

Working Paper

Industrial policy and technology in Italy

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Abstract

After the crisis started in 2008 Italy's industry has lost close to one quarter of its industrial production. The possibility for the country to reconstruct its production capacity largely depends on whether a new industrial policy is developed. The article documents the decline of Italy's industry and technology and the impact of the crisis. The demise of traditional industrial policy in Italy and Europe in the last two decades is examined, assessing the consequences of the retreat of public action in this field and the evolution of the current debate. A detailed analysis of the current tools used in Italy's industrial and innovation policy is carried out, showing its 'horizontal' approach, limited resources, fragmented measures, modest impact. Current initiatives appear unable to support a revival of production and domestic private investment, close Italy's gap in R&D and innovation and upgrade its technological activities. In conclusion, a proposal for a new industrial policy combining Italian and European initiatives is summarised.

JEL codes

E6, L5, O4

Keywords

Manufacturing industry, Industrial policy, Innovation, Italy

1. The impact of the crisis on Italian industry¹

The crisis started in 2008 has accelerated Italy's industrial decline. GDP has not yet returned to its 2008 values and its growth in 2015 is expected to be 0.9%² The current stagnation is unlikely to end quickly; 2016 forecasts by international organisations - the IMF, OECD and the EU Commission – put Italy's growth significantly below the Euro Area average; Italy's Economics minister Pier Carlo Padoan has even suggested that we can be in a “secular stagnation”.³

The long crisis has had a major impact on unemployment rates, that increased from 6% in 2008 to 11.5% in 2015; youth unemployment has reached 40%; total employment in 2015 is back to the level of 2005. In the European context, the Italian economy has reduced its weight in Europe, and has now a per capita GDP that has fallen below EU average. Regional inequalities have also increased, with greater losses in the South of Italy, where in 2013 is located 11% only of manufacturing value added, as opposed to 16% in the Centre, 33% in the North-East and 41% in the North-West.

The crisis has strongly hit Italy's manufacturing industry. As shown in Figure 1, in October 2015, the index of industrial production was below pre-crisis level by over 23%, about 30 points below the level of April 2008; if the pre-crisis trends had been maintained, the gap between potential output and current one would be about 40 points. This has been the consequence of a double recession that has brought the index back to the level of the 1980s.⁴ The lack of a significant recovery and the fall in variability of industrial production since the end of 2013 suggests a risk of “hysteresis” - an industrial system that has reached a “new normal” condition and is unable to return to its historical growth trend.

Figure 1 here

Figure 2 here

Uncertainty about the future has reduced new investments, which have broadly followed changes in manufacturing value added, as shown by Figure 2. In 2014, total investments at constant prices in the manufacturing sector were still 21% below the pre-crisis level of 2007; their value at current prices has dropped from 60 billion euros in 2007 to 51 billion in 2014. In 2013 and 2014 the fall over the previous year has been -5,2% and -3,4%, greater than the losses in value added, reflecting expectations of continuing low demand.

Looking at the technological content of production, shown in Figure 3, the decline of Italian industry is the result of a major fall in medium-high and medium-low technology sectors (-29% and -32% respectively from April 2008 to July 2015), while the reduction is less dramatic in low technology industries (-19%), and is limited in high tech sectors (-2%), which however account for

¹ Industrial policy is a theme of continuing research activity by the authors (Pianta, 1996; 2014; Lucchese and Pianta, 2014, 2015; Nascia and Pianta, 2014, 2015). Ideas have been presented at Industrial Policy workshops at Sapienza University of Rome (May 2014, June 2014, May 2015) and at a seminar at WIIW in Vienna (May 2014). This article is produced as part of the ISIGrowth project on Innovation-fuelled, Sustainable, Inclusive Growth that has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 649186 - ISIGrowth.

² ISTAT (2015) *Le prospettive per l'economia italiana nel 2015-2017*. Previsioni Istat, 5 novembre 2015, Roma.

³ Il Sole 24 Ore website 16.12.2015, <http://www.ilsole24ore.com/art/notizie/2015-12-16/padoan-ripresa-debole-c-e-stagnazione-secolare--122051.shtml?uuid=ACTdRYuB>

⁴ Data for this article are drawn from Istat and Eurostat websites, December 2015. For the manufacturing sector, the first recession took place between April 2008 and March 2009; the second from August 2011 to March 2013.

about 9% only of total value added in manufacturing and for 6% only of total employees (full-time equivalent units in 2013).

In 2015 no reversal of this trend is reported. From December 2014 to October 2015, the Italian index of industrial production has increased by a modest 1.4% (+1.3 points); 13 sectors (at two digit Nace Rev. 2 level) out of 24 still show a negative trend. The recovery is mainly due to three sectors: motor vehicles (+22%), rubber and plastic products; pharmaceutical products (+8%); conversely, major losses have occurred in furniture (-5%), wearing apparel and leather products (-3%).

Figure 3 here

Figure 4 here

Compared to major European countries, Italy has lost ground significantly, as shown in Figure 4. The recovery from the 2008 crisis has been robust in Germany; in France, production has barely reached pre-crisis levels; Spain has experienced a dramatic loss of production. In Europe as a whole industrial production is still lower than eight years ago. Italy is facing a structural loss in industries that have been the engine of past growth, with no other fast growing economic activity that could play a similar role in the future – finance is overblown and highly unstable; services suffer the slump in consumption; the public sector suffers cuts. This combination of stagnation and industrial decline has wide ranging consequences. As industry loses its role as a major source of employment – especially for mid-level skills – unemployment has become more intractable, wages have fallen, inequality and poverty have increased.

However, if we look at Figure 5 where industrial output is split between sales to domestic and foreign markets, we find that the former accounts for all the decline; the fall in domestic demand, worsened by austerity policies, appears to be the key driver of the loss of manufacturing production. Conversely, the performance of turnover for export has been very similar to that of Germany, with a fall in 2009 deeper than domestic sales, followed by a steady increase that by the end of 2015 has brought the production index (2007=100) to about 115 in Italy and 118 in Germany. In other words, the collapse of manufacturing production is not the result of a worsening of Italian competitiveness; in the context of rising world trade, Italian firms focusing on foreign markets have increased sales, strengthening their financial and economic conditions. It is the depression of domestic demand that has led to the dramatic fall of production.

However, two cautions are in order. First, the above data refer to turnover rather than value added and Italy's exports may be inflated by the import and re-export of intermediate goods associated to international production systems. Second, the current downturn in world exports could limit the space for exporting firms, making a recovery of manufacturing more difficult. Moreover, the fall of industrial production may lead – if domestic demand ever picks up - to a significant increase of final imports, a trend that has already emerged in the first two quarters of 2015. This could generate serious trade imbalances in the near future, which will have to be compensated by greater capital inflows, further expanding private and public debt and the risk of financial instability.

Figure 5 here

The divergent industrial dynamics between Germany and Italy have not only increased imbalances; they lead to the emergence of a production system centred in Germany and increasingly involving as subcontractors firms of a ring of surrounding countries, including Northern Italy (Stöllinger et al., 2013; Simonazzi et al. 2013; Pianta, 2014; Cirillo and Guarascio, 2015; De Nardis, 2015). International production systems are thus moving towards a more hierarchical and concentrated structure; leading firms increase their oligopolistic market power and control a wider network of outsourcing and offshoring activities, distributed in a larger number of countries. Italy now has very few leading firms in global markets, and has experienced a continuing loss of ownership of major Italian firms to foreign investors whose commitment to maintaining production, employment, R&D

and managerial activities in Italy is at best uncertain; in 2015 alone some of the most important Italian firms, including Telecom, Pirelli, Italcementi have become majority-owned by foreign investors.

Italy's high technology activities have been hit in a serious way by such changes. Research and Development (R&D) and innovation expenditures have stagnated for years. Istat reports for 2013 a R&D to GDP ratio of 1.30%, far from the 1.53% agreed as a Europe2020 objective; in order to fill the gap, an additional 4 billion euros should be spent. The weakness of Italy's innovation performance has been documented by the Innovation Union Scoreboard 2014 that ranks Italy as a 'moderate innovator' since its performance is well below the EU28 average for many indicators. The latest Italian Innovation Survey, reporting 2012 data, has shown that only 35.5% of firms have introduced at least one process or product innovation in the crisis years 2010-2012, much below the EU average; in 2012 16.3% only of total turnover has been originated by sales of new products – a record low; only 12.5% of innovating firms reported some cooperation with the public sector and Universities, as opposed to a EU average of 31.3% (Banca d'Italia, 2013; Nascia and Pianta, 2014, 2015).

In this context, the challenge for Italy's industry is the very possibility to survive as a major international player; this requires an active role of public policy for defending and reconstructing Italy's manufacturing capabilities. In the next section we review the initiatives undertaken by Italy's governments in the European context.

2. The evolution of industrial policy in Italy and Europe

Italy's growth after the second world war was supported by an extensive industrial policy. As in most other European countries, its objectives were the development of a large manufacturing base in the emerging industries of the 1950s and 1960s – steel, auto and chemicals, the typical sectors of "Fordist" production – and, in the 1970s, the development of new activities in electronics, telecommunications and aircraft. Industrial policy has also provided the country with communications and transport networks, and a reliable energy supply. Governments guided the development of the economy on the basis of a consensus with business, trade unions and public opinion; they were equipped with institutions - ministries, agencies, private and public firms, public authorities – with the resources and competences needed to achieve policy goals. They target the development of new activities that at first were relatively inefficient and more costly, but that became efficient over time, supported by learning processes, investments, market expansion and the cost reductions allowed by scale economies.

The rationale for industrial policy is that it can steer the evolution of the economy towards activities that are desirable in economic terms – improving efficiency –, in social terms – addressing needs and reducing inequality –in environmental terms – assuring sustainability – and in political terms - protecting key national interests. The economic rationale includes the search for improvements in static and dynamic efficiency (especially in the cases of market failure); in coordination of decisions; in the framework conditions of economic activities. Gains in dynamic efficiency are the most important argument for industrial policy. Public policy can expand available resources, favouring the growth of firms and industries that are characterised by strong learning processes, technological change, productivity increases, scale economies, internationalisation, and rapid demand growth. The resulting benefits include faster growth of production, incomes, employment and competitiveness (Pianta, 2014, Mazzucato et al., 2015).

In Italy as in most European countries the industrial policy tools that were adopted included an extensive role of state owned enterprises in manufacturing, infrastructures, services and banks - with dozens of firms of the IRI holding company⁵ -, in oil and chemicals (with ENI), in electricity

⁵ IRI, the Institute for Industrial Reconstruction, founded by the Fascist government in 1933, has played a key role in the development of strategic sectors such as military industry, mechanical

(with ENEL), and in several other industrial activities. The dominant presence of publicly owned banks allowed an allocation of credit that made it possible also for private firms to invest in the development of new production activities, expanding efforts for the industrialisation of Southern Italy. Italy's industrial policy also included support to private firms through financial and investment aid, R&D programmes, public procurement and some measures of market protection in selected fields (see Bianchi, 2013).

The strategy of diversification of national production, support to investment and employment creation worked well until the 1970s with high increases of output and productivity; the catching up of the South, however, was limited as state investments failed to create a network of dynamic firms capable to extend industrial activities. Since the 1980s the emergence of Information and Communication Technologies (ICTs), globalisation, greater trade openness, liberalisation of capital movements and the instability of the Italian currency changed the context for the operation of public enterprises and active industrial policy. Faster change, increased international competition and mobility of production made more visible the lack of dynamism of many public enterprises, that often lacked a critical mass of technological, production, financial, and managerial capabilities. The latter were also affected by the large influence of government parties over public enterprises that grew over time and led to problems of corruption and lack of efficiency in the use of public resources.

The early 1990s were a key turning point, with a combination, on the one hand, of policy choices – both international and domestic – that have contributed to a weakening of Italy's industry and, on the other hand, of major changes in the European context. The country's industrial decline has been favoured by the new role of intellectual property, the long term impact of currency devaluation, the flexibilisation of labour and the expansion of finance leading to firms' failure to reinvest growing profits.

First, the WTO TRIP agreement on Intellectual Property Rights (IPRs) – and the strengthening of IPRs in the strategies of multinational firms - has made more difficult and costly the acquisition of imported knowledge by “imitator” countries such as Italy, reducing the pace of innovation and the possibility of closing the technology gap with industries operating at the technological frontier (Pagano and Rossi, 2009; Pagano, 2014).

Second, the frequent use of devaluation of Italy's Lira as a tool to regain international competitiveness – including the dramatic 30% fall of the exchange rate in 1992 – has allowed Italian firms to avoid a much needed technological and organisation change towards larger, more capitalised and knowledge-intensive enterprises; Italy's industrial structure has increased its specialisation in traditional sectors where competition from Asian and emerging economies has since become particularly strong, expanding the polarisation between export-oriented and weaker domestic firms (Committeri and Rossi, 1993; Padoan, 1993; Pianta, 1996).

Third, the liberalisation of labour markets started with the Treu reform of 1997 – opening up the possibility of precarious and outsourced employment – has lowered labour costs for firms, reducing the pressure for technological innovation, capital investment and productivity increases; this has contributed to the long term stagnation of Italy's productivity and has widened the gap in competitiveness with other European countries (Saltari and Travaglini, 2006; Pini, 2013).

engineering, shipbuilding, iron and steel. It later supported the development of the country's high tech production in electronics, telecommunications. For decades, public enterprises have accumulated expertise and technological knowledge and have carried out most of R&D expenditure in Italy. Public enterprises also played a decisive role in fostering the growth of suppliers networks of small and medium-sized firms with specialised competences (see Ciocca, 2015; Antonelli et al. 2015). A review of Italy's postwar industrialisation and an analysis of the role of technology and trade is in Gomellini and Pianta (2007).

Fourth, in the last two decades the rise of profits has not been paralleled by a similar dynamics of real investment, weakening a key source of technological advancement and competitiveness; this is associated to the attraction of global financial markets offering high returns and to short-termism in the strategies of Italian firms (Pianta, 2012; Mazzucato, 2013). All the above factors are closely interrelated and are at the source of Italy's economic decline, a theme that has been at the centre of an important debate (De Cecco, 2004; Ciocca, 2007; Pianta, 2012).

The early 1990s have also accelerated European integration with the projects for the Single Market and the European Monetary Union. Under the neoliberal rhetoric of "market efficiency", the power to make choices on the country's trajectory of development was left to private actors, mainly large industrial and financial firms. Liberalisation of capital movements in 1990 promised to open up Europe's economies, but the huge speculative trading led to the collapse of the Italian Lira in the summer of 1992. The liberalisation of finance promised to provide large funds for the growth of private firms focused on profits, but investments in Italy's industry hardly increased. The Maastricht Treaty of 1992 opened the way to the creation of the Euro with a deeply flawed institutional construction, as revealed by the crisis started in 2008.

The Maastricht Treaty also forced a reduction of Italy's public debt and deficit that was partly funded by a massive privatisation of public enterprises. Public banks were privatised first, followed by manufacturing and service firms. In 2005 the total revenue obtained from the privatization process was estimated at over 120 billion euro; between 1997 and 1999 it provided the public budget an annual income close to 2% of Italian GDP (Micossi, 2007). After a temporary stop after the 2008 crisis, the Italian government is extending privatization to minority stakes in Poste Italiane and, in 2016, in the National Flight Assistance Agency ENAV and in the national railway company Ferrovie dello Stato.

The creation of the Single Market relied on the ability of market forces to direct investment and guide the evolution of European economies. The new policy (European Commission, 1990), pushed back political involvement in industry and reduced the role of policy, arguing that state support of specific industries had failed in promoting competitiveness and delayed the restructuring needed for internationalization and innovation. Moreover, discretionary government measures favouring particular firms or industries were seen as "distorting" market competition; public procurement was liberalised at the European level; the homogenization of rules among member countries required an end to established policies that could provide "unfair" support to national firms. A new consensus emerged against the State as a "producer", limiting its role that that of market "regulator". "Selective" industrial and technology policy, targeting particular fields, were to be abandoned as the market "knew best" which industries and firms were more efficient. "Horizontal" policies became fashionable, that is, policies such as R&D tax incentives, that affect all firms in the same way.

Government action was conceptualised as "State aid"⁶ and viewed with suspicion; Europe's statistics monitor such activities, showing that between 1992 and 2013 for the 28 EU countries State aid as a share of GDP fell from 1.2% to 0.5%, as shown in Figure 6 (European Commission, 2014). Public intervention in industry and services in Italy amounted in 2013 to 3.5 billion, 0.2% of GDP in 2013, as opposed to 1.6% in 1992; in 2014 the amount increased to 4.9 billion (MISE, 2015).

Italy, Germany, Spain and Portugal are the countries that reduced State aid faster. Conversely, Northern European countries maintained higher expenditure; in France in 2013 State aid amounted to 13 billion euros (0.6% of GDP), almost four times Italy's funds. Figure 7 shows that in all

⁶ State Aid expenditure is defined on the basis of four requirements. A State aid must come from a public source and must give an advantage to specific firms with an alteration of business competition and of the flow of exchanges between states. It refers to manufacturing industries, services, agriculture and fisheries. and includes resources devoted to "horizontal" objectives of common interest or granted to particular sectors of the economy and for specific objectives, such as rescue of firms and restructuring aid. Aid granted to the financial sector as a response to the financial crisis is excluded from non-crisis State aid.

Northern Europe most State aid goes to horizontal policies for environmental protection and energy saving; in Italy action of this type is among the lowest in Europe and the same applies to sectoral aid. The fall of State aid has slowed down during the crisis after 2008, but it played no counter-cyclical role in supporting demand and investment (Stöllinger et al, 2013).

Figure 6 here

Figure 7 here

Italy's resources devoted to industrial policy have been investigated by Brancati (2015), who found that from 2002 to 2013 State aid was reduced by 72%. Resources were reallocated to Northern and Central regions, where they supported efforts for the internationalization of firms, and focused on support for R&D and innovation.

European and national policies abandoned in this way the goal to support industrial development in backward regions; Europe's Structural Funds were the policy tools devoted to create more favourable conditions – education, infrastructures, etc. – for the growth of private firms in less favoured areas; direct support to firms and public investment in production however was not allowed by the rules of Structural Funds. The result is that since the crisis regional disparities have increased all over Europe (Eurostat, 2014) and such gap has dramatically grown in Italy (Prota and Viesti, 2012).

The hurried process of privatisation of public enterprises and the abandoning of industrial policy since the early 1990s have left three other negative legacies to the country. First, the disappearance of public enterprises led to a dramatic loss – and often the end - of the Italian presence in several high technology activities, namely within electronics, telecommunications, software, chemicals, transport equipment, etc (Gallino, 2003). Second, after privatisation business funded R&D experienced a dramatic fall; one of the first actions taken by new private management of such firms was to slash R&D spending and close research laboratories; when the new owners were foreign firms, R&D facilities were often transferred to the home countries. Third, privatisation failed to stimulate the emergence of new large private firms; the result is that in 2011 Italy's companies above 250 employees are about 3,000 - the 0.1% of all Italian firms - compared with 9,000 in Germany and 4,000 in France; in manufacturing they account for 35% only of value added, as opposed to a EU average of 55%. The country's industry ended up relying on a bloated number of micro-firms mainly active in machinery production and in traditional, low technology industries, often grouped in industrial districts (Onida, 2004); such a structure is at the root of the dramatic losses in manufacturing production after the 2008 crisis documented in section 1 above.

The last effort to bring back some elements of industrial policy emerged in 2006 when Pierluigi Bersani, then Minister of Industry of the government of Romano Prodi, launched the "Industria 2015" plan with modest resources and a short-lived strategy. The recent evaluation of the programme made by Italy's Corte dei Conti documented the failure of such measures as out of an appropriation of 663 million, 23 million only have been spent, concluding only three of the planned projects (Corte dei Conti, 2014). This failure is basically due to the change of Italy's government in 2008 and the lack of interest of the new Centre-right government in such policy (Di Vico and Viesti, 2014). A growing debate has recently emerged in Italy on the need to bring industrial policy back (Viesti, 2013; Economia & Lavoro, 2014; Pianta, 2014; Prodi, 2014; Sterlacchini, 2014, Bassanini, 2015; Brancati, 2015) but with modest effects so far on the country's policy (see section 3 below).

The most recent international trend in business and policy action is associated to the 'Industry 4.0' framework on the digital transformation of manufacturing. In this context, Italy's Ministry of Economic Development is introducing a new policy plan called "Manifattur@ Italia Digitale per competere" supporting the diffusion of new technologies such as cloud computing, big data, sensors, 3D-printers, expanding current policy tools and proposing a new governance system including business and policy makers (Fotina, 2015).

Europe's policy

In the last three decades industrial policy has had a marginal role in Europe's policies (Pianta, 2014). However, signs of a timid return of this agenda on the European scene are now visible, also as a result of the growing international debate that has reasserted the importance of public action for economic development (Chang, 1994; Rodrik, 2008; Cimoli et al. 2009; Aghion et al, 2011; Dosi and Galamos, 2012; Mazzucato, 2013; Stiglitz and Lin, 2013; Greenwald and Stiglitz, 2013; Aiginger 2014).

Since 2010 European Union policies are framed in the Europe 2020 strategy, replacing the Lisbon Strategy that had set the goal for Europe "to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion".

The Europe 2020 strategy identifies three priorities: 'smart growth': an economy based on knowledge and innovation; 'sustainable growth': a resource efficient, greener and more competitive economy; and 'inclusive growth' a high-employment economy with social and territorial cohesion. By 2020 the EU is expected to reach five "headlines targets"⁷, and eight "flagship" initiatives have been launched (European Commission, 2010a). The most relevant initiatives are the "Innovation Union" (European Commission, 2010b) and "An integrated industrial policy for the globalization era" (European Commission, 2010c); they aim to provide the best conditions for business to innovate and grow, supporting also the transformation of manufacturing towards a low-carbon economy.

The "horizontal" approach has dominated such initiatives, where the main policy tools are the provision of infrastructures, the reduction of transaction costs across the EU, a more appropriate regulatory framework favouring competition and access to finance. A significant role is ascribed to the ability of small and medium enterprises to promote growth and create employment. Key issues include the need to fight protectionism, increase the flows of goods, capital and people within and outside the EU, to exploit a more open single market for services, to benefit from globalization. When the crisis started in 2008 and austerity policies were imposed on Euro-area countries, the emphasis on fiscal austerity has sidelined any discussion on industrial policy. However, the huge losses in industrial production have led the European Commission to introduce in January 2014 a new policy initiative called "Industrial Compact", establishing the "target" of returning industrial activities to 20% of GDP by 2020, against the present 16% (European Commission, 2014a). German – and, to a lesser extent, Italian – industry and governments lobbied for such an action, which remains entirely within the Europe 2020 approach. The only novelties include the call to support investment in fast growing, high value added industries such as energy efficiency, green industries and digital technologies, and the consideration of industrial research among the aims of already existing EU initiatives, such as the Horizon 2020 R&D programme, the Competitiveness of Enterprises and Small and Medium-sized Enterprises (COSME), and the Structural Funds

⁷ The specific targets include the goal of devoting 3% of EU GDP to R&D expenditure (in 2008, R&D in EU-27 amounted to 2.1%). Innovation capacity should be supported by the formation of human capital: the share of early school leavers should be under 10% in 2020 (it was 14,4% in 2009 in EU-27) and at least 40% of the younger generation should have a tertiary degree (32,2% in 2009 in EU-27). Progress towards such goals has been highly uneven and the recession has rolled back advances in "periphery" countries. The strategy includes a set of indicators from the 20/20/20 climate/energy targets established in 2009 by the European Council. The first one is the 20% reduction of emissions by 2020 on the levels of 1990; in 2009, the EU level has declined by 17%, largely due to the economic crisis that has deeply reduced output as well as emissions. The second target is the reduction of 20% in the use of renewable sources (in 2008, it was 10.3%); the third one is a rise of 20% in energy efficiency, with a move towards clean and efficient production systems.

(including national co-financing). Greater attention is also emerging towards the need to act at the EU level on climate change and energy, but again little additional resources are available and no change has been made in the approach to industrial policy (European Commission, 2014b).

The inadequacy of such measures and the failure of private investment to pick up after the crisis have led in late 2014 to the most important change in European policy – the “Juncker Investment Plan” launched by the Commission President that has created in 2015 the European Fund for Strategic Investments (EFSI). The plan is expected to fund new investment projects for 315 billion euros. EU funds are providing 8 billions euros; the EU guarantee on the projects is expected to bring in additional 8 billion and 5 billion have come from funds of the European Investment Bank (EIB). This total of 21 billion is expected to mobilise private funds of an amount 15 times greater, relying on a huge leverage effect in financial markets expecting high returns on investment. However, national funds committed to the projects have been limited – at first 8 billion each from Germany, France and Italy – and have been made conditional to investment to be carried out in their own countries.

The European Fund for Strategic Investments (EFSI) is managed by the EIB and funds investments in infrastructure and innovation; it also provides finance for Small and Medium-sized Enterprises (SMEs) – with a role of EIB’s European Investment Fund (EIF). Interestingly enough, by spring 2015 member states had proposed 1,300 projects costing a total of 2,000 billion. This shows the great need for public investment in EU countries and the huge mismatch with current policies and available resources. This argument has now been made by a wide spectrum of voices – including the OECD, the IMF, etc. - that have called Europe and national governments to expand investment, moving beyond the constraints of austerity measures (Quadrio Curzio, 2015, *Economia & Lavoro*, 2014).

At the same time, however, a major policy development emerged in 2013 in Europe with the talks for the Transatlantic Trade and Investment Partnership (TTIP) with the United States. The Treaty is currently under negotiation and has come under strong criticism, but it is likely to be approved in 2016. TTIP would move Europe further along the road of trade liberalisation, would offer a strong protection for private foreign investment and scale back the scope for public policy and regulation in major fields, including environmental rules, GMOs, utilities and other public services.⁸ In case of approval of TTIP the scope for industrial policy and, more generally, for public action in the economy would be drastically reduced.

3. The tools of Italy’s policy

We have seen above how, following European policies, Italy has retreated from much of the industrial policies that were successful in post-war decades. The urgency of the crisis, however, has led to a range of actions. Claudio De Vincenti, under-secretary for Industry in the governments of Enrico Letta and Matteo Renzi, has argued that the key elements of Italy’s industrial policy today include the continuation of liberalisation in markets characterised by positions of rent; the provision of context conditions such as education and infrastructures; “horizontal” support for R&D and innovation by firms; “vertical” support to dynamic production systems (“filières”) identified by the European Commission through rule-setting, environmental regulation and encouragement of private investment; the new role as a sort of public investment bank of Cassa Depositi e Prestiti that can acquire shares of private firms operating as “market oriented” investors; intervention with public resources (through “contratti di sviluppo” or “accordi di programma”) when a major firm, a whole district or an industry are hit by the crisis, with the goal of returning to competitive performances. In all cases the logic of (static) market efficiency is not questioned and the emphasis is put on the integration between government regulation and private decisions that could lead to a new “public governance of markets” (De Vincenti, 2014). Other current policies that are relevant for Italy’s

⁸ A critical review of TTIP is in EuroMemo Group (2014, ch.7).

production system include measures introduced in the budget law, initiatives for attracting foreign investment, for accelerating the construction of infrastructures, incentives to machinery investment by firms, action in the most serious cases of industrial crisis, such as the large Ilva steel complex in Taranto. In this section we provide an account of the main industrial policy-related measures; as we will see, they tend to be fragmented, unstable and funded with modest resources.

The institutional setting of these policies is defined by the key role of the Ministry of Economic Development (MISE), with the Ministry of Education, University and Research (MIUR) managing some R&D measures and Cassa Depositi e Prestiti (CDP) expanding its role as “unofficial” public investment bank. MISE policies have been set up according to major “horizontal” goals such as R&D and innovation, Internationalisation, New entrepreneurship, Local and production development. The policy measures of MIUR are generally targeted towards the same thematic areas of EU programmes, such as Horizon 2020, the seven European Grand Societal Challenges and the European Digital Agenda, with a strategy of integration between national and EU priorities. The new National Research Programme will implement the same EU “horizontal” objectives and thematic fields.

Outside the scope of this article, however, are a number of policy actions that are relevant for the evolution of Italy’s production system and mobilise huge resources, but fall under other policy domains, including aid programmes for the banking system; regional policies and the use of EU structural funds; environmental policies, including the large incentives for renewable energy sources and energy efficiency; benefits for attracting foreign investors; aid packages for large firms in crisis such as Ilva, Alitalia, Alcoa, etc.; the huge hiring incentives provided in a “horizontal” way to firms that shift their workers from temporary contracts to the new open-ended, easy-to-fire contract introduced with the ‘Jobs Act’ of 2014; other specific measures addressing crisis situations. The amount of such programmes in 2015 is much larger than the resources invested in the industrial and innovation policy measures described below.

Government subsidies to firms

The more general indicator of the extent of public efforts to influence economic activities – leaving aside the demand coming from public procurement - is the amount of money spent for transfers to firms. According to national accounts (SEC2010 handbook definitions), in 2014 they amounted to 50.8 billion euros, including the following four activities: *production subsidies* (29.5 billion) including subsidies for public services such as transportation; *current transfers* to firms (1.3 billion); *capital transfers* to firms (10.7 billion); *other capital transfers* to firms (9.4 billion). These definitions are much broader than industrial policy incentives, but they exclude renewable energy subsidies and support coming from EU funds.

For 2014, the Ministry for Economic Development (MISE, 2015) reports a total of 6 billion of incentives provided to firms, of which 4.9 billion fall in the EU definition of “non-crisis State aid”. The main components of such expenditure are measures aiming at production and territorial development, urban development (Zone Franche Urbane), support to R&I by the Ministry of Research (MIUR) and support for Innovative Investments (by MISE). The majority of benefits is granted to SMEs and to business located in prevalence in Northern regions.

The extent of government subsidies to firms was at the centre of the report commissioned in 2012 by the government of Mario Monti to Francesco Giavazzi. For 2011, based on government budget data, it reported a total of 36.3 billion euros of public transfers to firms from central and local governments. Relevant for industrial policy activities is the subset of 6 billion euros that is managed by the Ministry for Economic Development (MISE) and is close to the EU definition of “State aid”. The Giavazzi Commission estimated a total amount of “unjustified” subsidies close to 10 billion. Building on the “expansionary austerity” view that was then influential, the report argued that a cut of these 10 billion subsidies, with a parallel tax cut, would increase Italy’s GDP by 1.5% over two

years (Giavazzi, 2012). This argument, however, was short-lived and little came out of the demands for a general cutting of government expenditure for firms.

An additional question is the ‘cost’ of the business tax benefits sustained by public budgets in terms of foregone income. The Ceriani Commission has addressed this issue and estimated an annual loss of around 32 billion of revenues for the public budget, as documented by Giavazzi report (Giavazzi et al 2012).

Financial support to firms

Loan guarantees for SMEs. A growing emphasis has been put on improving access to financial markets for SMEs. The main tool in this regard is a system of loan guarantees (Fondo Nazionale di Garanzia) established after the credit crunch originated by the 2008 crisis. The fund provides collateral and other instruments allowing SMEs and micro-firms to fund investment through bank loans. In the period 2008-2014 the fund made available 32 billion of collateral (of which 17.6 for manufacturing firms) triggering about 56 billion new investment (of which 31.2 in manufacturing) mainly by firms located in Northern regions. In 2014 8.3 billion of collateral led to 12.9 billion of new investments.

Support for Start-up firms. In 2012 the government introduced legislation supporting the emergence of innovative “Start-up firms”. They were defined as new small firms - established in the past five years, with a turnover lower than €5 million – focusing on technological innovation, located in a EU country with at least one branch in Italy, with no distribution of profits and with at least one of the following characteristics: a) R&D expenditure of at least 15% of sales; b) at least one third of the employees holding a PhD degree or attending a doctoral course and at least 50% of the workforce holding a university degree; c) ownership of at least one patent, trademark or license.

Start-up firms are offered indirect incentives (tax holidays, lower administrative costs, some exceptions to labour laws and tax bonus for investors), an earmarked access to the Loan guarantee fund, support for their internationalization efforts and access to innovative financial instruments such as crowdfunding.

In 2015 the government introduced also the notion of “Innovative SMEs” with softer requirements, providing them with some of the same benefits - fiscal holidays, a simplified bureaucratic burden, tax benefits for investors and innovative access to capital markets.

Incentives for machinery investments by SMEs. In 2013 reintroduced an incentive scheme for the acquisition of machinery and equipment by SMEs that has long been a key part of Italy’s industrial policy (DL 69/2013 ‘New Sabatini Law’). SMEs are offered soft loans with Cassa Depositi e Prestiti (CDP) providing the credit for the investment and the Ministry of Economic Development (MISE) covering the cost of interest reduction. Between April 2014 and June 2015 more than 5,000 SMEs applied to the scheme for an investment of around 1.7 billion. In addition, the 2016 budget law has introduced a measure allowing accelerated depreciation of investment up to 140% of the original cost, resulting in a tax reduction on profits.

Support for R&D and innovation

R&D tax credits. One of the main tools for Italy’s “horizontal” industrial and innovation policy is the R&D tax credit introduced in 2007 for the years 2008 and 2009. After a two year stop, the measure was reintroduced in 2011 for firms financing research projects in partnership with universities and employing highly skilled workers in R&D. After the debate opened up by the Giavazzi Report on the possibility that firms replace their own funds with public R&D subsidies, government action was focused on the principle of additionality of public funds; in 2013 a new tax credit measure was introduced based on incremental expenditures, i.e. the tax credit applied to the

difference between current R&D and the average R&D expenditure of the previous three years; the initial budget was €600 million for three years; the 2015 budget law financed tax credits with €2.6 billion for 2015-2020, increasing the maximum amount of eligible R&D expenditures to €5 million, and removing firms' turnover limit and patent expenditures (included in the 'patent box' measure, see below).

The Patent Box. The emphasis put in recent decades on a greater role and protection of intellectual property rights (IPRs) has brought to Italy – with the 2015 stability law - the 'patent box', a specific tax benefit for firms' earnings coming from patents, trademarks, licenses and software. A deduction from the firm's tax base is provided for 30% of the incomes from patents, trademarks, licenses and software in 2015, 40% in 2016 and 50% in 2017. Patent boxes are indirect, semiautomatic incentives common in the OECD countries. Their objective is to stimulate the production of patents and IPRs, but no empirical evidence on such an impact is available, as argued by Mazzucato (2013). In fact, the 'Patent box' plays a key role in the strategies of large firms to reduce taxation on their technology-related earnings. In particular, the global tax planning strategies of multinational companies often 'hide' profits in royalty payments for patents and IPRs, moving them to 'fiscal heavens'. Often the 'location' of subsidiaries owning patents and earning royalties is chosen with consideration of the tax reductions offered – such as the 'Patent box'. For the 'Patent box' as for R&D tax credits, serious evidence is lacking on the real additionality effect of such measures especially when the international dimension is considered, including the potential shift of the same activities from one country to another.

ICTs and the Digital Agenda. A comprehensive policy for the development of ICTs has long been missing in Italy. The 'Digital Agenda' is the current initiative addressing the issue. MISE has launched in December 2014 the call 'ICT-Agenda digitale' on key enabling technologies, funded by its 'Sustainable Growth Fund'. The same Fund will finance with €250 million the Sustainable industry plan (call 'Industria sostenibile', financing projects on sustainable growth and the green economy. In 2014 MISE introduced IT vouchers for SMEs, with a direct funding for the acquisition of IT materials; in 2015 the Government launched the internationalization voucher for SMEs.

Other technology programmes. The National Technology Clusters is a programme launched in 2012 aiming to develop aggregations of companies, universities, other public or private research organisations active in the field of innovation, focusing on eight technology fields. In 2012 the Smart Cities programme involved SMEs, large firms, universities and Public Research Organisations in innovative projects on social innovation for nine strategic areas in line with the Horizon 2020 Societal Grand Challenges.

University, R&D and Innovation. The EU reports on Italy's Research and Innovation policies for 2013 and 2014 (Nascia and Pianta, 2014, 2015) provide a detailed picture of Italy's conditions and actions in these fields. Key findings include a dramatic evidence of the downsizing of the higher education and public research sector, contrasting with Italy's good performances in terms of output and productivity of the country's researchers. There is evidence of a weaker formation of human capital and a serious brain drain of researchers and highly qualified youth. R&D expenditure by both public and private sources have remained highly inadequate compared to EU averages; firms' innovation activities and performances are distant from those of EU competitors. A worsening of the traditional gap between Northern and Southern regions has also emerged. The policies of the last decades have seriously weakened the research and knowledge base of the country that has always lagged behind that of major European economies.⁹

⁹ On Italy's prospect for innovation see also Banca d'Italia (2013) and Varaldo (2014).

EU Structural Funds

The consideration of Italy's regional policy using EU Structural Funds – which amount to the largest available resources for reshaping the country's economic and social conditions - is beyond the scope of this article. However, the National Operational Programme 'Research and Competitiveness' (PONREC) has been co-financed by EU Structural Funds and by Italy's Government with 4.4 billion for the period 2007-2013.¹⁰ MIUR and MISE jointly manage PONREC bringing action for R&D and innovation within policies for local development and social cohesion. The percentage of resources of Structural Funds spent for R&D has increased from 3.1% in 2000-2006 to 22% in 2007-2013; for the period 2014-2020, however, the share has been reduced to 15%.

PONREC activities support R&D, innovation and competitiveness in the four 'Objective 1 regions' of the South - Apulia, Campania, Calabria and Sicily.

The new PONREC 2014-2020 aims to spend €1.29 billion coming from FESR and FSE (€930 million) and from Italy's co-financing (€360 million). MIUR will be in charge of the programme that addresses three areas: technological clusters (€327 million), enabling technologies (€339 million) and research infrastructures (€286 million). The thematic fields of the new PONREC match the thematic fields of Italy's new National Research Programme (PNR); leveraging EU resources is considered crucial for the long term R&I strategy.

The new role of Cassa Depositi e Prestiti

Cassa Depositi e Prestiti (CDP) has a long history as the State bank collecting savings from the Post Office and investing them in public works of local authorities. In the last decades minority shares have been sold to Italy's private banks and its role has expanded as a major buyer of Italy public debt and as a private-type investment bank. In recent years its large liquid resources and its position outside the EU definition of 'public budget' have meant that the Government has called on CDP to carry out a growing number of financial operations that closely remember State intervention in industry; CDP has thus emerged as Italy's 'unofficial' public investment bank. A major recent example of this role is CDP's strategic investment in wide-band telecommunication infrastructure (Bassanini, 2015; CDP, 2015).¹¹

CDP has expanded its lending and investment in private business; in the period 2009-2014 CDP has invested about 58 billion in debt instruments, with credit lines designed for SMEs. Most importantly, CDP has assumed a prominent role in private equity financing, investing in companies that are considered 'strategic' for the country; financing tools include the 'Fondo Strategico Italiano' (FSI), with 5.1 billions, aiming to support companies' efforts to increase firm size, carry out consolidation and improve international competitiveness, and the 'Fondo Italiano di Investimento' (FII), with 1.1 billions, aiming to create a core of 'mid-sized national champions' with sufficient capitalisation to face international competitors.

¹⁰ Resources were reduced in October 2012 after the reprogramming of MISE and MIUR. Funding from the European Regional Development Fund (ERDF) is €3,102 million (<http://www.ponrec.it/programma/risorse-finanziarie>).

¹¹ The importance of CDP in the Government strategy is pointed out by the decision of Prime Minister Matteo Renzi in 2015 to replace the top managers of CDP with his new appointees. This strategy follows the actions taken by other countries with the key role of the German Kreditanstalt für Wiederaufbau (KfW), of the French Caisse des Dépôts et Consignations (CDC), of the Spanish Instituto de Crédito Oficial (ICO), which have sustained investment and allowed better credit conditions to firms especially in the aftermath of the financial crisis, playing a crucial counter-cyclical role (Mazzucato and Penna, 2014).

In December 2015 CDP has set out the new plan for 2016-2020 (CDP, 2015). The plan expands the resources devoted to supporting the real economy, with 160 billion of planned investment over five years. Areas of action include support for public institutions and local authorities; infrastructures; support for business; real estate development. Further resources could be guaranteed by involving private resources in co-financing new infrastructural projects; funds from the Juncker investment plan should be used in this respect. 117 billions are specifically aimed to growth and innovation in firms.

However, in terms of industrial policy no clear strategy emerges from the list of firms where CDP investments have been made. In terms of affecting the country's investment dynamics and contributing to a recovery, CDP actions remain too limited; CDP estimates that the companies in the FSI portfolio contributed to about 0.2% of national value added in 2014. The very nature of CDP is at odds with a broad industrial policy mission; CDP formally is a private institution that has to give priority to financial sustainability and profitability of its investments. This means that its resources are mostly directed at 'healthy' companies, while industrial policy should support in particular firms with a great technological and growth potential, but that currently may not yet be profitable. CDP is also far from assuming a leading role in emerging fields, promoting the kind of policies that can target the development of particular technologies that address a given societal challenge (Mazzucato and Penna, 2014).¹²

Italy's crisis has left in financial troubles many firms that have strong industrial capabilities. The Government has planned in 2015 the creation of a new 'turnaround company' assisting their recovery when solid long term business prospects, good competences and market potential are identified. CDP is supposed to play a key role in this project also through a strengthening of the FSI; however, action has still to materialise on this initiative.

The evidence so far provided clearly shows important developments in Italy's industrial policy, but major shortcomings include a lack of strategic vision, the persistence of 'horizontal' measures, modest resources and the risk of 'falling behind' in R&D and innovation, a high fragmentation of initiatives, the lack of a true public investment bank, as well as the continuing constraints coming from EU rules on State action in the economy. Facing the dramatic effects of the crisis and the failure of market based policies to bring results, the next section will outline current proposals for a return of industrial policy in Italy and Europe.

5. A new direction for industrial policy

Already twenty years ago, in 1996, we argued that "we are facing a weakening of the technological base of Italy's industry, which adds to the gap in aggregate indicators of technological activities (...). This dynamics is distancing Italy from the 'virtuous circle' between technology, growth and employment that is common to other advanced countries" (Pianta, 1996, pp.275-276). In the aftermath of the the 1992 currency crisis, and of an export-based recovery driven by a 30% depreciation, we argued that "devaluation, export-led growth, the deepening of the country's specialization in traditional industries and the reduction of the role of technology can be seen as the result of the failure to expand Italy's presence in high technology in the favorable period of the 1980s". The result was that "between 1980 and 1994, employment in industry decreased by 1.4 million, nearly a quarter of the total. After the recession of the 1990s, the combined effect of industry's technological fragility, labor-saving innovations, the international organization of production and competition in more open markets could have an even more serious impact on the decline of the industrial production and employment in Italy" (ibid., pp.276-276). The conclusion

¹² The need for a 'development bank' able to provide capital to firms has been pointed out also by the Governor of the Bank of Italy Ignazio Visco (Visco, 2015).

was that “the nature and pace of industry’s technological and organisational change in the 1990s are such that a major renewal is needed in the tools and approaches of industrial policy (ibid., p.278). What has happened in the last twenty years has been a deepening of Italy’s decline (Pianta, 2012, ch.1) and a systematic retreat of public policy, resulting – in the aftermath of the 2008 crisis – to the collapse of industrial activities documented in section 1 above.

As argued in detail elsewhere (Pianta, 2014), a new departure is needed for Italy’s and Europe’s policy, addressing the joint needs to end the depression and rebuild production activities that can be sustainable in economic, social and environmental terms. Decisions on the future of the industrial structure have to be brought back into the public domain. A new generation of industrial policies has to overcome the limitations and failures of past experiences - such as collusive practices between political and economic power, heavy bureaucracy, and lack of accountability and entrepreneurship. They should be creative and selective, with mechanisms of decision making based on the priorities for using public resources that are more democratic, inclusive of different social interests, and open to civil society and trade union voices. They have to introduce new institutions and economic agents, and new rules and business practices that may ensure an effective and efficient implementation of such policies.

The general principles of industrial policy are always valid; it should favour the evolution of knowledge, technologies and economic activities towards directions that improve economic performances, social conditions and environmental sustainability. An obvious list for would include activities centred on the environment and energy; knowledge and information and communication technologies (ICTs); health and welfare.

Environment and energy: The current industrial model has to be deeply transformed in the direction of environmental sustainability. The technological paradigm of the future could be based on ‘green’ products, processes and social organisations that use much less energy, resources and land, have a much lighter effect on climate and eco-systems, move to renewable energy sources, organise transport systems beyond the dominance of cars with integrated mobility systems, rely on the repair and maintenance of existing goods and infrastructures, and protect nature and the Earth. Such a perspective raises enormous opportunities for research, innovation and new economic and social activities; a new set of coherent policies should address these complex, long-term challenges.

Knowledge and ICTs: Current change is dominated by the diffusion throughout the economy of the paradigm based on ICTs. Italy has still to complete this diffusion, spreading wide-band communication and supporting the potential for wider applications of ICTs that could bring higher productivity and lower prices, new goods and social benefits. ICTs and web-based activities are reshaping the boundaries between the economic and social spheres, and new rules are needed. On the one hand the positive developments of open source software, copyleft, Wikipedia and peer-to-peer show that policies should encourage the practice of innovation as a social, cooperative and open process, easing the rules on the access and sharing of knowledge, rather than enforcing and restricting the intellectual property rules designed for a previous technological era. On the other hand, dangerous developments – such as the emphasis on labour-saving robotisation of the Industry 4.0 strategy and the emergence of technology platforms such as Uber in local transport – show that new policies should regulate how ICTs and business interact with people and society, protecting labour and social rights.

Health and welfare. Europe is an aging continent with the best health systems in the world, rooted in their nature of a public service outside the market. Advances in care systems, instrumentation, biotechnologies, genetics and drug research have to be supported and regulated considering their ethical and social consequences (as in the cases of GMOs, cloning, access to drugs in developing countries, etc.). Social innovation may spread in welfare services with a greater role of citizens,

users and non-profit organisations, renewed public provision and new forms of self-organisation of communities.

All these fields are characterised by labour intensive production processes and by a requirement of medium and high skills, with the potential to provide ‘good’ jobs.

A growing debate and a large number of proposals have merged on how an industrial policy of this type could emerge. The German trade union confederation DGB has proposed “A Marshall Plan for Europe” (DGB, 2013), envisaging a public investment plan of the magnitude of 2% of Europe’s GDP per year over 10 years. Along the same lines the European Trade Union Confederation has developed the proposal of “A new path for Europe” (ETUC, 2013). The Greens have proposed a similar plan for environmental issues (The Greens, 2014). Previous work advancing such arguments include Pianta (2010), Lucchese and Pianta (2013), the EuroMemorandum 2014 Report (EuroMemo Group, 2014). The proposal for “An industrial policy for Europe” (Pianta, 2014) combines many of these ideas; a summary is provided below.

The new industrial policy should be set within the European Union – or the Euro-zone, or a smaller area of EU ‘variable geometry’ policy. This is needed in order to coordinate industrial policy with macroeconomic, monetary, fiscal, trade, competition and other EU-wide policies, providing full legitimation to public action at the European level for influencing economic activities. Major changes are required in current EU regulations, in particular the ones that prevent State aid and public action from “distorting” the operation of markets.

Existing institutions could be renewed and integrated in such a new industrial policy, including – at the EU level – Structural Funds and the European Investment Bank (EIB). However, their mode of operation should be adapted to different requirements; in the longer term there is a need for a dedicated institution – a European Public Investment Bank.

Funds for a Europe-wide industrial policy should come from Europe-wide resources. It is essential that troubled national public budgets are not burdened with the need to provide additional resources and that national public debt is not increased. The order of magnitude of the funding for an industrial policy programme is the one suggested by the DGB plan and by the ETUC proposal – 2% of EU GDP over a period of 10 years, that is about €260 billion per year. As terms of reference, the European Central Bank provided in the period December 2011-March 2012 alone €1,000 billion of special funds to private banks at 1% interest rate, with no success in turning them into real investment; EU Structural Funds in the period 2007-2013 reached €347 billion; annual lending by the European Investment Bank is €65 to 70 billion per year. An investment effort of about 2% of EU GDP appears to be feasible – considering the size and power of European institutions - and would be big enough to end Europe’s stagnation.

Different funding arrangements could be envisaged. For the group of Euro-zone countries, financing through EMU mechanisms could be considered. Eurobonds could be created to fund industrial policy; a new European Public Investment Bank could borrow funds directly from the ECB; the ECB could directly provide funds for industrial policy to the spending agencies concerned. In alternative funds could be raised on financial markets by EIB or a new European Public Investment Bank. Funds could also come from Europe-wide receipts of the Financial Transactions Tax or from a wealth tax. Public funds could leverage private investment funds for some activities with lower risk and shorter-term profitability.

Considering the dangerous polarisation emerging within Europe in terms of economic and industrial activities, funds for industrial policy should be concentrated in the countries and regions of Europe’s “periphery”. For instance, 75% of funds could go to activities located in “periphery” countries (Eastern and Southern Europe, plus Ireland); at least 50% of them should be devoted to the poorer regions of such countries; 25% could go to the poorer regions of the countries of the “centre”. In this hypothesis

The new industry policy could finance a range of activities, possibly in combination with private investment, including R&D in universities, public and private institutions; innovation and its diffusion in private and public organisations; procurement programmes for innovative products relevant for public services. But the novelty would be the ability by a Public Investment Bank to take minority ownership of new start-up firms in higher risk innovative fields; the shares could then be sold if the start-ups are successful and attract private finance; it could also fund and organise networks of innovators, producers and users in new activities, in order to consolidate economic relationships and create markets. In addition, industrial policy could also continue to provide some ‘horizontal’ support to firms with the existing policy instruments.

The lessons from successful experiences outside Europe, such as ARPA-E in the US, the Brazilian Development Bank BNDES – discussed by Mazzucato (2013) – could lead to a more specific and effective forms of public action. Transparency in decisions would be required; monitoring and evaluation procedures – similar to those required by EU Structural Funds - could be arranged. New criteria for operation, transparency in decision making, accountability to the EU Parliament and citizens may contribute to overcome the collusion between industrial policy and economic and political power that has characterised past European and national experiences.

Opening up a debate on industrial policy is an urgent task. A wide range of ideas and proposals have to be shared and discussed. The political obstacles for such a new industrial policy are indeed huge, and major changes would be required in order to implement it. But the results of such efforts could be very important – ending stagnation, a successful economy with dynamic firms creating high wage jobs where they are most needed, greater social cohesion and public action and progress towards environmental sustainability.

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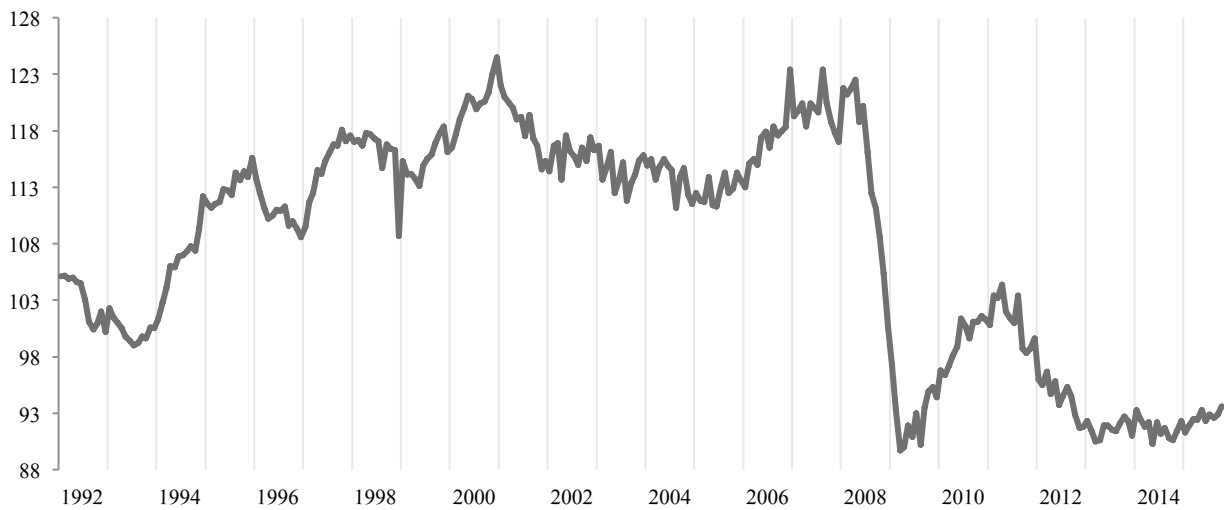
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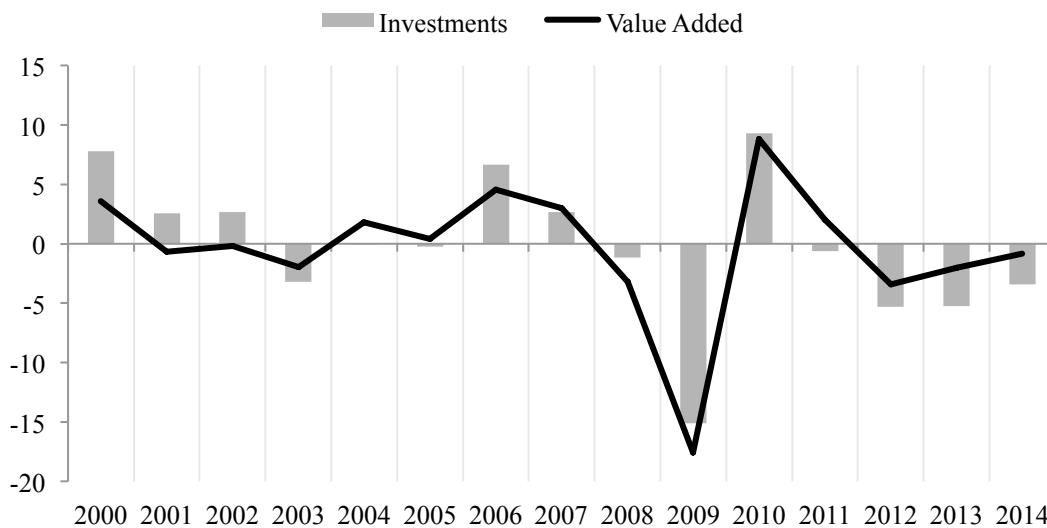
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Figure 1. Italy's production in industry, volume index of production
 Monthly data, seasonally adjusted and adjusted by working days, 2010=100



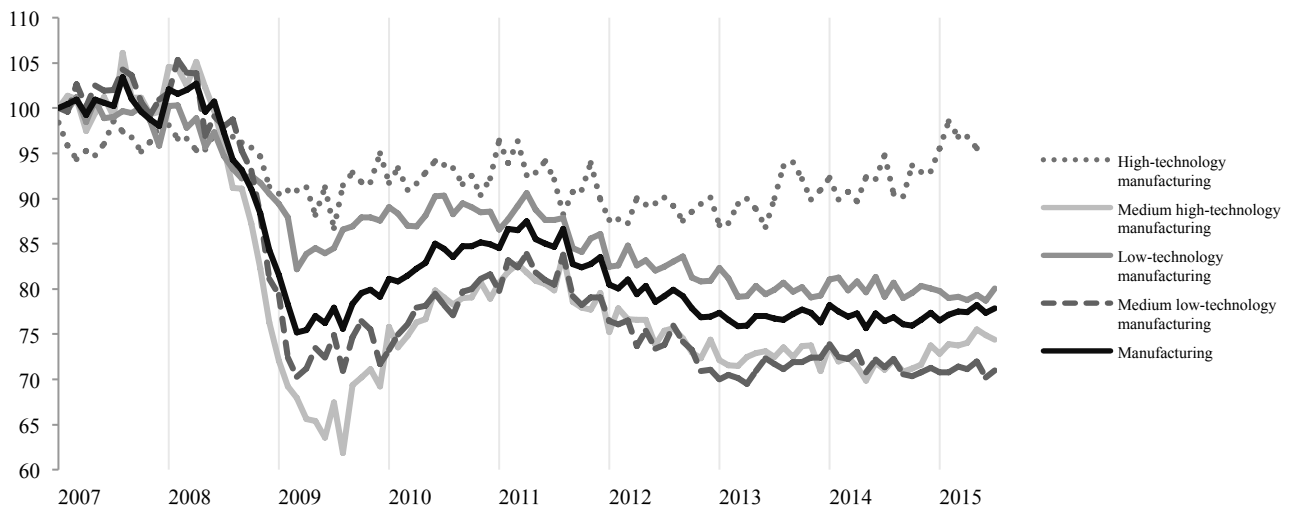
Fonte: Istat, Indagine sulla Produzione Industriale (release October 2015).

Figure 2. Change in value added and investments in Italy's manufacturing.
 Annual data; chain linked volumes 2010, percentage change over previous period.



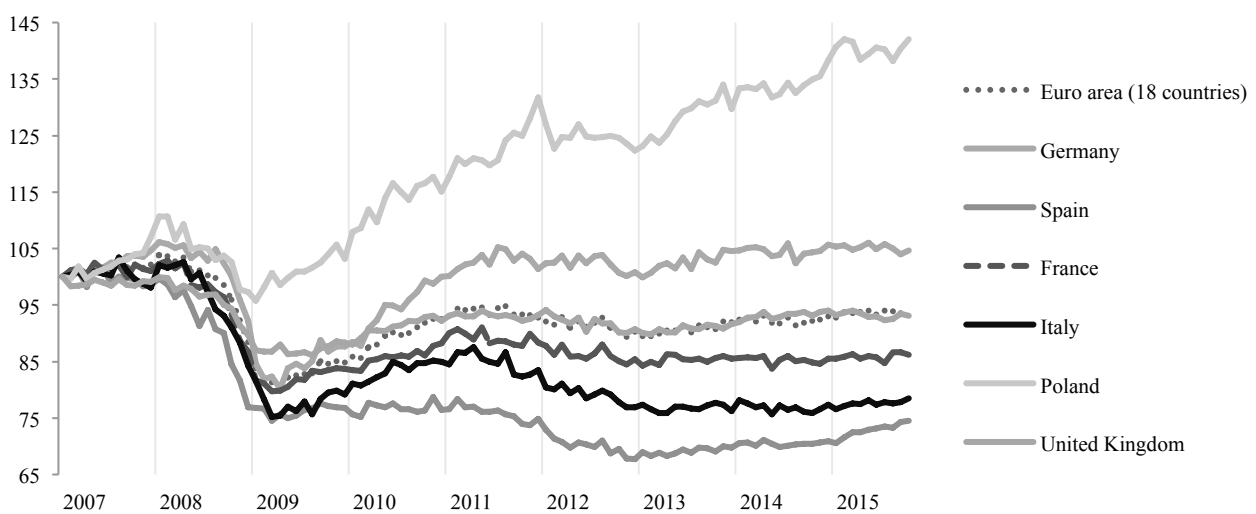
Fonte: Istat, National Accounts (September 2015).

Figure 3. Italy's production in industry, volume index of production by technology
 Monthly data, seasonally adjusted and adjusted by working days, 2007=100



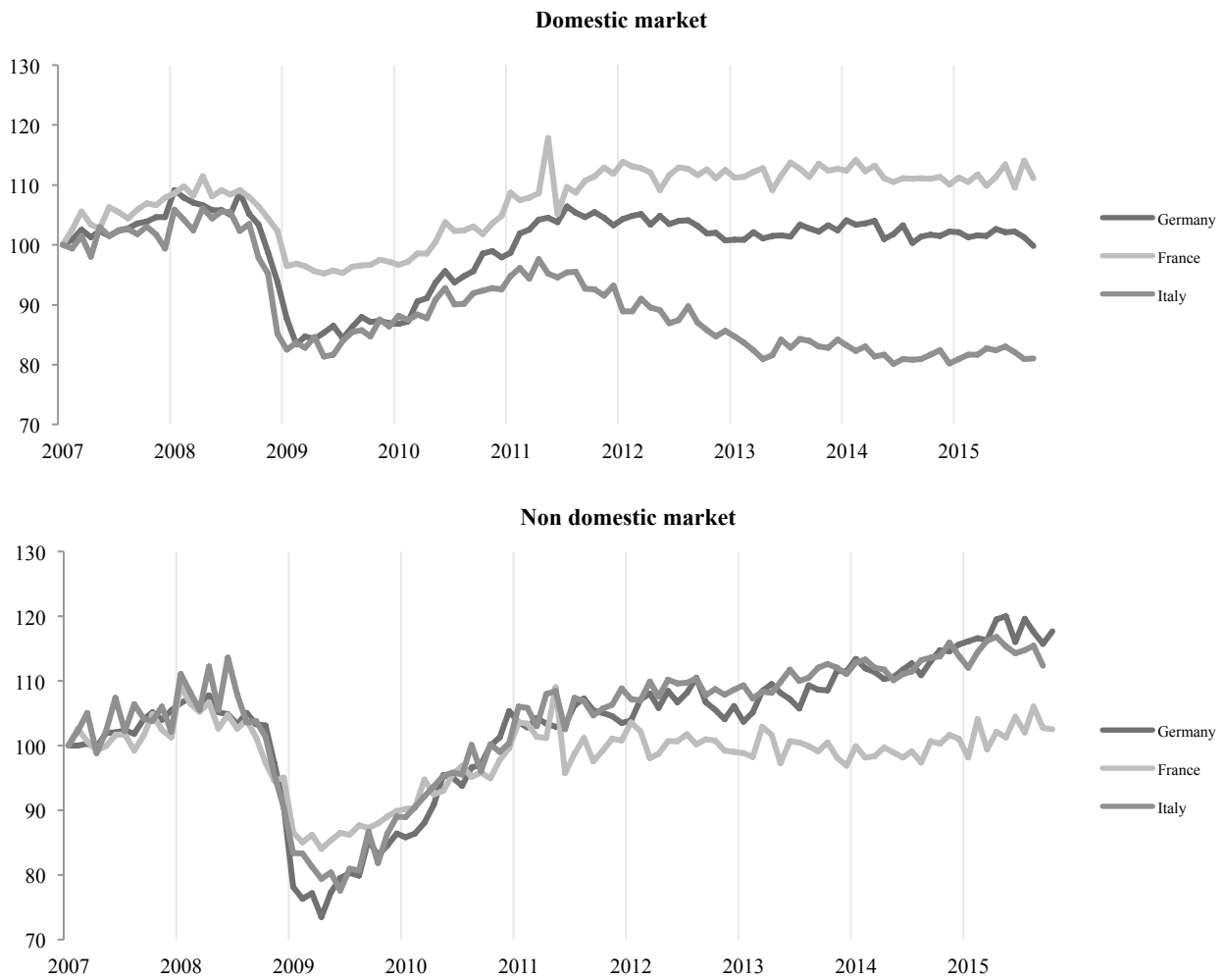
Fonte: Eurostat, Short-term business statistics, Industry.

Figure 4. Production in industry in Europe, volume index of production
 Monthly data, seasonally adjusted and adjusted by working days, 2007=100



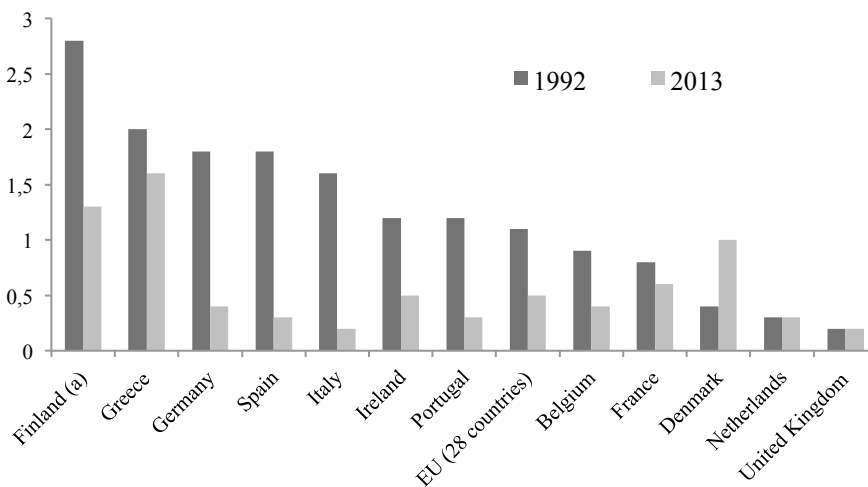
Fonte: Eurostat, Short-term business statistics, Industry.

Figure 5. Turnover in industry, domestic and non domestic market.
 Monthly data, seasonally adjusted and adjusted by working days, 2007=100



Fonte: Eurostat, Short-term business statistics, Industry.

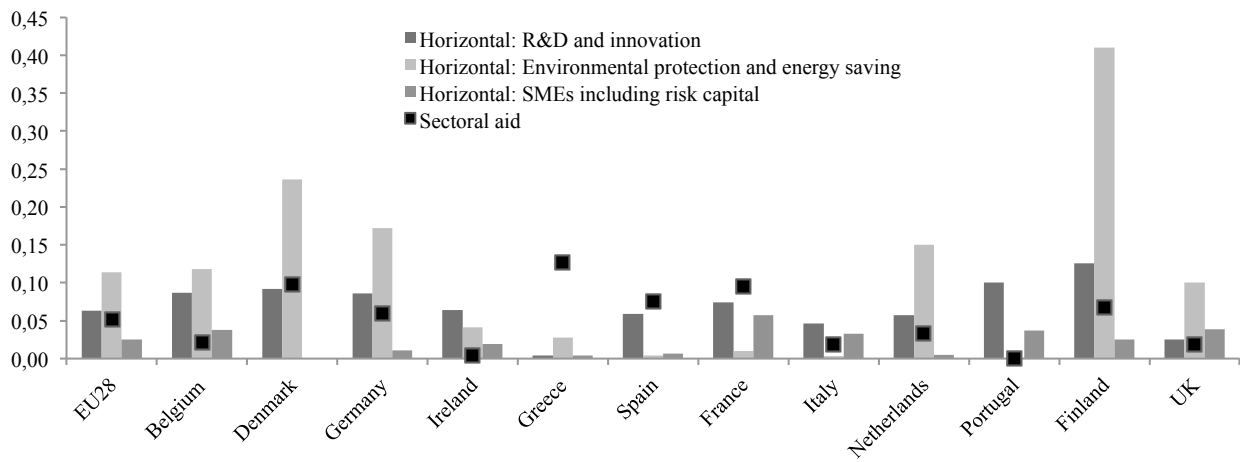
Figure 6. Non-crisis state aid as a percentage of GDP in European countries
 State aid data excludes railways



(a) For Finland 1995, 2013.

Fonte: State Aid Scoreboard 2014, DG Competition.

Figure 7. Non-crisis state aid by type of aid as a percentage of GDP in European countries.



Fonte: State Aid Scoreboard 2014, DG Competition.