



International Journal of Automotive Technology and Management

ISSN online: 1741-5012 - ISSN print: 1470-9511

<https://www.inderscience.com/ijatm>

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DOI: [10.1504/IJATM.2023.10052686](https://doi.org/10.1504/IJATM.2023.10052686)

Article History:

Received: 17 September 2022

Accepted: 12 October 2022

Published online: 17 March 2023

The Italian Government's industrial policies in the automotive sector

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Abstract: The automotive industry is undergoing a dramatic structural change that are potentially harbingers of serious industrial and employment consequences, calling for prompt and effective public intervention. It is necessary to determine what type of public intervention needs to be implemented and for what objectives. The focus of the present paper is Italy. Starting from a description of the evolution of production and employment levels in the last 30 years, it aims to analyse the National Recovery and Resilience Plan, singling out the measures that might affect the sector. Secondly, the papers deal with the FCA-PSA merger and Stellantis industrial plant and its consequences for Italy's industrial structure and employment levels. The aim of the paper is to analyse the Italian Government's industrial policies and highlight that these policies do not seem able to address the problems of the automotive sector.

Keywords: electric vehicles; Italian automotive industry; Italian National Recovery and Resilience Plan; Stellantis; industrial policy.

Reference to this paper should be made as follows: Gaddi, M. and Garbellini, N. (2023) 'The Italian Government's industrial policies in the automotive sector', *Int. J. Automotive Technology and Management*, Vol. 23, No. 1, pp.22–41.

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1 Introduction

In what follows, we provide a description of the Italian government's most recent industrial policies in the automotive sector. In particular, we will try to determine whether or not these policies are able to address the main critical issues of the sector, which are the reduction of locally produced volumes and the consequent dependence on the production of parts and components from abroad. In addition, we will try to understand how such policies are coping with the technological change (powertrain systems and digitalisation) underway. The analysis of the case studies concerning the cooperation between FCA and PSA before their merger and the Stellantis Strategic Plan call into question the strategies of the only major car manufacturer in Italy. They highlight how the Italian Government has given up pursuing an independent role. In this sense, even the modest measures defined by the government for the automotive sector risk being severely compromised.

The automotive industry, is undergoing a dramatic structural change determined by technological and organisational innovations – new powertrain systems, connectivity, new proprietary and business models (European Commission, 2017; European Parliament, 2021; McKinsey & Company, 2016; Deloitte, 2017; PwC, 2017; Stocchetti et al., 2013) – coupled with a strong geographical redistribution of volumes (Sturgeon et al., 2009; Jurgens and Krzywdzinski, 2009; Krzywdzinski, 2014; Pavlinek, 2020; Russo et al., 2022). In the face of these changes, the issue of public policy has gained relevance in the public, political and academic debate (Ramirez Perez, 2010; Calabrese, 2013; Begley et al., 2016; Goracinova et al., 2022), including the perspective of emissions regulation and its impact on the automotive industry (Klebaner, 2020).

In our opinion, these transformations might have serious consequences for employment and the industry. Public authority intervention is therefore urgently needed. However, it is necessary to distinguish what type of public intervention to implement and for what objectives.

Within the European Union, the term 'industrial policies' is always intended to indicate 'horizontal' industrial policies – aimed at creating the best possible environment for private entrepreneurial initiative, avoiding any kind of public intervention – most of all public ownership, but also planning, definition of priorities, choice of strategic sectors, etc. The definition of 'industrial policy' provided by the European Commission (2002) itself is clear: "Industrial policy is horizontal in nature and aims at securing framework conditions favourable to industrial competitiveness. Its instruments, which are those of enterprise policy, aim to provide the framework conditions in which entrepreneurs and business can take initiatives, exploit their ideas and build on their opportunities"; the only exception is that some sectors can be "subject to detailed sector-specific regulations dependent on their inherent characteristics or use."

The rise and dominance of the horizontal approach within EU institutions coincides with the establishment of neo-liberal hegemony. As such, the main industrial policy tools defined and implemented in the EU only concern tax reduction for enterprises, anti-trust and competition policy, incentives schemes, R&D subsidies, etc. Indeed, Crafts and Hughes (2013) list some typical horizontal policy interventions: competition policy, indirect tax, product market regulation, education policies, training subsidies, employment taxes, corporate tax policy, financial market regulation, R&D tax credit, etc. These kinds of interventions are contrasted with 'selective' policies that explicitly refer to

public intervention instruments: national champions, nationalisation/privatisation, state aids, public procurement, state investment bank, strategic investment fund, etc.

The prevailing of ‘horizontal’ approach has meant reducing the role of the public sector to merely delegating any strategic decision to the market – i.e., to private companies. The only role left to the public is that of creating and financing the best possible environment for private initiative – that is, in mainstream economics terms, eliminating ‘market failures’.

This approach has been applied to the whole automotive supply chain: the only interventions on batteries, semiconductors, connected and autonomous driving, transition to electric propulsion, have been regulatory in nature.

The Italian Government, as we shall see, has pursued the same type of policies.

2 Italy’s industrial policies in the automotive sector – a brief historical summary

Italy has had a long and robust tradition of industrial policies marked by strong state intervention.

After the Second World War, a decisive role in the reconstruction of the industrial fabric and the creation of new branches of industry was played by the Institute for Industrial Reconstruction (IRI), the Ministries of Industry and State Participation, and economic planning by the state (Saraceno, 1955; Ciocca, 2015; Amatori, 2020).

The IRI was a financial institution under public law that managed shareholdings in a wide range of companies; the general direction of its activities was set by the government’s Council of Ministers. Essentially, it was an instrument for acquiring and managing public holdings in companies; in this way, the Italian state could play an active role in the country’s industrial development.

Through the role exercised by the two Ministries mentioned above, by the IRI and by economic planning, the Italian state aimed to pursue:

- a the reconstruction, immediately after the war, of the industrial fabric heavily damaged by the war
- b the creation and/or expansion of industrial sectors necessary for economic and social development (steel, chemistry, energy, etc.)
- c a rise in employment
- d the reduction of territorial gaps.

The IRI was organised into ‘management bodies’, i.e., a series of financial companies that grouped together companies operating in the same sector of activity; these included Finmeccanica, which:

- a held shares in companies in the mechanical sector
- b carried out their technical coordination
- c gave them financial assistance.

Among Finmeccanica's holdings was also that of Alfa Romeo, which after the wartime interlude in which it concentrated on military production (trucks and aircraft engines), began producing cars again.

Alfa Romeo drew up various industrial and production expansion and investment programmes (for example, in 1953, 1956, etc.) that were approved by Finmeccanica and the IRI: these plans led to an expansion of the vehicle range and production volumes, and the construction of two new plants, one of which was in the south of Italy. Although operating in a particular market segment (middle-class cars with sports features) over the years Alfa Romeo increased its production volumes also as a result of industrial choices that expanded its range. While in 1951, Alfa Romeo produced 1,420 cars or 1.2% of national production, by 1980 it was producing 219,000 cars – over 15% of national production (Pirone and Zirpoli, 2015). Alfa Romeo's production also fed the production of other companies in the IRI group that provided production inputs. Starting in the 1980s, economic and industrial policies in Italy changed radically.

The year 1986 marked the sale of Alfa Romeo to Fiat. This sale was part of a reorganisation of the IRI aimed at restoring economic and financial equilibrium. The reorganisation was to take place by restructuring the business sectors, reducing those in crisis and transferring others to the market: this included the automotive sector. It marked the withdrawal of public participation in the country's car industry.

In the 1990s, a massive privatisation and liberalisation process was enacted in Italy within the ideological framework of the neo-liberal economic policies decided by the European Commission. These focused on the promotion of competition and the free market, seeking to reduce forms of public intervention in the economy as much as possible and classifying most state interventions as market distortions.

Industrial policies were heavily affected by this radical change in approach: member states limited themselves to implementing 'horizontal' policies, i.e., a set of measures aimed at encouraging an environment favourable to initiative and to the development of enterprises. Italy has been particularly diligent in implementing this type of industrial policy. Clear examples are the two main industrial policy instruments adopted in the last 20 years: Industria 2015 and the National Plan Industria 4.0.

As part of the Industria 2015 project, the Financial Law for 2007 introduced the Fund for Competitiveness and Development to finance Industrial Innovation Projects submitted by companies in some areas. With the Industria 4.0 National Plan, presented by the Italian Government ten years after Industria 2015 (i.e., in 2016), the same approach was essentially adopted again.

The Industria 4.0 Plan, in fact, provided for a series of tax and financial relief measures to support a range of investments by companies in new machinery, innovative technologies, R&D, as well as start-ups and innovative SMEs. To these measures were added those related to guarantee credit-access schemes, reductions in the tax burden and aid to strengthen assets.

The 'horizontal' nature of these measures is fully evident.

In short, Italy has completely divested itself of previous industrial policy instruments, and the automotive sector has particularly suffered as a result of this approach.

This decision is even more incomprehensible in the light of the significant state aid that has been granted to Fiat over the years. As highlighted by research promoted by the 10th Commission (Industry, Commerce and Tourism) of the Senate of the Republic (Unioncamere and Prometeia, 2015), in fact, between 1977 and 1995 Fiat received

around 6.5 billion euros. This research makes clear Italy's singular behaviour: following the 2008 economic and financial crisis, the European Commission defined a new system of access to state aid, allowing the automotive sector to benefit from greater public support; but while France, Spain and Germany put in place plans to support the sector and direct public financing to the industry, Italy limited itself to financing scrappage programmes to stimulate car replacement. The same policy of incentives to support demand has been followed in recent years to support 'green' vehicles.

To summarise, the industrial policies implemented by Italy in the automotive sector over the last 25–30 years have been characterised by:

- a the lack of sector planning
- b the implementation of 'horizontal' intervention tools
- c incentives for the purchase of vehicles, without any intervention in the industrial structure.

These aspects are evidenced by the fact that most studies on Italian automotive policies have focused on aspects such as innovation (Calabrese, 2001), technological districts (Bianchi et al., 2001) and carmakers (Balcet et al., 2013) or suppliers strategies (Follis and Enrietti, 2001).

3 The condition of Italy's automotive sector

Any assessment of Italian industrial policies must be grounded in an analysis of how production levels changed through time.

Table 1 shows how production levels changed over the period 1999–2021 in Italy, Germany, France and Spain. The sub-period 1999–2019 was added to provide a pre-COVID picture. Looking at this sub-period shows Italy's dramatic fall, unparalleled in major Western European countries.

Table 1 Passenger cars production 1999–2021

	<i>Production 1999</i>	<i>Production 2019</i>	<i>% change from 1999</i>	<i>Production 2021</i>	<i>% difference vs. 1999</i>
Germany	5,309,524	4,661,328	–12.2	3,096,165	–41.6
France	2,784,469	1,675,198	–39.8	917,907	–67
Spain	2,281,617	2,248,019	1.4	1,662,174	–27.1
Italy	1,410,459	542,472	–61.5	442,407	–68.6

Source: OICA database

This drop in production was reflected in the decline in employment in the sector. Table 2 shows that full-time equivalent (FTE) employment in the manufacture of motor vehicles, trailers and semi-trailers – *including parts and accessories* – in Italy declined by 18.9% over the 1999–2019 period. The case of France is also striking, since relative to production drop, employment contraction is even more pronounced.

Table 3 disaggregates employment figures by sub-sector. The largest drop in Italian (but also French and Spanish) employment is in the production of motor vehicles – including light commercial vehicles, of which Italy has retained a good market share; it

we had considered data on cars only, the drop would probably be even greater. While employment in the manufacture of bodies (coachwork) increased by 12.4% in Germany, it dropped in Spain, France and Italy – by 16.5%, 23.6% and 32.6%, respectively.

Table 2 FTE employment in the manufacture of motor vehicles, trailers and semi-trailers

	1999	2019	% change 1999–2019
Germany	824,722	888,559	7.7
Spain	153,834	154,793	0.6
France	258,475	211,813	–18
Italy	170,082	137,879	–18.9

Source: Eurostat database, Nace Code DM34 for the period 1999–2004 and C29 for 2005–2021

Table 3 FTE employment disaggregated by sub-sector, % change over the period 1999–2019

	Motor vehicles	Coachwork	Parts and accessories
Germany	9.3	12.4	3.8
Spain	–12.2	–16.5	20
France	–31.2	–23.6	10.9
Italy	–36.7	–32.6	4.8

Source: Eurostat database

On the other hand, employment in the manufacture of parts and accessories increased in all countries: by 4.8% in Italy, by 3.8% in Germany, by 10.9% in France and by 20.0% in Spain. To shed light on structural changes, Table 4 shows the percentage weight on total employment of the three sub-sectors.

Table 4 Distribution of employment within automotive sector

	1999			2019		
	Vehicles	Coachwork	Accessories	Vehicles	Coachwork	Accessories
Germany	62.2	5.6	32.2	63.6	5.4	31
Spain	50.9	8.2	40.9	44.4	6.9	48.7
France	60.4	10.1	29.5	50.6	9.5	39.9
Italy	49.1	8.9	42	38.3	7.4	54.3

Source: Eurostat database

This evidence can be confirmed by looking at data on Italian automotive exports and imports: while in the period 2017–2019 net exports of parts and accessories were positive (5.8 million euro in 2017, 6.7 in 2018 and 6.7 in 2019), the trade balance for cars was negative (–11.8 million euro in 2017, –13.5 in 2018 and –14.8 in 2019).¹ Qualitative research conducted through interviews (Gaddi, 2021) has shown that in the Italian north-east there are companies 90% of whose turnover is generated by foreign customers. This, coupled with the collapse of domestic production of finished cars, jeopardises the very existence of an Italian supply chain, for multinational companies could relocate production volumes to near final assembly plants, for example in low-cost Central and Eastern European countries.

Table 5 Passenger cars, production levels (number of cars produced) in Italy (1989–2021)

	Total	% change compared to 1989	Fiat	Alfa Romeo	Lancia	Maserati	Jeep	Ferrari	Lamborghini
1989	1,971,969		1,410,137	233,207	158,552	2,617	-	3,821	292
1999	1,410,459	-28.5	1,011,396	208,336	157,720	1,900	-	3,670	253
2009	661,100	-66.5	429,684	104,223	111,800	4,041	-	6,213	1253
2018	670,932	-66.0	315,011	109,814	-	34,312	198,066	9,416	6,577
2019	542,472	-72.5	2,79,020	66,552	-	17,582	160,528	10,131	8,659
2020	451,826	-77.1	202,893	53,791	-	15,698	162,967	9,119	7,358
2021	442,407	-77.6	213,632	44,483	-	23,360	141,371	11,156	8,405
Δ%			-84.9	-80.9	-29.5	792.6	-28.6	192.0	2,778.4

Source: Anfia studi e statistiche (<https://www.anfia.it/it/automobile-in-cifre/>)

By focusing on Italy only, a longer series of data – covering the period 1989–2021 – is available on the production of passenger cars only, both aggregate and disaggregated by brand. Results are shown in Table 5.

The change in production volumes by brand shows that the production of luxury cars such as Maserati, Ferrari and Lamborghini – now part of the Volkswagen Group – dramatically increased. At the same time, there was a dramatic collapse of Fiat/FCA, which in the meantime absorbed 84.9% of Alfa Romeo and Lancia. Of course, the growth in high-end production, as was to be expected, could not at all compensate for the slump in mid and low-range vehicles.

Overall, passenger cars production dropped by 77.6% over this 30-year period. Disregarding 2021 and stopping at 2019, the situation does not get any better.

In other words, in the absence of a long-sighted, ambitious and far-reaching industrial policy – also involving the supply chain and taking into account the changed conditions in the energy markets – Italy could eventually be left with less than 25% of its production capacity 30 years ago.

4 The measures for the automotive sector envisaged by the National Recovery and Resilience Plan

The Next Generation EU is an extraordinary intervention plan, approved by the Meeting of the European Council (17–21 July 2020) to introduce exceptional measures to support the recovery and resilience of member states' economies following the COVID-19 crisis. This plan for European recovery provides European resources to fund a “massive public and private investment at European level to set the union firmly on the path to a sustainable and resilient recovery, creating jobs and repairing the immediate damage caused by the COVID-19 pandemic whilst supporting the union's green and digital priorities” [European Council, (2020), p.2]. These resources (in the form of grants and loans) were allocated to member states on the basis of certain indicators and following the submission of specific National Recovery and Resilience Plans (NRRPs). On 30 April 2021, Italy submitted its NRRP to the Commission which was approved on 6 July 2021 by the European Council. Italy thus received EUR 191.5 billion to implement investments divided into six missions, which in turn are broken down into individual components. Despite the scale of the planned investments and the significant resources allocated to Italy, the Italian NRRP does not include a chapter specifically devoted to the automotive sector. Measures that might affect the automotive industry must therefore be sought in the various missions making up the plan.

Moreover, as anticipated, these measures are in full continuity with the ‘horizontal’ approach described above.

4.1 Support to the automotive supply chain

Supply chain industrial policies and internationalisation is Investment No. 5 in Mission 1 (*digitalisation, innovation, competitiveness, culture and tourism*), Component 2 (M1C2: *digitisation, innovation and competitiveness in the production system*), whose general objective is strengthening the production structure of the most strategic supply chains. The automotive supply chain is one of the twelve identified by the measure.

More specifically, financial support will be given through development contracts (DCs) to investment projects with a significant potential impact on Italian chains. DCs are defined as ‘a selective’ measure capable of directing public resources towards the strategic supply chains; ‘the intervention’ is carried out through ‘negotiation procedures that provide for an articulated and in-depth evaluation of projects and beneficiaries’, the final objective being ‘to foster the processes of structural transformation of the production system’ [Italian Government, (2021a), p.29].

These objectives, as described, seem positive, not least because the NRRP recognises the high degree of fragmentation and the excessively small company size characterising the Italian production system compared to other European countries.

As usual, however, the process is entirely left to the market, i.e., to private companies: there are no public instruments to implement aggregation processes between companies with the participation of public capital. The NRRP only mentions “cooperation and association logic [that] is encouraged between companies belonging to the same production chain for the realisation of large-scale joint investment projects’ [Italian Government, (2021a), p.32]. This will not be enough to overcome the above-mentioned structural flaws, all the more so since DCs “can also be carried out jointly by several parties through the network contract tool” [Italian Government, (2021a), p.32], without creating new entities through aggregation and dimensional growth.

The estimated cost for the measure is EUR 750 million to be mainly delivered through non-repayable grants and/or subsidised loans.

4.2 *Recharging infrastructures*

Development of electric recharge infrastructure is Investment 4.3 in Mission 2 (*green revolution and ecological transition*), Component 2 (M2C2: *renewable energy, hydrogen, grid and sustainable mobility*). In order to meet the European decarbonisation targets, a fleet of about 6 million electric vehicles (of which 4 million BEVs and 2 million plug-in hybrids) is expected to be on the road by 2030: 31,500 public fast-charging points will be needed as a consequence [Italian Government, (2021b), pp.76–77]. The aim of the investment is to build the infrastructure to enable the development of sustainable mobility by integrating fuel-based refuelling stations with electric vehicle charging infrastructure. The goal is to realise three types of infrastructure: 7,500 fast charging points on motorways, 13,755 in city centres, as well as 100 experimental charging stations with energy storage technologies. Contributions given cannot exceed 40% of the cost of each single infrastructure.

In the freeways, 175 kW recharging points are foreseen, the cost of which is 135,000 euro, 54,000 of which are provided by NRRP funds; in the urban areas, 90 kW (two-device) points are foreseen, the cost of which is 60,000 euros, 24,000 of which are provided by NRRP funds, and finally for the experimental stations (150 Kw – two devices) the foreseen cost is 155,000 euros each, with 62,000 in incentives.

This would make it possible to update approximately 4,893 conventional fuel distribution plants out of 22,000: 2,500 for freeways, 2,293 for cities, and 100 for the experimental measure with storage.

As can be seen, the number of planned interventions is very low.

The total cost of Investment 4.3 is 1.853 billion euros – of which 741,320 million euros are allocated to the NRRP: an insufficient amount compared to the country's infrastructure needs.

4.3 Batteries

Developing international industrial and research and development leadership in the main transition chains is Investment 5 in M2C2; in particular, Investment 5.1 is dedicated to *renewables and batteries*.

The NRRP recognises the problem of the development of a European battery supply chain in which Italy is to participate along with other countries such as France and Germany, in order to avoid an excessive future dependence on foreign producers.

Available resources are to fund two projects in which Italy is currently involved as a partner of the IPCEI:

- Batteries 1, “to create a fully integrated value chain in the EU which will produce raw materials, cells, modules and battery systems on a large scale, [...] which will enable industrial scale conversion, recycling and refining.”
- Batteries 2, to realise “a fully integrated value chain in the EU capable of producing cells, modules and battery systems on a large scale, enabling conversion, recycling and refining on an industrial scale” [Italian Government, (2021b), p.94].

Also in this case, the tools envisaged are DCs; the management of the measure is entrusted to Invitalia S.p.A. (National Agency for the Attraction of Investments and Business Development), under the supervision of the Ministry of Economic Development; “furthermore, to speed up the procedures for evaluating and allocating resources for investment programmes of greater strategic importance it is possible to sign specific program agreements or development agreements, which provide for a reduction in waiting and evaluation times” [Italian Government, (2021b), p.94].

Support is of two kinds: a non-repayable grant and/or a subsidised loan.

The estimated cost is 500 million euro to support 20 projects.

Once again, the Italian Government leaves the initiative entirely to private companies.

4.4 Semiconductors

Due to its wide use in virtually all supply chains – including automotive – the semiconductor sector can now be loosely defined as a basic industry. The NRRP stresses that fostering the growth of the national supply chain and developing the technological frontier – silicon carbide (SiC) chips – will be crucial for the electric mobility revolution. In fact, both SiC and gallium nitride (GaN) ensure high-efficiency performances – in terms of energy savings and systems simplification – and can be incorporated in a wide range of components and devices for vehicles, fast-charging stations, renewable energy production, etc. According to the Italian Government, the industrial availability of SiC is key to mass electrification.

Some of the main bottlenecks in SiC semiconductor production are the lack of silicon substrates – qualified suppliers are very limited and outside Europe – and their cost, the largest component of the final device manufacturing cost.

The investment aims to integrate the production of the epitaxial substrate upstream in the value chain in order to reduce dependency on non-European suppliers, improve device manufacturing yields by achieving a quality increase, gain competitive advantages by reducing the incidence of substrates on final device production cost, provide medium and long-term support to the SiC power devices roadmap² [Italian Government, (2021a), p.9; European Commission, 2022a, 2022b].

An investment of 850 million euro in five years (2021/2025) is estimated, aimed at increasing annual production capacity to at least 374,400 SiC substrates and hiring 700/900 employees. The NRRP will provide 40% of the funding, a part of which will go to the French-Italian public-controlled company ST Microelectronics (STM) to complete its SiC-producing facility in Catania. This, however, does not seem in itself sufficient to meet the above-mentioned targets, for at least two reasons:

First, STM only performs the front-end manufacturing phase in Italy. The back-end – the more labour-intensive, final assembling stage – is almost entirely located outside Europe (China, Malaysia, Morocco, the Philippines and Singapore).

Second, in line with the European Chips Act and in observance of the competition imperative, the allocation of public funding is limited to cutting-edge, ‘first-of-a-kind’ facilities – the first of their kind using a new design or technology, in this case, new node technologies (i.e., those below 10 nm), new materials for substrates (SiC and GaN), process innovations improving energy and environmental performances, etc. However, Europe does not lack cutting-edge facilities for key industrial applications (including automotive) but needs to reduce foreign dependence by increasing its productive capacity, both at the front end and back end – with less technologically advanced facilities. In general, Europe has to cope with the growing demand for semiconductors from an increasingly wide range of industries.

5 The NRRP’s implementation measures and the Automotive Fund

5.1 *Automotive supply chain*

The Minister of Economic Development’s (MED, hereinafter) decree of 13 January 2022 identified the strategic supply chains benefiting from the NRRP funds under M1C2, Investment No. 5.2: *competitiveness and resilience of production chains* – which, as anticipated, aims to strengthen the most innovative and/or strategic production chains by funding at least 40 DDCs. As mentioned, the resources provided amount to 750 million euro, intended to leverage investments for at least 1,500 million.

The identified sectors are agroindustry, chemical/pharmaceutical, design, fashion and furniture, automotive, microelectronics and semiconductors, metal and electromechanics. The last four will have to absorb at least 60% of the allocated funds. However, the ministry does not a priori define the percentage of funds distributed to each individual supply chain; most likely, the final distribution will depend solely on the composition of the applications submitted. Once again, the government is abdicating its role of governing structural economic dynamics.

The possibility of sending applications to Invitalia was opened on 11 April 2022.³ The results of the call are not yet known.

According to the regulations on DDCs⁴, such investment projects may provide for different forms of intervention:

- a the creation of a new production activity
- b the expansion of existing production capacity
- c the reconversion of an existing production unit
- d the restructuring of an existing production unit
- e the acquisition of an existing production unit located in a crisis area.

This is quite a wide range of possible investments, but once again the Italian government has made no decision, leaving companies completely free to decide.

Above all, the government decided not to play an active role in overcoming the endemic weaknesses of the Italian industrial system, characterised by the presence of SMEs. Yet, the NRRP explicitly mentions that the smallest enterprises have exhibited competitiveness problems over the long-term, especially when it comes to economies of scale and investment capacity; likewise, the economic impacts of the crisis have led to situations of serious financial tension with consequent impact on production chains. In many sectors, including automotive, criticalities have been generated by the excessively small size of companies, making it very difficult to make investments, engage in R&D projects, acquire a certain equity solidity, access credit, etc.

Within this mission, the government should have identified specific supply chains (or clusters) as targets of the intervention, promoting real business aggregations, with public entities acting as aggregating poles; for instance, the government could have defined a specific project for the automotive sector specifically devoted to aggregate small enterprises by means of a public entity becoming a shareholder of the new resulting company. This instrument could have been integrated with other instruments, like an operational arm of the Cassa Depositi e Prestiti⁵: for instance, the Consolidation and Growth Fund is dedicated to the acquisition of direct shareholdings in the capital of small and medium-sized Italian companies with the aim of fostering aggregation processes within their production chains.

In the automotive sector, therefore, this would amount to identifying which specific micro-companies are engaged in the production of:

- a the same product (same type)
- b products complementary to each other or parts of products sequential to each other
- c products destined for the same customer (or a small group of customers).

Once these enterprises have been identified, the design of the aggregation/enlargement projects should also include, among other things: supply chain industrial policies that would strengthen the link between client enterprises and aggregations/supply clusters; reward mechanisms for inclusive supply-chain bargaining; stabilisation, training and qualification measures for workers, etc.

Unfortunately, none of this has been done.

5.2 Recharging infrastructures

The implementation of this measure has not yet started as the first milestone (award of the contracts to build 2,500 rapid recharging stations along freeways and at least 4,000 in urban areas) is scheduled for June 2023.

5.3 *Battery sector*

The MED Decree of 27 January 2022 defined the directives for the implementation of M2C2 – Investment 5.1: *renewable energies and batteries*, whose purpose is to support the development of a value chain for, as far as the automotive sector is concerned, batteries. Investment 5.1.3 is related to the batteries sector, for which battery production with a target capacity of 11 GWh is expected by 31 December 2024. EUR 500,000,000 is earmarked for it.

The purpose of this intervention is to promote the development in Italy of production sectors related to electrochemical storage technologies through DCs. Also in this case, the Italian Government has not made any decisions regarding the kind of interventions to be financed, leaving all decisions to private companies.

Applications were made from 11 April 2022 to 11 July 2022. As of October 2022, the results are not yet known.

Previously, in March 2022, a Memorandum of Understanding was signed between MED, the Molise Region, Invitalia and the Automotive Cells Company (ACC) SE to support the latter's investment to build a gigafactory at Fca Italy's (Stellantis Group) plant in Termoli for the production of cells and battery modules. This investment envisages the creation of three production modules, each with a nominal annual capacity of up to 40 GWh. These cells and battery modules will be destined for BEVs.

The Termoli facility currently employs around 2,300 workers (many of whom have been laid off), and consists of three production areas: one for gearboxes, one for 8 and 16-valve engines (GSE and V6 2.0 T4 engines), and one for premium petrol engines. The first two areas – employing 341 and 889 workers, respectively – will be terminated and replaced by battery production for electric vehicles. The latter will take place in the three plants employing about 700 workers each – for a total of about 2,000 when fully operational. Production is scheduled to start by the end of 2024 at reduced capacity. It is unclear whether production of premium petrol engines will continue.

Stellantis, TotalEnergies/Saft and Mercedes-Benz are shareholders in ACC; the investment amounts to 2.3 billion, of which 370 million comes from government funding in the form of a DC and tax breaks for the Transition 4.0 Plan.

Trade unions have been voicing their concern about employment levels. As mentioned, there is currently a massive use of social shock absorbers and the transition will lead to temporary layoffs. Production in 2025 will involve about 1,000 workers, whereas full capacity is expected to be reached by 2030.

5.4 *Semiconductors*

The milestone for this measure (the realisation of an additional production capacity of at least 374,400 SiC substrates per year) is scheduled for June 2026.

Although it is understandable that much time is needed to build up production capacity, the scheduled date seems particularly late, especially if one takes into account that the NRRP was approved in 2021 and 2026 is the last year of its validity. The need for production capacity in the semiconductor sector is extremely urgent, not least in light of the large number of chips needed for new car models.

In Catania, STM has started working on a new site with a pilot line for the production of SiC substrates. A pilot line, however, replicates an industrial process on a smaller

scale, testing its possible industrialisation. At the moment, STM is limiting itself to this, leaving to market trends the decision as to whether to invest in actual production.

Undoubtedly, SiC semiconductors will be widely used in the automotive industry, as they are very high-performance for high voltages, so that they are excellent for power management, peripheral management (audio systems, lighting, etc.) and power systems inside electric vehicles, including traction inverters, on-board chargers and in the DC/DC conversion stage.

Since we do not know if the Catania plant will be expanded to support large-scale production, we cannot assume that this production will be located in Italy, especially in light of the fact that STM is making an investment to produce SiC semiconductors in Singapore, again with a front-end plant, while the final assembly (back-end) and testing plants are planned in China and Morocco.

Moreover, concerns increase if one takes into account that SiC technology could be flanked, if not even surpassed, by GaN technology, for which STM has planned major investment in France.

5.5 The Automotive Fund

The Energy Decree (*Decreto Energia*, 1 March 2022, No. 17) includes Article 22, establishing a fund to foster green transition and research and investment in the automotive sector, and to provide incentives for the purchase of non-polluting vehicles. This fund is endowed with 700 million euro for 2022 and 1,000 million euros for each year from 2023 to 2030, the total being 8.7 billion euro. The decree does not specify what percentage should go to industrial policies and what percentage to incentives for car purchases; this is left to subsequent decrees.

Firstly, the Prime Minister's Decree (PMD) of April 2022 defined the incentives for the purchase of non-polluting vehicles for 2022, 2023 and 2024. For each year, the amount of the Automotive Fund earmarked for incentives is EUR 650 million. This is a clear political choice: in the first three years of the fund's operation, 1.9 billion euro, or 72.2% of the total endowment (2.7 billion), will be absorbed by incentives, leaving residual and insufficient resources for industrial policies.

The resources to finance incentives are distributed according to CO₂ emission levels: 220 million euros for vehicles with emissions in the 0–20 gram range (BEVs); 225 million for the 21–60 gram range (hybrids); 170 million for the 61–135 gram range (low-emission endothermic). The remaining 35 million are divided between mopeds and commercial vehicles.

In August, another PMD was adopted, in this case relating to industrial policies, allocating only 50 million euro in 2022, and 350 million each for 2023 and 2024. At the time of writing, this decree has not yet been published in the Official Gazette and only press reports are available. These funds will be granted to companies to make investments in five areas:

- 1 the development of new vehicles and new power and propulsion systems
- 2 technologies, materials, architectures and components to lighten vehicles and transport systems for urban mobility
- 3 new mechanical, electrical, electronic and software systems and components to manage the main functions of vehicles

- 4 ADAS, connectivity, data management, HMI and infotainment
- 5 infrastructure for refuelling and charging vehicles.

As mentioned, there are very few resources available and here again, the mechanism used is that of the public tender, the problems of which have been addressed at length above.

6 The PSA-FCA merger

The FCA-PSA merger is a clear example of the total lack of industrial policies in Italy, which leaves operations of such industrial and employment importance entirely to the market. We believe it is important to describe this process because it highlights the lack of intervention by the Italian state: this absence contrasts with the approach of the French government, which is also a shareholder of PSA (and therefore of Stellantis). The decisions described in this paragraph further endanger the automotive sector in Italy and in particular its supply chain.

FCA and PSA have announced – before the conclusion of the merger process – collaboration on a specific model equipped with PSA’s Common Modular Platform (CMP). This collaboration concerns three new B segment vehicles (planned production: 400,000 vehicles per year, in other words, a mass-market model).

This production, however, will not be located in Italy but in Poland, at Tychy – a major decision from an industrial and employment point of view. At stake, in the B segment, are five models, all of which will be produced with PSA’s CMP platform.

The architecture chosen for these vehicles includes the use of PSA’s CMP, a newly designed platform which, like all modern platforms, has a modular design: it can be used to produce a wide range of models with a few targeted modifications. The fact that PSA has imposed its own floor plan will strongly impact the supply of all components. In essence, PSA will choose the solutions to adopt in the mechanical, electronic and powertrain parts as well.

FCA could therefore only maintain a role in product development (understood as the integration of the various components chosen by PSA and the design of the internal and external style) without any certainty about plants, their location, and the corresponding suppliers.

As stated above, the PSA platform is modular; the same platform employed in the production of DS3 crossback could be adapted to the three types of motorisation (endothermic, mild-hybrid and ‘pure’ electric). PSA’s objective is complexity (and hence cost) reduction; based on the engineering of the car, in fact, the underbody and the chassis could be the same in all three drive systems, limiting modifications only to the BEV steering system and the battery architecture.

With a platform made by PSA, and with PSA making investments in the powertrain sector, all components of future models could be decided by the French carmaker, with FCA only in charge of re-tuning some chassis components.

The same concerns can be raised for electronics: decisions about infotainment, connectivity, electronic components (movement buttons, electronic handbrake, video cameras, high voltage wiring, etc.) could be imposed by PSA, as it still controls Faurecia. What then will be the fate of Italian suppliers?

The answer is simple: those who are already PSA suppliers may still have a place; FCA suppliers, on the other hand, will be in danger of disappearing.

7 Stellantis Strategic Plan: a brief analysis

Thus we note, also in the case of the contents of the Stellantis Strategic Plan, the total absence of intervention by the Italian Government. The lack of government presence among the shareholders of Stellantis is reflected in the strategic orientations of this plan, which do not define future prospects for the Italian plants, just as the specific objectives of the plan show how Italian industry is not ready to play a significant role in them. For this reason, too, the already modest automotive objectives of the Italian NRRP risk being further compromised.

The Stellantis Strategic Plan 'Dare Forward 2030' was presented on 1 March 2022.

It presents several critical elements for the future of the Italian automotive industry and employment levels.

The plan does not provide answers to the concerns repeatedly expressed by Fiom-Cgil – it is worryingly general with respect to information that should instead be detailed immediately.

On the cost side, Tavares – the CEO of Stellantis – said that compared to the 3.2 billion euros in synergies already achieved, the goal is to reach 5 billion in 2024, through a general cost reduction that affects all group functions. This is a high target that is likely to have significant spillover effects.

The watchword is the reduction of complexity (i.e., costs) at all levels so as to reach the breakeven point below 50% of sales: this means that anything above this threshold is to be considered profitable and on the other hand, that even in the face of a significant reduction in sales volumes the company will not have difficulties. Again: this means that Stellantis is financially prepared to sustain a period of reduced production volumes without affecting its financial results; but in this case the employment consequences will be very heavy, in particular for Italy.

In fact, another general goal concerns the premium (Alfa Romeo, DS Automobiles, and Lancia) and luxury (Maserati) segments, for which an increase in the profit share is planned from 4% to 11% of total new car sales with 100% BEV models by 2030, leading to a fourfold multiplication of sales and fivefold expansion of profits. For this segment, 20 new launches are planned by 2030 out of the total 100. The precision of this data provides a rather worrying indication: these types of cars turn out to be very profitable for the company, but they foresee quite low volumes; two of these brands (Alfa Romeo and Maserati) are produced in Italy and this could suggest the intention to limit production in our country to niche segments, or at any rate far from the conditions and volumes of mass market models that foresee quite different numbers. These volumes will certainly not be the answer to the dramatic decline in employment in the sector that Italy has experienced in recent years.

Stellantis plans to have, by 2030, at least 75 BEV models in its portfolio; in terms of the BEV models on the European market, more than 60 are expected. The plan provides figures in terms of volumes of planned sales without any further detail about geographical allocation of production. In a few words, it is impossible to say what the plan implies for the future of Italian plants and workers.

In the Stellantis strategy, electrification of all 14 brands is envisioned through four platforms (small, medium, large and frame).

The four platforms are to be flexible, modular, able to share the same components, and able to install a standardised battery pack so as to cover all brands and all segments.

The three EDMs are electric component architectures that allow the three elements of electric propulsion – the battery pack, electric motor and power module – to be configured in different, alternative ways. The three configurations are very similar to each other, but what is notable is their adaptability to the four platforms envisioned so as to increase production flexibility in terms of both model mix and propulsion type. This choice seems to perfectly reflect the watchword of reducing complexity, with clear cost compression in the key of increasing marginality. The issue of platforms is of primary importance in the development of a vehicle, starting with the components; if the platforms are of PSA origin, as we described above, this choice could be a harbinger of consequences for Italian suppliers.

The planned investment in electrification is 30 billion euros by 2025 (including also investment in software). This new value chain covers the three key segments of electric mobility in which Stellantis has ongoing collaborations with several companies. The first is with Nidec, a Japanese multinational with plants also in Italy, for the development of the electric motor. The second is with LG, Samsung and ACC for batteries. The third is for the charging network with Free 2 move eSolutions, which is a joint venture with NHOA, formerly Engie EPS, part of the French energy giant Engie, the former Gaz De France-Suez.

In short: the collaborations in this crucial area, then, are with Asian multinationals and French companies.

In terms of batteries, Stellantis also plans to develop solid-state technology, again in collaboration with ACC and Factorial (the USA). Finally, for raw materials related to the development of electric cars Stellantis has a collaboration with Vulcan (also American).

No Italian companies are involved in such strategies.

The other strategy is focused on software, a major profit source in Stellantis plans. Thirty-four million cars could become interconnected and hence a target for over the air interventions. It remains to be seen how Stellantis will move into this area in which it still lacks in-house expertise, and it is unclear how and where these technologies will be developed and produced: alliances with industry giants such as Foxconn and Amazon (for smart cockpit using artificial intelligence and cloud solutions), BMW (to reach Level 3 in autonomous driving) and Waymo (for autonomous driving of commercial vehicles) are mentioned, suggesting that employment effects in Italy will be quite limited.

8 Conclusions

This paper deals with industrial policies put in place by the Italian Government for the automotive sector.

In Italy, the sector was characterised, between 1989 and 2021, by a dramatic drop in production levels which fell far below those of Germany, Spain and France.

This phenomenon also had significant repercussions on employment. Not only have employment levels decreased in FTEs, but there has been a change in the very structure of employment in favour of the production of parts and accessories, which are now above 50% of total employment in the sector – while only 38.3% of worked hours are devoted to the production of vehicles. This puts Italy in a subordinate position compared to France and Germany. Spain's situation is qualitatively similar, although with significantly different orders of magnitude.

The data on the export of parts and accessories also reflect the above-mentioned structural change: domestic suppliers are producing less and less for domestic manufacturers and increasingly for assembly plants located abroad.

This jeopardises the very existence of parts and accessories production in Italy, at least that of multinational companies. The latter, in fact, have factories in all European countries, including those with low labour costs, and in the absence of a domestic car manufacturer capable of absorbing a substantial part of their production, they could decide to transfer production volumes abroad, closer to final assembly facilities, further impoverishing Italy in terms of both employment and production.

The Italian Government's policies do not seem adequate to address the main critical issues in the sector, both because of the limited resources made available and of the type of intervention instruments.

First and foremost, the model of incentives for the purchase of new vehicles has prevailed: a form of demand support that does not address the problem from an industrial point of view. The measures envisaged on the industrial side, in turn, are framed as incentives and contributions to private companies, leaving them to decide on the content, methods and timing of investments.

Essentially, the Italian Government's industrial policies are in continuity with the neo-liberal policies implemented in recent decades.

In short, the Italian Government – unlike the French Government, traditionally more interventionist – has abandoned its guiding role.

The interventions envisaged by the government concern the strengthening of the automotive supply chain, the construction of recharging infrastructures for electric vehicles, and interventions to support the battery and semiconductor sectors. Again, public funds will be used to support investment projects decided by the companies; while in the case of the supply chain, no instrument has been adopted to promote forms of aggregation capable of overcoming the small size of companies.

In the meantime, the decisions taken by FCA in its cooperation with PSA, and later by the Stellantis Group, do not look good for Italian industry and workers.

The Stellantis Industrial Plan, presented in March 2022, did not specify any production mission for the Italian plants in terms of models and volumes; it did not define what investments will be made, and the planned collaborations in various areas (electric motors, batteries, charging infrastructure, raw materials and software) do not involve any Italian companies.

All these critical aspects suggest that the issue of the Italian Government's participation in Stellantis, as a form of public intervention, should be considered.

Furthermore, also in light of the changes taking place in the energy markets, it would in our opinion be appropriate to reopen the discussion on hybrid vehicles – which is, however, beyond the scope of this paper.

References

- Amatori, F. (2020) 'IRI: financial intermediary or entrepreneurial state?', *Financial History Review*, Vol. 27, No. 3, pp.436–448.
- Balcet, G., Comisso, G. and Calabrese, G. (2013) 'Structuring and restructuring Fiat-Chrysler: can two carmakers jointly survive in the new automotive arena?', *Int. J. Automotive Technology and Management*, Vol. 13, No. 2, pp.183–197.

- Begley, J., Berkeley, N., Donnelly, T. and Jarvis, D. (2016) 'National policy-making and the promotion of electric vehicles', *Int. J. Automotive Technology and Management*, Vol. 16, No. 3, pp.319–340.
- Bianchi, R., Enrietti, A. and Lanzetti, R. (2001) 'The technological car district in Piedmont: definitions, dynamics, policy', *Int. J. Automotive Technology and Management*, Vol. 1, No. 4, pp.397–415.
- Calabrese, G. (2001) 'Innovation capabilities in small-medium autocomponents: evidence from Italy', *Int. J. Automotive Technology and Management*, Vol. 1, No. 4, pp.471–489.
- Calabrese, G. (2013) 'Industrial policies for sustainable mobility in the leading European automotive countries', in Stocchetti, A., Trombini, G. and Zirpoli, F. (Eds.): *Automotive in Transition. Challenges for Strategy and Policy*, pp.139–159, Edizioni Cà Foscari, Venezia.
- Ciocca, P. (2015) *Storia dell'IRI. Vol. 6, L'IRI nella economia italiana*, Editori Laterza, Bari.
- Crafts, N. and Hughes, A. (2013) *Industrial Policy for the Medium to Long-term*, Working Paper No. 455, Centre for Business Research, University of Cambridge.
- Deloitte (2017) *The Future of the Automotive Value Chain – 2025 and Beyond*.
- European Commission (2002) *COM(2002) 714 Final Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions, Industrial Policy in an Enlarged Europe*, Bruxelles.
- European Commission (2017) *Gear 2030 – Final Report 2017, Ensuring that Europe has the Most Competitive, Innovative and Sustainable Automotive Industry of the 2030s and Beyond. The Report of the High Level Group on the Competitiveness and Sustainable Growth of the Automotive Industry in the European Union (GEAR 2030)*, Bruxelles.
- European Commission (2022a) *COM(2022) 45 Final Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A Chips Act for Europe*, Bruxelles.
- European Commission (2022b) *COM(2022) 46 Final 2022/0032. Proposal for a Regulation of the European Parliament and of the Council Establishing a Framework of Measures for Strengthening Europe's Semiconductor Ecosystem (Chips Act)*, Bruxelles.
- European Council (2020) *EUCO 10/20 CO EUR 8 CONCL 4, Special meeting of the European Council (17, 18, 19, 20 and 21 July 2020) – Conclusions*, Bruxelles.
- European Parliament (2021) *The Future of EU Automotive Sector*, Bruxelles.
- Follis, M. and Enrietti, A. (2001) 'Improving performances at the second tier of the automotive supply chain: a draft case study of an innovative initiative in the Italian car industry', *Int. J. Automotive Technology and Management*, Vol. 1, No. 4, pp.449–458.
- Gaddi, M. (2021) 'Italian automotive sector and its transition to green vehicles', in Rosa Luxemburg Stiftung-Brussels Office (Ed.): *The Need for Transformation. Challenges for the International Automotive Sector*, Rosa Luxemburg Stiftung, Bruxelles, pp.57–90 [online] <https://www.rosalux.eu/en/article/2066.the-need-for-transformation.html>.
- Goracinova, E., Galvin, P. and Wolfe, D.A. (2022) 'Emerging models of networked industrial policy: recent trends in automotive policy in the USA and Germany', *Int. J. Automotive Technology and Management*, Vol. 22, No. 1, pp.29–51.
- Italian Government (2021a) *Description of Reforms and Investments – COMPONENT M1C2: Digitalization, Competitiveness of the Production System*, Technical Annex to the Italian NRRP.
- Italian Government (2021b) *Description of Reforms and Investments – COMPONENT M2C2: Renewable Energy, Hydrogen, Power Grids and Sustainable Mobility*, Technical Annex to the Italian NRRP.
- Jurgens, U. and Krzywdzinski, M. (2009) 'Changing east-west division of labour in the European automotive industry', *European Urban and Regional Studies*, Vol. 16, No. 1, pp.27–42.
- Klebaner, S. (2020) *Normes environnementales européenne et stratégie des constructeurs automobile. Un jeu coopératif aux résultats ambigus*, Presses des Mines, Paris.

- Krzywdzinski, M. (2014) 'How the EU's eastern enlargement changed the German productive model. The case of the automotive industry', *Revue de La Régulation*, Vol. 15, No. 1, pp.1–20.
- McKinsey & Company (2016) *Automotive Revolution – Perspective Towards 2030. How the Convergence of Disruptive Technology-driven Trends Could Transform the Auto industry*.
- Pavlinek, P. (2020) 'Restructuring and internationalization of the European automotive industry', *Journal of Economic Geography*, Vol. 20, No. 2, pp.509–541.
- Pirone, F. and Zirpoli, F. (2015) 'L'Alfa Romeo e l'industria automobilistica italiana', in Russolillo, F. (Ed.): *Storia dell'IRI. Vol. 5, Un Gruppo singolare. Settori, bilanci, presenza nell'economia italiana*, pp.57–90, Editori Laterza, Bari.
- Pwc (2017) *Five Trends Transforming the Automotive Industry*.
- Ramirez Perez, S. (2010) 'Automobile standardization in Europe. Between technological choices and neo-protectionism', in *Les trajectoires de l'innovation technologique et la construction Européenne. Des voies de structuration durable?*, pp.187–204, Peter Lang, Bruxelles.
- Russo, M., Alboni, F., Carreto Sanginés, J., De Domenico, M., Mangioni, G., Righi, S. and Simonazzi, A. (2022) *The Changing Shape of the World Automobile Industry: A Multilayer Network Analysis of International Trade in Components and Parts*, Working Paper No. 173, Institute for New Economic Thinking.
- Saraceno, P. (1955) 'IRI: its origin and its position in the Italian Industrial Economy (1933–1953)', *The Journal of Industrial Economics*, Vol. 3, No. 3, pp.197–221.
- Stocchetti, A., Trombini, G. and Zirpoli F. (Eds.) (2013) *Automotive in Transition. Challenges for Strategy and Policy*, Edizioni Cà Foscari, Venezia.
- Sturgeon, T.J., Memedovic, O., Biesebroeck, J.V. and Gereffi, G. (2009) 'Globalisation of the automotive industry: main features and trends', *Int. J. Technological Learning, Innovation and Development*, Vol. 2, Nos. 1/2, pp.7–24.
- Unioncamere and Prometeia (2015) *Il settore automotive nei principali paesi europei. Ricerca promossa dalla 10 Commissione Industria, Commercio, Turismo del Senato della Repubblica*.

Notes

- 1 Source: Anfia, Studi e statistiche.
- 2 See STM's financial statements where the development strategies of this technology are made explicit.
- 3 MED, Directorate-General for Incentives to Enterprises, Directorial Decree, 25 March 2022.
- 4 Decree of the MED of 9 December 2014 – and subsequent amendments and additions.
- 5 The Italian National Development Bank.