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Working Paper 01/24

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Abstract

L'obiettivo di questo working paper è quello di approfondire il ruolo del Piano Nazionale di Ripresa e Resilienza (PNRR) come strumento di politica industriale nell'ambito della NextGenerationEU, nonostante il limitato riferimento esplicito a una strategia industriale. Il PNRR è emerso in un momento unico per l'Unione Europea (UE), caratterizzato dall'interruzione temporanea del Patto di Stabilità e Crescita e dall'allentamento delle restrizioni sugli aiuti di Stato, che hanno collettivamente ampliato le opportunità di intervento pubblico. Ciò segna un cambiamento significativo rispetto all'enfasi ideologica post-1990 sul mercato rispetto al coinvolgimento dello Stato, in particolare in Italia, dove le riduzioni della spesa in conto capitale dal 2009 hanno limitato le infrastrutture pubbliche. Il presente documento analizza il panorama attuale evidenziando il potenziale di un approccio più efficace alla strategia industriale utilizzando gli investimenti pubblici. Concentrandosi su alcune componenti della Missione 1 e della Missione 4, si intende sintetizzare la direzione della politica industriale del PNR, compreso il rafforzamento delle zone economiche speciali (ZES) istituite nel 2017.

Abstract

The objective of this working paper is to investigate the role of National Recovery and Resilience Plan (NRRP) as an industrial policy tool within the NextGenerationEU framework, despite limited explicit reference to an industrial strategy. The NRRP emerged during a unique moment for the European Union (EU), characterized by the temporary halt of the Stability and Growth Pact and the easing of state aid restrictions, which have collectively expanded public intervention opportunities. This marks a significant shift from the post-1990s ideological emphasis on market over State involvement, particularly in Italy, where reductions in capital expenditure since 2009 have constrained public infrastructure and private investments. This paper delves into the current landscape highlighting the potential for a more effective approach to industrial strategy using public investment. By focusing on some components of Mission 1 and Mission 4, we aim to describe the NRRP's industrial policy direction including reinforcing the special economic zones (SEZs) established in 2017.

Indice

1 Introduction[1]

The National Recovery and Resilience Plan (NRRP), the Italian declination of NextGenerationEu, can be seen as an important tool of industrial policy although the expression is mentioned explicitly, as we will show, only once.

NextGenerationEU was launched in an unprecedented context for the EU: the temporary halt of the Stability and Growth Pact (SGP) and the ban on state aid to firms and companies, one of the cardinal principles on which the European single market rests. These two derogations from the previous *status quo* have allowed States within the EU to glimpse unprecedented room for manoeuvre in public intervention and public policy design. Among these, industrial policy certainly deserves a prominent place, as it also plays a very important role in accompanying the structural transformation processes of companies and industries: innovation, company size, technological specialisation. Throughout Europe, the interest in industrial policies has declined since the 1990s, following a decisive ideological shift according to which they should be strongly limited, relying exclusively on the protection of competition and a limited role for fiscal policy. Italy had also followed this path. Especially from 2009 onwards, capital expenditure in Italy has been reduced both with reference to public infrastructure investments and with reference to the component of government investments grants to private firms. Certainly, these grants, for many reasons, are not a panacea, and should be used with caution within a strategic industrial policy approach. However, there is a very clear difference with what happened in the 1960s and 1970s both in Italy and in Europe where an industrial structure was created both thanks to these instruments and to public investment as part of a

[1] A shorter version of this article has been published in Cerniglia, F., Saraceno, F. (eds) (2024), *Investing in the Structural Transformation, European Public Investment Outlook 2024*, Open Book Publisher, Cambridge: UK.

clear vision of economic growth also guided by industrial policy. Moreover, the recently reformed SGP greatly reduces the room for fiscal manoeuvring for certain States which will have to implement sound fiscal consolidation policies (i.e. Italy and France). This new fiscal scenario will likely have an impact on the effectiveness of European industrial policies as it may distort the output of the investment decisions made under the NextGenerationEU programme in a fundamentally different fiscal regulatory framework.

In this work we attempt to illustrate what (and if) an industrial policy direction can be traced in the Italian NRRP, looking in particular at Mission 1 (*Digitalisation, innovation, competitiveness, culture and tourism*) and Mission 4 (*Education and Research*). This includes also the strengthening (with investments and reforms) of the SEZs established in 2017.

2 NRRP and Industrial Policy

2.1 A European perspective

As for the industrial policy profiles outlined in the NRRP, we try to frame them in the broader field of European industrial policy: a rich topic, analysed in the economic literature and firmly anchored in an international debate that has been evolving since at least the 1970s and 1980s[2].

Since the beginning of the 21st century, many changes have occurred globally in the sphere of industrial policy. The European Union (EU) has seen its share of changes in both theory and practice in this important area of public policy. The picture of the EU that emerges is

[2] For a literature survey, among many others: Barbieri Goés M. G. and Viesti G. (2024); Mosconi F. (2015); Pianta M., Lucchese M. and Nascia L. (2020); Bianchi P. and Labory S. (2016); Andreoni, A. (2017).

one of light and shadow. Does manufacturing Europe need an industrial policy? If so, what kind? The answer is yes, especially if one takes into account what is meant today by a 'new industrial policy', which is different from the one that prevailed in the last decades of the XX century. The recent definition offered by Réka Juhász, Nathan Lane and Dani Rodrik (2023) is an excellent description of the state of the art:

> "We define industrial policies as those government policies that explicitly target the *transformation of the structure of economic activity* in pursuit of some public goal (…) *The goal is typically to stimulate innovation, productivity, and economic growth*. But it could also be to promote climate transition, good jobs, lagging regions, exports or import substitution (…) *Since IP targets structural change*, a key characteristic is the exercise of choice and discretion by the public authorities: 'we promote *X* but not *Y*', though the latter part of this statement is typically left implicit." (emphasis added)

Before delving into the measures envisaged by the Italian NRRP that can be framed within an industrial policy design, it seems useful to briefly retrace the stages of the evolution of industrial policy as conceived by the EU, mainly due to the driving role played by the European Commission. The Brussels-based approach that has emerged from the early 2000s to the present can be summarised in three phases (Mosconi 2022): (i) *Integrated approach*; (ii) *Holistic approach*; (iii) *Twin transition*.

The first phase was the *Integrated approach* developed by the Commission between 2002 and 2014, during the presidencies of Romano Prodi and Manuel Barroso. There was, from an institutional and economic point of view, the Eastern enlargement of the single

market towards countries that, in more than one case, boasted significant industrial-manufacturing traditions.

The basic idea was therefore that of an industrial policy capable of leading towards the creation of a genuine pan-European, continental market, where manufacturing industry could continue to play its proper role: that is, the motor [engine] of technological change and openness to the international markets. A manufacturing industry, of course, that had to try to meet the dual challenge of the beginning of the century: the New Economy and New globalisation.

At the same time, it is a policy that must take into account the specific needs and characteristics of individual industrial sectors and must therefore be applied differently. Hence, the word *integrated* means a mix of the traditional horizontal approach (policies for all sectors, e.g. antitrust, deregulation, etc.) and vertical applications (i.e., for individual sectors considered strategic from a technological point of view).

As a matter of facts, when President Prodi presented his 2002-Communication (Prodi 2003), he offered an initial list of suitable industrial sectors as a breeding ground for the growth of the so-called European Champions: i) *biotechnology and life sciences*; ii) *information and communication technology* (where our leadership in mobile communications is at great risk); iii) the so-called *hydrogen economy* (as a means of alternative energy storage and transfer); iv) *the defence industry* (still fragmented in the absence of will to build a truly integrated European defence system); v) *our aerospace* (still uncertain between civil and security applications).

This series of Communications continued from 2005 with the new Commission, which in the meantime took office under the chairmanship of José M. Barroso, which takes up and further develops

the concept of an integrated approach, linking it more directly to the Lisbon Strategy (European Commission, 2005). Towards the final part of President Barroso's double mandate (2012-2014), the European Commission completed its design by identifying six priority action lines (European Commission 2012). Following the official terms, these are: i) *advanced manufacturing technologies for clean production*; ii) *key enabling technologies* (KETs); iii) *bio-products*; iv) *sustainable industrial policy, construction and raw materials*; v) *clean vehicles and ships;* vi) *smart grids*.

The subsequent Communication (European Commission, 2014a) confirmed these six lines of action. In addition, in a perhaps overly dirigiste manner, it reflected on the major theme of reversing industrial decline by setting a precise percentage to which the contribution of manufacturing industry to GDP was to be restored by 2020, that is 20 per cent at EU level (a target that has not been reached, according to Eurostat data)[3].

The second phase, referring to our excursus, is that of the Juncker Presidency (2014-2019). Building on President Jean-Claude Juncker's State of the Union Address (Juncker, 2017) as well as the 2017 Communication (European Commission, 2017), what became clear was a further evolution of the integrated approach. In other words, it moved towards a *Holistic approach* to industrial policy that would bring – we quote – "*all existing and new initiatives – horizontal and sector-specific – together in a single strategy*". Besides the measures now part of the *acquis communautaire* (above all, the Single market),

[3] According to EUROSTAT data, the contribution of manufacturing industry to GDP was 14,62% in 2020 https://ec.europa.eu/eurostat/databrowser/view/NAMA_10_A10__custom_2584492/bookmark/table?lang=en&bookmarkId=397c5a53-0d6c-4381-854b-7d7c0cb04f0d)

the main strategic (or vertical) instruments of this new strategy can be summarised as follows:

i. to implement *sector-specific measures, such as in the steel, space and defence industries and place a strong focus on key enabling technologies*;

ii. to strengthen leadership in *green production and clean energy technologies,* with a special emphasis on *low-emission mobility* and, within this framework, on the automotive industry and the *missing links in the relevant value chains (investments in batteries* are considered of *strategic importance*);

iii. to base the *competitiveness of the manufacturing industry on Europe's strengths and assets in strategic value chains in new technologies and make them more robust*.

The Commission Communication on Important Projects of Common European Interest (IPCEI) (European Commission, 2014b) was designed for such strategic projects. Examples of value chains of strategic importance for Europe include energy storage and electronic chips.

Along the same vein is the document entitled Industrial Policy Strategy, part of the broader State of the Union 2017, which within the specific sectoral measures (as in the case of space, defence, automotive and steel) expressly speaks of a *strong focus on key enabling technologies: a group* – it is specified – *of six technologies*.

The mandate of the Junker Commission was characterised, in particular, by the launch in 2015 of the Investment Plan for Europe (the so-called Junker Plan). The first of its three pillars is the European Fund for Strategic Investments (EuSEF), which provides an EU guarantee in order to mobilise private investment. In doing so, it works

together with its strategic partner, the European Investment Bank Group (EIB), and the EIB's cooperation with the National Promotion Institutes, Cassa Depositi e Prestiti (CDP) in the case of Italy, is also significant.[4]

The third stage of our excursus, running from 2019 to the present, is that of the von der Leyen presidency (2019-2024)[5]. Right from the start, with the two speeches to the European Parliament delivered in July and November 2019 the central role that emerges is that of the *dual transition, ecological and digital* (von der Leyen 2019a, 2019b). And this in order – the argument goes on – to *strengthen our industrial base and our innovation potential*.

There is more, because just on the eve of the declaration of a state of emergency for the pandemic (COVID-19), on 10 March 2020, the von der Leyen Commission approved its first communication on industrial policy: *A new industrial strategy for Europe* (European Commission 2020).

In it, reference is firstly made to the *dual, ecological and digital transition* [that] *will touch every component of the economy, society and industry*. Secondly, it recalls the fundamental act already approved by the new Commission (December 2019): the European

[4] The numbers achieved with the EuSEF, since its establishment in 2015, are indeed significant. The targets for the mobilisation of investment, gradually set (it started with a target of 315 billion euro for mid-2018, and then increased to 500 billion for 2020) have been reached and exceeded.

[5] As we write, Ursula von der Leyen, president-designate of the European Commission after the European elections of June 2024, has obtained the approval of the European Parliament.

Green Deal, which is *Europe's new growth strategy* (European Commission, 2019)[6].

Summing up: two characteristics emerge from the approach that has been consolidated in Brussels over more than 20 years of thinking on the new industrial policy (in particular, by the European Commission): the emphasis on technological trajectories and/or strategic sectors and a supranational cooperation.

In so doing, the *Industrial Alliances* and the *Important Projects of Common European Interest* (IPCEI) appear to be the crucial instruments in the strategy pursued by the European Union and focused on public-private partnerships at the EU level.

Table 1 summarises the projects launched so far: 10 IPCEIs and 11 Alliances.

[6] It goes beyond the scope of this paper to analyse the *Green Deal*. For an overall overview see Cerniglia, F. and Saraceno, F. (eds.) (2022), Greening Europe. 2022 European Public Investment Outlook.

Table 1. European supranational industrial cooperation

*Important Projects of Common European Interest (IPCEI)**	*European Industrial Alliances***
First on Microelectronics (2018)	Zero-Emission Aviation
First on Batteries (2019)	SMRs (Small Modular Reactors)
Second on Batteries (2021)	Raw Materials
First on Hydrogen (2022)	Solar Photovoltaic Industry
Second on Hydrogen (2022)	Clean Hydrogen
Second on Microelectronics and Communication Technologies (2023)	Battery
Next Generation Cloud Infrastructure and Services (2023)	Circular Plastics
Third Hydrogen (2024)	Industrial Data, Edge and Cloud
Fourth Hydrogen (2024)	Processors and Semiconductors Technologies
Med4Cure (2024)	Renewable and Low-Carbon Fuels Value Chain
	Critical Medicines

(*) *'Nine of these IPCEIs concern predominantly R&D as well as projects of first industrial deployment. One IPCEI is dedicated to infrastructure. The increasing number of participating Member States and companies shows a positive trend'* (https://competition-policy.ec.europa.eu/state-aid/ipcei/approved-ipceis_en).

(**) *'Industrial Alliances are a tool to facilitate stronger cooperation and joint action between al interested partners'* (https://single-market-economy.ec.europa.eu/industry/industrial-alliances_en). *Source*: adapted from European Commission's website (accessed on 30 Aug 2024).

A final remark on such European perspective. The change in attitude that we have tried to highlight (i.e., not only horizontal measures but also vertical applications) is also confirmed by the approval of the *Chips Act*: the *European Semiconductor Act* with a budget of €40 billion – approved by the Commission on 8 February 2022 (European

Commission, 2022)[7]. All in all, we have tried to summarize at least two emerging concerns: one of method, the other of substance.

The first concern is about whether or not the "mission-oriented R&I policies" are implemented in the EU. A growing consensus has arisen on this method as many documents of the European Commission demonstrate. In this perspective, Mariana Mazzucato (European Commission, 2018) pointed out a formal definition:

> "*Mission oriented policies can be defined as systemic public policies that draw on frontier knowledge to attain specific goals or 'big science deployed to meet big problems*".

In her 2018-Report she concludes that

> "*Missions are both a means of setting economic growth in the direction of where we want to be as a society and a vehicle we can use to get there*".

Given the many programs launched at EU level since 2002 and their fragmentation, there is room for maneuver to rationalize both the objectives and the instruments.

In terms of substance, which is the second concern, it is a matter of resources for mission-oriented policies, given their focus on the technological frontier. The comparison between the Biden's

[7] Semiconductors also form the subject of other instruments used by the Union to strengthen its 'strategic autonomy', such as the first IPCEI on microelectronics launched in 2018.

Administration Act(s) for the green economy and the digital revolution – e.g. the IRA, *Inflation Reduction Act,* of August 2022 (White House, 2022) –, and the European ones has been mentioned several times in the policy debate in recent years. The order of magnitude of the IRA ($369 billion from the Federal Government) stands in contrast to the approximately €40 billion (European plus national funds) of the abovementioned *Chips Act*.

NGEU certainly represents a paradigm shift for the EU. Although it was originally conceived as a post-Covid19 stimulus package, its mission-based articulation could form the architecture of a future European industrial policy.

After the approval of the NGEU (European Commission, 2021), each Member State has been obliged to prepare its own National Recovery and Resilience Plan (NRRP). We now turn our attention to the Italian one in order to better understand what Industrial policy measures it contains, if any[8].

2.2 The NRRP and Industrial Policy

Italy is the EU's second largest manufacturer and also one of its biggest exporters. Industrial policy is therefore a key issue.

The excursus – seen from Brussels – on industrial policy has highlighted three passages, but the reconstruction could be even more detailed. What is important is not to lose sight of the overall view of

[8] A general overview of the Italian NRRP is avalaible at https://www.italiadomani.gov.it/content/sogei-ng/it/en/home.html . For data on monitoring, reporting and control of the measures and projects financed, refer to https://www.italiadomani.gov.it/content/sogei-ng/it/en/catalogo-open-data.html?orderby=%40jcr%3Acontent%2FobservationDateInEvidence&sort=desc

this policy area, which remains important in the European tradition. The image of an industrial policy as the result of a triangle is timely and effective: competition policy, commercial (trade) policy, technology policy. These are its three sides. As already noted (Mosconi, 2015):

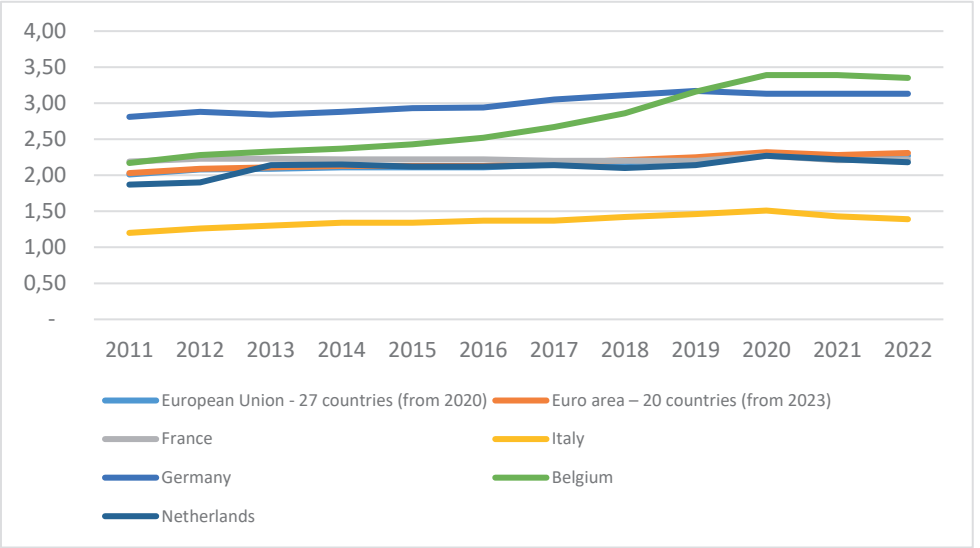
> "*Today's core issue, more than in the past, is how to envisage policies for the competitiveness of European industry in this period of new technological revolutions [...], and the expansion of international markets in which to compete [...]; policies that here in Europe call into play R&D investment, innovation and human capital. In a word: the third side of the aforementioned 'triangle'. A suitable path to reform should be – to our mind – that the new industrial policy we are beginning to glimpse in the EU must lean towards a definite reinforcement of the triangle's third side ('technology policy') at a pan-European level, without weakening the other two sides ('competition' and 'commercial' policies)*".

The strengthening of the technology policy is, today, even more urgent. Focusing our attention on the post-pandemic, the European framework is evolving and it manifests its influence on all Member States. There is a direct link between the two plans, ensured – to borrow the language of jurists – by the combined arrangement of the NGEU and the various NRRPs developed at national level.

The interpretative key that we consider most appropriate in examining our NRRP from the point of view of industrial policy is that of investment in knowledge. In comparison with the other major founding countries of the EU, Italy has for some time shown more than one weakness both in terms of investments (think of R&D and

education expenditure) and in terms of fragmentation of interventions and the proliferation of deputed bodies.

Figure 1. R&D investment (all sectors) %GDP



Source: own elaboration based on Eurostat data 2023 (https://ec.europa.eu/eurostat/databrowser/view/tsc00001/default/table?lang=en&category=t_scitech.t_rd)

If the strengthening of the technology policy (the third side of the triangle) is the essential one for shaping a new industrial policy, what are the next steps?

A very interesting perspective, born at the European level, is that of *Technical-scientific platforms* (Quadrio Curzio, Silvani, Fortis and Cerniglia, 2023). Under this perspective, we will attempt to assess what the Italian NRRP contains from the point of view of industrial policy, considering it as a policy aimed at structurally change the

economy: we will recall the definition by Rodrik et al. (2023) at the beginning of the paragraph 2.1[9].

Let us begin by saying that the NRRP, as is widely known, is divided into six Missions, which in turn are subdivided into 16 Components; all in all, a total of over 200 funded interventions. Another important feature, which is also well known, is that of a Recovery Plan based on *investments and reforms*[10] .

An initial reading of the Italian NRRP is made possible precisely by the reference to the individual Missions; after this, we will turn our gaze to the Recovery Plan's components that, in our shared opinion, have most to do with industrial policy.

Mission 1 is dedicated to *Digitalisation, innovation, competitiveness, culture, and tourism* (€41.34 billion, or 21.26% of the total amount of the NRRP); Mission 2 concerns *Green revolution and ecological transition* (€55.52 billion, or 28.56% of the total); Mission 3, *Infrastructure for sustainable mobility* (€23.74 billion, or 12.21% of the total); Mission 4 is dedicated to *Education and Research* (€30.09 billion, 15.48% of the total); Mission 5 concerns *Inclusion and*

[9] In Mosconi (2015), the so-called 'Jacquemin-Rodrik Synthesis' was outlined, juxtaposing the work of the late Alexis Jacquemin (his 1987 book, The New Industrial Organisation, is fundamental) and of the Kennedy School of Government professor, author in 2004 of the seminal paper that, in the international literature, reopened the debate around industrial policy after years (in truth, decades) of substantial silence on the subject.

[10] For an initial analysis of the NRRP considering both the efficiency side and the equity side, see Mosconi (2021). On reforms, the 'horizontal or contextual' ones are, first of all, the following two: the reform of public administration and the reform of the justice system. Then there are, again within this framework, two 'enabling reforms': measures to simplify and rationalise legislation; promotion of competition. On the other hand, the 'sectoral reforms' are contained within the individual Missions.

Cohesion (€16.92 billion, 8.70% of the total) and, finally, Mission 6 on *Health* (€15.62 billion, 8.03% of the total)[11].

Here, we will focus on the intertwining between competitiveness, research and innovation Components.

In such a broad context, the question is: what is the role that, in our country, industrial policy plays (or does not play) in the path outlined by the Recovery Plan?

The expression industrial policy – as has been noted by many – does not recur often; indeed, to be accurate, it shows only once and, in particular, in Component 2 of Mission 1 where funding is provided for the investment component *Industrial sector and internationalisation policies* (as we shall see in Table 2, the allocation is €1.950 billion). Of course, no one can or wants to stop at just words in such a broad and, at the same time, complex document.

Matteo Lucchese and Mario Pianta (2021), reflecting precisely on the NRRP and industrial policy, write:

> "*The NRRP envisages various interventions in favour of the production system. The most significant nucleus of measures can be found in two specific Components of the NRRP: Digitisation, Innovation and Competitiveness in the Production System (Mission 1) and From Research to Enterprise (Mission 2)*".

In the NRRP we read that:

[11] All amounts are those resulting from the currently online version of the NRRP available at https://www.italiadomani.gov.it/content/sogei-ng/it/it/home.html (last accessed 9-9-2024).

(i) *Component 2 of Mission 1 (M1C2) has the objective of strengthening the competitiveness of the productive system by reinforcing its rate of digitalisation, technological innovation and internationalisation through a series of interventions that are complementary to each other*;

ii) *Component 2 of Mission 4 (M4C2) aims to support investments in R&D, promote innovation and the dissemination of technologies, and strengthen skills, fostering the transition to a knowledge-based economy*.

Table 2 gives an account of the planned funding for each of the two Components considered. The latter, as well as their amounts, are those resulting from the NRRP currently in force (Meloni government –at the end of 2024), but the differences with respect to the first version of April 2021 (Draghi government), approved by the European Commission, are minimal.

The total amounts, in both the first and second versions of the Recovery Plan, are still in the order of €24-25 billion for M1C2, and around €10 billion for M4C2. In the version currently in force, the amounts of the 'Supplementary Plan' are also expressly indicated by the government: they are €5.88 billion in the case of mission 1 and €1.5 billion for mission 4[12].

Altogether, we are talking of about 17 investments (out of which dozens and dozens of interventions/actions) for a total of €34.181 billion, approximately 17-18% of the total resources allocated by the NRRP.

[12] The National Plan for Complementary Investments (PNC), established by Decree-Law No. 59/2021, is designed to supplement, with national resources, the interventions of the National Recovery and Resilience Plan (NRRP), totalling €30.6 billion for the years 2021 to 2026.

Table 2. Financing for the production system: the two crucial components

M1C2 = €24,980BN	**M4C2 = €9,201BN**
Microelectronics Innovation and Technology (€0,340BN)	Creating and strengthening 'innovation ecosystems', building 'territorial R&D leaders' (€1,243BN)
Investment in Industrial Property System* (€0,030BN)	Funding of projects submitted by young researchers (€0,210BN)
Industrial supply chain policies and internationalisation (€1,950BN)	Start-up funding (€0,400BN)
Ultra-fast networks - Ultra-wideband and 5G (€5,292BN)	Fund for the realisation of an integrated research and innovation system (€1,578BN)
Supporting the ecological transition of the production system and strategic supply chains for net zero tech (€2,500BN)	Introduction of innovative doctorates that meet the innovation needs of companies and promote the recruitment of researchers from companies (€0,510BN)
Satellite technologies and space economy (€1,487BN)	IPCEI (€1,500BN)
4.0 transition (€13,381BN)	Partnerships – Horizon Europe (€0,200BN)
	Partnerships extended to universities, research centres, companies and funding for basic research projects (€1,610BN)
	Strengthening and thematic and territorial extension of technology transfer centres for industry segments (€0,350BN)
	Strengthening research structures and creating R&D 'national champions' on *key enabling technologies* (€1,600BN)

(*) Listed as 'reform".

Source: 'Italia Domani' (https://www.italiadomani.gov.it/content/dam/sogeing/documenti/Quinta%20Relazione%20al%20Parlamento_Sezione%20II.pdf).

Coming back with our thoughts to our basic question, we ask ourselves: what is, given this approach (type of interventions and related funding) the role of industrial policy for the period 2021-2026? We can say that there are two diametrically opposed visions: a

minimalist one, which assigns only the ad hoc investment (the €1.950 billion investment) to this policy; and an all-encompassing vision, which includes both the above-mentioned components (totalling €34.2 billion). It is reasonable to say that, between these two extremes, there is a middle way; that is, a more balanced view, which fortunately is widely dominant in the debate that emphasises the strategic nature of some instruments. The (partial) differences in the assessment of NRRP and Industrial Policy lie precisely in this greater or lesser strategic nature of the investments (which, given the approach shared by all, must contribute to raising the level of investment in knowledge).

Lucchese and Pianta's (2021) assessment of the joint reading of the two Components in question highlights more than one critical element:

> *"The analysis of the individual instruments highlights two basic choices made by the government in drafting the NRRP: firstly, it was decided to focus on already existing instruments and institutions – in particular, on strengthening the business incentive instruments already in force; secondly, there is a glimpse of an attempt to align – at least in part – national industrial objectives with a European logic, both in terms of instruments (such as the IPCEIs and the Horizon funds) and in terms of strategic sectors to be supported (space, cloud, microelectronics) [... What is lacking is an industrial policy strategy capable of integrating the various lines of action and developing skills and jobs in Italy, guaranteeing a significant improvement in the supply of goods, services and technologies in the face of the – potential – demand triggered by the measures envisaged by the NRRP"*[13].

[13] Along the same lines, Pianta (2021), again commenting on the NRRP that had just been published at the time, wrote as follows (June): 'What is not to

If we consider this fundamental part of the NRRP in the broader perspective opened up, at EU level, by the *techno-scientific platforms*, the judgement can take on – in our opinion – a less problematic and more positive connotation.

The Cranec of the Catholic University has worked intensively on this EU instrument, recalling first of all how (Cerniglia, Silvani, Fortis and Quadrio-Curzio, 2023):

> "*The European technology platforms understood as ETPs, have constituted, in their variety, a pilot instrument to rationalise scientific research activity by carrying it out in a public-private cooperative environment with the aim of helping to define the economic-strategic priorities of all industrial sectors [...]*".

An initial taxonomy has led to the emergence of numerous models for techno-science platforms: ETPs (post-2000, Lisbon Agenda) are just one of them[14]. They have one salient feature (Cerniglia, Silvani and Quadrio Curzio, 2023):

> "*Because they were set up to chart the strategic R&D path for key European sectors and with the participation of*

be found in the NRRP is an industrial policy strategy to expand the country's production capacities in sectors such as those mentioned [electronics and IT goods and services that Italy does not produce] and in activities related to the ecological transition.

[14] Other models in the taxonomy elaborated by Cranec (Cerniglia et al., 2023) include: pre-Lisbon Platforms; JRC; EIT, EIC. In fact, as already pointed out by Barbieri and Gahn (2023), 'ETP-European Technologic Platforms, as such, do not enjoy a shared definition and the term over time has been associated with different interpretations'.

potential stakeholders, the evolutionary paths that have been taken have been uneven and have resulted in performance gaps that have also been accentuated. However, many of these realities work together with the European Commission and focus on strategic fields – such as food, biotechnology, chemicals and nanotechnology – where Europe's future growth, competitiveness and sustainability depend on major technological breakthroughs".

In this broader perspective, which is genuinely European, Italy's NRRP (part of the NGEU) represents a great opportunity, but it requires the construction of a potentially feasible platform (or network) facility.

What can be said about strategic initiatives (ascribable to M4C2) such as the National Centres (Research Champions in KETs), Extended Partnerships and Innovation Ecosystems since have they been implemented?

Resta (2023) emphasises first of all the fact that, in designing these networks, it was decided to take a cue from a model already tried and tested at European level: the KICs (Knowledge and Innovation Communities), networks that – we quote – "*link education, research and innovation*". And again:

"*Their [the networks and/or platforms, ed.] operation is the key to nurturing organised, coherent and continuous collaboration between research centres, large companies, small and medium-sized enterprises, start-ups and local institutions [...] There is, not least, a deep gap between our country and Europe that we cannot be reduced to a minor offence: 'in terms of technology transfer we are still too weak [...] We therefore need strategies, funds and qualified personnel capable of identifying potential innovations*

developed within the academy and transforming them into products and services that generate economic returns for investors".

What applies to this part of the NRRP is the same as for the Recovery Plan as a whole: the implementation phase is crucial, also in light of a timeframe that is far from being endless for concluding the investments (in 2025 and 2026, depending on the case).

In Table 3 we list the five *National Centres* for cluster research and the eleven *Innovation Ecosystems at territorial level* selected by the MUR (*Ministry of University and Research* – Italian acronym) in June 2022 after the assessment of the applications received on the calls published a few months earlier, referring to the Ministry's website for the other measures (*Foreign Partnerships* and *Research Infrastructures*)[15].

Overall, the table suggests that the most relevant technological trajectories of our time are part of the challenge launched with the NRRP. The instruments adopted and the chosen areas of action seem to confirm that, especially through Component 2 of Mission 4, many of the ingredients needed to build true platforms in the European meaning of the term are present. The refinement work – now that Centres, Ecosystems, Partnerships, Research Infrastructures have been established – must be carried out on the links between the

[15] For more detailed information, in addition to the NRRP portal, 'Italia Domani', which has been mentioned several times, for these investments, see the website of the Ministry for Universities and Research (https://www.mur.gov.it/it, last access 10-9-2024) and, in particular, the press releases of 15/06/2022 ('NRRP: the 5 national research centres are born'); 28/06/2022 ('The impact of knowledge thanks to a new way of doing research and innovation'); 03/08/2022 ('14 partnerships for research activities selected').

individual phases. It is a matter of systemising all those realities that have been financed through the NRRP calls for proposals in order to create real models of techno-scientific platforms capable of independently surviving beyond the limit of the initial public capital funding and becoming real 'basins' of innovation and development (Barbieri&Gahn, 2023).

Table 3. The Impact of Knowledge: Centres and Ecosystems*

5 NATIONAL CENTRES *For suplly chain research*	*11 INNOVATION ECOSYSTEMS* *At territorial level*
Agritech National Centre	Ecosystem Innovation, digitisation and sustainability for the widespread economy in Central Italy
Biodiversity National Centre	TECH4YOU ecosystem
National Centre for Simulation, Computation and High Performance Data Analysis	Ecosystem for Sustainable Transition in Emilia-Romagna
National Centre for Sustainable Mobility	MUSA ecosystem
National Centre for Gene Therapy and Drug Development with RNA Technology	INEST ecosystem
	NODES ecosystem
	RAISE ecosystem
	Roma Tecnopolo ecosystem
	SAMOTHRACE ecosystem
	e.INS ecosystem
	THE ecosystem

(*) The Ministry notes how more than €4.3 billion were allocated through competitive procedures for these two types of investment, plus a third called 'Research and Technology Infrastructure' (here the number is high, 49).

Source: adapted from MUR (2022), NRRP, MUR: l'impatto della conoscenza grazie a un nuovo modo di fare ricerca e innovazione, Roma, 28 giugno.

Reading the NRRP from the angle of industrial policy, the story does not end there. It is worth remembering that Italy found itself having to come to terms both with the consequences (medical and economic-

social) of the pandemic and with structural weaknesses coming from afar (think of the insufficient rate of productivity growth).

In general, the NRRP could not (in the drafting phase) and cannot (in the implementation phase) be seen as a complete and exhaustive answer to the proverbial *chaier de doléances*, widely known in every sphere of collective life, but rather as an extraordinary opportunity to deeply change some of the country's economic and social institutions; a country that has more than one problem on the efficiency side (without forgetting the equity side).

2.3 Investment in knowledge and in key (or strategic) sectors

The overall picture sketched above through the combination of the interventions on competitiveness (M1C2) and industrial research (M4C2), would have other elements, in addition to the platforms, worthy of further investigation. Let us think of the Transition 4.0 Plan and the complementary Transition 5.0 Plan. The call that the Ministry of Enterprise and Made in Italy launched on August 2024, although it has a very substantial budget (6.5 billion euro), in the opinion of the business community has two shortcomings: it came out too late, leaving little time for companies to prepare their plans; its procedures are too complex. The possibility of replicating the success of the (original) plan Industry 4.0 (2016-2017 onwards) cannot be taken for granted.

The whole framework must be completed by still looking at Mission 4 (Education and Research), but in its first Component: namely Strengthening the supply of education services: from kindergarten to university. It addresses the issue of the education of young people throughout their (potential) education. The relevant point, for our purposes, is the one that goes by the name of Development of the tertiary vocational training system; that is, the increase in Higher Technical Institutes (ITS – Italian acronym) for more widespread

vocational training. The NRRP thus illustrates the objective of this investment, for which the allocation amounts to €1.5 billion[16]:

> "*Increase the number of ITSs and strengthen their scientific facilities and laboratories also through 4.0 technology while simultaneously investing in teachers' skills. The investment will include the creation of a national digital platform that allows students to find out about job offers for those who obtain their professional qualification*".

This investment in ITSs should be fully valorised, albeit in the knowledge that it will not be the solving investment for the age-old issue of mismatch in the labour market. However, some Italian experiences concentrated, in particular, in the regions with a higher industrial vocation (think of Lombardy, Emilia-Romagna, Veneto) show that the direction is the right one, but that there is still a long way to go: the employment rate of young people coming out of ITSs is very high, but there are still too few young people who choose this channel of post-diploma studies parallel to university.

The model to look at is the German one – the EU's first manufacturing industry – which has its mainstay in higher technical education (i.e. *vocational training*) centred on the *Fachschule*. In this tertiary education pathway, parallel (and complementary) to the university, are allocated around one million German students; this stands in stark contrast to the few tens of thousands of students who – to date – attend ITS in Italy.

To sum up, the gaps that, in terms of investment in knowledge, separate Italy from the other two great founding countries of the united

[16] See also the NRRP portal, 'Italia Domani': https://www.italiadomani.gov.it/content/sogei-ng/it/it/il-piano/missioni-NRRP/istruzione-e-ricerca.html

Europe – France and Germany – are significant (as we have mentioned some of them along these pages).

To begin bridging these gaps, two strategic lines of action are required – at the very least. The first, is a complete implementation of the NRRP in everything that has to do with industrial policy. The second, closely dependent on the first, is the strengthening of the European perspective in all the interventions (investments and reforms) envisaged in the crucial Missions/Components examined here. Italian companies participating in the IPCEIs (e.g. STMicroelectronics) and the construction of 'techno-scientific platforms' (starting from Centres/Ecosystems/Partnerships) can be seen as the first empirical evidence of the Italy-EU nexuses that the NRRP, part of the NGEU, aims to stimulate.

These are EU-Member State nexuses in the great field of science, research, technological innovation and education, which the Union itself will have to strengthen if it intends to play a further leading role on the international scene, as was lucidly highlighted by the almost simultaneous publication of the Reports edited respectively by Enrico Letta (*Much More Than A Market, 2024*) and Mario Draghi (*The Future of European Competitiveness, 2024*).

The Draghi report, expanding the Letta Report from an operational point of view, highlights at least three factors of weakness in the European economy with respect to the challenges that lie ahead in the near future. First, Europe has a marginal productivity problem when compared to the levels of the US economy, revealing an ever-increasing gap in marginal productivity per capita. In this sense, it calls for decisive intervention in the area of R&I policy funding.

Secondly, the European economy is still heavily dependent on fossil fuels in an international context in which the rapid restructuring of supply chains will make these energy sources dangerously dependent on uncontrollable external variables. The Green Deal should therefore

be an opportunity to be seized to develop new energy technologies capable of making the EU economy self-sufficient and energy independent.

Finally, economic policy efforts should be directed at bridging the chronic dependence on critical raw materials (on which the entire semiconductor and technology industry depends), for which European economies still pay high import prices, also with a view to internal security. This requires investing heavily in international cooperation and geo-strategic partnerships at a time when global political alignments are also being restructured.

3 SEZs: an industrial policy bet for the Mezzogiorno

In this context of renewed interest in industrial policy, a significant measure implemented in Italy in recent years is the establishment of SEZs (Special Economic Zones).

It should be noted that SEZs have been a widely used industrial policy tool for several decades and in various countries around the world. There are some 5,400 SEZs, located in 147 countries, 88% of which are in developing economies. In Europe, just over a hundred are active (2% of the world total), in the United States almost 5% and in Asia 75% of the world total. The lion's share is held by China (47.2% of the world total), which is the most studied case in the literature and also the most successful[17]. In Europe, Poland sets the example by

[17] About these data see Nisticò, R., Prota, F. (2023). Sviluppo industriale per poli? Le zone economiche speciali in Italia e nel NRRP. Stato e mercato, fascicolo 2, agosto. doi: 10.1425/108269

establishing its first SEZ in 1995 and now has 14 SEZs throughout the country[18].

In brief, a SEZ is characterized by being: a) a clearly delimited area where a single administration and governance system is envisaged; b) different kinds of benefits are offered to investors physically settled within the area; c) they can include within them "free zones", i.e., areas that have a customs regime that differs from that applied to the rest of the state territory. This instrument, thus designed, should attract more investment by leveraging comparatively advantageous conditions. For this expectation of higher growth in these areas to have a chance of success, these areas should receive public investment in transport infrastructure. A highly qualified workforce could also be created where specialised SEZs are realised. The economic literature that has studied SEZs[19] has shown that SEZs (i) positively influence the economy of the surrounding territories, even if they do not make exceptional leaps; (ii) governmental and administrative quality, together with proximity to large markets, influence the dynamism of SEZs; (iii) the dynamism of SEZs depends much on its size and

[18] In Poland, SEZs between 1995 and 2015 attracted investments of 170 billion and created 280,000 new jobs. Cfr. PWC (2024). *Dalle Zone Economiche Speciali regionali e interregionali alla ZES unica.* https://www.pwc.com/it/it/assets/docs/pwc-dalle-ZES-regionali-e-interregionali-alla-ZES-unica.pdf

[19] Several studies have analysed SEZs. For a review Nisticò, R., Prota, F. (2023). Sviluppo industriale per poli? Le zone economiche speciali in Italia e nel NRRP. Stato e mercato, fascicolo 2, agosto. doi: 10.1425/108269; Buba,J., Wong,Michael D. (2017). *Special economic zones: an operational review of their impacts* (English). Washington, D.C.: World Bank Group. http://documents.worldbank.org/curated/en/316931512640011812/Special-economic-zones-an-operational-review-of-their-impacts ; Viesti, G. (2024). La ZES unica: dal mito alla dura realtà. Menabò n. 208, https://eticaeconomia.it/la-zes-unica-dal-mito-alla-dura-realta/

negatively by the technological content of the productions that take place within it.

In Italy, SEZs were introduced as an urgent measure by Decree-Law No. 91/2017 later converted by Law No. 123 of 3 August 2017[20]. Other regulatory interventions have taken place in recent years and between 2018 and 2021, eight SEZs were established (see Table 4b). The industrial policy vision was linked to the logic of reshoring and the increasing role and integration of logistics within industrial processes. Therefore, the government envisaged one SEZ for each of the TEN-T core ports of Southern Italy.[21]
The evolution of the regulatory framework is summarized in Table 4a.

Table 4a. Evolutionary milestones of SEZ legislation in Italy

D.l. n. 91/2017	SEZ Establishment Act
D.p.c.m. 25/01/201	Regulation for the establishment of SEZs
D.l. n. 135/2018	Reducing time for administrative and authorisation procedures
L. n. 12/2019	Reducing time for proceedings; one-stop shop
L. n. 160/2019	Extraordinary Commissioner of Government; Interlocking Free Customs Zones (ZFDi) Taranto; extension of tax credit
D.lgs. n. 76/2020	Role of the Extraordinary Government Commissioner; structure; possibility of Interlocking Free Customs Zones (ZFDi) in SEZs
NRRP aprile 2021	SEZ in M5-C3, Inv.4 and Reform 1
D.l. n. 77/2021	SEZ reform
L. n. 108/2021	Termination of previously appointed SEZ Commissioners
D.interm. dicembre 2021	Interministerial Decree on the allocation of resources for investments in SEZs
D.l. n. 36/2022	Procedure for revision of SEZ perimeter; extension of tax credit; resources for development contracts in SEZ areas

Source: Nisticò and Prota (2023) based on data based on normative references given in the table.

[20] See Coco (2020).
[21] See Coco and Lepore (2018).

Between 2018 and 2021, 8 SEZs were established (see Table 4b). Various expectations are poured on this industrial policy measure of SEZs because it could serve to bridge the economic and social gap that still separates the South from the more developed areas of the country.

Table 4b. SEZs in Italy by year of establishment, surface area, appointment of extraordinary commissioners post SEZ-NRRP reform

	Typology	*Year of establishment*	*Total hectares*	*% of total surface area SEZ*	*Commissioner (finalising appointment decree post SEZ Reform)*
SEZ Calabria	Regional	2018	2,445	10,4	August 2022
SEZ Campania	Regional	2018	5,154	21,9	November 2021
SEZ Adriatica	Interregional (Puglia-Molise)	2019	3,406	14,5	May 2022
SEZ Ionica	Interregional (Puglia-Basilicata)	2019	2,579	11	February 2022
SEZ Abruzzo	Regional	2020	1,703	7,2	October 2021
SEZ Sicilia Occidentale	Regional	2020	1,953	8,3	January 2022
SEZ Sicilia Orientale	Regional	2020	3,627	15,4	December 2021
SEZ Sardegna	Regional	2021	2,659	11,3	August 2022

Source: Nisticò and Prota (2023) based on data from agenziacoesione.gov.it

The per capita GDP of an inhabitant of the Mezzogiorno is less than 60 per cent of the per capita GDP of an inhabitant of the Centre North. Through the SEZ instrument, those who invest in the Mezzogiorno could have a great competitive advantage in terms of tax relief, certain financing, and faster and more streamlined procedures for obtaining authorizations. Companies setting up in SEZs can enjoy a higher tax

credit than in other areas of southern Italy, with the possibility of reaching (after the latest regulatory interventions) a ceiling of €100 million per investment. The governance strategy is based on multi-level governance through a SEZ steering committee chaired by the minister responsible for the South and territorial cohesion and the government commissioner of each SEZ.

The legislation also stipulates that each region in the Mezzogiorno must submit a Strategic Development Plan that delimits the SEZs in each region. It should be noted that the industrial design of SEZs to some extent follows in the wake of the policy of industrialization by clusters that came to life in Italy in the 1950s, assuming that industrial development is a spatially unbalanced phenomenon, i.e. that it can be concentrated in a few points but that economic growth can then start from them in neighboring territories through imitation processes, inter-sectoral and functional links and multiplier effects on income and the birth of new enterprises.

Even the NRRP has identified SEZs as an important intervention in favor of the southern economy: it includes them among the investment programs (Mission 5, component 3[22]) and provides for the reform of discipline and governance (Decree Law No. 77/2021). The resources earmarked for the SEZ by the NRRP amount to €630 million for infrastructure works for special economic zones, to which must be added further investments for works in the main ports in southern Italy. This investment amount is broken down by regions, implementing entities, and areas of intervention, and can be divided into three categories: a) last mile connections, i.e. between port and

[22] Labelled "Interventi speciali per la coesione territoriale" (Special interventions for territorial cohesion). https://politichecoesione.governo.it/it/NRRP-e-coesione/la-missione-5-componente-3-del-NRRP-su-interventi-speciali-per-la-coesione-territoriale/

industrial areas and the infrastructure and road network forming part of the main transport networks; b) digitalisation and enhancement of logistics, green urbanization, energy and environmental efficiency in the back-ports and industrial areas of the SEZs; c) enhancement of the security and resilience of port access infrastructure. It should also be noted that the projects chosen for funding were already available for each Region and selected because they were deemed to be more feasible and executable given the constraints of the NRRP's timetable. These are projects that, if useful, are not necessarily linked to the specific requirements of the new business location SEZs.

Table 5 shows that the areas receiving the greatest use of resources are those of Campania (21.6%) and Calabria (17.7%) and the interventions selected are mainly for last mile connection and logistics interventions, while further investments related to ports are flanked by other measures that fall under other missions of the NRRP. In essence, the interventions planned for SEZs implement a two-stage industrialization policy, i.e. to create an infrastructure that serves to strengthen the industrial production base that SEZs are supposed to promote through tax benefits to enterprises. The SEZs are thus given an important role as part of an overall strategy to strengthen and complete the infrastructure and logistics networks for a revitalization of the southern production apparatus. By connecting the main strategic ports located in southern Italy, one should exploit the positional advantage offered by the centrality of the Mediterranean in the global context by enhancing the privileged position with respect to the emerging African, Balkan and Middle Eastern markets.

Table 5. Infrastructure investments in SEZs planned in the NRRP

SEZ	Amount	%	Last Mile	Logistics	Harbors' resilience
Abruzzo	62.9	10	5	2	3
Adriatica (Puglia-Molise)	83,092	13,2	6	16	1
Calabria	111.7	17,7	7	1	3
Campania	136	21,6	6	4	
Ionica (Puglia-Basilicata)	108.1	17,2	2	7	
Sardegna	10	1,6	1		
Sicilia occidentale	56.8	9	1	1	1
Sicilia orientale	61.408	9,7	6		
SEZ total	630	100	34	31	8
Road map: start by 12/31/2023; end 30/6/2026 of at least (number of projects)			22	15	4
% of total projects			0,65	0,48	0,5

Source: Nisticò and Prota (2023) based on D.interm. MIMS e Ministro per il Sud e la Coesione territoriale n. 492/2021

As previously mentioned, to enhance the SEZs appeal to new enterprises, in addition to the NRRP-funded infrastructure, tax cuts are provided of up to 45% for investments of up to €100 million (the rate varies by company size), provided that the firm invests in and remains in the SEZ for at least seven years. This tax credit was later increased to a maximum of 65% and applied both to the expansion of the company's capital goods and to the purchase of land and real estate. In addition, the 2021 budget law included a 50% tax reduction for up to six tax periods for companies undertaking new economic initiatives in the SEZs. Companies wishing to benefit from the measure will have

to meet three requirements: they must not be in a state of liquidation or dissolution, they must maintain their activity in the SEZ, and they must keep the related jobs created for at least ten years. Additional facilities for companies are also envisaged through resources from the Development and Cohesion Fund. The governance structure was simplified as well and each of the eight SEZ was entrusted to a single commissioner with full power of authorization over private investments and procurement for new infrastructure.

The previous regulatory framework and set-up of SEZs (summarised in Table 4a and 4b) had an important recent turnaround: Decree Law No. 124 of 19 September 2023, with which Minister Fitto intervened by abolishing the 8 SEZs and replacing it with a so-called single SEZ extended to all the regions of southern Italy. A 'special' territory of such enormous size has no parallel in any international experience. In essence, two years after Decree Law No. 77/2021), both the governance and the incentive system of a single SEZ are (re)configured. For 2024, €1.8 billion have been earmarked in the budget law for the tax credit for 2024, but this is only valid for investments made up to 15.11.24. There are therefore still no tangible economic and entrepreneurial results with regard to the single SEZ. More generally, an overall vision of industrial policy for the Mezzogiorno is still rather lacking, within which a single SEZ is now being set up that adopts a 'sprinkling automatic aid' approach to the entire Mezzogiorno. Any connection with possible strategies for attracting investment in port areas is thus lost.

4 Conclusions

Italy's austerity measures between 2009 and 2017 led to a loss of €200 billion in public investment, which is almost equivalent to the NRRP's total budget. Resources coming from the plan might represent a unique opportunity for industrial policy in Italy. While this working paper has explored potential projects, particularly those connected to other industrial policy initiatives, the future beyond 2026 remains uncertain for both Italy and Europe. The Draghi report emphasizes the need for swift action.

Surely, programs such as NextGenerationEU and Horizon Europe, as well as cohesion policies, represent important elements of a European industrial policy that can foster the transition to a green economy, support research and innovation in numerous technological fields, and hopefully reduce inequalities. Still, the Multiannual Financial Framework for 2021–2027 foresees the allocation of resources equal to only 1.11% of the EU-27's gross national income. This amount is inadequate to support an effective European industrial policy. As for Italy, it is entirely uncertain what will happen after 2026, even considering the recent Stability and Growth Pact rules that require Italy to undertake significant adjustments to its public finance budgets.

Since the 1990s, neoliberal trends in Italy have consolidated a bipartisan consensus for economic policies favoring austerity and limiting industrial policy intervention, making it difficult to consider implementing strong industrial policies. The neglect of the Southern Question in the political agenda has further widened the national North-South gap. The changing global landscape (completely different from that of the 1990s), however, calls for new policies and a more active role for the State.

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