with the public sector and supporting the internationalisation of research. The Industry 2015 programme (2006-15) sets out to support business networks and industrial innovation projects and includes a fund for enterprise finance. However, the National Reform Programme 2011-12 requires general policies to have a small impact on the national budget. The country's south and SMEs have attracted special attention in STI strategies and policies. The National Strategic Framework 2007-13 includes the National Operational Programme (PON) Research and Competitiveness 2007-13, funded by the European

### Key figures

<b>Labour productivity, GDP per hour worked in USD, 2010</b>	<b>43.9</b>	<b>GERD, as % of GDP, 2010</b>	<b>1.26</b>
(annual growth rate, 2005-10)	(-0.1)	(annual growth rate, 2005-10)	(+2.7)
<b>Environmental productivity, GDP per unit of CO<sub>2</sub> emitted in USD, 2009</b>	<b>4.99</b>	<b>GERD publicly financed, as % of GDP, 2009</b>	<b>0.55</b>
(annual growth rate, 2005-09)	(+3.6)	(annual growth rate, 2005-09)	(-0.9)

Figure 10.24. **Science and innovation in Italy**

Panel 1. Comparative performance of national science and innovation systems, 2011



Note: Normalised index of performance relative to the median values in the OECD area (Index median = 100).

Regional Development Fund (ERDF) and by the national Revolving Fund (Fondo di Rotazione), which is of high importance for regional cohesion and competitiveness.

**STI policy governance:** The Ministry for Economic Development (MISE) is in charge of industrial innovation, and the Ministry for Education, University and Research (MIUR) is responsible for the national education system, including higher education, but also for promoting research at national and international level. The National Agency for the Evaluation of Universities and Research Institutes (ANVUR) has operated under MIUR since 2010.

**Science base:** The public research system, with HERD of 0.36% and GOVERD of 0.18% of GDP in 2010, performs the greater part of R&D. Higher education and PRIs contribute to innovation in a number of ways but their co-operation with business firms needs to be improved. In order to improve public research performance, a reform of funding mechanisms for and management of universities was approved in 2010 by Parliament and is being implemented. The reform of the PRIs under MIUR has also recently been undertaken.

**Business R&D and innovation:** As in other OECD countries, there has been a shift towards indirect funding of R&D in recent years. As stated in the National Reform Programme 2011, for 2011/12, tax incentives have been strengthened for research commissioned by firms to universities and PRIs as well as for research developed in collaboration with them.

**Public-sector innovation:** The e-Government Plan 2012 of the Department for Public Administration defines a set of digital innovation projects to modernise the public administration, to make it more efficient and transparent, and to improve the quality of services and reduce costs. The plan sets out some 80 projects and 27 targets to be achieved by 2013.

**Knowledge flows and commercialisation:** Various initiatives aim at bridging the gap between academia and industry. Technological districts and high technology poles as well as public-private laboratories are established in different parts of the country. The National Innovation Fund (FNI) was

created in 2012 by MiSE to facilitate the financing of innovative projects based on the exploitation of industrial designs and patterns. In addition, the Innovation Package introduced in 2011 supports the patenting activity of SMEs. The National Technology Platforms and Industrial Innovation Network (RIDITT) were set up in 2010 to ensure dissemination of innovation and technology between research system and enterprises.

**Globalisation:** The Strategy for the Internationalisation of Italian Research (SIRIT 2010-15) integrates the national research priorities in international strategies and priorities, notably the EU's 2020 Strategy. Italy actively participates in EU R&D programmes, the European Strategy Forum on Research Infrastructures (ESFRI) and other European initiatives such as EUREKA (for international S&T co-operation) and Erasmus (for mobility of students and researchers).

**Human resources:** Italy has a dearth of highly skilled human resources, and the most highly qualified sometimes find better opportunities abroad. During 2011/13 academics' salaries and career progression have been frozen in order to contain public spending. A lack of opportunities and unattractive career prospects and working conditions for talented individuals may further weaken the human resource base. A recent parliamentary act aims to support the recruitment of early career researchers. A new action plan for future youth employment (Italia 2020) aims to better align curricula with the changing demand of industry.

**Emerging technologies:** Italy is addressing various cross-cutting research issues considered crucial for enhancing economic growth, e.g. research on the natural and cultural heritage and on the complex systems of smart cities.

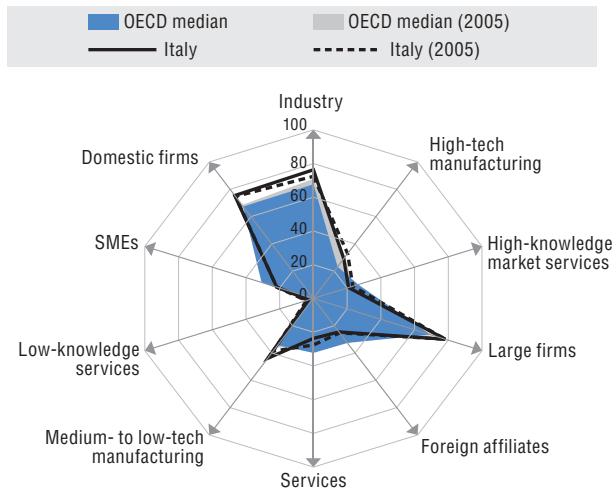
**Green innovation:** Italy has improved its RTA in environment-related technologies over the past decade and will soon develop a specialisation if this trend continues (Panel 3). The government provides a number of incentives for renewable energy production. The Energy Account (Conto Energia) initiative promotes solar photovoltaic, and a Kyoto Fund was set up to finance measures to reduce greenhouse gas emissions. Green Certificates (CV)

promote electrical energy produced from renewable sources and White Certificates – energy efficiency labels (TEE) – encourage energy-saving measures. A

package of fiscal incentives for energy efficiency interventions in existing and new buildings was approved by Parliament in 2011.

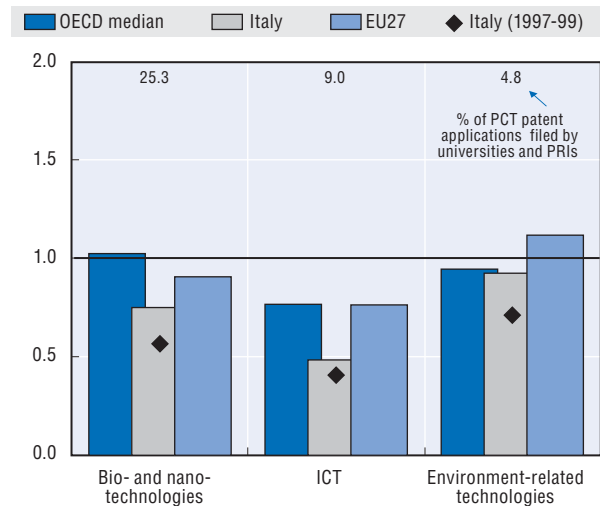
**Panel 2. Structural composition of BERD, 2009**

As a % of total BERD

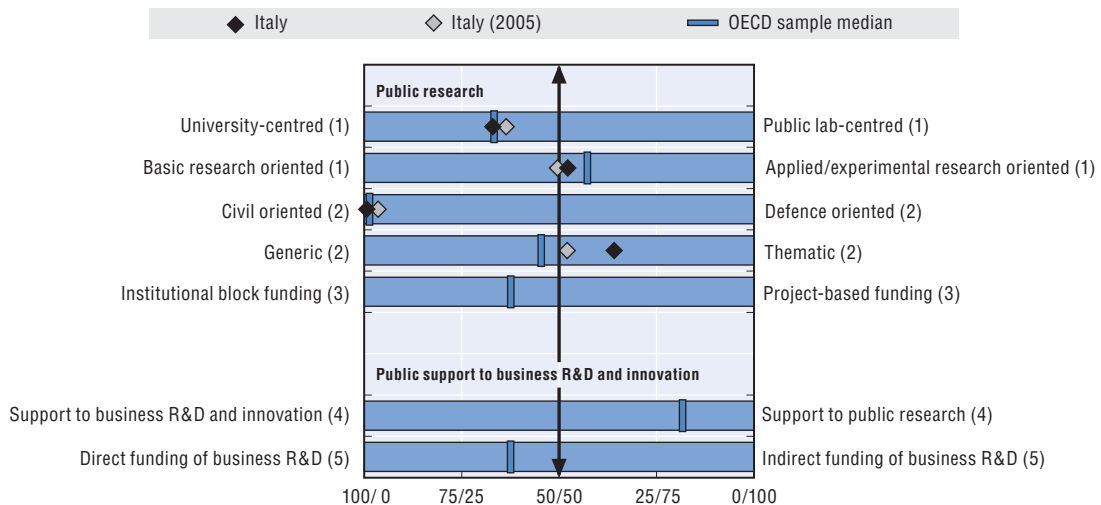


**Panel 3. Revealed technology advantage in selected fields, 2007-09**

Index based on PCT patent applications



**Panel 4. Overview of national innovation policy mix, 2010**



1. Balance as a percentage of the sum of HERD and GOVERD.
2. Balance as a percentage of total GBAORD.
3. Balance as a percentage of total funding to national performers.
4. Balance as a percentage of the sum of HERD and GOVERD funded by government and higher education and components of (5).
5. Balance as a percentage of the sum of indirect funding of business R&D and innovation through R&D tax incentives and direct funding of BERD through grants, contracts and loans.

Source: See reader's guide and methodological annex.

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