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## RIO Country Report 2015: Italy

Chapter:

*3. Public and private  
funding of R&I and  
expenditure*

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**Abstract**

The 2015 series of RIO Country Reports analyse and assess the policy and the national research and innovation system developments in relation to national policy priorities and the EU policy agenda with special focus on ERA and Innovation Union. The executive summaries of these reports put forward the main challenges of the research and innovation systems.

### 3. Public and private funding of R&I and expenditure

#### 3.1 Introduction

**Table 1:** Basic indicators for R&D investments

Indicator	2011	2012	2013	2014	EU average (2014)
GERD (% of GDP)	1.21	1.27	1.30	1.29	2.03
GERD (€ per capita)	333.7	345.2	351.6	341.7	558.4
GBAORD (€m)	9,161.4	8,822.3	8,444.3	8,145.2	92,828.145 (total for EU-28)
R&D funded by business enterprises (% of GDP)	0.55	0.56	0.59	NA	1.12 (2013)
R&D funded by PNP (% of GDP)	0.04	0.04	0.04	NA	0.66 (2013)
R&D funded by HEIs and GOV (% of GDP)	0.52	0.55	0.55	NA	0.68 (2013)
R&D funded from abroad	0.11	0.12	0.13	NA	0.2 (2013)
R&D performed by HEIs (% of GERD)	0.35	0.36	0.37	0.35	0.47
R&D performed by government sector (% of GERD)	0.16	0.19	0.18	0.19	0.25
R&D performed by business sector (% of GERD)	0.66	0.69	0.71	0.72	1.30

Italy's Europe2020 target for R&D investment is 1.53% of GDP. Current policies have not been able to significantly improve this indicator, which in 2014 was equal to 1.29%, in spite of the continuing fall in Italy's GDP. It was 1.26% in 2012 and has remained broadly stable since (ISTAT, 2014a). In 2013 and 2014, Italy continued to reduce public expenditure while business R&I expenditure has been contained by the recession. Public sector's salary policies, whose increases have been stopped by law since 2009, and the restrictions on replacing retired members of staff contributed to contain any increase in public R&D expenditure.

The R&I system of Italy has been seriously affected by the economic recession that has hit the country since 2008. After the slump of 2009 (-5.5% in GDP), Italy's GDP stagnated in 2011 (+0.4%) and fell in 2012 (-2.3%), 2013 (-1.9%) and 2014 (-0.3%). This fall in GDP follows a decade when growth and economic performance were below the EU average.

According to ISTAT, total intramural expenditure on R&D (GERD) was €20.5b in 2012, a 1.9% increase in real terms over 2011. Preliminary data for 2013 report a 2.9% fall in real terms since 2012. A further fall of 1.9% in public R&D and a 1.4% increase in firms'

expenditure are expected by ISTAT for 2014 (ISTAT, 2014b, p. 1). Total R&D personnel in 2013 was 253,000 FTEs, a 5.2% increase over 2012. There were 118,000 researchers, 6.6% more than in 2012.

Italy's GERD per capita in 2013 was €338.50, lower than the EU-28 average (€539.20). In order to reach the Europe2020 target, the yearly R&D investments should increase – assuming a constant GDP – by €4b, an amount far from the resources made available by present policies.

Considering the development of GERD in real terms since the start of the economic crisis in 2008, we find a limited decline and an overall stability in its composition; in 2013, GERD was mainly performed by the private business sector (54%), followed by HEIs (28.2%) and the public sector (14.9%). In terms of GBAORD, expenditure recorded a continuous fall from €9.711b in 2009, to €8.825b in 2011, €8.822b in 2012, €8.444b in 2013 and €8.145b in 2014.

Research funding from abroad – both private and public, including EU funds – has become a significant source for Italy's R&I, reaching 0.12% of GDP in 2012. The funding flows from abroad originate from three important sources: foreign direct investment (FDI)-associated R&D, EU framework programmes and EU Structural Funds. Framework programmes (FP6 and FP7) have become a relevant channel of European funding for research in Italy. Participation in FP7 calls was widespread, with a 18.3% success rate for Italian applicants. Italy is the fourth highest-financed country in FP7 (more than €3.6b from 2007 to October 2014),<sup>1</sup> after the UK, France and Germany; business participation is strong, with six Italian firms among the top 50 recipients of signed grants for firms in 2007-2013, two universities in the top 50 and six research centres in the top 50.<sup>2</sup>

Data on Italy's participation in FP6 and FP7 – based on elaborations by the JRC Research and Innovation Observatory of EC data – show for the former 3,244 projects approved with 6,836 participants and a EU financial contribution of €1.5b (20% of EU total). In FP7, 6,303 projects were approved with 12,101 participants and an EU financial contribution of €3.6b (17.6% of EU total). First data from H2020 indicate 1,146 projects with 2,150 participants (8% of total EU), well below the envisaged level in the new PNR.

EU Structural Funds co-finance PONREC, which was funded with €4.4243b for 2007-2013.<sup>3</sup> PONREC is the major instrument for the implementation of measures for innovation and industrial R&D. Strategic documents consider PONREC a key driver for the improvement of the R&I system. PONREC's objective is to increase the competitiveness of the four Objective 1 regions through progress in R&I as a source of higher competitiveness for the entrepreneurial system. The integration of research and innovation as a pillar of such initiatives and the joint management by MIUR and MISE of PONREC has led to an increase in the R&I dimension in the local development and social cohesion policies. PONREC granted over €4.8b of funds to 3,315 projects in 2007-2014<sup>4</sup> in Italy's four Objective 1 regions (Calabria, Campania, Puglia and Sicily).

The recent release of the new PONREC scheduled the first calls by the end of 2015 and will take advantage of the previous monitoring and evaluation activities of the DPS.

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<sup>1</sup> [http://ec.europa.eu/research/fp7/index\\_en.cfm?pg=country-profile](http://ec.europa.eu/research/fp7/index_en.cfm?pg=country-profile)

<sup>2</sup> Seventh FP7 Monitoring Report 2013 11/03/2015.

<sup>3</sup> Available resources were reduced in October 2012 after the reprogramming round of MISE and MIUR. The funding from the ERDF is €3.102b. The budget available can be downloaded from <http://www.ponrec.it/programma/risorse-finanziarie>.

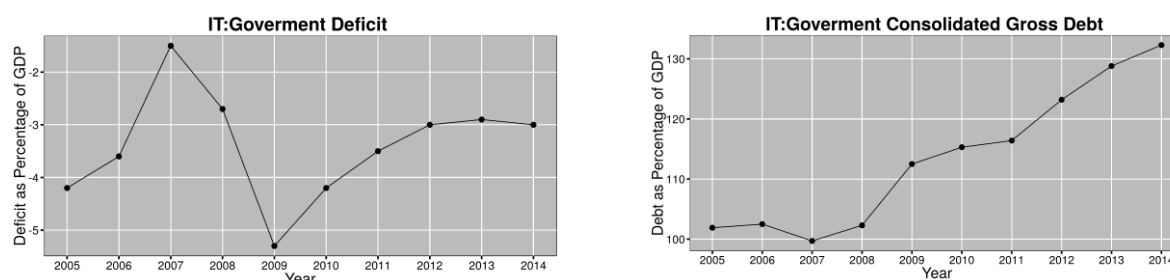
<sup>4</sup> <http://www.ponrec.it/open-data/progetti> Data updated on 30/04/2015.

## 3.2 Smart fiscal consolidation

### 3.2.1 Economic growth, fiscal context and public R&D

After a long contraction, Italy's real GDP is back to its early 2000s level.<sup>5</sup> Most of the difference is due to the poor performance of total factor productivity. As a consequence of the financial crisis, potential output also declined amidst an ageing population, weak labour market participation, fiscal consolidation and private sector deleveraging. The Italian economy is still struggling after years of recession. Growth was expected to turn positive in 2015 (0.8%), but it is predicted to remain well below the EU average. It is supported by increasing global demand, improved confidence, the weaker euro, falling oil prices and improving financial conditions. Growth is expected to accelerate somewhat in 2016 (1.4%) and 2017 (1.3%), driven by the same main factors.

The government's balance sheet sharply deteriorated during the crisis, from close to balanced in 2007 to a more than 5% headline deficit by 2009 (Figure 2, left). Because of the 2011 austerity measures the deficit declined to 2.8% in 2013 and 3.0% in 2014. It is expected to fall to 2.6% by 2015 thanks both to the primary balance (planned savings, extension of the public sector wage freeze, improved VAT collection, pick-up in the corporate income tax) and to declining interest expenditures. Despite the improving growth outlook, the deficit is expected to fall to 2.5% only in 2016 because of the flexibility required under the 2016 Stability Law. On a no-policy-change assumption, the deficit is projected to narrow down to 1.5% in 2017. The very high government debt (127-130% of GDP) remains a heavy burden for the Italian economy and a major source of vulnerability, especially due to weak growth. Recent reforms of the pension system are expected to be beneficial in the medium and long term, but only in a context of growth-friendly consolidation, sustained nominal growth and ambitious structural reforms.



**Figure 1:** Government deficit and public debt.

Data source: Eurostat.

Total GERD in Italy was €20.983b in 2013. There were three main sources of R&D funding: the business sector (€9.483b), the government (€8.696b) and foreign funding (€2.026b). Direct funding from the government goes to R&D in the business enterprises (€735m), the government (€2.554b) and the higher education sector (€5.266b).

<sup>5</sup> In contrast the Eurozone GDP is 10% higher than at the beginning of the 2000s.

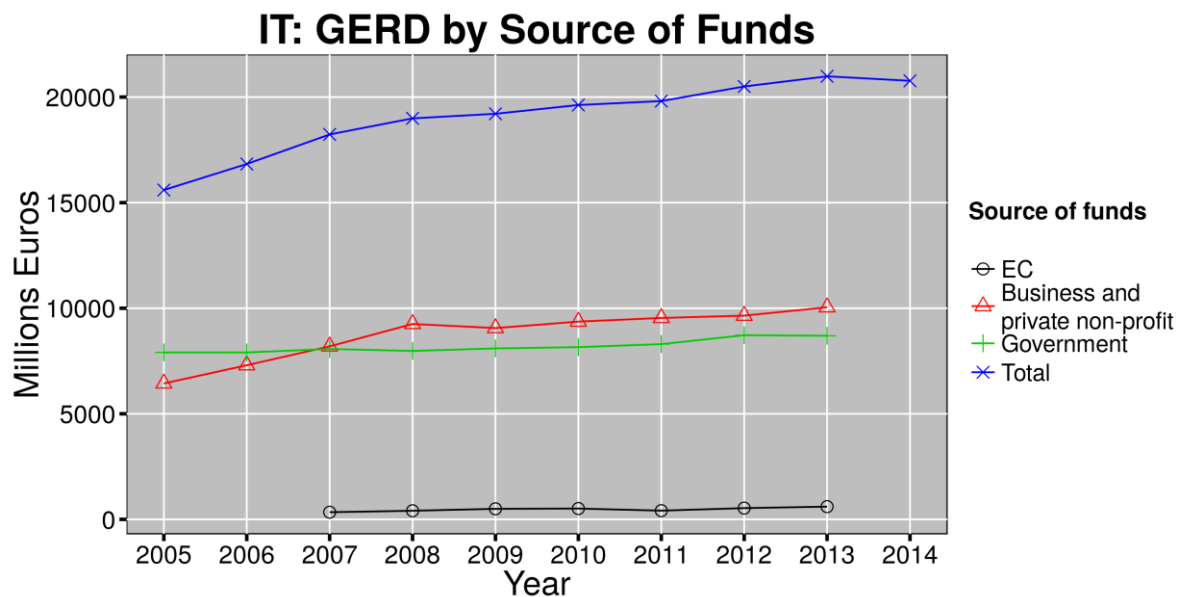
**Table 2:** Key Italian public R&D indicators

Indicator	2007	2009	2013
GBAORD (% of government expenditure)	1.30	1.19	1.05
GERD (% of GDP)	1.13	1.22	1.30
of which GERD to public (% of GDP)	0.50	0.53	0.55
Funding from government to:			
(% of GDP)			
Business	0.04	0.04	0.05
Public (government + higher education sector)	0.45	0.46	0.49
Total	0.50	0.51	0.54
EU funding (% of GDP)	0.02	0.03	0.04

Source: Eurostat.

### 3.2.2 Direct Funding of R&D activities

Figure 3 shows the historical development of GERD financing in Italy, in current prices.



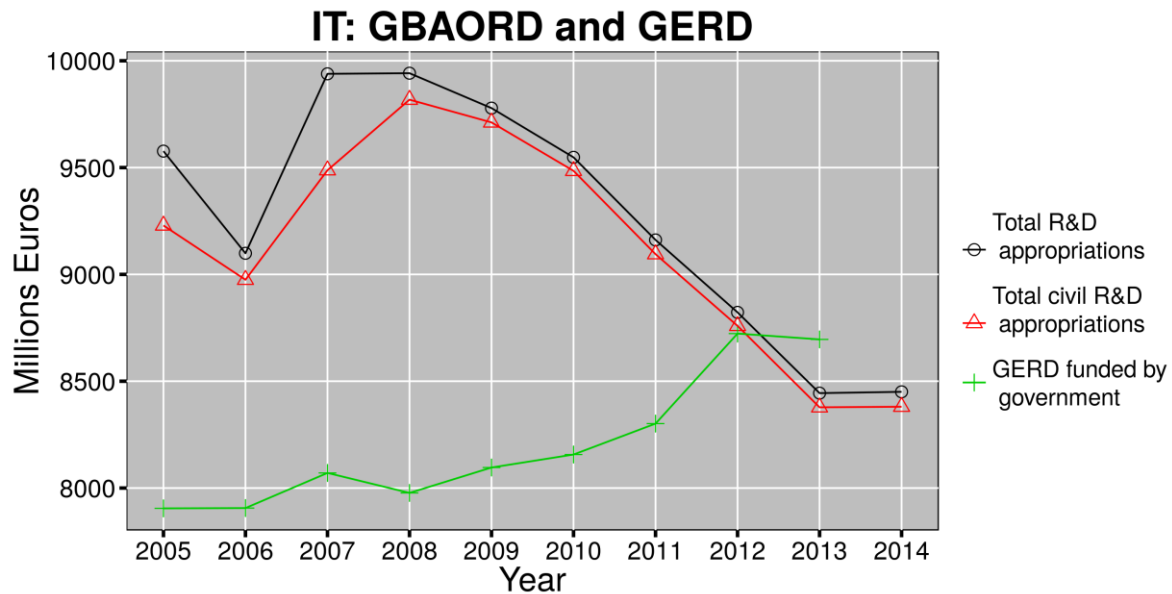
**Figure 2:** Funding of GERD.  
Data source: Eurostat.

The government's and private sector's (meaning the aggregated funding from business and private non-profit) contributions to the total GERD are the largest and similar in size, with the private sector outperforming the government as a source of funding for Italian R&I from 2007 onwards. The contributions from both the private sector and the government have grown modestly (less than 10%) in nominal terms from 2008 onwards. The consequence is of course a limited growth of the total GERD in the same period.

Despite increasing in nominal value over time, EC funding of Italian R&D expenditure plays a marginal role in the Italian GERD.

#### 3.2.2.1 Direct public funding from the government

Direct public funding is usually the main source of the total governmental support to R&D. Figure 4 shows the time evolution of the total R&D appropriations (GBAORD) and the GERD directly funded by the government in millions of euros. The EC contribution, aggregated with the funding provided by the government, is also shown.



**Figure 3:** R&D appropriations and government-funded GERD (millions of euros).  
Data source: Eurostat.

Starting from the onset of the financial crisis in 2008, the total (civil) appropriations (GBAORD) exhibit a declining trend. In 2014 the total (civil) appropriations were significantly lower than their pre-crisis levels. The latest data for 2014 indicate stasis in the decline of the R&D appropriations between 2013 and 2014.

The trend of growth in the GERD funded by the government from 2008 onwards appears to have come to a halt in 2013, but the lack of more recent data make it impossible to assess if this applies also to the last 2 years.

In fact, the last three Italian governments followed a policy aimed to reduce the 'unproductive' public expenditures, using the 'spending review' as a method to cut the budget and the stability laws as a legal act to summarise all the budget constraints for each year.

The current government also has not released any measure aimed to increase the overall public expenditure for R&D; some measures are targeted to trigger business investments, but the policy of tax reduction on firms is addressing another round of fiscal consolidation in the forthcoming stability law.

The Renzi government policy is focused on stimulating growth through tax reductions for firms and real estate owners, and the fiscal wedge on labour.

Budget savings undermined university activities, as argued by the CUN report in 2013, leading to fewer professors, fewer students and fewer courses. According to MIUR data, the number of enrolments in Italian universities fell by more than 50,000 between 2008 and 2014. The number of researchers and professors reduced by more than 10,000 (around 20%) from 2008 to 2014, more than in any other public institutions. In the same period universities increased students' fees to compensate for the lower amount of resources from the government and, as stressed by the OECD, the Italian universities are becoming more expensive for students than the EU average.

The reduction of available resources delayed PRIN and FIRB, the two traditional competitive calls in R&D intended to finance 'not targeted' research. Also, a new competitive research call, SIR, has not yet been launched again after the 2014 round. In 2013, FAR, the more relevant fund for industrial R&D, stopped its activities for lack of available funding.

The research career is much less attractive since opportunities for permanent employment have become scarce and wages are low. In 2015, CRUI, the body representing deans of universities, released a document commenting on the new FFO (CRUI, 2015a), and argued against the loss of more than €800m from FFO since 2009, from 0.49% of GDP to 0.42%, in contrast to 0.99% in France and 0.93% in Germany.

Military R&D allocations have played a marginal role in Italy in recent years, as can be seen from the small difference between the total and civil allocations. The gap between the appropriations and the funding from the government tends to close starting from 2009, and in 2012 the two almost overlap. A possible explanation is provided by ISTAT in its publication *La ricerca e sviluppo in Italia - 2012*, published in December 2014, which states that the public sector experienced a significant increase in the estimated expenditure, thanks to a more accurate accounting of expenditures by some important research institutes and, to a lesser extent, the emerging of new public entities that perform R&D activities (ISTAT, 2014b, p. 2).

### 3.2.2.2 Direct public funding from abroad

In Italy, the business sector is the most important (non-public) foreign source of R&D funding, as shown in Table 4.

Table 4 clearly shows that the EC is the most important foreign source of direct public funding, reaching more than 50% of the contribution from the business sector in 2013, whereas the contributions from foreign governments, higher education sector in other countries and international organisations are negligible.

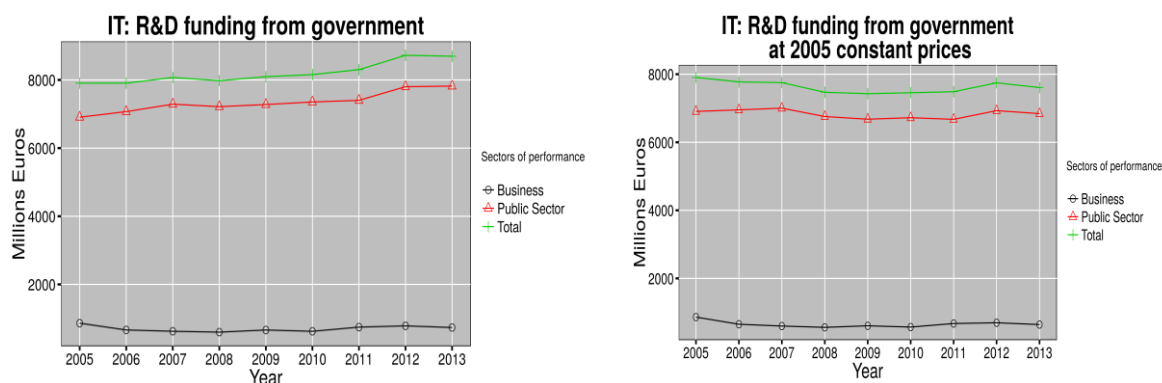
**Table 3:** Public funding from abroad to Italian R&D

Source from abroad	2005	2006	2007	2008	2009	2010	2011	2012	2013
Total (millions of euros)	1,241.7	1,389.2	1,736.5	1,509.8	1,810.2	1,927.2	1,794.5	1,938.5	2,025.5
Business enterprises (millions of euros)	NA	NA	1,243.3	948.2	1,106.2	1,182.0	1,103.5	1,186.0	1,101.4
EC (millions of euros)	NA	NA	339.7	408.7	499.9	512.8	413.5	533.4	604.0
Government (millions of euros)	NA	NA	110.9	100.7	149.4	177.5	182.5	134.3	139.2
Higher education sector (millions of euros)	NA	NA	0.8	14.7	18.8	19.6	21.3	7.4	54.3
International organisations (millions of euros)	NA	NA	19.2	19.9	16.5	16.8	52.6	52.2	54.9
Total (% of GERD)	7.96	8.25	9.52	7.95	9.42	9.82	9.06	9.45	9.65
EC (% of GOVERD)	NA	NA	4.21	5.12	6.17	6.29	4.98	6.11	6.95



## Distribution of public funding

Figure 5 shows how the public funding to sectors of performance has developed over time.



**Figure 4:** Government intramural expenditure by sectors of performance. Data source: Eurostat.

Not surprisingly, the public sector (government + higher education) is the main recipient of government-funded GERD. When reckoned in constant 2005 prices, the modest growth in total government funding (mirrored in the government funding to the public sector) is washed away.

### 3.2.3 Indirect funding: tax incentives and foregone tax revenues

Considering the absence of harmonisation of the tax regimes in EU law, data come directly from national sources, using domestic definitions. Attention should be paid when interpreting data from different sources.

The Italian framework for indirect support to business R&D has been characterised by a high degree of unpredictability and instability.

A first general R&D tax credit was introduced by the 2006 Budget (Legge 296/06 – art. 1 comma 280/283). The tax credits were allocated via the so-called 'click day', a selection process that awarded funds to firms on a first-come, first-served basis, according to order in which their online requests were submitted. As the Italian government set a cap for the tax incentives, the financial resources for the fiscal years 2007-2009 were already finished in May 2009. The 2010 Budget allocated some new resources for 2010-2011.

According to a study by the Italian Association for Industrial Research (AIRI), a total of €1.7299b was allocated for R&D tax incentives in the period 2006-2012.<sup>6</sup>

In 2011, tax credits were reintroduced only for businesses financing university research projects or projects in partnership with public research entities and for firms employing highly skilled workers in innovation and research, with very limited allocations.

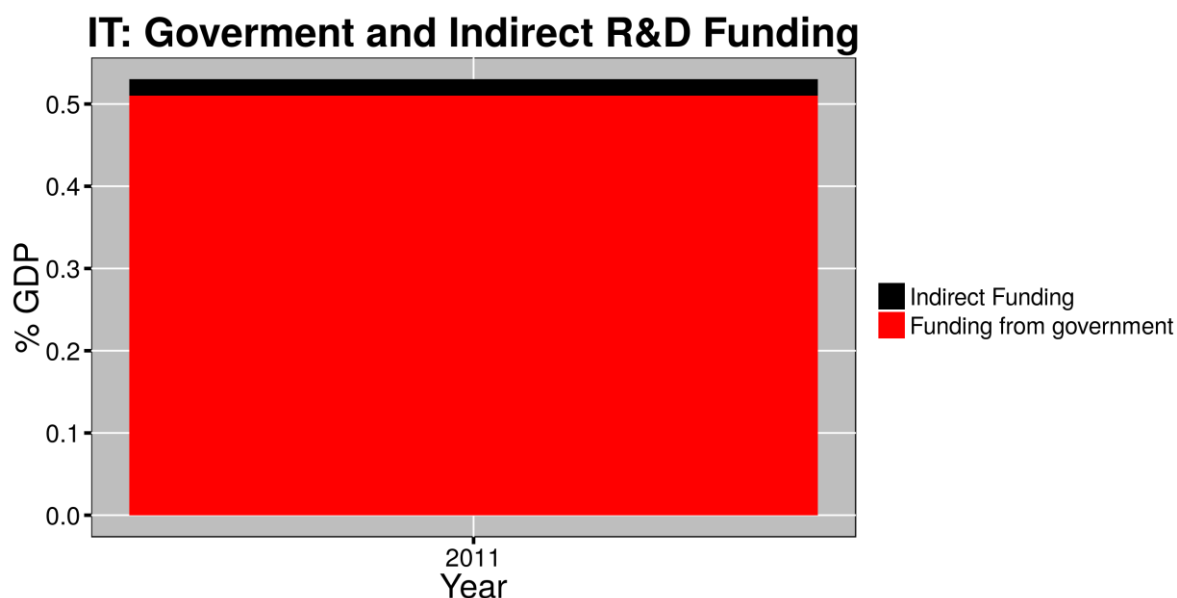
A new R&D tax credit scheme, available for the period 2015-2019, has been operational since the summer 2015. It allows a 25% tax credit for incremental investments in R&D, up to a maximum annual amount of €5m for each beneficiary. Incrementality is calculated upon the average of investments made in the 2012-2014 period, and the annual expenditure should be at least €30,000. For costs related to highly qualified personnel employed in R&D and the costs of the research performed in collaboration with universities, research organisations or other companies (including start-ups), the tax credit is increased to 50%.

<sup>6</sup> <http://www.airi.it/wp-content/uploads/2010/03/tab5.4.pdf>

The foregone tax revenues have been estimated at nearly €2.5b for the whole period 2015-2019, which is the highest amount allocated in the last 10 years.

Italy also introduced a patent box for the first time in 2015, allowing the deduction of 50% on the revenues from direct/indirect use of intellectual property (patents, trademarks, industrial design and models).

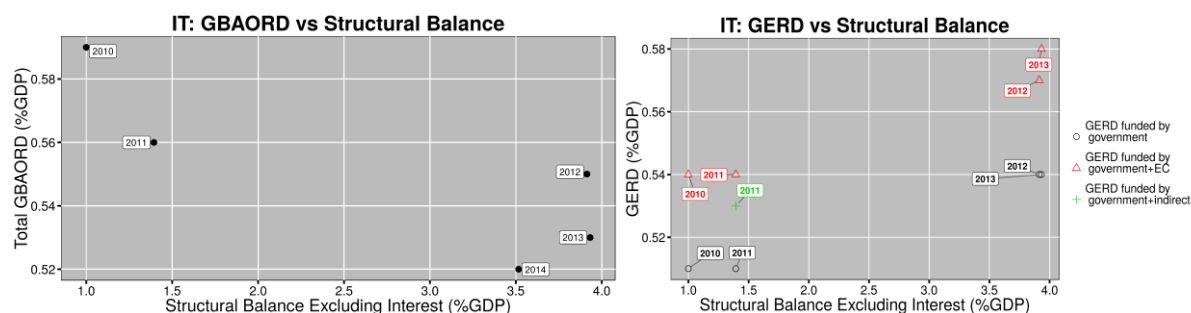
**Figure 5:** Government and indirect funding to R&D in Italy. Source: OECD.



Unfortunately, only very sparse quantitative data are available about indirect R&D funding in Italy. Figure 6 shows that indirect funding played a limited role in public sector support of business R&D in 2011.

### 3.2.4 Fiscal consolidation and R&D

Figure 7 shows the scatterplot of the structural balance versus GBAORD as a percentage of GDP (left), and structural balance versus GERD as a percentage of GDP (right)<sup>7</sup>:



**Figure 6:** Fiscal consolidation and R&D.

Data sources: annual macro-economic database (AMECO), Eurostat, OECD

The Italian structural balance, as percentage of GDP, increased monotonically from 1% in 2010 to nearly 4% in 2013 and registered a minor setback in 2014. Meanwhile (see Figure 7, left), the total GBAORD expressed as a percentage of GDP decreased from

<sup>7</sup> Structural balance data come from the annual macro-economic database (AMECO). The other indicators were taken from Eurostat.

about 0.59% in 2010 to 0.52% in 2014. As a consequence, it is possible to conclude that the fiscal consolidation came at the expense of the GBAORD.

In contrast, the GERD funded by the government (Figure 7, right) in 2012-2013 is clearly above the 2010-2011 levels. These figures can be explained by more accurate accounting of R&D expenditures by PROs and the emergence of new public R&D performers.

Based on section 3.2.3 and the above discussion, it can be argued that the fiscal adjustment process in Italy has come at the expense of public support for R&D.

The limited available data concerning indirect financing through R&D tax incentives strongly limit the possibility of taking it into account in this analysis.

### **3.3 Funding flows**

#### **3.3.1 Research funders**

MIUR, for research, and MISE, for innovation, are the main players for the national R&I funding mix. However, other ministries are involved in financing R&D. The funding coming from other ministries usually finances the PROs they supervise.

MIUR and MISE jointly manage PONREC for the provision of R&I funds within the social cohesion policies, jointly coordinate Italy's participation in Horizon2020 according to the HIT2020 strategy, and coordinate the Smart Specialisation Strategy. The new PONREC 2014-2020 will be managed by MIUR only, with the assistance of the Agency for Territorial Cohesion.

The DPS within MISE is in charge of Structural Funds. On the other hand, the new Agency for Territorial Cohesion, created at the end of 2013, and fully operational since the end of 2015, will be the main player in the management of Structural Funds.

ANVUR is the institution in charge of the evaluation of HEIs and PROs and it regularly provides criteria for the institutional funds allocation using the results of the quality assessment review published in 2013 (ANVUR 2013).

AgID, established in 2012,<sup>8</sup> is in charge of the IDA under the control of the Prime Minister's office and has responsibility for funding R&D in information and communication technology (ICT). Until 2015, AgID was not fully operational, since in 2012 and 2013 governments amended its role and mission, causing some delays to the beginning of activities.

The provision of resources for both institutional and project funds is regulated by the annual budget, which allocates resources for R&I policies for a 3-year period, but only the budget for the first year is mandatory, while the plans for the second and third years can be amended by the next budget.

The provision of resources from the institutional funds usually does not include any private agency.

Uncertainty in resource availability has been a further problem for both institutional and project funding of R&D efforts, and delays in the approval of PNR increased the degree of uncertainty in the scheduling of competitive calls.

In Italy, institutional funding continues to play a major role and public research and academic institutions are financed mainly through institutional funding with a variable share in accordance with institutional assessments rather than through project funding.

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<sup>8</sup> Law 134/2012 amended the constitution of the previous agency for the Agenda Digitale, which has never been fully operational.

The main R&D fund is FIRST (Fondo per gli investimenti nella ricerca scientifica e tecnologica), which supports the FAR (Fondo per le agevolazioni alla ricerca), as well as funds mainly directed towards universities and PROs such as PRIN (Progetti di interesse nazionale) and FIRB (Fondo per gli investimenti nella ricerca di base). The FAR is intended for co-financing PONREC projects with MISE.

Since 2013, the FCS, focused on technological innovation, has replaced the Fondo rotativo per sostegni alle imprese e gli investimenti in ricerca (FRI).

An increasing proportion of institutional funding is allocated in accordance with awarding rules, but the criteria adopted, except for the VQR assessment, are not stable and change every year, creating issues about transparency and their effectiveness in increasing the productivity of the system, as discussed in section 3.4.1. The ANVUR quality assessment is becoming more important. The major funds access regulations were streamlined in 2012 and 2013.

The major source of private not-for-profit funding is the Associazione Italiana Ricerca sul Cancro (AIRC), which in 2014 allocated €97.4m to R&D.

### **3.3.2 Funding sources and funding flows**

As already discussed in Chapter 1 and in section 3.1, the budget for R&D is largely managed by the national public budget. The funding mix of MIUR and MISE is strongly dependent on the approval of the yearly budget, which can change the financial resources available for research. EU structural funds and FP funding are relevant but not yet comparable to the central budget. Regions do not invest large amount of resources in R&D; their involvement usually happens within the framework of PONREC. Strategic documents such as HIT2020 and the new PNR envisage an increasing share of R&D funding coming from EU research programmes, with an increase of 20% of the resources awarded to national players. The new PNR 2014-2020 envisages higher shares of private funding to the strategic projects too, with estimated co-financing of 50%.

The new PONREC release will make available additional resources for R&D: €1.29b coming from the ERDF and €930m from the ESF, which contribute to human capital, research infrastructures and KT as detailed in Chapter 2.

In 2015 the amendments to the innovative start-up law increased the eligibility of facilitations to local branches of EU firms. This could increase the inflow of R&D funds from multinationals but an assessment of the size of foreign R&D funds coming from the new innovative start-up policy and from the new tax credits is not available yet.

## **3.4 Public funding for public R&I**

### **3.4.1 Project vs institutional allocation of public funding**

In 2015, no relevant change happened in the legal framework for the allocation of R&D project and institutional funding. In 2013 and 2014, the major changes in public funding regarded the allocation of funding for HEIs and have been largely investigated in the 2013 ERAWATCH Country Report and in the 2014 RIO Country Report.

A continuing shift from the dominance of R&D institutional funding towards funding based on performance or on projects is clearly visible.

Since 2012, public funding has increased the proportion of the institutional block funding allocated in accordance with performance indicators with the aim of reaching the 30% allocated in accordance with 'merit' indicators.

Actually, the share of FOE based on performance criteria has been 7% for 3 years now, although its progressive increase has been scheduled by MIUR.

FFO allocation rules change each year. Thus, in the last 3 years the VQR-based share has increased, other performance indicators have changed every year and since 2014 the standard student cost has been in place.

Other 'merit' indicators are not stable. This makes the framework for HEIs less clear, since they are not involved in a negotiation round to determine in advance indicators, achievements and the size of the awarded resources. The inclusion of standard costs is an additional issue, since it shifts the competition from quality to costs. The reference period for the current VQR is quite long ago and its ability to indicate the real performance of universities is decreasing. The new VQR results are an emerging key point for an effective performance-based allocation of resources within HEIs.

### **3.4.2 Institutional funding**

Since 2013, a growing proportion of institutional funding has been allocated on quality-related criteria, as discussed in the previous section. In the 2014 FFO, mechanisms for the variable share of funds recorded some changes from 2013, and in 2015 MIUR introduced new criteria. The 'standard cost' per student<sup>9</sup> is increasingly more relevant than output indicators. As discussed in the previous section, only the VQR is a stable and clear indicator of performance, although it refers to the 2004-2010.

First, 20% of the FFO is distributed among universities on the basis of a 'standard cost' per student, with a new (but not yet tested) mechanism of resource allocation. Second, 18% of the FFO will go to 'better-performing' universities, and is distributed in the following way:

- 70% on the basis of their performance in the ANVUR quality assessment review (ANVUR, 2013);
- 20% on the basis of their recruiting policies (scientific production, assessed by ANVUR, of the professors who have been recruited or promoted);
- 10% on the basis of the relevance of international teaching activities, combining the presence of foreign students and courses followed abroad by local students.

ANVUR based its assessment on the best research outcomes obtained by each organisation (universities and research institutes) in the 7 years from 2004 to 2010. Approximately 195,000 publications by 130 organisations were evaluated, partly by submitting them to international experts, who appraised their scientific quality, and partly by analysing the citations received from third parties and examining their impact in their field of research. Moreover, the ability of the evaluated organisation to attract funding and the number of international collaborations, patents registered, spinoffs, museums and archaeological sites, third-party activities, etc. were also considered.<sup>10</sup> A VQR for the period 2011-2014 is currently being prepared.<sup>11</sup>

According to the EC (2015b), effective implementation of the performance-based funding regimes is made more difficult by the overall decrease in higher education funding and the restrictive rules that limit the yearly change in the amount of funds allocated to each university.

Other output indicators have changed every year, with a negative impact on the readability of the effective performance, since HEIs' output is assessed ex post without communicating the scheme, the indicators and shares in advance to HEIs. The mechanism of planning the performance-based share of FFO is managed by MIUR in a top-down process that does not include a round of negotiations with HEIs. In the 2015 FFO, the performance criteria included the evaluation of the recruitment policies according to the VQR results, the international share of foreign students, for example ERASMUS students, both inward and outward, the number of unit training credits from abroad, and the proportion of students with at least 20 credits. The current procedure is

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<sup>9</sup> The standard cost methodology is outlined in a joint regulation of MIUR and MEF (Decreto Interministeriale 9 December 2014 no 893).

<sup>10</sup> <https://www.researchitaly.it/en/understanding/overview/assessment/>

<sup>11</sup> <http://www.anvur.org/attachments/article/867/FAQ%20VQR%2021092015.pdf>

not able to trigger the necessary adjustments to the internal policies and strategies of the universities.

Finally, the introduction of standard costs, for budget reasons, is an additional issue with the basic criteria for evaluating performance. Standard cost methodology, although publicly available, is very complex, with issues related to understating the awarding rules. The introduction of cost competition indicators could bring the whole university system towards an allocation of resources based on cost savings, with some issues about the quality of the output, far from the original intentions of the current national and EU legislative acts.

### **3.4.3 Project funding**

The traditional programmes for non-targeted research (PRIN) and for young researchers' proposals (FIRB) have been experiencing progressive budget reductions through the years.

Resources for PRIN decreased from €100m in 2009 to €38.2m in 2012.<sup>12</sup> Resources for FIRB in the call launched at the end of 2012 were €29.5m<sup>13</sup>. No funds were made available in 2013 and 2014.

The main novelty for 2015 was the re-funding of PRIN by MIUR: a new competitive call with an allocated budget of €91.9m was launched in November.<sup>14</sup>

In January 2014, MIUR published the call SIR, addressed to young researchers.<sup>15</sup> The budget of €47m was intended to finance projects managed by researchers aged under 40 in any scientific domain of the ERC. However, in 2015 the SIR programme did not launch any new call. Selections have been implemented in accordance with the core principles of international standards and from 2015 MIUR has managed a register of independent national and foreign experts.

Postdoctoral grants are traditionally scarce in the Italian system and no relevant changes happened in 2015.

### **3.4.4 Other allocation mechanisms**

Defence R&D is not usually included in the MIUR planning policies. Some R&D funding to the military industry is managed directly by the Ministry of Defence, with ad hoc procedures not always based on competition. The planning bodies within the Ministry of Defence schedule R&D investments and the modalities of funding. Information on military R&D is often not available to the public and MIUR rules about peer review, assessment and monitoring do not apply. Some financing of defence R&D is managed by MISE. According to the information available in the 2015 stability law, MISE expenses for high-technology military programmes amounted to €2.5b in 2014, €2.4b in 2015 and €2b in 2016 and 2017.

## **3.5 Public funding for private R&I**

### **3.5.1 Direct funding for private R&I**

In 2014 the government launched some relevant programmes and in 2015 shifted the support to private R&D to indirect incentives such as tax credits and the revision of the innovative start-up law.

The regulation of the major funds for allocating competitive R&D projects, FAR and FCS, was revised in 2012, 2013 and 2014 in order to streamline the access modalities.<sup>16</sup>

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<sup>12</sup> PRIN call D.M. 28 December 2012 n. 957/Ric.

<sup>13</sup> FIRB call 2012 D. M. 28 December 2012 no 956/ric.

<sup>14</sup> <http://prin.miur.it>

<sup>15</sup> SIR call 2014 D.D. 23 January 2014 n. 197. <http://www.sir.miur.it>

<sup>16</sup> In March 2013, MISE reformed the system of firms' incentives, concentrating them into the FCS, which will include all

The FCS financed two calls in December 2014: one call of around €150m called 'ICT-Agenda digitale', within the framework of the digital agenda on key enabling technologies in ICT to create a single digital market; the second, called 'Industria sostenibile', targeting projects on sustainable growth and green economy with funding of €250m.

In September 2014, MISE issued the FCS call for industrial R&D projects covering the fields of ICT, nanotechnology, advanced materials, biotechnology, advanced manufacturing, and technologies associated with the EU Horizon 2020 programme. Available funding amounted to €300m, 60% earmarked for SMEs. Funds were provided in the form of low-interest loans.<sup>17</sup>

The National Technology Clusters are aggregations of companies, universities and public or private research organisations active in the field of innovation. They focus on eight technology fields. The programme, launched in 2012, financed 48 projects to the amount of €266m.

The 2012 Smart Cities call targeted the four Cohesion regions: Sicily, Calabria, Puglia and Campania.<sup>18</sup> It aimed to involve SMEs, large firms, universities and PROs in innovative projects on social innovation in nine strategic areas, in line with the Horizon 2020 Societal Grand Challenges. After the selection phase, eight projects were awarded total funding of €200m.

The above initiatives are generally targeted towards the same thematic areas of EU programmes, such as Horizon 2020, the seven European Grand Societal Challenges or the European Digital Agenda, with a strategy of integration between national and EU R&I priorities.

Further initiatives have included the MIUR Technological Cluster programme, which supports eight aggregations of private and public bodies with €266m to foster innovation in selected thematic fields. In addition, the 2014 Budget allocated €100m in 2014 and €50m in 2015 to SMEs in the form of collateral as loan guarantees, managed in the frame of the FCS fund, using European Investment Bank financing.

The R&D programmes are specialised in specific parts of the R&D process. In the case of private business, R&D calls are focused on market innovation and industrial research.

Benchmarking with foreign programmes does not have a long tradition in the Italian system. Since 2012, a monitoring system has been set up, except for the calls under the PONREC programmes.

Innovative public procurement is included in the R&D strategies, although MIUR is not in charge of the innovation in the public sector; the Public Function Ministry and AgID are the bodies in charge.

As discussed in the previous RIO Country Report, the government has already launched a number of tenders for the provision of innovative products and services.

On 28 April 2015, MIUR and AgID signed a partnership agreement for the planning and implementation of innovative public procurement services. AgID is the central commitment for local and central public administration; it is part of the European Consortium in charge of the pre-commercial procurement (PCP) Cloud for Europe. During the second half of 2015, the call Cloud for Europe made awards to projects in three lots: Federated Certified Service Brokerage; Secure, Legislation-Aware Storage; and

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the resources for technological innovation, linked to Horizon 2020 guidelines and definitions. It replaces the previous Fondo rotativo per sostegni alle imprese e gli investimenti in ricerca (FRI). Law 147/2013 added €100m to the FCS for 2014 and €50m for 2015. The MISE DM of 25/07/2014 regulated the modalities of access to the FCS.

<sup>17</sup> [http://www.sviluppoeconomico.gov.it/index.php/it/?option=com\\_content&view=article&viewType=1&idarea1=593&idarea2=0&idarea3=a=0&idarea4=0&andor=AND&sectionid=0&andorcat=AND&partebassaType=0&idareaCalendario1=0&MvediT=1&showMenu=1&showCat=1&showArchiveNewsBotton=0&idmenu=2263&id=2031108](http://www.sviluppoeconomico.gov.it/index.php/it/?option=com_content&view=article&viewType=1&idarea1=593&idarea2=0&idarea3=a=0&idarea4=0&andor=AND&sectionid=0&andorcat=AND&partebassaType=0&idareaCalendario1=0&MvediT=1&showMenu=1&showCat=1&showArchiveNewsBotton=0&idmenu=2263&id=2031108)

<sup>18</sup> D.D. 5th July 2012 n. 391/Ric.

Legislation Execution. Within the framework of the European Digital Agenda, AgID set up two strategic documents on digital growth and on ultra-width broadband regarding open access policies.<sup>19</sup> They detail the national strategies for the implementation of the European Digital Agenda.

### 3.5.2 Public procurement for innovative solutions

The total value of public procurement contracts above €40,000 was €101.4b in 2014, equal to approximately 6% of GDP. This figure represents a remarkable increase after the contraction recorded in 2012 and the trough of 2013, when the value was around €84b.

The breakdown of the different types of procurement was 26.2% works, 46.4% services and 27.4% goods.<sup>20</sup>

#### PCP/PPI landscape

Pre-commercial procurement was explicitly mentioned in the Italian legislative framework in the so-called 'Decreto Crescita' (Decree for Growth), D.L. 18/10/2012, which was then converted, with amendments, into Law 122 of 17 December 2012.<sup>21</sup>

Article 19 of the decree is entitled 'Grandi progetti di ricerca e innovazione e appalti precommerciali' (Large research and innovation projects and pre-commercial procurement).

The decree assigns to the newly established AgID the task of carrying out PCP initiatives in the context of large-scale innovation projects, assigning to the agency a dedicated budget of €170m. The decree also plans the adoption of guidelines by MISE and MIUR to promote the diffusion of PPI and PCP by the public sector.

The strategy HIT2020, issued by MIUR at the beginning of 2013, aligns the Italian R&I strategy framework to the Horizon 2020 priorities and timeline. It mentions public procurement as a tool to stimulate and incubate research and innovation, in particular for SMEs. The document highlights the need to consolidate the legal framework for PCP with the aim of promoting R&I, including in regional Smart Specialisation Strategies.<sup>22</sup>

A significant step forward was made with the signature of a formal agreement between MIUR and AgID on 28 April 2015,<sup>23</sup> with a programme based on four main objectives:

1. promoting the use of PCP as a tool to foster R&D activities;
2. promoting the use of 'demand-driven' innovative procurement, including PCP, with the aim of fostering innovation in markets, and maintaining and enhancing the presence of significant industrial R&I capacities in the country;
3. promoting the modernisation of the public administration services through the adoption of innovative solutions;
4. in the frame of the previous objectives, implementing the activities started with the call 'Avviso Pubblico per la rilevazione di fabbisogni di innovazione all'interno del settore pubblico nelle regioni convergenza' ('Public call for the identification of the innovation needs of the public sector in the convergence regions') in March 2013 (see below).

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<sup>19</sup> The strategic documents can be downloaded from:

[http://www.agid.gov.it/sites/default/files/documentazione/strat\\_crescita\\_digit\\_3marzo\\_0.pdf](http://www.agid.gov.it/sites/default/files/documentazione/strat_crescita_digit_3marzo_0.pdf);

[http://www.agid.gov.it/sites/default/files/documenti\\_indirizzo/StrategiaBandaUltraLarga2014.pdf](http://www.agid.gov.it/sites/default/files/documenti_indirizzo/StrategiaBandaUltraLarga2014.pdf).

<sup>20</sup>

[http://www.autoritalavoripubblici.it/portal/rest/jcr/repository/collaboration/Digital%20Assets/anacdocs/Attivita/Pubblicazioni/RelazioniAnnu ali/2015/ANAC\\_Relazione\\_2014.02.07.15.pdf](http://www.autoritalavoripubblici.it/portal/rest/jcr/repository/collaboration/Digital%20Assets/anacdocs/Attivita/Pubblicazioni/RelazioniAnnu ali/2015/ANAC_Relazione_2014.02.07.15.pdf), p. 72.

<sup>21</sup> [http://www.gazzettaufficiale.it/atto/serie\\_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2012-12-18&atto.codiceRedazionale=12A13277](http://www.gazzettaufficiale.it/atto/serie_generale/caricaDettaglioAtto/originario?atto.dataPubblicazioneGazzetta=2012-12-18&atto.codiceRedazionale=12A13277)

<sup>22</sup> <https://www.researchitaly.it/uploads/50/HIT2020.pdf>

<sup>23</sup> [http://www.agid.gov.it/sites/default/files/accordi\\_istituzionali/03\\_accordo\\_miur\\_-\\_agid.pdf](http://www.agid.gov.it/sites/default/files/accordi_istituzionali/03_accordo_miur_-_agid.pdf)



The agreement assigns to AgID the task of elaborating tools in support of the execution of PCP tenders, including templates for tendering documents, management models to define tender strategies, and guidelines for the realisation of PCP calls.

### **PCP/PPI initiatives**

A series of relevant initiatives on PCP have been developed in Italy in the last 5 years, both at the national and regional/local levels.

The DPS launched in 2010 a joint project with AgID for the diffusion of the technologies for innovation, called 'Sostegno alle politiche di ricerca e innovazione delle Regioni' (Support to regional research and innovation policies<sup>24</sup>).

One of the outcomes of the project was the publication in 2012 of the report *Gli appalti pre-commerciali per il finanziamento dell'innovazione nelle Regioni* (Pre-commercial procurement to finance regional innovation<sup>25</sup>). The report was prepared by a working group that involved managers from the national and regional administrations, researchers and experts from innovation and technology transfer agencies. Its aim was to design some examples of PCP schemes that were consistent with the national legal framework, regional practices and the powers of the administrations. The design of the administrative documents went together with the launch of some pilot initiatives, namely in the Valle d'Aosta and Puglia regions.

### **Puglia**

The Puglia region launched a PCP call<sup>26</sup> in August 2012 around the theme of independent living, in two macro-areas: *assistance and inclusion* and *health and safety*.

The total budget allocation was €2.3m, to fund a maximum of eight R&D services in the first phase, and a maximum of four projects during the second phase.

The initiative Open Labs was launched in April 2015 with a market consultation in three areas:

- A. adaptive water management platforms;
- B. treatment, reduction and reuse of sewage sludge in the processes of depuration of urban wastewaters;
- C. detection and monitoring of leakages in the water network distribution.<sup>27</sup>

Two calls for items B and C have been launched (deadline 31 March 2016), with an allocated budget of €625,000 each.<sup>28</sup>

### **Lombardy**

One of the most significant Italian pilot experiences is that of the Lombardy region, which launched a PCP initiative in April 2012 for the provision of industrial research and experimental development services to produce a new automated hospital bed-handling system<sup>29</sup> for the Niguarda Hospital in Milan. The project started in April 2012 with a technical dialogue among procurers, industry and research organisations to inform them about the new PCP procedure, and to identify possible gaps between the procurers' needs and the state of the art of industrial developments.

The call was then published in March 2013, with a total budget allocation of €750,000.

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<sup>24</sup> <http://www.aginnovazione.gov.it/notizie/progetto-%E2%80%9C sostegno-alle-politiche-di-ricerca-e-innovazione-delle-regioni%E2%80%9D/>

<sup>25</sup> <http://www.aginnovazione.gov.it/wp-content/uploads/2012/05/QI08-QI09.pdf>

<sup>26</sup> [http://www.sistema.puglia.it/portal/pls/portal/SISPUGLIA.RPT\\_DETAGLIO\\_DOC.show?p\\_arg\\_names=id&p\\_arg\\_values=26294&p\\_arg\\_names=PAGINATE&p\\_arg\\_values=NO](http://www.sistema.puglia.it/portal/pls/portal/SISPUGLIA.RPT_DETAGLIO_DOC.show?p_arg_names=id&p_arg_values=26294&p_arg_names=PAGINATE&p_arg_values=NO)

<sup>27</sup> <http://www.empulia.it/pcp/SitePages/openlabs.aspx>

<sup>28</sup> <http://www.empulia.it/bandi/SitePages/RegionePuglia.aspx?expired=0&type=Servizi>

<sup>29</sup> [http://www.arca.regione.lombardia.it/cs/Satellite?c=Attivita&childpagename=DG\\_CRA%2FWrapperBandiLayout&cid=1213588632524&p=1213588632524&pagename=DG\\_CRAWrapper](http://www.arca.regione.lombardia.it/cs/Satellite?c=Attivita&childpagename=DG_CRA%2FWrapperBandiLayout&cid=1213588632524&p=1213588632524&pagename=DG_CRAWrapper)

The procedure sets out three different phases: feasibility study, technical design (five selected solutions), and prototyping, testing and experimentation (two selected solutions).<sup>30</sup>

The procedure reached the final stage in early 2015 and two solutions were officially selected in September 2015. They were awarded €320,000 and €245,000. The tender envisages the signature of a contract for experimental development activities and for the management of IP rights.<sup>31</sup>

Building on the successful experience of the Niguarda hospital project, Regional Law No 26 of 24 September 2015, 'Manifattura Diffusa Creativa e Tecnologica 4.0' ('Diffused and creative manufacturing 4.0'<sup>32</sup>) mentions support to PCP and PPI as measures to stimulate the purchases of innovative technologies by the region.

The Regional Smart Specialisation Strategy<sup>33</sup> plans to extend in the coming years the experience of the first PCP project in the healthcare sector to new projects in the sectors of water, sustainable construction, energy and environment, transport, ICT, culture and healthcare.

### **Convergence regions**

Some PCP/PPI initiatives were launched by MIUR and MISE between 2012 and 2013, targeted at the four Convergence regions (Calabria, Campania, Puglia and Sicily) and using PONREC funds.

In particular, in March 2013, the PCP call 'Avviso Pubblico per la rilevazione di fabbisogni di innovazione all'interno del settore pubblico nelle regioni convergenza' ('Public call for the identification of the innovation needs of the public sector in the convergence regions'<sup>34</sup>) was published by the two ministries. The scheme, for which €150m was allocated (€100m by MIUR and €50m by MISE), is a 'call for ideas' to solve some innovation needs of the public sector.

A total of 30 expressions of interest/needs from the public administration were approved by MIUR.<sup>35</sup> The following step was the collaboration agreement signed in April 2015 between MIUR and AgID to plan and implement the activities for the development of innovative products and services aimed at satisfying the needs expressed by the public administrations.

The preliminary market consultation<sup>36</sup> for the development of R&D services intended to create innovative solutions, products, services or processes not yet available on the market in the areas of civil protection and emergency management was officially started on 22 October 2015. The consultation responded to the needs expressed by Sicily's Department of Civil Protection and the provincial fire departments of Lecce and Caserta.

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<sup>30</sup> <http://cordis.europa.eu/fp7/ict/pcp/docs/pcp-lombardia-v4.pdf>

<sup>31</sup> [http://www.arca.regione.lombardia.it/shared/ccurl/830/892/GUUE\\_publicata\\_agg\\_2\\_2013\\_PCP.pdf](http://www.arca.regione.lombardia.it/shared/ccurl/830/892/GUUE_publicata_agg_2_2013_PCP.pdf)

<sup>32</sup> [http://www.attivitaproductive.regione.lombardia.it/cs/Satellite?c=Redazionale\\_P&childpagename=DG\\_Industria%2FDetail&cid=1213754836211&pagename=DG\\_INDWRapper](http://www.attivitaproductive.regione.lombardia.it/cs/Satellite?c=Redazionale_P&childpagename=DG_Industria%2FDetail&cid=1213754836211&pagename=DG_INDWRapper)

<sup>33</sup> [http://www.attivitaproductive.regione.lombardia.it/shared/ccurl/206/417/DGRX\\_3486\\_S3II.pdf](http://www.attivitaproductive.regione.lombardia.it/shared/ccurl/206/417/DGRX_3486_S3II.pdf). Page 67.

<sup>34</sup> <http://attiministeriali.miur.it/anno-2013/marzo/di-13032013.aspx>

<sup>35</sup> [http://www.aqid.gov.it/sites/default/files/reqole\\_tecniche/elenco\\_30\\_manifestazioni\\_di\\_interesse.pdf](http://www.aqid.gov.it/sites/default/files/reqole_tecniche/elenco_30_manifestazioni_di_interesse.pdf)

<sup>36</sup> [https://www.researchitaly.it/uploads/13377/Agenda\\_30ottobre2015%20-%20concise.pdf?v=ed06d0f](https://www.researchitaly.it/uploads/13377/Agenda_30ottobre2015%20-%20concise.pdf?v=ed06d0f)

### 3.5.3 Indirect financial support for private R&I

The shift towards indirect financial support for private R&I is a recurrent issue in Italian research policy. The traditional approach was focused on direct financing, usually tailored to large firms. Since 2012, governments have implemented three type of measures aimed to support firms indirectly: tax credits, innovative start-ups support and patent boxes (see Chapter 2 for additional details).

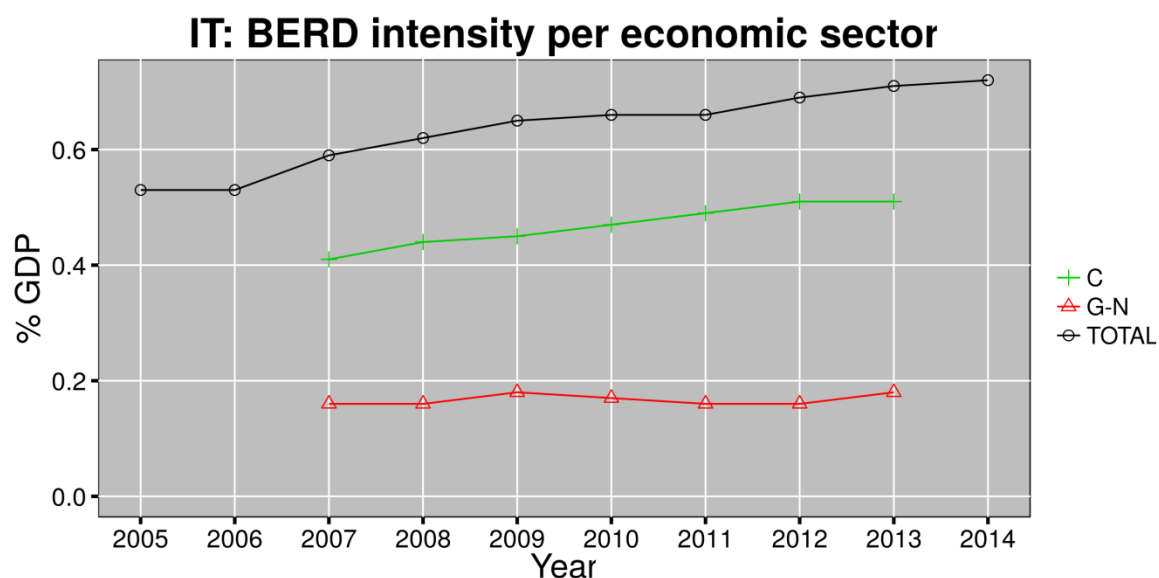
The 2012 and 2015 innovative start-up laws have introduced facilitations, tax exemptions, derogations to the general legislative system about work and failures, and some innovative methods for access to the finance and capital market. The current tax credit scheme was released in the 2015 stability law. It is an incremental scheme, financed with about €2.6b for 2015-2020. The 2015 stability law has also introduced the so called 'patent box' measure, a specific tax scheme for patents, trademarks, licences and software.

## 3.6 Business R&D

### 3.6.1 The development in business R&D intensity

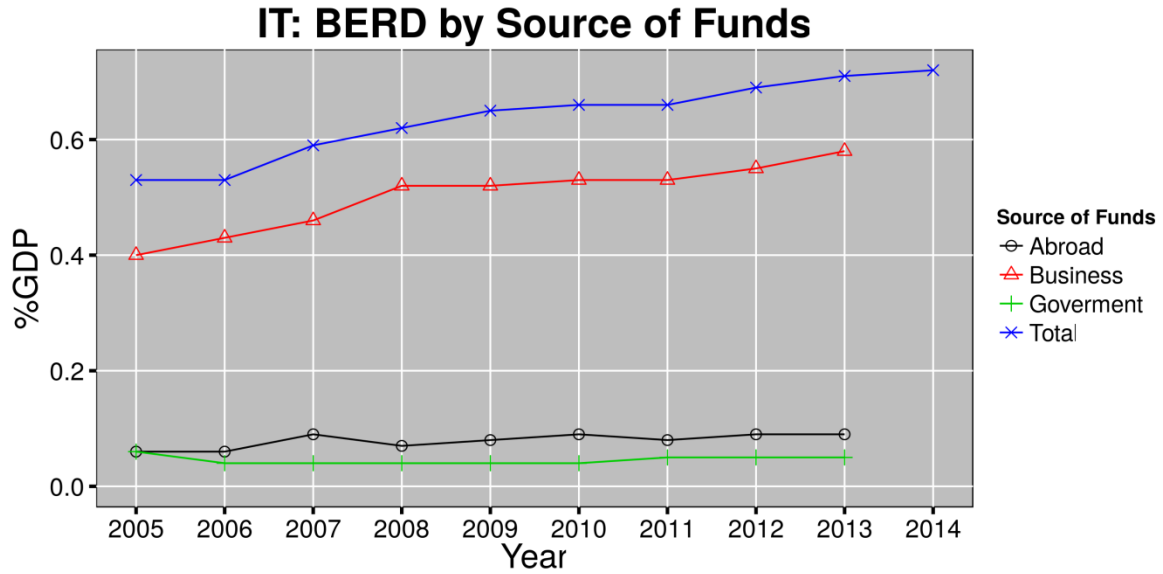
The BERD intensity in Italy, although on the rise since 2006, remains relatively modest. It was around 0.7% of GDP in 2013-2014 (see Figure 8). This is the main barrier to increasing the R&D intensity to a level closer to other large EU countries such as France or Germany (where it is close to 1.5% and 2% respectively).

Manufacturing and services account for more than 95% of the BERD intensity. In particular, the contribution from manufacturing is more than double that from services and it has been on the rise since 2007. Unlike that, the BERD intensity of the service sector stagnated in 2007-2013.



**Figure 7:** BERD intensity broken down by most important macro sectors. C, manufacture; G-N, services.

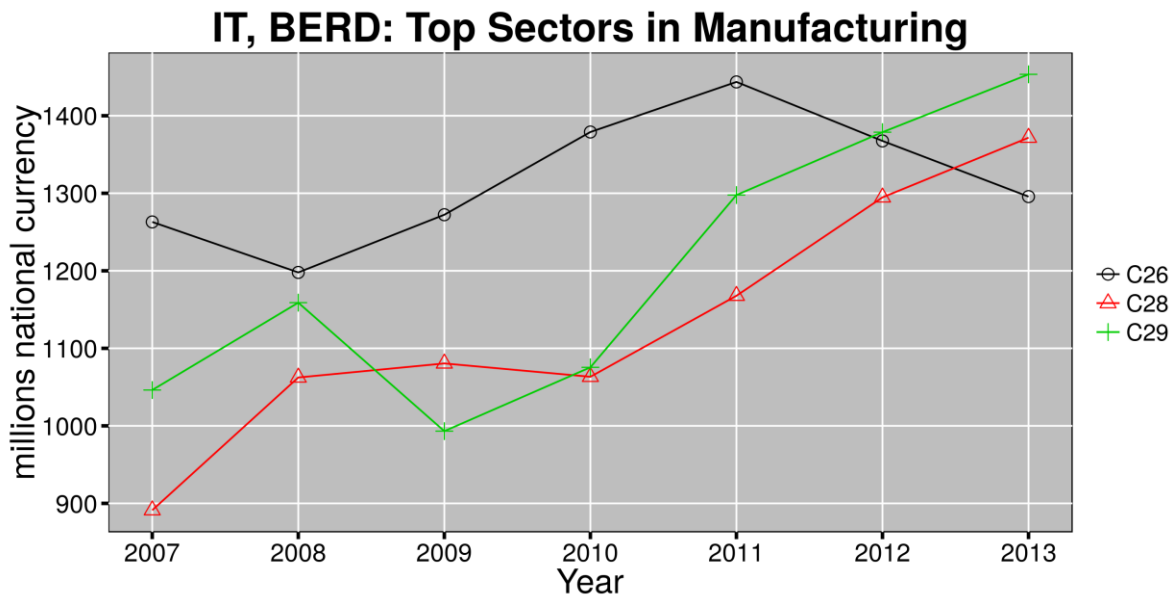
The business sector is the main funder of Italy's BERD (see Figure 9). The contribution from the government is rather small (in the range 0.04-0.06% of GDP in the period under scrutiny) and so is the funding from abroad, which has always been below 0.1% of GDP.



**Figure 8:** BERD by source of funds.

### 3.6.2 The development in business R&D intensity by sector

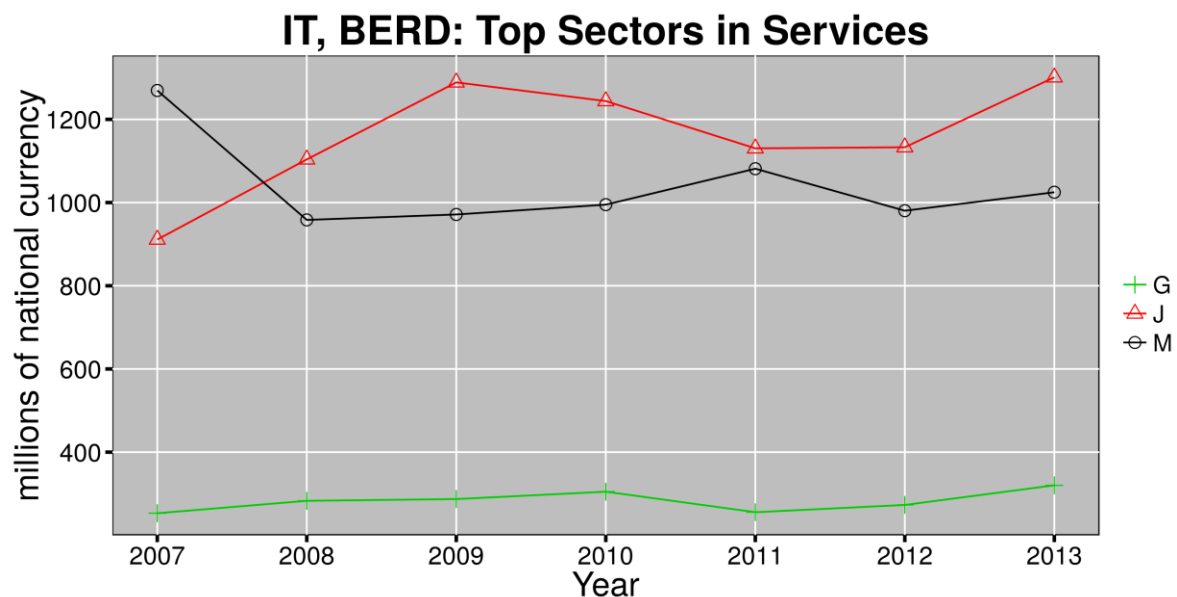
The manufacture of motor vehicles, machinery and equipment, and computer, electronic and optical products are the leading R&D performing sectors in Italy (see Figure 10). We observe substantial growth of BERD in the manufacture of machinery (C28) and motor vehicles (C29) between 2010 and 2013.



**Figure 9:** Top sectors in manufacturing.

C26, manufacture of computer, electronic and optical products; C28, manufacture of machinery and equipment n.e.c.; C29, manufacture of motor vehicles, trailers and semi-trailers.

Among services (see Figure 11), the information and communication field and professional, scientific and technical activities play a leading role. Each of them spends about 3-4 times as much on BERD as the wholesale and retail trade, the third service sector in terms of BERD expenditure.

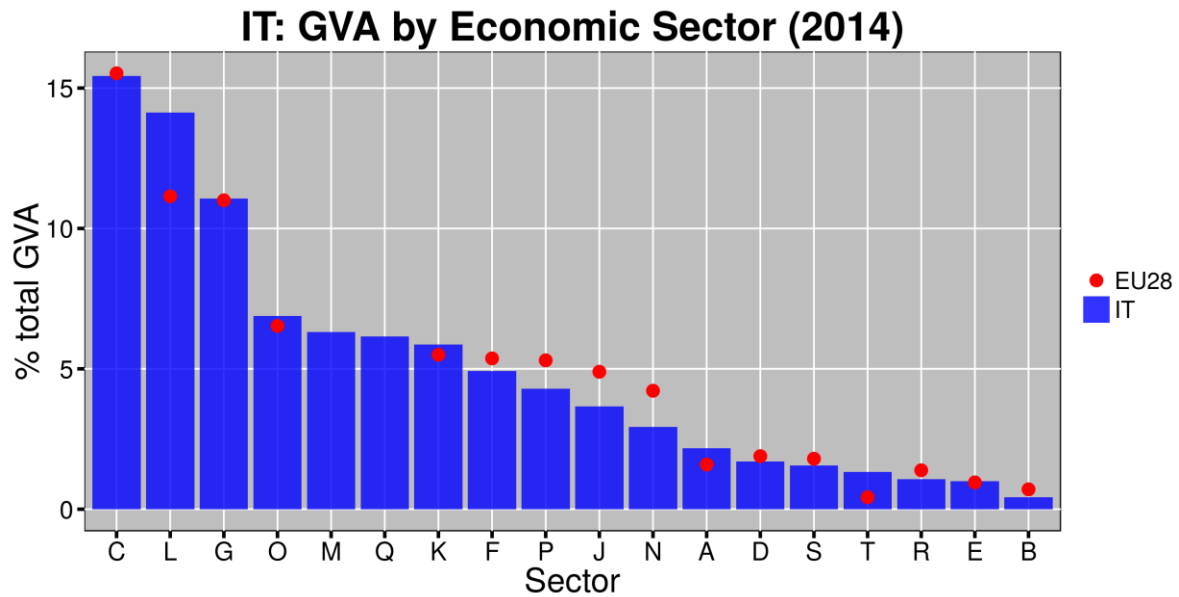


**Figure 10:** Top service sectors.

J, information and communication, G, wholesale and retail trade; repair of motor vehicles and motorcycles; M, professional, scientific and technical activities.

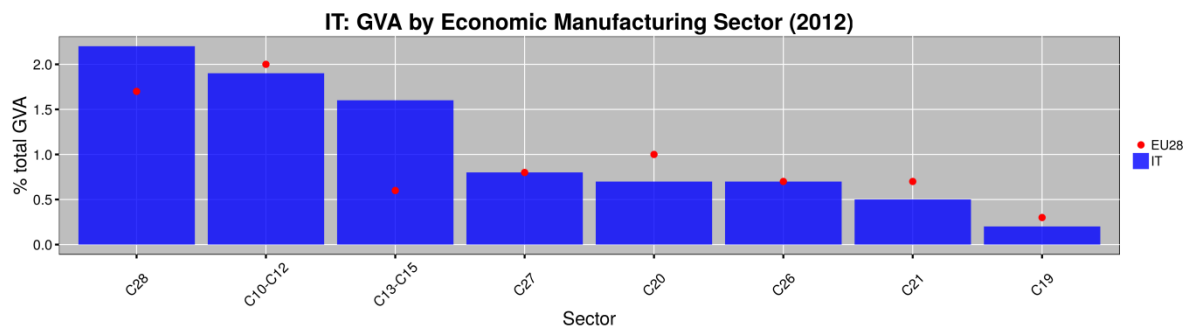
### 3.6.3 The development in business R&D intensity and value added

Manufacturing, professional, scientific and technical activities and wholesale and retail trade also play a leading role in the creation of gross value added (GVA) in Italy. Not surprisingly, considering that the structure of the economy still relies a lot on more 'traditional' sectors, among the most prominent sectors in terms of GVA are low R&D-intensive sectors such as real estate activities or compulsory social security, human health and social work activities (driven by the growing proportion of the population that is ageing and needing care) (see Figure 12). The manufacture of machinery, food, beverages and tobacco products, and clothes and textiles are also prominent manufacturing sectors in terms of GVA (see Figure 13).



**Figure 11:** Economic sectors as percentage of total GVA.

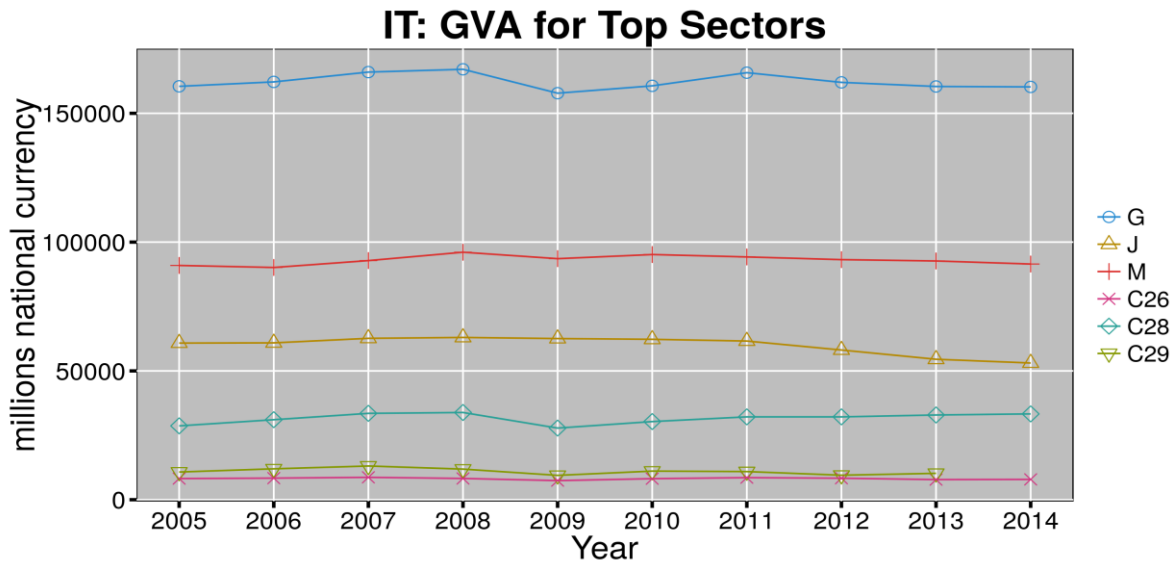
Top six sectors in descending order: (1) manufacturing; (2) real estate activities; (3) wholesale and retail trade; repair of motor vehicles and motorcycles; (4) public administration and defence; compulsory social security; (5) professional, scientific and technical activities; (6) human health and social work activities.



**Figure 12:** GVA in manufacturing.

Top six manufacturing sectors: (1) manufacture of machinery and equipment n.e.c.; (2) manufacture of food products; beverages and tobacco products; (3) manufacture of textiles, wearing apparel, leather and related products; (4) manufacture of electrical equipment; (5) manufacture of chemicals and chemical products; (6) manufacture of basic pharmaceutical products and pharmaceutical preparations.

When examining the GVA contribution of the top service and manufacturing sectors, it can be noted that wholesale and retail trade is set apart from the rest and generates the highest value added at factor cost (see Figure 14).



**Figure 13:** Value added at factor cost for the leading manufacture and service sectors in Figures 10 and 11.

### 3.7 Assessment

The policy mix for funding R&D has recorded some major changes from 2012, since the governments streamlined the access to the main direct funds, revised the performance scheme of the institutional funds, revised the indirect incentives for private businesses and introduced peer review as a regular feature of the evaluation procedure in competitive programmes.

However, delays, postponements and change of strategies, in addition to the smaller available budget, caused uncertainty for the operators and about the scheduling and the effective relevance of the major measures.

The traditional competitive programmes for untargeted research, after years of underfinancing, have not recorded any new calls for years, and only a few new programmes started in 2014 and 2015. Among them was a new PRIN call in November 2015 (see section 3.4.3 above).

The institutional funding is allocated according to performance-based schemes but the implementation modalities have been limited, since the indicators are released ex post and they are not stable. The inclusion of indicators such as standard costs may go against quality, since they could lead HEIs to compete on cheaper output.

The current policy mix encourages public-private partnerships, especially within PONREC, and it is intended to trigger R&D investments with more indirect incentives through tax credits, start-up laws and patent boxes.

An assessment of the additionality of the current indirect incentives is not yet available, although Cantabene and Nascia (2014) have assessed the effectiveness of R&D tax credits provided in 2007-2009, finding some additionality of public and private funds.

The current schemes are a novelty for the Italian system and the positive effects could be counterbalanced by the negative effect on the tax revenues especially for the patent box and innovative SMEs. The enlargement of the scope of the law on innovative start-ups to innovative SMEs, with very generous tax exemptions and quite flexible requirements to comply with, and the patent box scheme could lead to a reduction in the fiscal revenues for the public budget in exchange for little additional R&D investment.

However, the official data available do not show any increase in R&D investments and the country is still far from the Europe2020 headline target.

