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PREFACE

Stefano Firpo (Director General, Assonime) and Gian Paolo Manzella (Vice President, SVIMEZ)

This policy report, edited by Donato Di Carlo and Lorenzo Moretti, has many merits.

First and foremost, there is its timeliness. The policy report appears at a moment in which industrial policy has forcefully returned to the global stage. This well-organised set of essays thus offers a clear compass for navigating, from an Italian perspective, this "new era."

The second merit concerns its orientation. These are concise contributions focused on concrete problems, combining careful historical reconstruction with close attention to policy design.

The third noteworthy aspect is generational. The contributors are generally young scholars, often based for years at foreign universities, connected through an international network of genuine cultural globetrotters. They look at Italy, in other words, from a global vantage point. And it is also from the novelty of this perspective that insights emerge which deserve to be highlighted.

The first message, set out very clearly, concerns the governance of industrial policy. Italy suffers from a structural deficit in this regard - one that has become even more apparent today. The essays show - sometimes explicitly, sometimes indirectly - how serious a task it is to do industrial policy and how essential it is - now more than ever - to build an administration that works for industry. As the contributions indicate, such an organisation should display an accurate understanding of problems and a long-term strategic vision; it should be able to orchestrate interventions and make them interact; it should rely on a limited number of well-defined policy instruments capable of incentivising desired behaviours; it should establish evidence-based evaluation and monitoring mechanisms that allow for the effectiveness of these instruments to be assessed; and it should maintain a structured and open dialogue with the private sector. In short, a true "governance of industry" (*governo dell'industria*) becomes all the more necessary given that the various attempts at industrial policy undertaken over the past twenty years have often moved in the opposite direction: fragmentation of interventions and the associated dispersion of resources; weak coordination and orchestration across different administrations; insufficient ex post evaluation of policies; and a structurally fragile dialogue with industry - too often intermittent, episodic, and generally oriented toward short-term objectives.

The second issue emerging from the essays - also a critical one - concerns the fundamentally incentive-based nature of Italian industrial policy. The "financing state" has undoubtedly been the traditional guiding element of public action, while other forms of industrial policy have remained underdeveloped: limited support for technology transfer, limited interaction with universities and research centres, few public-private partnerships, few shared platforms to increase firms' efficiency,

limited analytical capacity, and limited sectoral prioritisation. As a result, not only have subsidies and state aid come to define industrial policy in Italy, but they have also generated an inevitable side effect. As resource-allocation mechanisms moved progressively toward automatic schemes, an industrial policy centred on subsidies has ended up favouring Italy's Centre-North over the South, due to the higher density of innovative firms or simply of firms more inclined to invest.

This insight shifts our attention - here is the third point - to the longstanding question of Italy's economic dualism. The authors address this issue by advocating an industrial policy capable of differentiating across territories, identifying local strengths, and substantively addressing the specific drivers of regional disparities.

In sum, this policy report edited by Donato Di Carlo and Lorenzo Moretti outlines an analytical path that sets down important markers in the field of industrial policy - markers that should be taken up. This is all the more true in a historical phase in which an Italian industrial policy is necessary for a combination of reasons that interlock, like a Matryoshka doll, across different levels. Industrial policy is needed, first of all, because of developments in the global arena, where such policy has become a deliberate choice, debated and implemented daily across advanced economies. Alongside these global reasons, there are those arising from the European context, where the Commission's agenda is now urgently oriented toward strengthening strategic autonomy and reassessing industrial competitiveness as a policy priority, with a European public discourse increasingly marked by "industrialism." Finally, there are reasons specific to Italy itself - quite simply, because our country must have a policy for its firms that matches its position as the second largest manufacturing economy in Europe.

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INTRODUCTION

Donato di Carlo (LUHNIP Founder and Director and London School of Economics)
Lorenzo Moretti (LUHNIP Italy Lead and Head of Advisory, and European University Institute)

Industrial policy has returned to the centre of economic debates in Europe and beyond. Governments are once again using public tools to steer investment, reshape production structures and try to build economic resilience. The Luiss Hub for New Industrial Policy and Economic Governance (LUHNIP) was launched to bring together young academics and policy practitioners with critical minds to analyse what this trend means for Europe's political economy and bring novel perspectives to both policymakers and academia.

Located within the Luiss Research Center for European Analysis and Policy, LUHNIP is a non-partisan, interdisciplinary hub that conducts research, policy advocacy and public engagement on industrial policy and economic governance in Europe and in Italy. It was founded in 2023 with funding from the Berlin-based think tank Dezernat Zukunft and is part of the European Macro Policy Network (EMPN), a pan-European network working on Europe's fiscal, monetary and economic architecture.

One of LUHNIP's two focus areas has been Italy's political economy and industrial policy, which we covered through monthly briefs, policy briefs, and extended papers. This volume grows out of that stream of work. It brings together a series of thematic discussions papers (henceforth chapters) published over summer 2025 into a single, integrated work. Although it should not be read as a conventional, unified academic monograph, the volume is the result of a two-year coordinated effort between us editors and the many authors who have produced a set of complementary papers. Overall, they provide a comprehensive picture of the state of industrial policy in Italy.

This volume starts from an intuition: if industrial policy is "coming back" across Europe, Italy provides a particularly revealing case that could help understand its potential, limits, contradictions, and implementation challenges. On the one hand, for several decades after the Second World War, the country relied heavily on state-led industrial development, which helped it join the club of advanced economies. On the other, however, these efforts never succeeded in closing the structural divide between a dynamic, export-oriented North and a South more reliant on public demand and low-productivity services[1]. From the 1980s onwards, Italy has gradually scaled back traditional industrial policy, constrained by fiscal consolidation, evolving EU state-aid rules and a broader shift towards market-oriented policy paradigms. The result is an economic system marked by deep contradictions: a three-decade long stagnation in productivity and investment combined with pockets of world-class manufacturing; a dense fabric of small and medium-sized enterprises, many deeply integrated into global value chains - but almost entirely located in the North of the country. Overall, a picture that makes designing industrial policy particularly challenging as economic structures, and thus also related stakeholders and interests,

1 On Italy's regional growth models, see Donato Di Carlo, Andrea Ciarini & Anna Villa (2024): Between exportled growth and administrative Keynesianism: Italy's two-tiered growth regime, New Political Economy, DOI: 10.1080/13563467.2024.2336515.

vary significantly across the country.

With this in mind, the LUHNIP project set out to answer three core questions. First, how has Italy used industrial policy over recent decades - for which goals, through which instruments, and through which governance structures? Second, what has been the politics of industrial policy - have these policies been accompanied by a coherent political vision concerning their role in economic development? Third, what is the underlying reality of Italy's economic system that the country's industrial policy must confront - and what kind - and what kind of approach does that reality require? The report thus starts from a long-term analytical review of political debates around Italy's industrial policy (in Chapter 1), followed by a detailed review of major industrial policy initiatives since the mid-2000s (in Chapter 2), to then assess the country's economic strengths and weaknesses (as exemplified by patterns of export competitiveness, sectoral productivity and innovation), at both macro and sectoral level (in Chapter 3) and at the firm and territorial levels (in Chapter 4). It concludes with the suggested design principles and a "menu" of tools for a modern industrial policy (in Chapter 5) - a useful resource for Italian political decision-makers and policy officials rethinking the country's industrial policy.

While the authors make no claim to provide an exhaustive analysis of Italy's policy challenges, nor to offer definitive recommendations, we hope that this policy report will contribute to ongoing political and policy debates around these pressing issues. To this end, we summarise and preview three key themes that, in our view, emerge as some of the most salient findings of the volume.

The first concerns the politics and political vision of industrial policy in Italy. Chapter 1 shows that since the end of the developmentalist era, Italian political elites have struggled to sustain a forward-looking interpretation of industrial policy. While the 1950s–1970s featured a broad cross-party consensus in favour of state-led transformation, subsequent decades saw a progressive narrowing of political imagination. From the 1980s onwards, parliamentary debates became increasingly dominated by concerns about assistentialism, fiscal constraints and inefficiencies. By the 1990s and 2000s, the discourse had shifted decisively towards a defensive and reactive view of industrial policy - primarily as a tool to prevent "*delocalizzazioni*," protect sunset industries (textiles, steel, agriculture), and buffer the social costs of globalisation and EU integration. A more positive consensus re-emerged only in the mid-2010s, largely in response to EU-driven strategic agendas around decarbonisation, digitalisation and the twin transitions. This long trajectory reveals a system where political elites in recent decades have rarely used industrial policy to shape the future structure of the economy and have instead treated it as a residual, compensatory or emergency instrument.

The second concerns the coherence of Italy's industrial policy architecture. Chapter 2 shows that the absence of a consistent political vision has produced a fragmented and weakly coordinated policy mix that has been often unable to catalyse strategic evolutions in the country's industrial system. Over 2006–2024,

Italian industrial policy has relied overwhelmingly on horizontal tax incentives and subsidies. Targeted, mission-oriented, or place-based instruments have instead remained sporadic and marginal. The chapter documents a persistent pattern of institutional layering whereby new measures are introduced - whether national schemes such as Industria 4.0 and Transizione 4.0 or a multitude of regional programmes - without retiring or evaluating earlier ones. This layering has not helped accountability nor efficiency in the allocation of resources, particularly where national and regional instruments operate in parallel without coordination. A central and related finding is the near-complete absence of formal evaluation: few interventions undergo ex ante appraisal or ex post assessment, which would instead help simplify the system and double-down on effective programmes. Compared with OECD peers, Italy's governance and administrative capacity appear weakened by implementation bottlenecks, uneven stakeholder engagement, and limited use of conditionalities to steer private behaviour or ensure public value creation. As a result, even well-designed measures often struggle to achieve their intended impact in a system where new programmes are often launched without replacing (or coherently integrating) the existing ones, and without embedding them within a coherent, long-term strategic framework.

The third concerns the underlying reality of Italy's economic structure and the implications for industrial policy design. Chapters 3 and 4 show that Italy's productive system is highly heterogeneous - not only in income levels but also in economic models, technological capabilities and positions within global value chains. Crucially, Chapter 3 presents a dual picture. On the one hand, Italy's sectoral productivity in manufacturing is slightly above the OECD average, driven by those sectors where it historically developed genuine comparative advantages. Indeed, Italy's sectoral productivity profile closely resembles that of Germany and other leading manufacturing economies: the country ranks among global productivity leaders in machinery, fabricated metals, leather, apparel and beverages - sectors that underpin its export strength. On the other hand, many of these strongholds lie in relatively lower–value-added segments, and Italy has begun to lose market share even in its most competitive industries, raising doubts about the long-term sustainability of this model. Export competitiveness remains overwhelmingly concentrated in the North, while the Centre, South and Islands specialise in low-productivity, low-complexity sectors. Chapter 4 complements this macro- and sectoral analysis with firm-level evidence: high-exporting firms-larger, more diversified and more innovative - are clustered in Northern regions and in sectors such as Machinery, Pharmaceuticals and Chemicals, whereas several traditional strengths (textiles, apparel, leather, mineral products) exhibit signs of weakening. At the same time, high-growth firms (HGFs), which account for over 80 percent of national employment growth, are more geographically dispersed. Various provincial areas in Southern Italy display significant HGF concentrations, signalling that pockets of latent competitive strength exist across value chains and sectors, and may be located in those territories not traditionally associated with manufacturing dynamism.

The implication is clear: Italy's North and South do not merely differ in income

levels; they embody fundamentally different economic models and occupy distinct positions within global value chains. In such a context, the default approach of a single, uniform industrial policy to serve the entire country is not just unrealistic - it has proven counterproductive. **The "one size fits all" model, centred largely on broad subsidies, has in practice functioned as a "one size fails all" strategy.** What is needed instead is a dual approach. In the North, industrial policy should focus on consolidating and upgrading the existing comparative advantages - ensuring export-oriented sectors and higher-value segments of production remain globally competitive. At the same time, unlocking Italy's future growth potential requires a different strategy for the Centre, South and Islands: one that is more proactive, more targeted and more coordinated. Here, the priority should be to cultivate what this report defines as latent competitive advantages - revealed in the presence of high-growth firms and emerging clusters that signal genuine, if underdeveloped, possibilities for new specialisations. Supporting these trajectories demands tailored instruments, strategic coordination across levels of government and a willingness to take risks where the potential payoff is the creation of entirely new sources of competitiveness.

Drawing on the evidence presented in this volume, **we propose a method summarised by the acronym RISE, designed to help policymakers intervene where new potential is emerging but not yet fully realised:**

- **Recognise emerging firms and clusters**, including those in "unlikely" territories often overlooked by existing industrial policy schemes and national initiatives;
- **Identify their position within strategic sectors and potential role in global value chains**, to understand where bottlenecks or upgrading opportunities lie;
- **Scale these firms by supporting, over time, their move into higher-value-added and more innovation-intensive activities**, using targeted financial instruments and smart conditionalities;
- **Elevate the local institutional and regulatory ecosystem around them**, strengthening coordination between central, regional and local administrations to remove barriers, favour integration in value chains with Northern competitive firms and crowd in private investment.

This approach shifts the focus from generic subsidies to a more selective, evidence-based industrial strategy - one capable of both reinforcing Italy's existing strengths and activating new sources of competitiveness across the country. **Chapter 5 offers some frameworks and a practical toolkit to turn this approach into precise policy choices.**

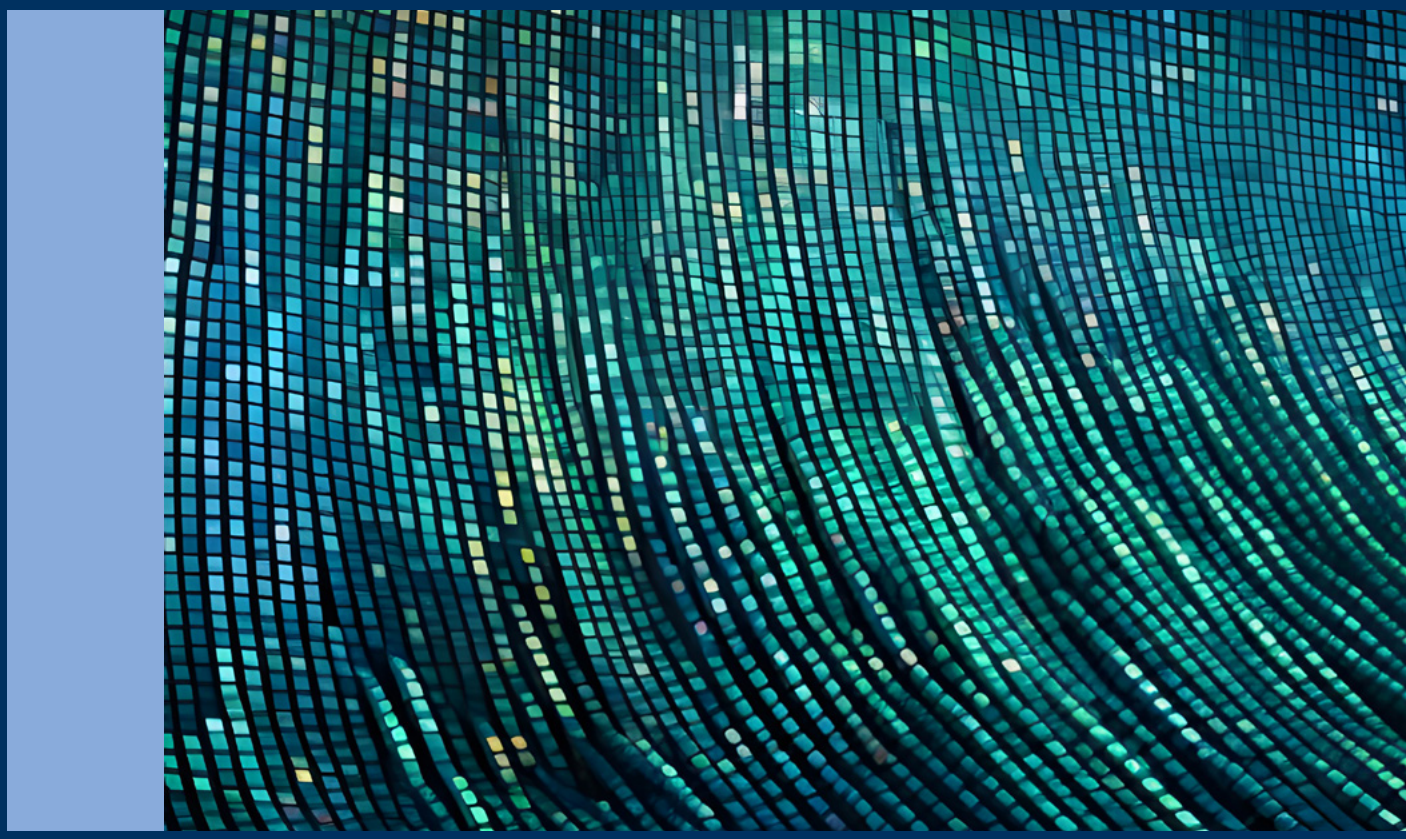
Importantly, the report is also explicit about what it does not do. It does not prescribe a list of "winning" sectors or propose a single blueprint for Italian industrial policy. Industrial policy is intrinsically political: it involves choices that no technical analysis can fully resolve. Our aim is therefore more modest and, we hope, more useful. We provide a diagnosis of how Italy has used industrial policy, how it has been debated, and what structural and firm-level realities it must now confront. And we offer a

method - a way of thinking about instruments, objectives and territorial diversity - that can help policymakers design interventions that are both more coherent nationally and more responsive to local conditions. In doing so, we hope to clarify the potential and limits of industrial policy in Italy - and beyond.

As a final word, we want to highlight that this work would have not been possible without the many colleagues who have authored the chapters and contributed to the realisation of this report. We are deeply grateful to our funders, the Berlin-based think tank Dezernat Zukunft, whose support made the creation of LUHNIP possible in the first place, and to the EMPN for their constant backing. We also thank Luiss Guido Carli and the Luiss Research Center for European Analysis and Policy for hosting us; Stefano Firpo and Assonime, as well as Gian Paolo Manzella and SVIMEZ, for their personal and institutional support. Finally, we want to thank Centro Studi Tagliacarne's director, Gaetano Fausto Esposito, and Unioncamere for their collaboration and for funding and supporting the publication of this report as a book, which shall take place in the months following the launch of this policy report.

Rome, January 2026

Donato Di Carlo
Lorenzo Moretti



01

THE POLITICS OF ITALY'S INDUSTRIAL POLICY: PARLIAMENTARY DEBATES ON ITALY'S INDUSTRIAL POLICY (1948-2022)

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ABSTRACT

In this first chapter, the author examines how Italian policymakers have debated industrial policy in Parliament from 1948 to 2022, using the newly released ItaParlCorpus of plenary speeches in the *Camera dei Deputati*. Combining dictionary-based selection, topic modelling, named-entity recognition and close reading of 13,000 interventions, the chapter traces the changing salience, sectoral focus and ideological framing of industrial policy across parties and over time, and links these shifts to broader transformations in Italy's political economy and EU integration. The analysis identifies four phases. In the post-war decades, industrial policy enjoyed high salience and broad cross-party support as a state-led strategy for growth, employment and the industrialisation of the Mezzogiorno. From the 1980s, liberal and far-right parties became vocal critics, denouncing "assistentialism", rent-seeking and loss-making SOEs, while mainstream parties sought to recalibrate, rather than abandon, intervention. In the third phase (1990s–mid-2010s), under tighter EU state-aid and fiscal constraints, the parliamentary discourse on industrial policy became more sporadic and sceptical. When support was expressed, it was primarily reactive and defensive - motivated by concerns over offshoring and the need to shield traditional sectors, such as agriculture and heavy industry, from the pressures of globalization, rather than by a proactive upgrading vision. Since the mid-2010s, the salience of industrial policy has risen again, now tightly linked to EU-driven agendas around the green and digital transitions, the NRRP and strategic autonomy, with new "issue owners" such as the Five Stars Movement and the Democratic Party and renewed criticism of past privatizations. The chapter concludes that Italian elites have rarely developed an autonomous, forward-looking national vision of industrial policy and recommends using the current window of EU-backed intervention to articulate a domestically grounded, place-sensitive strategy that treats industrial policy as a tool for structural upgrading rather than reactive crisis management.

1. INTRODUCTION

For Italy's political and economic decision-makers, historically, industrial policy has frequently played a crucial role in shaping the country's economy. Most notably, in the post-war period, state intervention in the economy, particularly through institutions like IRI (Istituto per la Ricostruzione Industriale), was central in rebuilding and modernizing key economic sectors such as steel, energy, and transport. Although the role of the state in industrial policy diminished from the 1980s onwards, leading to a more fragmented policymaking approach, in the aftermath of the COVID-19 crisis, state-led and EU-funded industrial policy initiatives have once again come to be seen as important instruments for promoting Italy's economic modernization.

While previous research has examined the impact of industrial policy on Italy's

economic development (Audretsch and Lehmann, 2016; Lucchese et al., 2016; Zecchini 2020; see also the chapter by Gronchi and Ughi in this volume), this chapter focuses on how elite-level political discourse on industrial policy has evolved over time and across political parties. Here, we seek to identify the key differences in how industrial policy was framed and assess the extent to which these party-political differences influenced the trajectory of Italy's industrial policy development.

To achieve this, we leverage data from the ItaParlCorpus database (Cova, 2025), a recently published database containing a comprehensive collection of all plenary speeches from the Italian Camera dei Deputati between 1948 and 2022. This database includes information on parliamentarians' party affiliation, allowing us to systematically analyse policymakers' political discourse on industrial policy. In doing so, we highlight how parliamentary rhetoric on industrial policy has evolved, revealing differences between political parties and across time. This quantitative text analysis allows us to focus not only on the salience that accompanied the topic of industrial policy in Italian political discourse, but also on the themes and issues that were most frequently highlighted in these discussions.

As we demonstrate, applying quantitative text analysis and natural language processing (NLP) techniques to a large corpus of parliamentary debates allows us to trace the evolution of policymakers' rhetoric on industrial policy: from its post-war framing as an instrument for state-led development, through the privatization wave of the 1980s and 1990s, to its recent 'come-back'. Finally, this chapter will present a focused analysis of parliamentary discourse in the most recent period, examining how policymakers from different political orientations discussed the set of policies that, as will be documented by Gronchi and Ughi's chapter in this volume, have comprised Italy's vertical and horizontal policies from 2006 onwards.

Our methodological approach combines a large-scale quantitative text analysis of parliamentary corpora with a qualitative, in-depth reading of selected parliamentary interventions on the topic of industrial policy. The quantitative analysis enables us not only to trace the way in which the salience of industrial policy has shifted over time, but also to identify the different ways in which policymakers from different political parties discussed the topic. The in-depth qualitative analysis of parliamentary speeches offers a deeper understanding of specific themes that were brought to the fore, revealing the ideological fault lines between political groups and their differing views on the role that industrial policy should play in the Italian economy.

Our first finding is that the salience of industrial policy, measured through the extent in which industrial policy features in parliamentary speeches, was notably high in the early decades following the Second World War, subsequently declined through the late 1990s and early 2000s, and, finally, experienced a revival beginning in the mid-2010s.

Second, the themes dominating industrial policy debates have varied over time

and across political parties. In the post-war decades, there was broad consensus on the importance of state intervention in the economy, often framed around macroeconomic goals such as income growth and employment creation. Nevertheless, the most enduring motivation for industrial policy during this time remained its use to modernize the economically lagging South.

By the 1980s, party-political divisions became more pronounced. While the major parties, DC, PSI, and PCI, continued to somewhat support industrial policy as a driver of growth and employment, policymakers also expressed concern over inefficiencies and the continued support of declining, sunset industries. In contrast, parliamentarians from the economically liberal parties (PLI, PRI) and the far-right (MSI) voiced more forceful critiques, portraying industrial policy as fostering 'parasitic' economic behaviour and thereby even posing risks for the quality of democratic institutions. These critiques were increasingly framed within the context of European integration and the need to introduce greater market liberalization. Policymakers also expressed concerns that state intervention in the economy was not only economically inefficient but also politically inequitable.

By the 1990s and early 2000s, this critical perspective had become dominant. Only far-left parties remained staunch advocates of state intervention, while most other political forces had grown increasingly sceptical. Policy constraints stemming from increased European integration, EU state aid regulations, the Maastricht convergence criteria, and the ensuing need to reduce budget deficits and public debt further limited the space for the development of industrial policy. Where industrial policy was mentioned, it was primarily framed in what we term a defensive stance; used mainly to prevent offshoring and to support traditional economic sectors like agriculture and heavy manufacturing. This, we argue, could be indicative of a failure on the part of Italian policymakers to adopt a proactive and forward-looking industrial policy at a time when most other European economies were adapting to globalization and the transition to a knowledge-based economy. What appears to be missing, in other words, is a view of industrial policy as a tool to continuously upgrade the country's economy and maintain it at the technology frontier by promoting investment in those sectors with greater future potential.

By the mid-2010s, the political and economic landscape had shifted once again. A renewed consensus emerged around the strategic role of industrial policy in addressing the twin digital and environmental transitions as these became EU-wide priorities. At the same time, critical voices from both the right and the left have begun highlighting the extent to which past privatization efforts have weakened the country's economic structure and increasingly pleaded for state intervention in economically strategic sectors.

The chapter proceeds as follows. The next section (Section 2) shows the varying salience of industrial policy over the post-war period, contextualising it in the dynamics of the country's economic development. Section 3 then presents our detailed theme analysis by showing trends for each of the four time periods and for each party-family. The last section draws some conclusions.

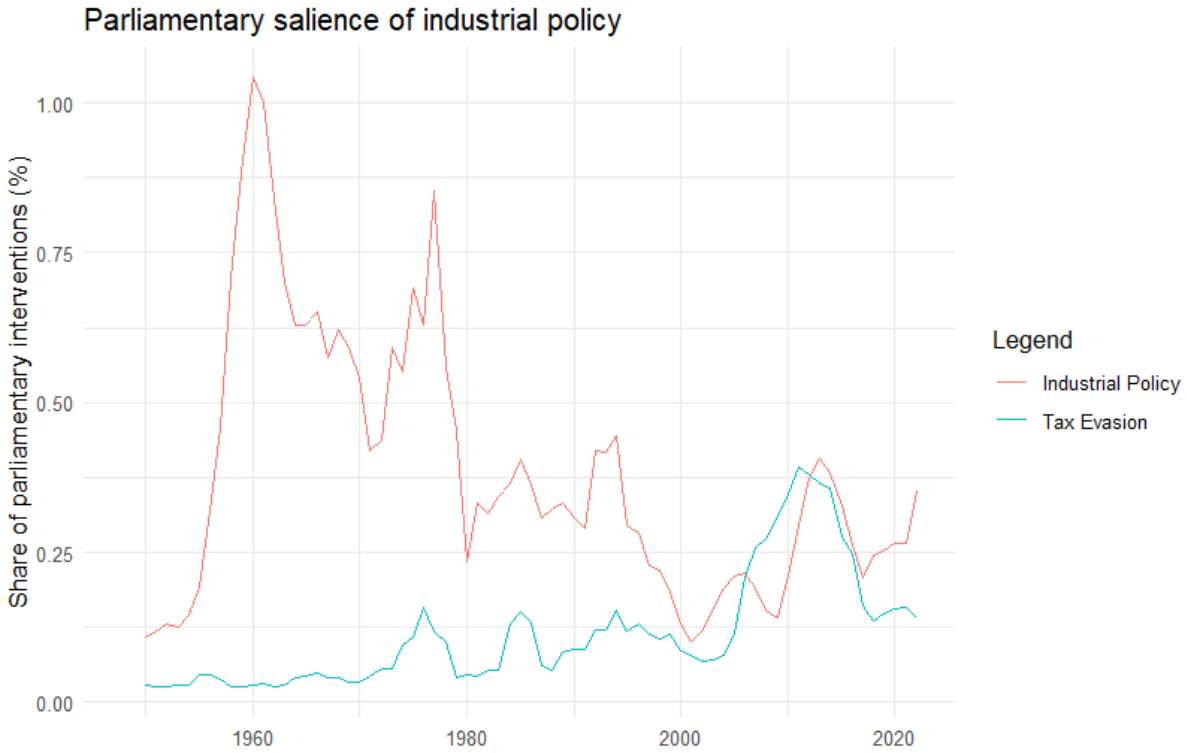
2. TRACING THE PARLIAMENTARY SALIENCE OF ITALY'S INDUSTRIAL POLICY (1948-2022)

In this section we introduce our analysis of elite-level discourse on industrial policy that examines how parliamentarians discussed industrial policy in parliamentary debates from 1948 to 2022. We provide the high-level trends and contextualise the evolutions the Italian economy underwent over the period.

We use data from a newly published dataset, the ItaParlCorpus dataset (Cova, 2025), a machine-readable and fully annotated database containing all parliamentary speeches made in Italy's Lower House of Parliament's plenary debates from 1948 to 2022. Given the size of the dataset, which contains over 470 million words and 2.4 million parliamentary speeches from 5,830 unique speakers, we subset from the entire corpus of parliamentary speeches recorded in the ItaParlCorpus dataset a sample that specifically encompasses only those speeches that are highly likely to explicitly address industrial policy. To identify those parliamentary speeches which have a high likelihood of discussing industrial policy, we utilize a dictionary of industrial policy-specific terms (see Table A1, recorded in the Appendix). The resulting dataset contains 13,000 parliamentary interventions with an average of 1,201 words per parliamentary intervention.

Figure 1 charts the proportion of parliamentary speeches discussing industrial policy relative to the total yearly speeches made in the Italian Parliament. To contextualize the importance of industrial policy for Italian policymakers, we compare its parliamentary salience with that of another key policy preoccupation of the Italian political class in the post-war Republican period: tax evasion (evasione fiscale). Through this tax evasion benchmark, we are better able to contextualize the importance of industrial policy in relative terms. As illustrated by Figure 1, parliamentary debates on industrial policy peaked in the 1960s and 1970s before gradually declining in the 1980s and 1990s, and increasing once again in the mid-2010s.

Figure 1: Share of parliamentary speeches discussing industrial policy - aggregate shares (3-year rolling averages).



The trend illustrated in Figure 1 reflects key developments in the Italian and European political economy of the period. Similarly to other European countries, in the aftermath of the Second World War, Italy also embarked on a robust industrialization strategy, with the state playing a leading role in economic development and in the organization of the economy. The Italian government, through institutions such as the IRI, actively invested in key sectors. This interventionist approach facilitated Italy's rapid economic growth and modernization, and contributed to propelling Italy towards the position as one of the world's leading industrial economies of the second half of the twentieth century. During the 1950s and 1960s, state-owned enterprises (SOEs) contributed significantly to Italy's economic miracle, fostering industrial diversification and technological advancement (Rolfo and Calabrese, 2003; Lucchese et al., 2016). This period saw the rise of the 'industrial triangle' of Milan-Turin-Genoa, expansion across various economic sectors and SOEs accounting for a large portion of the country's total economic output.

From a party-political perspective, there was a significant degree of ideological convergence around the importance of industrial policy as a key strategy for post-war reconstruction. While they might have disagreed on the direction and the scope, Communist and Christian Democratic policymakers agreed on the importance of industrial policy for Italy's economic development. Rebuilding Italy's industry was widely seen as requiring strong state involvement and high levels of investments. Conflicts concerning Italian industrial policy during this time usually

transcended the otherwise rigid left–right demarcations that distinguished economic policymaking in the post-war era.

However, the economic model that had fuelled Italy's post-war growth, which was characterized by strong public investment and state intervention in the economy, began to falter by the 1970s, as sustained GDP growth gave way to mounting public debt, a lower productivity of SOEs (Locke 1995), inflation, and declining investment levels. This led to a shift towards greater market-oriented reforms, particularly from the mid-1980s onwards, ushering in a more liberal policy phase, which significantly reduced the role of the state in the economy (Bianchi, Labory, and Pontarollo, 2010).

As extensively documented by cross-national research, from an ideological perspective, the appeal of industrial policy also progressively waned by the 1980s as party-political conflicts on the importance of, and the need for, industrial policy became increasingly prominent (Graham, 1994; Wade, 2014). Changing economic policy paradigms, coupled with growing European economic and monetary integration, promoted market openness and stricter limits for state intervention in the economy (Clifton et al., 2006). Indeed, the decline of Italy's state involvement in industrial policy was deeply shaped by the influence exerted by its EU membership, including the constraints derived from an increasingly strict implementation of European competition and state aid regulation (Majone, 1994, 1997; Thatcher, 2014).

As a founding member of the European Economic Community (Treaty of Rome, 1957), Italy gradually aligned its domestic policies with European market standards and regulatory frameworks. By the time the Single Market was launched in 1992, Italy, like all other EU member states, was required to liberalize key sectors and dismantle remaining state monopolies. Italy implemented one of the most extensive privatization programs in Europe, significantly reducing the state's direct role in the economy (Barucci and Pierobon, 2008). This shift was further reinforced by the avalanche of EU competition and state aid rules, which restricted the use of national subsidies to support domestic industries.

At the same time, Italy, and particularly its southern regions, continued to benefit from EU structural funds through the Cohesion and Regional Development programs, tools that increasingly supplemented national industrial policy aimed at addressing regional disparities. However, with the EU's eastern enlargement in the 2000s, these funds were increasingly redirected towards newer member states, leading to a gradual decline in economic support for Southern Italy. As a result, Italian governments found themselves in a predicament: on the one hand, national industrial support was increasingly constrained by Maastricht-era fiscal rules and EU competition law. On the other, EU cohesion funding, once a key compensatory mechanism, was increasingly oriented away from its traditional Italian regional beneficiaries (Staehr and Urke, 2022).

More recently, however, in the aftermath of the Eurozone crisis, Italian governments began to reengage with industrial policy through targeted initiatives aimed at modernizing the country's industrial base. These efforts included measures such as tax incentives, support for digitalization, and funding for research and development. Amongst the most prominent initiatives were Industria 4.0 and its successors Transizione 4.0 and 5.0, both designed to enhance innovation, digitization, and

productivity, particularly within the manufacturing sector and amongst small- and medium-sized enterprises (SMEs) (see the chapter by Gronchi and Ughi in this volume for further details). By the early 2020s, interest in industrial policy gained renewed momentum, driven by shifting geo-economic dynamics, disruptions in global supply chains, and the intensification of strategic competition among global powers (Di Carlo and Schmitz, 2023).

These policy efforts received a further boost with the launch of the 2021 Piano Nazionale di Ripresa e Resilienza, PNRR (the National Recovery and Resilience Plan - NRRP): Italy's national strategy under the EU's Recovery and Resilience Facility. With nearly €191.5 billion in funding allocated, the NRRP represents an unprecedented opportunity for the country. A significant portion of these resources has been directed towards supporting industrial transformation, digital infrastructure, green technologies and strategic and innovative sectors. More broadly, the NRRP marks a reassertion of the state's strategic role in industrial development, reflecting a shift in both Italian and European economic governance (Cotta and Domorenok, 2022). In contrast to the earlier era of market liberalization and privatization, recent industrial policy initiatives seem to have embraced a more proactive strategy of state intervention, mostly in order to ensure that the economy is well-prepared for the challenges associated with the 'twin' digital and green transitions.

3. ITALIAN PARTY POLITICS AND INDUSTRIAL POLICY

While the analysis above is informative of the changing salience of industrial policy in Italy's parliamentary debates, the level of aggregation does not provide information as to whether there are significant differences in the way in which different political parties discussed the topic. How often did different Italian political parties discuss industrial policy? And what differences and similarities emerge when considering the way in which different political parties broached the issue? In the following analysis we gauge the extent to which each main party in the Italian political spectrum has been an "issue owner" on industrial policy by measuring this issue's "salience" in the party communication. To do this, we look at the proportion of a party's parliamentary speeches devoted to the topic of industrial policy as a share of all parliamentary speeches made by the party.[2]

The profound party-political transformations that marked the transition from the First Republic (1946–1993) to the Second Republic (1994–onwards) provide a natural structural break in the history of Italy's politics. We thus divide the analysis of the party-political salience of industrial policy into these two distinct historical periods. Additionally, given the fragmented and often short-lived nature of many Italian

2 In the political science literature on party politics, a common way to assess the importance that a policy issue has for a party is by measuring its salience. Salience is defined by how frequently a political party addresses a given issue in its policymaking discourse or in its electoral platforms and agendas. According to 'standard' models of party-political competition, the more often a party discusses a topic, the more it is perceived by the electorate to be what is known in the literature as an 'issue owner' (Petrocik, 1996; Budge, 2015). In the context of our analysis on Italian industrial policy, issue salience is quantified as the proportion of a party's parliamentary speeches devoted to the topic of industrial policy as a share of all parliamentary speeches.

political parties, we examine party-political salience by aggregating parties into broader party families.[3]

As shown in Figure 2, during the period 1946–1993, parties belonging to the centre-left/social-democratic camp, such as the *Partito Socialista Italiano* (PSI), and far-left parties, such as the *Partito Comunista Italiano* (PCI), devoted a greater share of their parliamentary interventions to industrial policy compared to other Italian parties. By the 1980s, however, as privatization efforts gathered pace, liberal parties such as the Partito Liberale Italiano (PLI) and the *Partito Repubblicano Italiano* (PRI), which notably advocated for greater economic orthodoxy, increasingly discussed industrial policy. However, as we illustrate below, this shift was likely shaped by the negative framing these parties employed when discussing industrial policy. Indeed, just because a party discusses the topic of industrial policy more than its counterparts do, that does not mean that these discussions are necessarily framed positively. In any case, the analysis presented below suggests that while left-wing parties dominated parliamentary discussions on industrial policy during its peak, liberal parties took a more active 'discursive' role during its decline.

With the advent of the Second Republic in the early 1990s and the emergence of new party-political constellations, the dynamics of parliamentary discourse on industrial policy changed (Figure 3). After the collapse of the old party system in 1992, Italy shifted towards a bipolar (now multipolar) party-political system. Centre-right coalitions (Forza Italia, National Alliance, later Lega–Brothers of Italy) generally championed market reform, tax cuts, and lower spending. Silvio Berlusconi's governments privatized utilities and sought to reduce state involvement in the economy, though they also notably protected some industries (Vassallo, 2013). By the 1990s, similarly to other European social-democratic parties, Italian centre-left governments also adopted a more liberal economic policy agenda and engaged in extensive privatization efforts (Obinger et al., 2016).

The analysis of how frequently political elites referred to industrial policy in Parliament in the 1990s-2000s is indicative of the topic's declining salience among political actors. Although the overall share of parliamentary speeches on the topic has remained low, far-left parties have raised it more actively than other political groups. In more recent years, however, both the *Movimento 5 Stelle* and the centre-left *Partito Democratico* have become increasingly vocal on this issue and thus emerged as potential "issue owners".

3 The aggregation of political parties into party families follows the existing mapping included in the ParlGov database (Döring and Manow, 2023), which classifies parties into party families according to their position in "an economic (state/market) and a cultural (liberty/authority) left/right dimension.

Figure 2: Share of parliamentary speeches discussing industrial policy (3-year rolling averages), by party family (1955-1993).

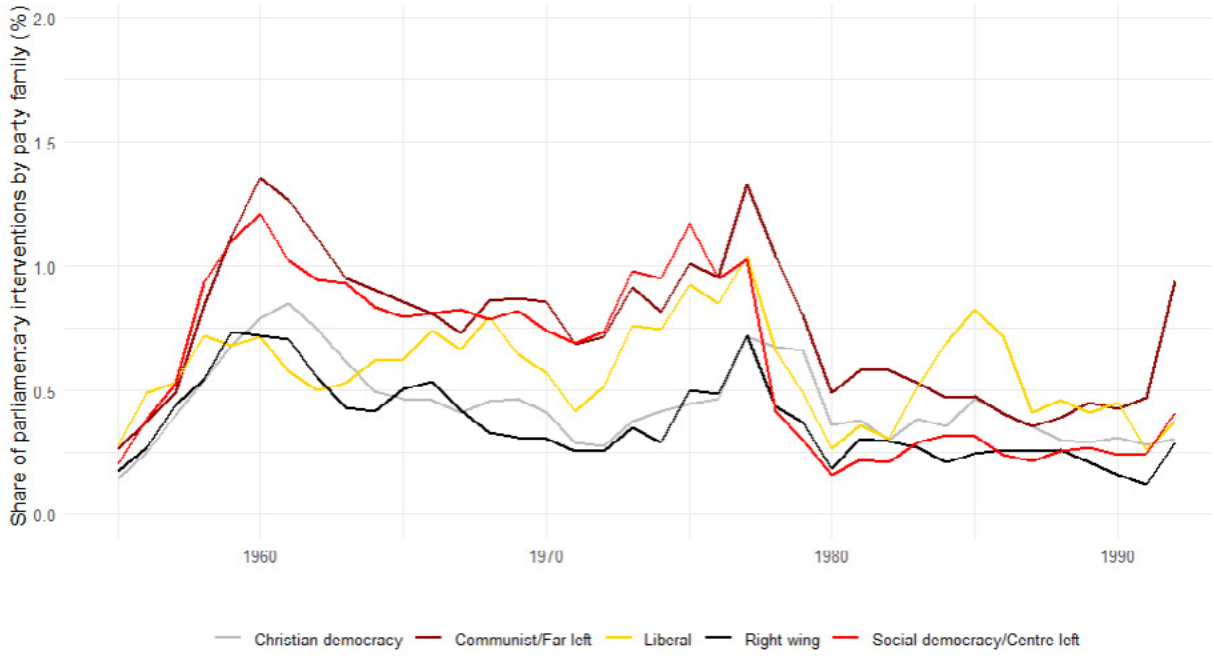
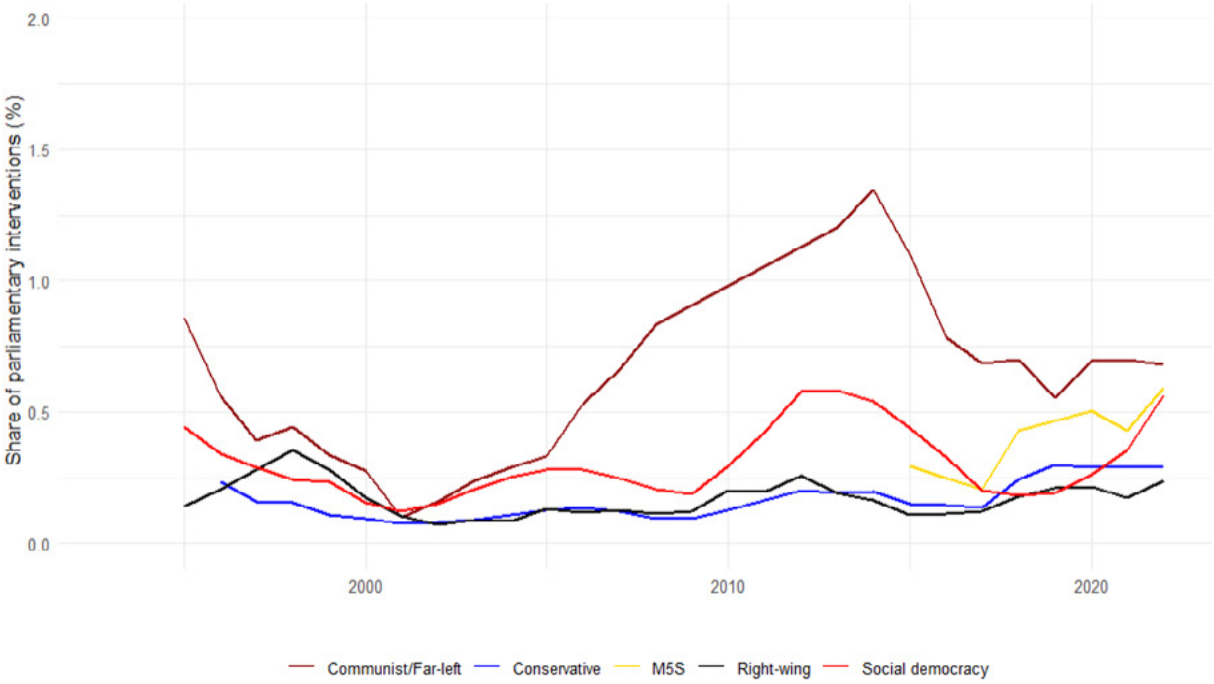


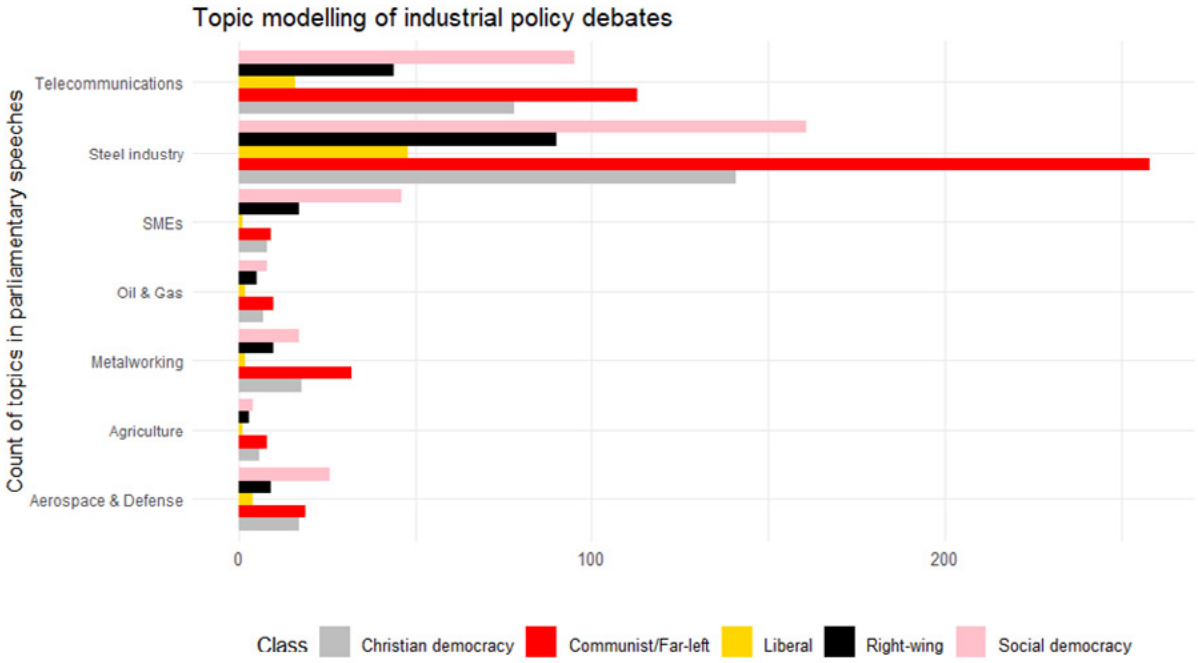
Figure 3: Share of parliamentary speeches discussing industrial policy (3-year rolling averages), by party family (1994-2022).



While the charts presented so far provide valuable insights into the party-political dynamics shaping parliamentary discourse on industrial policy, it is useful to supplement this analysis by examining the specific ways in which parliamentarians have discussed industrial policy over time. We thus now proceed to an analysis which focuses on examining the context in which discussions on industrial policy have occurred.

To do this, we apply two widely used techniques in natural language processing: topic modelling and Named Entity Recognition (NER). Briefly, topic modelling is an unsupervised machine learning technique that automatically identifies clusters of related words - referred to as "topics" - within a collection of texts, allowing us to detect the main, underlying themes discussed across the corpus of industrial policy debates. NER, on the other hand, enables us to extract and classify specific types of information, such as the names of people, places, and organizations that co-occur in text passages in which parliamentarians discuss industrial policy. These methods are commonly used in quantitative text analysis, and we provide further technical details in the appendix for interested readers. By combining these two approaches we are better able to understand the way parliamentarians discussed industrial policy among political parties and across time. Since the topic modelling algorithm generates a broad array of topics in which words tend to co-occur, we narrow our focus to those with a clearly identifiable sectoral dimension. This allows us to examine how different political parties discussed industrial policy in relation to specific economic sectors. As shown in Figure 4, the results highlight that steel and telecommunications "topics" are particularly prominent in the discourse of left-wing parties, while SMEs emerge more frequently in the speeches of centre-left as well as right-wing policymakers.

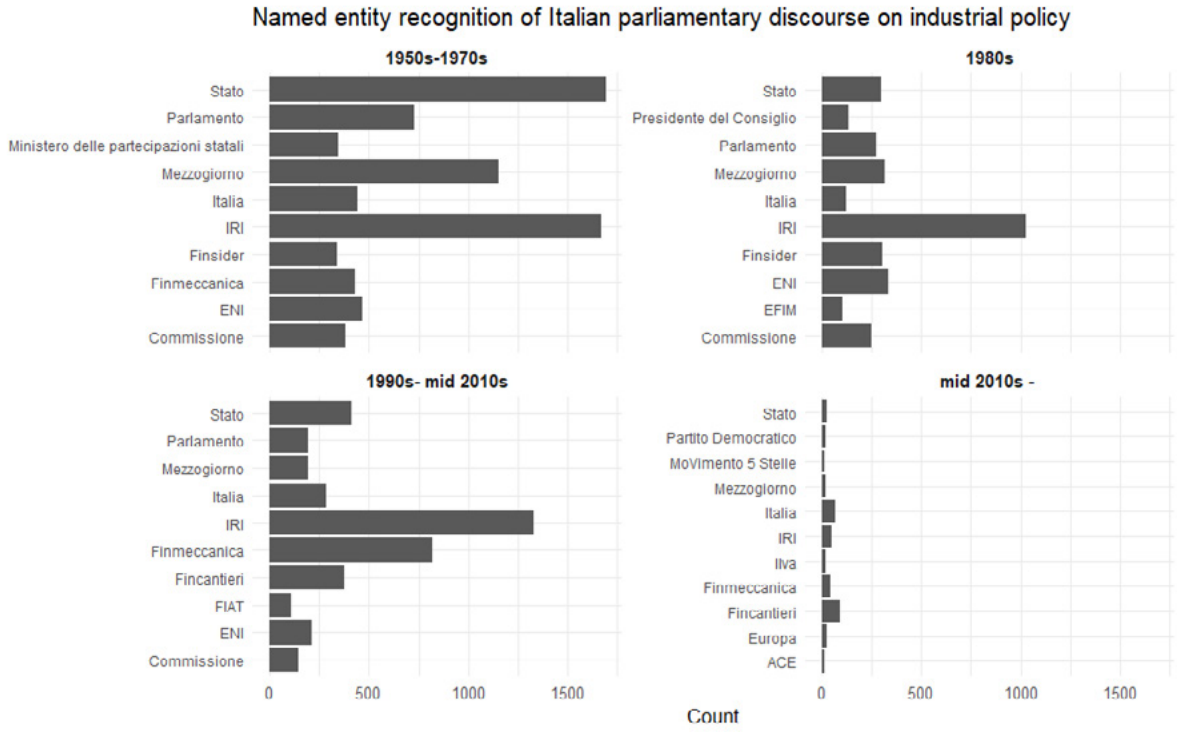
Figure 4: Selection of topics as identified by a topic model analysis of parliamentary debates discussing industrial policy (1948-2022)



We complement this initial topic modelling analysis of economic sectors with a NER analysis, which, as discussed above, identifies the names of people, organizations, and places that most frequently co-occur in sentences in which parliamentarians discuss industrial policy. The results of this analysis, shown in Figure 5, reveal that in the latter half of the twentieth century discussions on industrial policy were

often centred on the South of Italy (Mezzogiorno). Throughout the period, our NER analysis also reveals that there was a consistent focus on tying discussion of industrial policy to specific industries and SOEs, such as ENI (electricity), Finmeccanica (defence and aerospace), and Finsider (steel). The next section deep dives into each key period we identified, discussing how the rhetoric of each party family has evolved.

Figure 5: Named entity recognition of Italian parliamentary discourse on industrial policy (1948-2022)



3.1 INDUSTRIAL POLICY IN THE ERA OF STATE-LED DEVELOPMENTALISM: PARLIAMENTARY DEBATES ON INDUSTRIAL POLICY (1950s-1970s)

After having presented this high-level overview of parliamentary discussions on industrial policy, we now proceed in examining specific and representative parliamentary speeches on the topic from different parties. As discussed above, we do this by analysing a series of parliamentary speeches from the corpus of parliamentary speeches that specifically deal with industrial policy (N = 13,000 parliamentary speeches).

Our qualitative, in-depth analysis of the parliamentary discourse on industrial policy strongly supports existing historical accounts that highlight industrial policy as a central pillar of Italy's economic strategy during the first three decades of the Republic (Baldissari, 1993; Grabas, 2014). During this period, across all major political parties, there appears to have been broad agreement on the importance of industrial policy as an economic development strategy. Two dominant themes

emerge from this discourse: 1) The recognition of the state as a key actor regulating the economy; 2) The emphasis on regional development, particularly on the South, where industrial policy was seen as a crucial tool for reducing the economic gap with the rest of the country.

The importance that industrial policy plays for the economic development of the South garnered particularly high levels of support across political parties, which otherwise had very different economic policy priorities and ideological outlooks. For instance, the far-right Movimento Sociale Italiano (MSI) repeatedly stated that SOEs and industrial policy were fundamental for the industrialization of Southern Italy[4]. This is a perspective that was shared by MSI's arch-rivals, the PCI, which instead often discussed industrial policy in conjunction with the regional development of the poorer Southern Italian regions. This aligns with the stance of the DC, which for decades had been the dominant party in successive coalitions governments and which saw in the regional development of Southern Italy a key plank of the country's industrial policy strategy. Some DC parliamentarians in the 1960s even proposed that it should become official government policy for industrial policy interventions to be by default located in the South of the country as well as in other impoverished areas[5]. The political imperative of using industrial policy as a developmental strategy to assist the less economically developed regions thus seemed to have trumped considerations derived from economic calculus alone, which would have presumably directed state funding to the industries and geographic areas in which it would have been more economically advantageous to do so.

In addition to industrial policy's important regional dimension, discussions on the issue were also deeply embedded in broader debates about the role that the state should have in directing the economy. PCI parliamentarians, in particular, emphasized industrial policy as a vehicle for asserting the state's leadership in political economy and highlighted the democratic nature of economic planning[6]. Given the state's significant role in the economy, one key socio-economic outcome was that industrial policy could serve as an effective means of expressing and advancing a broader range of economic policy goals. On the one hand, for example, former Industry Minister Pietro Malvestiti (DC) argued that industrial policy was closely linked to income growth. Drawing on Keynesian macroeconomic ideas, there emerged the view that state support for industry via industrial policy could foster overall economic growth through the "propulsive" effect of rising incomes on the economy[7]. On the other hand, PCI policymakers in particular argued that robust state investments in the economy

4 For example, MSI parliamentarian, Antonio Guarra (MSI, 1970) stated that: "l'apporto delle imprese a partecipazione statale sarà sempre determinante per intensificare l'industrializzazione meridionale".

5 See for example, Francesco Fabbri (DC): "Per quanto concerne l'intervento delle aziende a partecipazione statale, tutte le nuove iniziative a localizzazione non vincolata da motivi tecnici - ivi comprese quelle relative all'ampliamento di attività delle imprese già esistenti o sostitutive di loro attività produttive in atto, dovranno essere realizzate nel Mezzogiorno (e nelle zone economicamente depresse del Centro Nord), in particolare nelle << aree di sviluppo globale >> precedentemente indicate., I programmi delle aziende a partecipazione statale dovranno essere, anno per anno, riveduti alla luce dell'evoluzione degli investimenti complessivi nel Mezzogiorno"

6 See for example, Giuliano Pajetta (PCI, 1958): "Poniamo anche il problema della funzione dell'industria di Stato, oggi attaccata da tante parti, e dalla destra con tanta ferocia. Questo attacco non puo essere respinto se non contrattaccando; non puo essere respinto se non attribuendo all'industria di Stato una funzione di guida d'una politica nuova. Ecco il carattere democratico della programmazione!"

7 See for example, Pietro Malvestiti (DC, 1953): "I redditi di lavoro, e in modo particolare, i redditi di lavoro dipendente dall'industria (salari e stipendi), per loro natura, per l'omogeneità della domanda cui si applicano, per il carattere stesso della domanda che è suscettibile di determinare produzioni di massa a costi decrescenti, hanno una funzione altamente propulsiva dell'economia nazionale. Ignorare questo fatto, considerare i redditi di lavoro solo sotto l'aspetto dei costi aziendali, significa di fatto non solo commettere un errore di natura economica, ma rinunciare a una coerente politica industriale".

could ensure that the level of unemployment remained low[8].

Which economic sectors benefited most from industrial policy? While the majority of parliamentary discussions during the heyday of industrial policy notably focused on supporting the manufacturing sector, heavy industry, and the energy sector, it is noteworthy that industrial policy was also frequently framed as a tool for modernizing and developing the agricultural sector. Industrial policy was considered an effective means to mechanize agriculture and enhance its competitiveness, often through the involvement of SOEs. This aspect of industrial policy was especially significant for the DC, a party that had historically represented agrarian interests[9].

In conclusion, this period was marked by a high importance of industrial policy reflected by the large share of parliamentary speeches which dealt with aspects connected to industrial policy. Across political parties the consensus that seems to have emerged was that industrial policy and state intervention in the economy could not only serve as an economic development strategy to develop Southern Italy and other less affluent parts of the country, but also as a macroeconomic strategy designed to foster income growth and reduce unemployment.

3.2 BEMOANING ASSISTENTIALISM: CHANGING ECONOMIC POLICY PARADIGMS, AND THE DECLINE OF INDUSTRIAL POLICY IN ITALIAN PARLIAMENTARY DEBATES (1980s)

Enthusiasm for industrial policy as a driver of national growth and regional economic development declined in the following decades. This shift was mostly caused by rising fiscal pressures, growing scepticism about the necessity of strong state involvement in the economy, and the constraints imposed by European integration (Baldassari, 1993).

In this section, we address what specific aspects of industrial policy policymakers took issue with and how policymakers from different political parties positioned themselves on the topic. The declining significance of industrial policy becomes evident when analysing parliamentary discourse from the 1980s. Notably, liberal parties became increasingly critical of industrial policy, focusing their critiques on its centralised and heavily planned nature, which they argued could distort market dynamics. They also grew concerned about the emergence of *assistenzialismo*, that is, the tendency to provide excessive state support to 'sunset industries', as well as about the risk that industrial policy was primarily used to serve the interests of specific and politically well-connected interest groups. This is clearly what emerges from the discourse of the liberal parties (PLI and PRI), whose parliamentarians expressed the view that the state should exit from non-strategic economic sectors and engage in wholesale privatization efforts, blaming 'corporativism' for the poor state of the economy. They increasingly saw the 'Leviathan' state as a drag on the

8 See for example, Giuseppe di Vittorio (PCI, 1956), "I.R.I, E.N.I e le altre aziende dello Stato devono essere utilizzate, mobilitate, potenziate per assecondare lo sforzo di industrializzazione che si impone per dare un serio colpo alla disoccupazione permanente, che e la più grave piaga sociale del nostro paese"

9 See for example, Giuseppe Medici (DC, 1954): "Da ciò la necessita di favorire un crescente sviluppo della meccanizzazione attraverso una collaborazione tra il settore industriale ed il settore agricolo; collaborazione che non e difficile realizzare se le industrie meccaniche sono di proprietà dello Stato".

national economy[10]. Moreover, parliamentarians also grew concerned that industrial policy was used to keep inefficient organizations ("*carrozzoni*") afloat[11].

Concerns relating to *assistenzialismo* were also rife in the parliamentary speeches made during this time by far-right parliamentarians from the MSI, who stated that state-funded assistance to industry was not only problematic from a distributive perspective, but also from an intergenerational one[12]. The concern that industrial policy was not 'future-proof' was also present in speeches that criticized the way in which state funding was allocated, as MSI parliamentarians pointed out that too little funding was directed to the productive sectors which had an economic future[13]. Moreover, MSI policymakers expressed concern that *assistenzialismo*, by favoring specific interest groups, could endanger the quality of the country's democratic institutions[14]. The concern that industrial policy was misguided and directed to economic sectors which were not considered to become particularly profitable and productive in the future continued, as we will see in the subsequent section, to be a dominant theme for policymakers' speeches on industrial policy.

While the smaller liberal and the far-right parties thus emerged as the main critics of the assistenzalismo that had often characterized state interventions in the economy, policymakers from the mainstream parties, the PSI and the DC, which had traditionally been the main advocates of industrial policy also changed tactics by the 1980s. Although PSI parliamentarians seemingly freely acknowledged the existence of problems in the industrial policy strategy that Italian governments had embarked upon in the post-war period, they were also critical of the view that the private sector should be deemed as being inherently more efficient than SOEs[15]. PSI policymakers also highlighted the need for industrial policy to fit within the country's current macroeconomic situation, as they argued that it was necessary to balance productive investments with the need to achieve budget surpluses[16].

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10 See for example Giuseppe Facchetti (PLI, 1986): ""Noi vorremmo anticipare il momento in cui lo Stato dovrà uscire da quei settori che non sono strategici. Esso dovrà permanere solo in quei pochi e ben limitati settori che definiamo strategici. Per questo motivo il gruppo liberale, pur registrando le notevoli ed importanti modifiche apportate, voterà contro l'emendamento in questione per testimoniare la propria indicazione di tendenza a favore di una integrale privatizzazione di tutto ciò che non e strategico nel settore delle partecipazioni statali." And Giovanni Spadolini (PRI, 1985) "Lo Stato sopporta per tutti i settori parassitari delle partecipazioni statali, dell'industria di Stato e di tutti i settori dominati da un corporativismo e da un burocratismo che hanno ridotto il nostro paese come l'hanno ridotto" and Paolo Battistuzzi (PLI, 1983): "La voracità del leviatano statale sulla ricchezza nazionale".

11 See Gerolamo Pellicano (PRI, 1983): "Dobbiamo, insomma, assolutamente evitare di tenere in vita carrozzoni improduttivi e costosi per la collettività, a dispetto degli impieghi e degli impianti produttivi, ed anche a dispetto delle possibilità di risanamento e di sviluppo dell'intero sistema industriale italiano".

12 See Domenico Mennetti (MSI, 1985): "Ritengo che in Italia vi sia senz'altro bisogno di una riforma del collocamento, di rivedere certi meccanismi, ma vi sia intanto bisogno - parliamoci con estrema chiarezza - di rivedere i meccanismi assistenziali, che sono stati profondamente distorti e che si risolvono in un danno reale, soprattutto per quanto riguarda le aspettative delle nuove generazioni".

13 As stated by Cesco Baghino (1985), "E necessario ribaltare l'intera impalcatura di politica industriale creata in Italia in questi anni. Come ha detto il governatore della Banca d'Italia, e necessario chiudere definitivamente la fase in cui hanno predominato provvedimenti di difesa dell'esistente ed aprirsi invece ad una logica di promozione dell'avvenire, dove gli aiuti alla ristrutturazione aziendale e settoriale ed al riequilibrio territoriale si uniscano ad investimenti non limitati al capitale fisso. Ma estesi alla produzione e all'accumulazione di ricerca, concentrati in settori in espansione e ad elevate potenzialità rinnovate"

14 See Agostino Greggi (MSI, 1985): "[...] enti di Stato che sappiamo nella realtà politica e sociale italiana di oggi sono gli enti che contano, sono gli enti che manovrano i miliardi, che manovrano la politica... Ma una democrazia non può fondarsi sugli enti di Stato, si fonda sui privati, su associazioni private, sui gruppi privati".

15 See Mario Seppia (PSI, 1980): "Non possiamo distinguere, non possiamo neanche accettare, se non vogliamo dimetterci da un ruolo e da una funzione di Governo, che l'impresa pubblica debba essere per forza una impresa deficitaria, mentre l'impresa privata debba essere per forza una impresa efficiente, perché la storia, l'esperienza ci hanno dimostrato che le cose non stanno affatto in questo modo. Si tratta allora di affrontare in modo serio un problema di risanamento dell'impresa a partecipazione statale, un problema di razionalizzazione del sistema dell'impresa a partecipazione statale, anche di consolidamento del suo ruolo".

16 See Franco Bassanini (PSI, 1983): "Sul merito, crediamo che si debba puntare ad un'operazione di riqualificazione della spesa pubblica, che sappia accoppiare rigore e reflazione, cosi da porre una scelta metodologica di rigore al servizio di una politica di reflazione attraverso, quindi, il contenimento della spesa corrente improduttiva, il rilancio qualificato e selettivo degli investimenti produttivi e l'impostazione di una seria politica industriale".

By the 1980s, DC parliamentarians, like their counterparts, were increasingly aware of the danger of economically 'parasitic' behaviour, even as they sought to preserve the underlying rationale for industrial policy[17]. There was also a growing emphasis on fostering stronger synergies between the public and private sectors, as highlighted by Clelio Darida, then Minister of State Holdings (*partecipazioni statali*)[18]. Despite these shifts, DC policymakers continued to stress the strategic importance of industrial policy for Southern Italy in particular[19]. This was also echoed by parliamentarians from the PCI who stated that industrial policy could aid in employment creation in Southern Italy[20]. At the same time, concerns mounted on the part of PCI parliamentarians over the implications that deeper European integration would have[21].

Overall, the decade marked a shift in the discourse surrounding industrial policy. There was increasing scrutiny of state-funded support mechanisms and their effects on market dynamics, alongside a growing push to rationalize investments and prioritize funding for future-oriented sectors: all while considering the increased constraints posed by evolving European fiscal rules and regulations on state aid.

3.3 ITALIAN INDUSTRIAL POLICY IN THE ERA OF EUROPEAN MARKET-ORIENTED INDUSTRIAL POLICY (1990s-MID 2010s)

While the 1980s saw industrial policy increasingly questioned due to concerns over cronyism, economic inefficiencies, and increased fiscal constraints, the 1990s marked a turning point as adherence to European state aid regulations and the Maastricht convergence criteria accelerated the pace of privatization efforts and increasingly led to an abandonment of industrial policy. As a result, parliamentary discourse around industrial policy grew more critical. Opponents argued that several interest groups which were seemingly dependent on state intervention would be unable to survive in a competitive, market-oriented environment without continued public support[22].

A prominent example of this shift in perspective is the troubled history of the Italian flag carrier, Alitalia. In particular, politicians from the Lega, at the time very economically liberal, openly called for allowing the "animal spirits" of the free market to prevail, arguing that if Alitalia could not sustain itself or remain competitive

17 Gerardo Bianco (1982) Indubbiamente vi sono sacche di parassitismo che vanno contrastate e battute. Alcune di queste consistono nel fatto di assistere, sotto forma di investimento, aziende decotte. E mi riferisco anche alle aziende a partecipazione statale. Ecco perché riteniamo che il sistema industriale italiano non vada suddiviso in due settori: esso va mantenuto in una concezione unitaria per evitare giustificazioni ad un ulteriore assistenzialismo.

18 See for example Clelio Darida (DC, 1985): ""Naturalmente, sono disponibile, come ministro delle partecipazioni statali, dunque titolare dell'azionariato pubblico, ad ogni forma di convergenza tra strutture pubbliche e strutture private. Al momento di affrontare l'ampio mercato offshore, non esiste da parte nostra alcuna pregiudiziale del tipo cui fa riferimento l'onorevole Macciotta; anzi, riteniamo positiva ogni collaborazione tra aziende pubbliche e aziende private"".

19 See for example Calogero Pumilia (DC, 1982): "Credo che sulla necessita di un intervento sempre più massiccio delle partecipazioni statali alla nuova fase dello sviluppo del paese, particolarmente del Mezzogiorno d'Italia, non si possa non concordare ampiamente".

20 See for example, Enrico Marrucci (PCI, 1986): "A nostro parere, infatti, e necessario aprire una nuova fase nell'iniziativa delle partecipazioni statali che accompagni la pur necessaria opera di risanamento finanziario e allargare la base produttiva ed occupazionale, in modo particolare in direzione del Mezzogiorno".

21 See Luigi Castagnola (PCI, 1983): "Non si dica che è la CEE che ce lo impone, perché questo non è giusto da nessun punto di vista e tanto meno dal punto di vista dell'interesse e della stessa dignità nazionale. Non è possibile subire dalla CEE quella doppia imposizione, non è possibile addossare interamente alla siderurgia pubblica tutto il peso dei tagli che operano nel vivo della produzione e dell'occupazione".

22 For evidence of criticism of industrial policy see for instance this parliamentary speech on the question by Franco Frattini (Forza Italia, 1999), "'La visione centralistica e pianificante dell'economia, schiacciata sempre più nel suo vortice finanziario costituito dall'assistenzialismo, dal debito pubblico, dalla pressione fiscale, dalla difesa e protezione delle minoranze più forti a danno di quelle più deboli. È utile ormai soltanto - forse - a difendere il conservatorismo delle classi politico-burocratiche e dei gruppi di pressione impegnati nella difesa di attività economiche non competitive e sovvenzionate - oltre a tutto - con il denaro di tutti." Or criticism by Alleanza Nazionale, which in parliamentary debates also sought to underline the 'degenerazione di mercato', which was seen as a byproduct of industrial policy.

without continuous reliance on taxpayers' support, it should be allowed to fail. This stance reflected broader scepticism towards state intervention and a growing emphasis on market discipline and efficiency[23]. The Lega's politicians' critique focused not only on the specific choices surrounding privatization, particularly which companies were targeted, but also on broader economic structural concerns. Parliamentarians from the Lega argued that globalization undermined the viability of national industrial policies and challenged the legitimacy of state subsidies to the economy. Their stance was broadly critical of dirigiste approaches, favouring market-based solutions and reduced state involvement in economic affairs[24].

While adopting a different tone, policymakers from the centre-left also notably emerged as active proponents of reforming Italy's industrial policy and privatising the large SOEs. Indeed, their speeches on industrial policy were often accompanied by concerns about the pace and direction of change; that is, whether changes were being implemented too rapidly or whether policy was targeting the wrong sectors. There was also a growing effort to distance industrial policy from its earlier reliance on centralization and "excessive" state control. For example, the Democratici di Sinistra (DS) advocated for a reoriented industrial policy that prioritized targeted support for SMEs rather than one focused on a blanket support of large SOEs[25].

From this perspective, it is particularly interesting to examine the evolving stance of the DC and the party's various centrist successor parties. Long-standing champions of industrial policy, these parties gradually recognized the need to re-evaluate the state's role in the economy by the late 1980s and early 1990s. This shift was driven by both fiscal constraints and the process of European integration, which demanded greater market discipline and reduced levels of state intervention. As a result, centrist and Christian-Democratic parties began advocating for a new type of industrial policy. This was aimed at remodelling the state's presence in the economy, moving away from traditional forms of direct intervention towards more strategic and market-compatible approaches[26]. A notable shift in the approach to industrial policy involved linking state-funded industrial policy projects more explicitly to concerns about productivity and competitiveness, particularly in the context of deeper engagement with the European Union[27].

Interestingly, however, during this period there appears to have been no real

23 For this position, see for example this parliamentary speech by Giovanni Didone (Lega, 2004): "Se una di queste compagnie non è in grado di restare in piedi sulle proprie gambe, la lascia fallire. Secondo il mio punto di vista, in questi 11 anni qualcuno in Alitalia, soprattutto tra i dipendenti che i nostri colleghi della sinistra vogliono in qualche modo sostenere, si è convinto che lo Stato avrebbe continuato ad elargire risorse anche nostre - tutti noi, infatti, paghiamo le tasse - ad un'azienda priva della possibilità di competere da sola".

24 See for example Domenico Comino (Lega, 1996) "La globalizzazione dell'economia fa sì che gli investimenti non siano più vincolati dai confini nazionali e la dinamica industriale non sia più condizionata da antiquate sovvenzioni statali, bensì dal desiderio e dall'esigenza di servire mercati interessanti, ovunque essi siano, e di attingere risorse ovunque siano disponibili. Anche i consumatori non sono più condizionabili dai loro governi, essi vogliono semplicemente i prodotti migliori al prezzo più basso, qualunque sia la loro provenienza. Onorevole Prodi, nel suo programma c'è ancora troppo dirigismo e manca la consapevolezza del venir meno del ruolo di mediatori tradizionalmente svolto dagli Stati-nazione e dai loro governi"

25 See for example, Gianni Vernetti (L'Ulivo, 2004): "Pertanto, questo pacchetto di emendamenti ha esattamente l'obiettivo di permettere al nostro sistema industriale di diventare meno energivoro, più efficiente, più innovativo e più evoluto".

26 See for example, Rino Nicolosi (DC, 1992): "Si tratta di decisioni alle quali non potevamo sottrarci, sia per i vincoli europei sia per quelli di bilancio, e che aprono anche una nuova fase dell'intervento pubblico che consentirà di rimodellare la presenza pubblica in economia".

27 Hubert Corsi (DC, 1993) "Non siamo più, onorevoli colleghi, in presenza di fasi congiunturali cicliche, ma di situazioni nella maggior parte dei casi economicamente non più recuperabili o comunque non più trascinabili nel tempo con gli interventi assistenziali tipici del passato, anche perché le normative comunitarie impediscono rigorosamente aiuti di Stato senza una prospettiva di recupero di efficienza e di produttività legata alla competitività del mercato".

evolution of political thinking towards a reconsideration of industrial policy as a means to promote the upgrading of the country's economic model in the face of deeper globalization and EU-integration.

DC policymakers, for instance, continued to justify state intervention in the economy mostly on the basis of socio-economic considerations. They argued that if left unchecked, private sector competition could lead to harmful socio-economic outcomes. From their perspective, industrial policy remained a vital tool to ensure a more equitable and balanced economic development, even as the form and rationale for such intervention evolved in response to new fiscal and supranational constraints[28].

A new, forward-looking interpretation of the role of industrial policy in the country's economic development seemed to be lacking also in its few remaining outright strong supporters. In the 1990s-2000s, a new far-left party, *Partito della Rifondazione Comunista*, stood out as the only staunch defender of industrial policy. During a period otherwise marked by a declining importance of this type of policy, this party emerged as the standard-bearer for industrial policy, emphasizing its historical role in Italy's economic development[29]. The party framed the marginalization of industrial policy within a broader critique of globalization, increased international competition, and the socio-economic challenges these processes created. In doing so, *Rifondazione Comunista* thus sought to reassert the relevance of state-led economic planning, but mostly as a means to counteract growing inequality and economic insecurity, rather than as a proactive tool for state-led industrial and technological upgrading.

Similarly, on the right, where positive references to industrial policy were made, these references also tended to emphasize a reactive use in response to emerging threats. That is, industrial policy was predominantly framed as a tool to prevent offshoring (*delocalizzazioni*) and defend 'traditional' economic sectors, rather than as a strategic instrument to promote future-oriented industries, particularly within the broader context of the transition to a knowledge-based economy, which other advanced economies were grappling with. Most mentions of industrial policy during the time lamented the decreasing levels of support for Southern Italy and continued to focus on sectors that had been central in the immediate post-war period but were now increasingly uncompetitive (sunset industries). This suggests that several Italian policymakers during this time embraced a more protective, reactive, and defensive vision of industrial policy: one aimed at supporting the South, safeguarding the traditional economic sectors of agriculture and heavy industry, and preventing offshoring[30].

28 Bruno Napoli (DC, 1993) "Le partecipazioni statali non sono nate perché il settore pubblico voleva entrare nel privato, ma perché quest'ultimo non era capace di restare nel privato, provocando danni economici ed umani spaventosi al paese. Le partecipazioni statali hanno avuto un grande ruolo nello sviluppo del paese; hanno equilibrato la spinta dello spontaneismo economico, hanno consentito di dare più spazio alla parte debole del sistema industriale, hanno fatto spesso ciò che il privato non ha voluto o non ha avuto possibilità di fare".

29 See for example Alfonso Gianni (Rifondazione Comunista, 2002) "Non si può agire semplicemente a colpi di rottamazione o a colpi di incentivi o sgravi fiscali che premiano le grandi famiglie del capitalismo italiano, ma mortificano lo sviluppo produttivo del paese e ingenerano serie preoccupazioni per la stabilita dell'occupazione in un settore che resta, per la nostra economia, un settore fondamentale... Insomma, le risposte del Governo dimostrano che esso si disinteressa di una seria politica industriale degna di questo nome di cui, invece, il nostro paese avrebbe bisogno, proprio in un processo di integrazione europea".

30 See for example Carlo Giovanardi (FI, 2005): "E' chiaro che le industrie, come la Finmeccanica, si comportano anche facendo riferimento alle condizioni del mercato; tuttavia, ritengo sia giusto che il Governo faccia il possibile e, in modo particolare, prema - ciò si definisce come, moral suasion, - sulla Finmeccanica affinché le attività di questa azienda siano svolte in Italia e non delocalizzate laddove vi sono condizioni migliori di mercato" or Pietro Armani (AN, 1998): "Tuttora il Governo non è riuscito a rendere accessibili investimenti per alcuni settori di vitale importanza, ad esempio l'agricoltura".

3.4 CONTEMPORARY LINEAGES OF ITALY'S INDUSTRIAL POLICY: PARLIAMENTARY DEBATES ON INDUSTRIAL POLICY (2006-2022)

In the last part of our empirical analysis of Italy's parliamentary discourse on industrial policy, we focus on the current period. We do this by focusing specifically on how parliamentarians discussed the subset of industrial policies identified in the chapter by Ughi and Gronchi as the key industrial policies for Italy from 2006 onwards (See Table A1 in the Appendix). As illustrated by Figure 1, the years around the COVID-19 pandemic saw a resurgent interest in the topic of industrial policy. This trend is not unique to Italy; indeed, since the mid-2010s, the European Commission has adopted a more flexible approach in regulating state intervention in areas with market failures (Bulfone et al. 2025). In particular, by the time of the COVID-19 pandemic, EU institutions had somewhat relaxed their perspective on state aid rules.

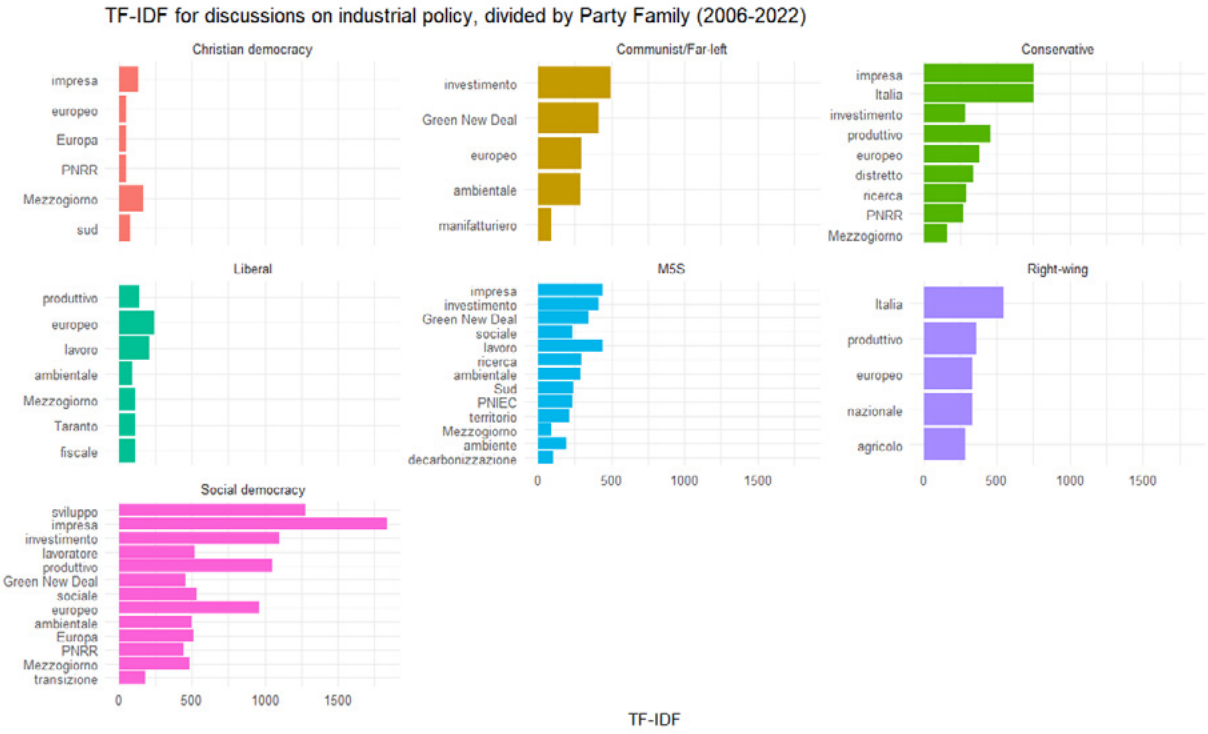
To understand the way in which policymakers discussed industrial policy in the more recent period (2006-2022), we once again complement a quantitative text analysis of the corpus of parliamentary speeches discussing industrial policy with a qualitative analysis. To do this, we make use of another commonly employed technique in the field of NLP, which allows us to examine how distinctive certain key terms are for policymakers from different political parties. As we illustrate below, in Figure 6, we make use of the TF-IDF (Term Frequency – Inverse Document Frequency) metric, which evaluates the importance of a word within a document (parliamentary speech) in relation to the entire corpus of documents[31].

Our analysis shows that across all major parties, parliamentarians have tended to discuss industrial policies by mentioning the NRRP and Europe. Yet, our analysis also clearly illustrates that, when discussing the topic, different parties also tend to emphasize the different terms and issues in which they can be reputed to be particularly interested or competent in.

Thus, parliamentarians from the M5S in their discussions of industrial policy seem to show a particular propensity to focus on environmental issues or to mention the National Energy and Climate Plans (PNIEC). Parliamentarians from the party family 'Communist/Far-Left', which aggregates parties such as *Alleanza Verdi e Sinistra* and *Sinistra Italiana*, instead have opted to frame their discussions on industrial policy through distinctive terms such as 'Green New Deal' and 'workers'.

31 This metric thus measures how often a term appears in a parliamentary speech by weighing for how rarely it appears across the entire document collection, which in our case is constituted by all parliamentary speeches which discuss industrial policy from 2006 onwards.

Figure 6: Term Frequency – Inverse Document Frequency (TF-IDF) indicator for parliamentary speeches discussing specific industrial policies in the period 2006-2022.



One of the most notable developments that emerges in the parliamentary speeches of the more recent period is the increased prominence of environmental concerns. Across party lines, parliamentarians have increasingly linked industrial policy to the goals of decarbonization and achieving a successful energy transition. The new emphasis positions the state as a pivotal actor in steering the green transformation of the economy and stresses the need of aligning industrial objectives with climate policy.

From a sectoral standpoint, the automotive industry emerges as a key target when policymakers call for a more robust industrial policy. Parliamentarians, especially from centre-right parties, often frame their support of a green industrial policy by pleading at the same time to "pragmatically" protect and modernize the energy-intensive automotive sector - in continuity with the earlier trend of advocating for state intervention for declining sectors[32]. Specific environmental themes that are at times integrated into these arguments are appeals to support hydrogen research and low-emission technologies as part of a broader climate strategy.

On the left of the political spectrum, parties have emphasized the role of industrial policy in safeguarding Italy's manufacturing base and countering the threat

32 See for instance Guido Germano Petterin (Forza Italia, 2022), "Chiedere con forza una visione strategica in questo senso, che non ci condanni a diventare marginali rispetto alle grandi potenze industriali, non significa negare l'importanza della transizione ecologica, significa affermarla, ma rendendola consapevole, sostenibile e pragmatica. Per questo al Governo chiediamo ragionevolezza ed un serio appello per una politica industriale comune a livello europeo in questo settore, di modo che l'Europa, anche qui, batta finalmente un colpo, non limitandosi solamente a parole, ma facendo quei fatti che ci porteranno ad essere una vera, unica Unione europea".

of offshoring (*delocalizzazioni*)[33]. Left-wing parliamentarians have thus often framed industrial strategy as a means to protect domestic employment and retain strategic production capabilities within national borders. However, they also voiced scepticism regarding the actual beneficiaries of industrial policy and state subsidies to industry. Whereas critiques from previous decades criticized "parasitic" state owned enterprises for seizing industrial subsidies, attention now seems to center more on multinational corporations.

One of the most notable and recurring themes that emerges across both left-wing parties as well as the right-wing Fratelli d'Italia argues that the privatization policies implemented during previous decades have weakened Italian industry and harmed workers[34].

Most notably, however, more recent debates on industrial policy have been strongly conditioned by a distinctly European dimension. In particular, the implementation of the NRRP, funded through the EU's Next Generation EU program, is seen by policymakers as a historic opportunity to reshape Italy's industrial landscape[35]. More critical voices, however, focus on the restricted fiscal flexibility entailed by European integration and have referred to the NRRP as a "masked ESM [European Stability Mechanism]" ("*MES mascherato*") due to its performance-based conditionality requirements[36].

Apart from the NRRP, debates on industrial policy are often intertwined with discussions on the European Union, with policymakers typically divided along ideological lines on the question of whether it is possible to implement a successful industrial policy strategy within the fiscal and regulatory limits of the EU. Pro-European parliamentarians thus typically stress the importance of aligning industrial policy with broader European objectives and conceptualize European industrial policy as a key strategy to successfully decarbonize the economy[37]. Conversely,

33 See Federico Fornaro (LEU, 2021) "Occorre compiere tutti insieme uno sforzo di sistema per riporre al centro della politica industriale italiana proprio l'industria manifatturiera e questo va fatto, soprattutto, in relazione ai partner europei, al fine di costruire strategie di lungo periodo che possano comportare un effettivo rilancio dell'economia, rendendo più attrattivi gli investimenti in Italia. Occorre, cioè, che l'Italia rafforzi le misure di contrasto alle delocalizzazioni anche con eventuali nuovi interventi normativi che devono disincentivare questi comportamenti che spesso - e mi assumo la responsabilità di quello che dico - hanno una fattispecie di tipo predatorio e non imprenditoriale." See Piero Fassino (PD, 2018): ""Se si vuole evitare la delocalizzazione, più che mettersi in una logica di carattere punitivo, bisognerebbe mettersi in una logica di carattere positivo e propositivo vedendo quali sono gli interventi e le misure che possono accrescere i fattori di convenienza per un'impresa e quindi indurla a mantenere le proprie produzioni qui, piuttosto che portarle altrove laddove appunto ci sono convenienze maggiori. E quindi questo richiama misure di politica industriale più che misure di carattere punitivo".

34 See for instance Marco Osnato (FdI, 2020) "Perché troppo spesso, dentro quest'Aula, e fuori da quest'Aula, magari da professori, commentatori, giornalisti, certo con atteggiamento da Solone, ci sentiamo ripetere che la politica deve restare fuori dall'economia, altrimenti, magari, potrebbe configurarsi questo spettro, che sempre aleggia, del dirigismo o, peggio, dello statalismo. In nome di queste presunte accuse, queste presunte ombre, negli anni, qualcuno ha voluto far credere che l'autoregolamentazione del sistema economico fosse la situazione più virtuosa, quasi necessaria e ineluttabile. Cosi ci siamo ritrovati, negli ultimi tre decenni, aziende di Stato, per esempio spesso decotte, ma talvolta in ottima salute, privatizzate senza la tutela del prodotto, dei lavoratori e, soprattutto, del vantaggio pubblico economico. Abbiamo visto liberalizzazioni che hanno portato più vantaggi a operatori di multinazionali a capitale straniero, piuttosto che a consumatori e utenti italiani. Abbiamo visto perdere sostanzialmente il controllo pubblico di realtà fondamentali per alcuni ambiti d'importanza strategica." See also Giuseppina Servodio (PD, 2012): "Tuttavia ciò non deve portarci, man mano che procediamo nelle privatizzazioni 'e che lo Stato si ritira dall'economia, a svilire e svuotare di contenuto il ruolo dello Stato stesso, al quale compete di farsi carico di definire una politica industriale capace non solo di superare qualsiasi forma assistenzialistica e parassitaria di supplenza, ma anche di individuare strade profondamente innovative, in linea con le esigenze di un reale ammodernamento".

35 See for example, Raffaelle Baratto, (Forza Italia, 2022) "che gran parte degli investimenti previsti per ridare impulso alla politica industriale nazionale oggi arriveranno dalla concreta attuazione del PNRR" and also Giorgio Silli (Noi Moderati, 2022) "Duecento miliardi non è che possiamo stamparli di nuovo: o questi 200 miliardi li investiamo nel modo giusto, secondo le norme dell'economia politica e usando strumenti di politica economica, o, se sbagliamo, noi veramente rischiamo di trovarci come i Paesi, non tanto del Sud d'Europa, ma quasi del Sud del mondo".

36 See Raphael Raduzzi (M5S, 2022), "Con il PNRR abbiamo approvato una sorta di MES mascherato, un MES con l'ombretto"

37 See Rossella Murroni, (Centrosinistra, 2021) "L'Europa, nata su un patto legato al carbone e all'acciaio, può trovare nuovo slancio ed una leadership internazionale, puntando sulla green economy, a partire dalle fonti di energie rinnovabili., Il futuro dell'Europa passa necessariamente per il Green New Deal".

more Eurosceptic voices, both from the right and the left, raise concerns about the constraints imposed by EU fiscal rules and question the feasibility of an ambitious industrial policy within the current European economic governance framework. In particular, left-wing criticisms mostly seem to target the enduring influence of austerity policies, which they argue undermines the state's ability to engage in long-term industrial planning and investment[38].

In the more recent period, parliamentary debates on industrial policy also frequently involve conflicts over the most appropriate policy instruments to implement industrial policy strategies. There is a cross-partisan emphasis on investments in research, development, and innovation[39]. Thus, for instance, Guglielmo Epifani, former General Secretary of the main Italian trade union, CGIL, and erstwhile leading figure of the centre-left, emphasized the need to prioritize innovation and R&D over the profitability of multinational corporations. Similarly, some right-wing figures, including those from FdI, have linked industrial policy with broader concerns over labour costs and competitiveness, arguing for measures that would reduce the structural cost of labour alongside the need to strengthen targeted R&D investments[40]. Another area of cross-party interest concerns the development and support of Special Economic Zones (Zone Economiche Speciali, ZES), which were introduced in 2017 and offer fiscal and administrative incentives to firms operating in specific geographical areas, particularly in the South[41].

Parliamentarians from the M5S have emerged as strong advocates of a more assertive industrial policy, emphasizing the strategic role of the European Union in supporting such efforts. Their recent discourse on industrial policy highlighted a focus on sustainability and decarbonization, alongside a pronounced concern over the pace of past privatizations and the resulting lack of state control over economically strategic sectors, particularly in the area of energy security[42].

Parliamentarians from the PD instead emphasize the role of the state in supporting R&D, particularly for SMEs. Notably, in light of Italy's weak economic growth in recent years, PD parliamentarians have increasingly framed industrial policy as a

38 See Titti De Salvo (SEL, 2019), "Naturalmente, nessuno ignora che nuovi posti di lavoro hanno bisogno di nuovi investimenti: questo è il punto. E il punto che la legge di bilancio affronta con <<Industria 4.0>>, per superare quel modello di specializzazione antico, italiano, con i problemi legati alle dimensioni dell'impresa e agli scarsi investimenti in ricerca ed innovazione ed è il punto dello scontro con l'Europa sull'austerity, su che cosa vuol dire fare politiche di crescita".

39 See for example Alessio Butti (FdI, 2022) "Quindi, concludo, dicendo che, certamente, quello che proponiamo non è la panacea per tutti i mali, ma ci dobbiamo rendere conto che non si può impostare la politica industriale di un Paese semplicemente sull'incentivo all'acquisto: bisogna investire sulla ricerca, bisogna investire sulle nuove industrie, bisogna indubbiamente investire anche sull'innovazione" and also Anna Laura Orrico (M5S) "La digitalizzazione e l'esigenza di preservare attività imprenditoriali e posti di lavoro sono sfide alle quali lo Stato non può mancare di rispondere, supportando le imprese in percorsi di formazione, accompagnamento e innovazione responsabile".

40 See Alessandro Colucci, (Centrodestra, 2020) "una politica industriale, che per noi vuol dire rafforzare i distretti industriali, che vuol dire investire in ricerca e innovazione, e soprattutto ridurre il costo del lavoro, perché è l'unica strada possibile".

41 See for example, Catello Vitiello (M5S, 2021) "Nonostante gli interventi fiscali di questi anni - penso ad esempio all'istituzione delle zone economiche speciali - non riusciamo ancora ad essere attrattivi per gli investitori stranieri; vuol dire, allora, che anche quel sistema va implementato e migliorato per evitare che resti lettera morta".

42 See for example Massimiliano De Toma (FDI, 2021): ""scindere l'energia dalle politiche industriali del Paese è stato un grave sbaglio, che pagheremo salato, anzi mi sia concesso, Presidente, di dire che lo stiamo già pagando tutti." See Lucia Scanu (M5S, 2022)"Modernizzare le nostre infrastrutture energetiche è diventata non più un'ambizione con scadenza lontana ma una scelta doverosa, immediata e improrogabile, in uno scenario geopolitico radicalmente mutato. L'energia e tutte le filiere ad essa collegate sono un asse imprescindibile per la sopravvivenza del nostro modello economico." See also Ilaria Fontana (M5S, 2022) "La strategia per superare la crisi è comprensibilmente complessa e articolata su più fronti, ma anche rispetto a quanto lamentato dall'interpellante, non prescinderà assolutamente dalle politiche di decarbonizzazione. In particolare, ci si riferisce al dato per cui, nel perseguire la differenziazione delle fonti energetiche, si dovrà puntare primariamente sull'accelerazione della penetrazione nel sistema delle fonti rinnovabili, nonché sullo sviluppo di biocombustibili, biometano e idrogeno; parallelamente, sarà necessario agire sulla riduzione della domanda e sul risparmio energetico, attraverso il continuo miglioramento del livello di efficienza energetica e dell'impulso alle politiche per il risparmio energetico".

tool to stimulate broader economic growth[43]. Their speeches on industrial policy are also reflective of a concern over the consequences of past privatizations, alongside a recognition of the importance of the European Union in shaping the scope and overall thrust of national industrial strategy plans[44].

To conclude, in recent years, the Italian parliamentary debate on industrial policy has witnessed significant shifts in how policymakers across the political spectrum have discussed the topic. An analysis of parliamentary discourse reveals the emergence of several key themes. First, there is a growing concern that the pace of past privatizations was too rapid or poorly managed and that successive Italian governments had been wrong in relinquishing control over strategically important economic sectors. Second, while industrial policy continues to be linked to the economic development of Southern Italy, this issue appears to carry less weight than it did in earlier periods. Third, industrial policy is increasingly viewed as a vital instrument for addressing the environmental transition, promoting decarbonization, and supporting investment in future-oriented and innovative sectors of the economy (e.g. in renewable energy). However, this renewed interest in the strategic use of industrial policy appears deeply linked to discussions and reactions around EU-level initiatives (Next Generation EU, Green Deal, etc.). Indeed, a parallel growing issue is the role of EU rules, specifically the extent to which it is feasible to engage in industrial policy within the constraint of EU state aid and fiscal rules. Overall, these last two points, which associate industrial policy mentions with EU-related considerations, call into question the extent to which the Italian political-party system has truly elaborated its own vision of the role industrial policy can play to meet the specific industrial needs and economic challenges of the country - or, rather, is only reacting to an EU-driven policy momentum.

4. CONCLUSION

This chapter has explored the preferences of Italian policymakers and political parties regarding industrial policy. Although increased European integration and shifting economic policy paradigms have increasingly constrained policymakers' discretion in economic matters, industrial policy has recently regained significant relevance within policymaking circles, particularly in the context of the Next Generation EU program and the Recovery and Resilience Facility.

The chapter has examined how Italian political elites have discussed industrial policy in the parliamentary arena over recent decades. Using a combination of natural language processing techniques and a qualitative analysis of parliamentary

43 See for example Ivano Strizzolo (PD, 2011): "Non intravediamo nelle azioni che il Governo sta mettendo in campo iniziative di politica industriale che contrastino questa situazione di difficolta e di crisi e che creino i presupposti affinché l'economia del nostro Paese torni a crescere. Senza crescita - e concludo, signor Presidente - e senza sviluppo economico non vi è neppure la possibilità di contrastare efficacemente anche l'enorme debito pubblico che, lo ricordo, in due anni e mezzo - dall'avvento di questa maggioranza e di questo Governo - e aumentato di 200 miliardi. Credo che serva proprio una nuova politica industriale da parte del Governo".

44 See for example Paola De Micheli (PD, 2013): "si deve chiedere all'Europa di fare di più per la crescita: non solo fiscal compact, dobbiamo chiedere che l'Europa si faccia carico di promuovere investimenti, attuando finalmente la golden rule. Quindi, politiche industriali di filiera, crediti di imposta, rilancio attraverso meccanismi di esclusione dal Patto di stabilita di alcuni indispensabili investimenti pubblici, attivando le risorse che la virtù di tanti nostri amministratori e stata in grado di conservare".

speeches, we have sought to provide a view of inter-party and intra-party (over time) shifts in preferences. Empirically, we have sought to increase our understanding of the way in which policymakers have discussed industrial policy by focusing on its salience as well as the broader thematic context in which the topic has been discussed in parliamentary debates.

Our in-depth analysis of parliamentary speeches in Italy's lower House of Parliament concerning industrial policy reveals four distinct phases. The first phase, spanning from the 1950s to the late 1970s, was marked by high salience. During this period, industrial policy was not only closely associated with state-led development, particularly targeting the modernization of the South and other less developed regions, but was also broadly accepted across the political spectrum as an effective macroeconomic tool to promote income and employment growth.

Beginning in the early 1980s, we observe a marked decline in the prominence of industrial policy, evidenced by two key facts: first, a quantitative reduction in salience; second, a qualitative shift in the discourse, with growing scepticism about industrial policy's role as a driver of economic growth and increasing concern over its potential to facilitate rent-seeking behavior by interest groups.

This was followed by a third phase, which we have termed the European Market-Oriented Industrial Policy era. Here, discussions became increasingly shaped by European integration and the broader trend of market liberalization. References to industrial policy became even less frequent. Importantly, it is in this phase that the term's usage took on a more defensive and reactive tone, focused more on protecting declining ("sunset") industries than on promoting innovation. This period was characterized by heightened concern over offshoring and a strong emphasis on safeguarding traditional sectors such as agriculture, along with continued attention to the economic needs of the South. Industrial policy, however, stops being conceived as a forward-looking strategy to upgrade the economic system.

Finally, since the mid-2010s, we note a resurgence of interest in industrial policy. In this most recent phase, debates have increasingly focused on energy transition and the strategic role of the state in supporting key sectors, most notably the automotive industry. These discussions are often framed within the context of the European Union and, in particular, the National Recovery and Resilience Plan, which many policymakers regard as an unprecedented opportunity for advancing Italy's industrial development. This link to EU-level policymaking debates, however, also casts doubt on whether Italy's political system has genuinely developed a new appreciation of industrial policy and a domestically informed vision of the role this policy can play in the country's competitiveness.

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APPENDIX

In this Appendix, we provide additional information on the empirical analyses, which have been conducted in this chapter. First, we document the way in which we have extracted from the ItaParlCorpus dataset only the parliamentary speeches that specifically concern the topic of industrial policy. Second, we provide further information to the reader on the methodological aspects pertaining to our quantitative text analysis.

Dictionary analysis

To identify which parliamentary speeches discuss the topic of industrial policy, we use a dictionary of key terms, which contain words that can be deemed to be closely connected to industrial policy. If parliamentary speeches contain the words that we have included in the dictionary, they are thus included for further analysis. We use two different types of dictionaries. First, we use a more general dictionary (Dictionary 1) which includes more general terms that can be indicative of industrial policy discussions throughout the period under investigation (1948-2022). We supplement this more general dictionary with a second, more specific dictionary (Dictionary 2), which only includes the vertical and horizontal pillars of Italy's industrial policy (as documented by Gronchi and Ughi's chapter in this volume) in the more recent period. Given that these policies only pertain to the most recent period, we only use those to subset parliamentary speeches for the period from 2006 onwards.

Table A1: Dictionary of industrial policy-related terms.

Dictionary	Terms
Dictionary 1: All terms related to industrial policy	"Politica Industriale", "Partecipazioni Statali", "IRI", "Finsider", "Finmeccanica", "Italstat", "Fincantieri", "Intervento Straordinario per il Mezzogiorno", "Distretti Industriali"
Dictionary 2: Terms connected to specific industrial policies (2006 – onwards)	"Piano Industria", "Distretti produttivi", "Credito d'imposta aree svantaggiate", "Credito d'imposta R&S", "Fondo per la Competitività e Sviluppo", "Fondo Investimenti Ricerca Scientifica & Tecnologica", "Bando ISI", "FFI", "Fondo per la Finanza d'Impresa", "Agevolazione R&S industriale", "Aiuto crescita economica", "Brevetti+", "Fondo Crescita Sostenibile", "Italian Startup Act", "Bando investimenti innovativi", "Nuova Sabatini", "Fondo Italiano Investimento", "PNR", "Fondo Strategico Italiano", "Banca del Mezzogiorno", "Credito R&S", "CDP", "Cassa Depositi e Prestiti", "Bando Investimenti Innovativi", "Piano Made in Italy", "Strategia Banda Ultra Larga", "Credito Mezzogiorno", "Resto al Sud", "Zone economiche speciali", "SNSI", "IncentivO Lavoro (IO Lavoro)", "Fondo Trasferimento Tecnologico", "Fondo Nazionale Innovazione", "Fondo IPCEI", "Green New Deal", "PNIEC".

Quantitative text analysis

In this chapter, we employ a range of different quantitative text analysis techniques, which we briefly discuss here. Recent advances in QTA and natural language processing (NLP) have made it possible to systematically analyse large corpora of political texts in ways that would not have been possible before. These tools allow

researchers to systematically extract high-level information, such as recurring themes and frequently used terms, across a large range of different documents, which in our case are constituted by parliamentary speeches.

As we have demonstrated in this chapter, applying QTA/NLP techniques to the corpus of parliamentary speeches allows us to identify the terms and themes most commonly used by policymakers when discussing industrial policy. These semantic associations offer insights into the themes/terms different parties choose to emphasize when discussing industrial policy. While these methods are invaluable for mapping large-scale discourse, they are most effective when complemented by a close, qualitative analysis of the text, which can reveal the nuance, context and rhetorical strategies adopted by parliamentarians; elements that automated techniques may miss but which are crucial for understanding how policymakers envisioned the changing role of industrial policy for Italy's economic development.

To start, we first apply a technique from the field of natural language processing known as topic modelling. This method is particularly well-suited for analysing large text corpora, as it automatically identifies groups of words that frequently co-occur across documents: thus, revealing latent thematic structures within the data. Topic modelling enables us to uncover underlying topics and patterns in the discourse that, due to the size of the corpus, would be difficult to compile through a manual or purely qualitative analysis alone. As such, it offers an efficient and scalable approach for interpreting complex, large-scale textual data like parliamentary speeches on industrial policy. Moreover, by using a dynamic topic modelling approach we are also able to examine how the salience of specific topics has varied in time.

To explore the broader context in which policymakers discuss industrial policy, researchers have often used a keywords-in-context analysis, which tabulates the frequency with which words appear within the broader context in which a set of target words are found. The more frequently a word appears in conjunction with the keywords of interest, the easier it becomes to infer the particular context that political actors tend to discuss those terms in. Concretely, for our case, we are interested in examining the words that most frequently appear in sentences in which industrial policy is discussed. However, a potential limitation of this approach is that relying solely on a word frequency analysis may overlook the substantive content of parliamentary discussions on industrial policy. Common words do not confer much substantive information on the way in which policymakers from different parties discuss the issue of industrial policy. This is why in the chapter, we have applied a Named Entity Recognition (NER) analysis, a widely used natural language processing technique, to the corpus of parliamentary speeches on industrial policy. This method allows us to identify key terms, such as names of people, places and organizations, that systematically appear in conjunction with parliamentary discussions related to industrial policy.

02

REVIEWING ITALY'S INDUSTRIAL POLICY (2006 - 2024)

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ABSTRACT

In this chapter, the authors assess Italy's industrial policy (IIP) from 2006 to 2024 through a systematic review of annual reports by the Ministry of Economic Development (MISE, renamed the Ministry of Enterprises and Made in Italy – MIMIT – in 2022) and a wide range of complementary grey literature. They classify Italy's policy mix along three dimensions – strategy design, instrument choice and operating channels – and reconstruct five successive policy eras, from Piano Industria 2015 through Industria/Transizione 4.0 to the National Recovery and Resilience Plan (NRRP) and the current Transizione 5.0 phase. The analysis yields six stylised facts. (1) Italy lacks a coherent long-term strategy capable of guiding policy across electoral cycles. (2) Horizontal measures dominate over targeted, mission-oriented or place-based tools. (3) Subsidies and guarantees far outweigh equity, coordination or demand-side instruments. (4) Interventions remain heavily skewed toward supply-side, within-firm upgrades rather than system-level transformation. (5) Institutional layering has accumulated across ministries, agencies and funding lines, creating duplication and weak coherence. Finally, (6) evaluation practices are largely absent, limiting learning and accountability. These characteristics depict a fragmented and weakly integrated policy mix, only partially aligned with contemporary mission-oriented and place-sensitive approaches adopted in peer economies, and constrained by limited administrative and coordination capacity. The authors propose three reforms. First, co-producing an integrated national industrial strategy with the central government, regions, the social partners and key innovation actors to establish shared long-term priorities and situate existing measures within a coherent architecture. Second, introducing strategic conditionalities and clearer evaluation criteria to enhance accountability and policy coherence. Third, mapping and strengthening the governance infrastructure of IIP, including coordination across ministries, Cassa Depositi e Prestiti, its subsidiaries and regional actors. These reforms are presented as prerequisites for positioning Italy's industrial policy to meet the structural demands of the twin green and digital transitions.

Acronyms

Dictionary	Terms
CDP	Cassa Depositi e Prestiti
EC	European Commission
EU	European Union
IIP	Italian Industrial Policy
IRI	Istituto per la Ricostruzione Industriale
MISE/MIMIT	Ministero dello Sviluppo Economico (2006-2022) Ministero del Made in Italy (2022-)
MIUR/MUR/MIM	Ministero dell'Istruzione, Università e Ricerca (2006-2020) Ministero dell'Università e della Ricerca (2020-2022) Ministero dell'Istruzione e del Merito (2022-)
NRRP	National Recovery and Resilience Plan
OECD	Organisation for Economic Cooperation & Development
RRF	Recovery and Resilience Facility

1. INTRODUCTION

After World War II, Italy extensively employed industrial policy to develop its manufacturing base - particularly in the emerging industries of the 1950-60s (steel, automotive, chemicals) and the 1970-80s (electronics, telecommunications, aeronautics). In these attempts, industrial policy also played a key role in equipping the country with modern infrastructure (Ciocca e Toniolo, 2004). These years saw the widespread use of state-owned enterprises (SOEs) as key instruments for the reconstruction of the country and the expansion of the available national capital stocks in strategic sectors - including energy production, distribution, as well as other key public services. In this regard, Italy aligned with a global trend where, by the early 1980s, SOEs ranked among the largest companies worldwide[45].

With the acceleration of European integration through the Single Market and Monetary Union (EMU), the early 1990s marked a significant shift for European countries – including Italy (Mosconi, 2015). The political and legal developments underpinning European integration moved the focus of national industrial policy from 'vertical' interventions supporting specific sectors/companies to 'horizontal' measures aimed at creating a level playing field in the single market (Mosconi, 2019; Blauberger, 2009). In Italy, the scope for industrial policy reduced, also in light of the worsening performance of IRI (Locke, 1995) and increased budgetary pressures to achieve EMU targets. As stressed by Lucchese et al. (2016), during these years public intervention in the industrial and service sectors decreased from 1.6% of GDP in 1992 to around 0.2% in 2013 - including through the privatisation of SOEs. This shift aligned with a broader reduction in industrial policy expenditure across the EU, a trend that continued until the financial crisis of 2008 (European Commission, 2024; see Figure 1).

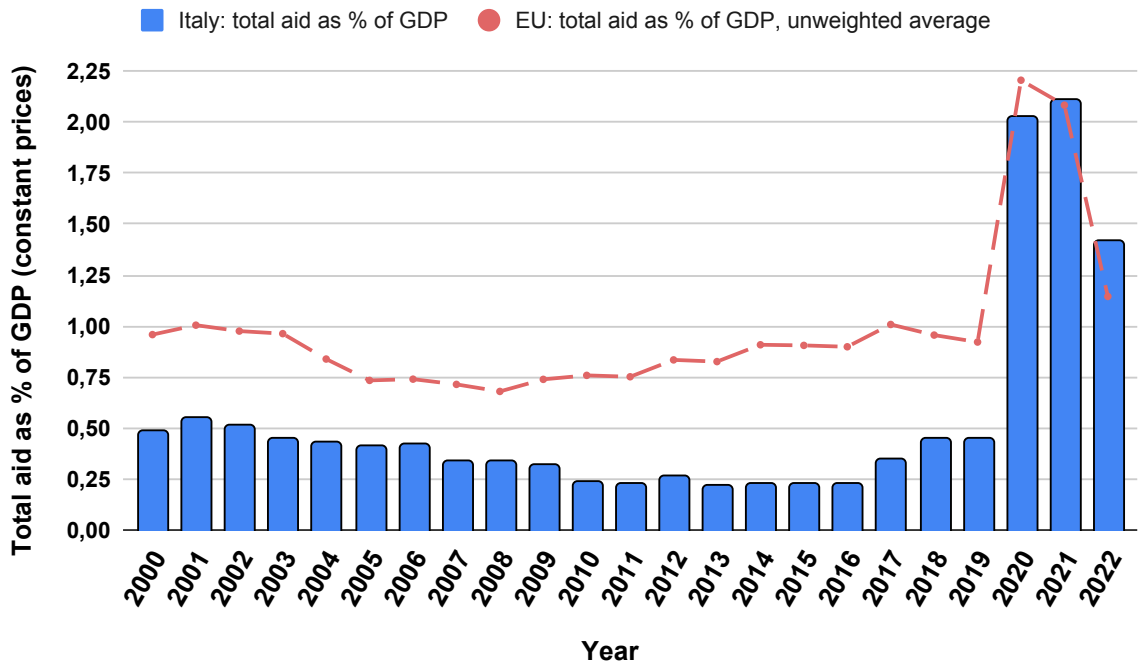
However, following the 2008 financial crisis - and especially during the COVID-19 pandemic - there has been renewed interest in the concept and practice of industrial policy (Evenett et al., 2024). Notably, since the mid-2010s, the European Commission has adopted a more flexible approach to state aid ("Modernisation"), allowing targeted investments in priority areas affected by market failures - such as innovation (LUHNIP, 2024). During the COVID-19 crisis, and the subsequent energy crisis, the EU state aid exemption regulations enabled national governments, including the Italian one, to support their industrial structure much more extensively than before.

In this context, Italy has again expanded its use of industrial policy and the related expenditure, while remaining below EU average (European Commission, 2024; see Figure 1)[46]. However, there is limited evidence of the role and scope of this renewed industrial policy action - particularly with respect to its underlying strategic focus.

45 To explore the historical evolution of the Italian system of SOEs, see e.g. Gasperin (2023).
46 Figure 1 and later elaborations (see sections below) use expenditures for state aid as a proxy for expenditure on industrial policy. Using state aid expenditures as a proxy for industrial policy spending may present challenges, as industrial policy usually includes a broader set of tools, such as tax incentives and infrastructure investments, which are not fully captured by state aid data. In the absence of consistent data on the full range of industrial policy expenditures across tools, state aid figures serve as a useful second-best proxy (see also Criscuolo et al., 2022).

This chapter aims to help Italian policymakers understand what the focus of Italian industrial policy (IIP) has been during the last 18 years. This appears to be a critical task at a time when industrial policy is being placed again at the centre stage of economic policy and Italian policymakers are therefore called on to make important decisions on this front.

Figure 1. Expenditure for State Aid in Italy and European Union, by year



Notes: The figure shows the expenditure on State Aid in Italy (taken as a proxy of industrial policy expenditure; see also footnote 46) as a percentage of national GDP (blue bars) and the unweighted average percentage expenditure across EU countries from 2000 to 2022. The countries included in the average are Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Germany, Denmark, Estonia, Greece, Spain, Finland, France, Croatia, Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, Malta, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, and Slovakia. Similar results are obtained focusing only on major European economies (France, Germany).
Source: Authors' elaboration on European Commission data (European Commission, 2024).

The chapter shows that Italian Industrial Policy (IIP) experienced major challenges and shifts yet consistently lacked a cohesive long-term strategy in the period from 2006 to 2024. While evolving through different 'eras' and tentative directions, IIP has been marked by gaps both in design and, most notably, in implementation. Those are summarised in six findings: a persistent lack of strategic design; a predominance of horizontal policies; a large reliance on subsidies and guarantees; a focus on supply-oriented measures; considerable institutional layering; and an absence of evaluation mechanisms.

As a result, the chapter recommends a comprehensive reappraisal of IIP to tackle its longstanding deficiencies and align it with current developments seen across OECD countries. First, it suggests elevating the development of an integrated industrial strategy as a national priority, engaging private and societal actors to identify long-term priorities by drawing inspiration from other leading countries. Second, it advocates streamlining and rewiring the extant policy mix with conditionalities

capable of ensuring its accountability and coherence - including via a rationalisation of extant public funds and evaluation criteria. Third, it emphasises the need to map and strengthen the governance infrastructure of IIP, performing gap assessments to better invest in administrative capacity building, and fostering better coordination among actors for effective implementation.

The remainder of the chapter is organised as follows. Section 2 presents the analytical framework employed. Section 3 elaborates on the main strategic 'eras' of Italian industrial policy from 2006 to 2024. Section 4 discusses the main findings of the analysis. Finally, Section 5 concludes the chapter with recommendations for the main areas for policy improvement.

2. METHODOLOGY AND DATA

2.1. ANALYTICAL FRAMEWORK

Today, policymakers thinking about industrial policy cannot easily find one definition and set of best practices. As a result, while definitions of industrial policy abound, the scope of the instruments that underpin it varies considerably for each author, policymaker, or context[47]. This work relies on the most recent conceptual framework adopted by the OECD, which adopts the following definition:

Industrial policy encompasses all types of [policy] instruments that intend to structurally improve the performance[48] of the domestic business sector (Criscuolo et al. 2022).

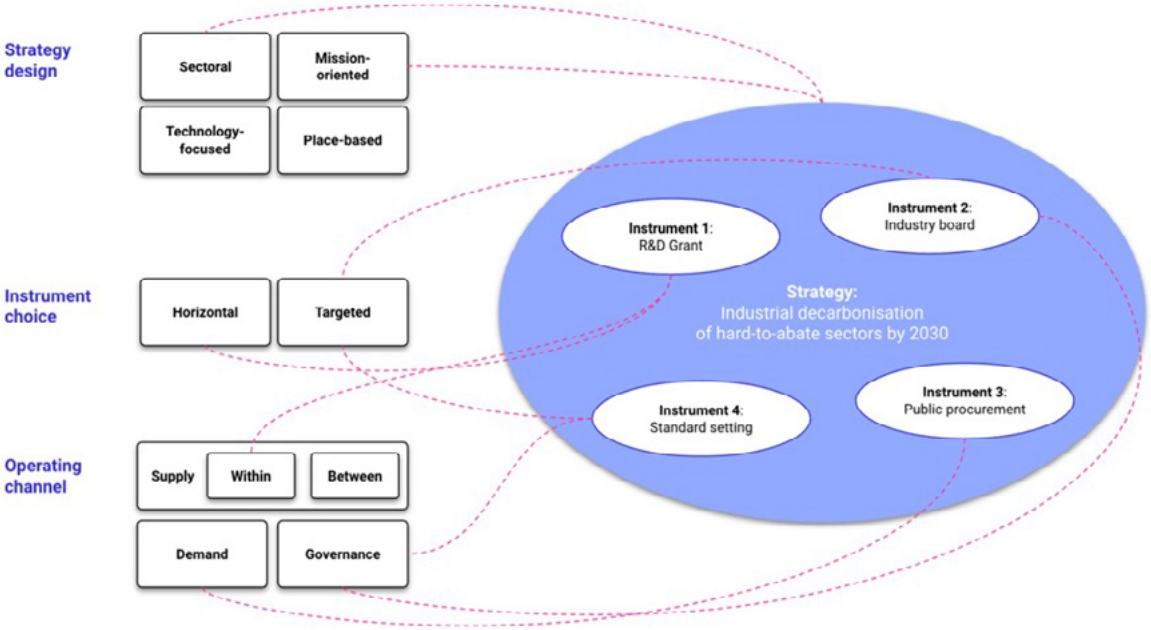
This definition has three characteristics: first, it is purposefully broad as it aims to provide a framework to analyse interactions between different policy instruments; second, it includes both horizontal policies (i.e., available to all firm regardless of their activity, technology, or location) and targeted policies (i.e., available to a subset of firms based on one or more of these criteria); third, to keep the analysis tractable, it excludes all other policy areas that have an important but only indirect impact on the performance of the business sector (i.e., fiscal, trade, competition, regulation, education, business framework, or macroeconomic).

47 For a review, see Warwick (2013).
48 The definition of performance depends on the objective of the policymaker. For example, while some policy measures may target exclusively economic performance, others may target the social and/or economic performance of a given industry. In this respect, the definition is agnostic and non-normative.

The definition lays the foundation for an analytical framework that can be used to analyse industrial policy in a holistic fashion. Such framework is structured around three dimensions (see Figure 2)[49]:

- Strategy design: the connection between a (set of) objective(s) and policy instruments.
- Instrument choice: the target and key characteristics of any given policy instrument.
- Operating channel: the mechanism by which it improves domestic performance.

Figure 2. Analytical framework and example



Source: Authors' adaptation and elaboration of Criscuolo et al. (2022). The example is fictitious.

At the level of strategy design, the work identifies four main types: sectoral (focused on a specific sector or group of interrelated sectors); mission-oriented (focused on specific societal challenges); technology-focused (focused on a specific set of technologies); and place-based (focused on the regional distribution of economic activity). Two caveats should be added to this typology: strategies may overlap (strategies can at the same time be place-based and sectoral); and strategies may either be 'intended' (deliberately designed) or 'emergent' (result from the layering of policy instruments designed in different circumstances and for different purposes)[50].

At the level of instrument choice, the chapter identifies two types: horizontal policies (which do not imply any discretionary selection of recipients by a public organisation) and targeted policies (which do imply such selection). At this stage, the analysis also accounts for the specific parameters that characterise any policy instrument – including designated recipient; amount of allocated funding; method of implementation; et cetera.

49 The work adopts a modified version of the framework proposed in Criscuolo et al. (2022) in which 'scope' and 'channel' are divided into two separate dimensions (instead of conflating them as 'instrument choice'). The rationale lies in the intent to highlight distinctive features of the Italian industrial policy mix with respect to both of these dimensions.
50 The distinction between 'intended' and 'emergent strategy draws on Mintzberg and Waters (1985).

Lastly, at the level of operating channels, the work identifies three types: supply (affecting domestic production); demand (affecting domestic consumption); and governance (affecting coordination among relevant stakeholders - including those beyond the business sector, such as public and research institutions). Importantly, the supply channel can be further split into two sub-channels: the 'within' channel (affecting efficiency within the firm) and the 'between' channel (affecting efficiency in the allocation of production factors between firms).

2.2. DATA

The following analyses are based on a systematic review of two main sources: i) annual reports published by Italy's Ministry of Made in Italy (MIMIT); and ii) grey literature published by independent organisations (OECD for industrial policy evaluation). Additional information on industrial policy expenditures is derived from official sources when not available through annual reports by MIMIT[51]. The first source (MIMIT's annual reports) is used to identify industrial policy instruments and main expenditures, while the second (grey literature) to gather further evidence of the aggregate, sectoral, regional, and technological impact. As this approach may involve biases arising from both the primary source (MIMIT's annual reports) and the authors' perspective, the work also relied on a recent appraisal performed by Zecchini (2020) on IIP - up to the present, the most authoritative mapping of the landscape - and shared the dataset compiled during the research with prominent IIP experts for validation. Overall, in the absence of a comprehensive dataset on IIP, this work seeks to lay the groundwork for further research on the systematic appraisal and historical evaluation of IIP.

2.3. EMPIRICAL APPROACH

The analysis leverages the analytical framework discussed in section 2.1 to characterise the nature, evolution, and role of IIP from 2006 to 2024. First, a general overview of IIP figures is derived from MIMIT's annual reports, focusing on the number of reported policy instruments - both at national and regional level - and associated aggregate expenditure levels[52].

Second, MIMIT's annual reports are scanned to identify the main national policy instruments adopted and specify their i) 'instrument choice' (horizontal or targeted), iii) 'operating channel' (supply – within or between –, demand, or governance), iv) 'type' (Tax expenditure, Equity/VC, Support/Coordination, Grant/Subsidy, Loan/Guarantee), (v) 'criteria' (R&D, Place-based, Labour, Sectoral, Size/age, Green, Technology-focused), (vi) 'expenditure' levels[53], (vii) related national or subnational

51 As the study focuses on the evolution of Italy's industrial policy (IIP) between 2006 and 2024, the work relies only on sources that have been published in this period. The Ministry responsible for IIP changed name in 2022: from the Ministry of Economic Development (MISE) to the Ministry of Made in Italy (MIMIT).

52 In the following, aggregate expenditure levels refer to amount granted (i.e. 'concessioni') and not to the amount of resources eventually disbursed (i.e. 'erogazioni'). Similar results are obtained using information on 'erogazioni', while the average aggregate yearly amount for 'erogazioni' is consistently lower than the one for 'concessioni'.

53 Information on expenditures for single policy measures is derived from additional sources (see below). Expenditure levels for policy measures are not directly comparable for lack of consistent information across data sources (cf. notes to Tables B.1., B.2., B.3., B.4., B.5. in Appendix B).

'law' and (vii) 'managing entity'[54]. The classification of policy instruments by operating channel, instrument choice, and criteria was guided by the need to identify the primary focus of each instrument while acknowledging the multi-dimensional nature of many policies.

For the operating channel, policies were categorised based on whether they primarily acted through supply-side support (e.g., subsidies or incentives to firms), demand-side initiatives (e.g., encouraging consumer uptake or enhancing public procurement), or governance-oriented measures (e.g., regulatory frameworks or administrative support).

The instrument choice - horizontal (applying across sectors) or targeted (applying on specific sectors or regions) - was determined by the dominant intention of the policy. Similarly, for criteria, the underlying goals and target areas of each policy were analysed - for example, when distinctively focused on a (set of) technology(-ies) or sector(s).

The primary classification is chosen and reported wherein policies intersect multiple domains. As a final step, the resulting longlist of policy instruments is mapped from MIMIT's reports into different 'eras' based on the presence of an intended strategy (e.g., Piano Industria 4.0 in 2013) or an emergent strategy following a critical juncture (e.g., in the aftermath of the Great Financial Crisis in 2008). Overall, this mapping resulted in the identification of five 'eras' - four of which represent intended strategies, and one an emergent strategy. The descriptive results of the data gathering process are presented in the next section. A critical appraisal of the IIP trajectory throughout the last 18 years is then presented in Section 4.

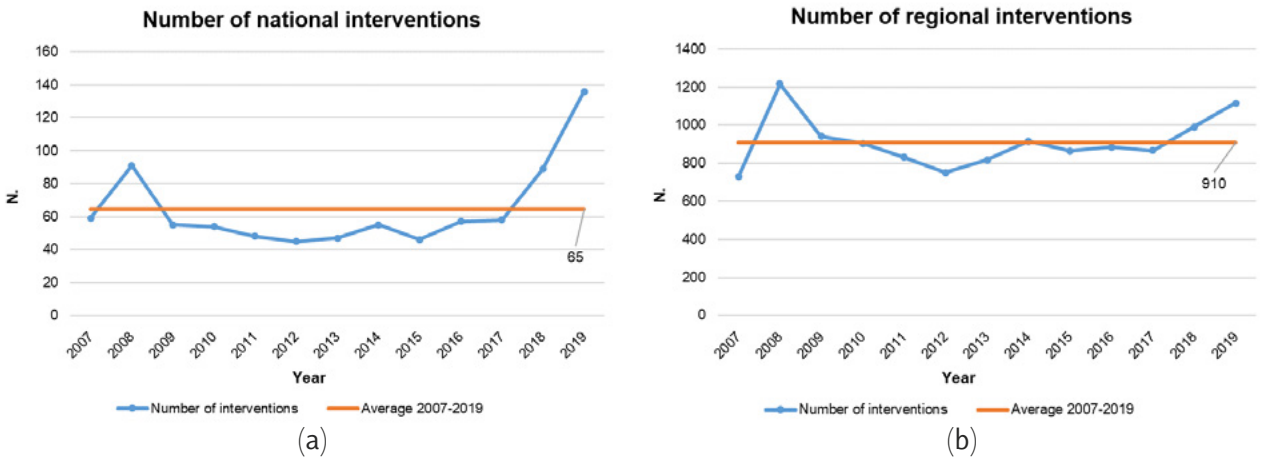
3. ITALY'S INDUSTRIAL POLICY (IIP) OVER 2006-2024

This section focuses on the main characteristics and phases of IIP over the period 2006-2024, as identified through MIMIT's annual reports.

Figure 3 reports the number of policy interventions mapped over the years[55]. In general, IIP has been characterised by a high number of interventions, both at the national (panel 3.a) and regional (panel 3.b) levels. On average, 65 policy measures were active during the period at the national level; around 910 measures were active at the regional level. While the number of interventions was almost stable over the years 2009-2017[56], the year 2019 saw a sharp increase in the number of interventions[57].

54 Several policy measures, such as the 'Fondo di Garanzia', remain active across various IIP 'eras'. The following review provides information on these measures for the period when each policy was first introduced.
55 Policy interventions are all those interventions that the authors have manually gathered and coded from the MISE / MIMIT annual reports between 2006 to 2024. No expenditure threshold has been used.
56 The number of interventions increased in 2007-2008 vis-à-vis 2005-2006, also as a consequence of the Global Financial Crisis.
57 The number of interventions increased substantially in 2020 and in the subsequent years.

Figure 3. Number of policy interventions over 2007-2019, national and regional levels



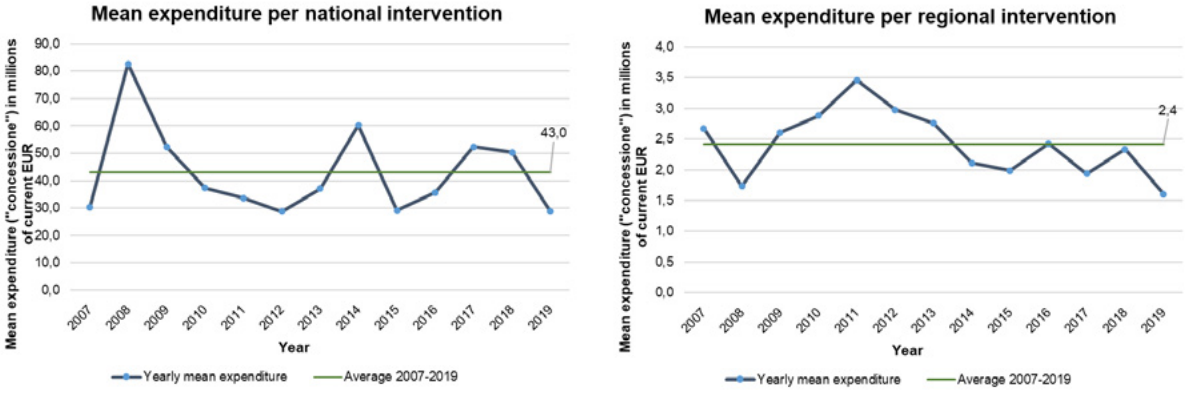
Notes: The Figure shows the number of national (panel 3.a) and regional (panel 3.b) policy interventions over the period 2007-2019 (blue line), as well as the average number of interventions active during the period (orange line). Notice that the y-axes across the two panels have different scales. The number of yearly interventions is derived – for each year t – using information from the corresponding annual report (published in year t+1). For years 2007, 2009, 2010, information from the 2013 annual report was used instead (due to the lack of information from the corresponding reports). For the year 2018, the average number of interventions between 2017 and 2019 is used due to the lack of information in the reports. For some reports, the evolution of the number of interventions is also accounted for: using the most updated values for each year, the figures remain similar. Figure A.1. in shows the same information including the years 2005 and 2006, for which the mapped number of national and regional interventions were lower. Notably, for the year 2005 the mapped number of regional interventions was 291, while the number of national interventions was 54. For 2006, mapped regional interventions were 283 while national interventions were 56. Period averages including the years 2005 and 2006 are consequently smaller but close to the reported values for 2007-2019.

Source: Authors' elaborations based on MIMIT annual reports (2008-2020).

Based on annual expenditure data from the reports (see Figure A.3. in Appendix A), Figure 4 presents the average yearly expenditure for national (panel 4.a) and regional (panel 4.b) interventions. The analysis reveals that the average national measure absorbed 43 million EUR per year, while regional interventions averaged around 2.4 million EUR per year[58]. However, the simple averages hide the unequal distribution of resources across measures. As shown in Figure 5, between 2010 and 2017 more than 70% of national resources were concentrated on the 5 largest policies adopted that year. This concentration of resources in a few major initiatives suggests that most national policies operated on a much smaller budget, with a high dispersion and fragmentation of resources. When considering the period from 2018 to 2019, the evidence further suggests an increase in the dispersion in the allocation of resources, as the allocation became more spread out among a wider range of interventions.

58 Similar figures are obtained using 'erogazioni' (actual payments) as the main expenditure measure. In general, actual payments 'erogazioni' result on average lower than granted expenditure 'concessioni' (see Figure A.4. in Appendix A).

Figure 4. Mean expenditure per intervention over 2007-2019, national and regional levels

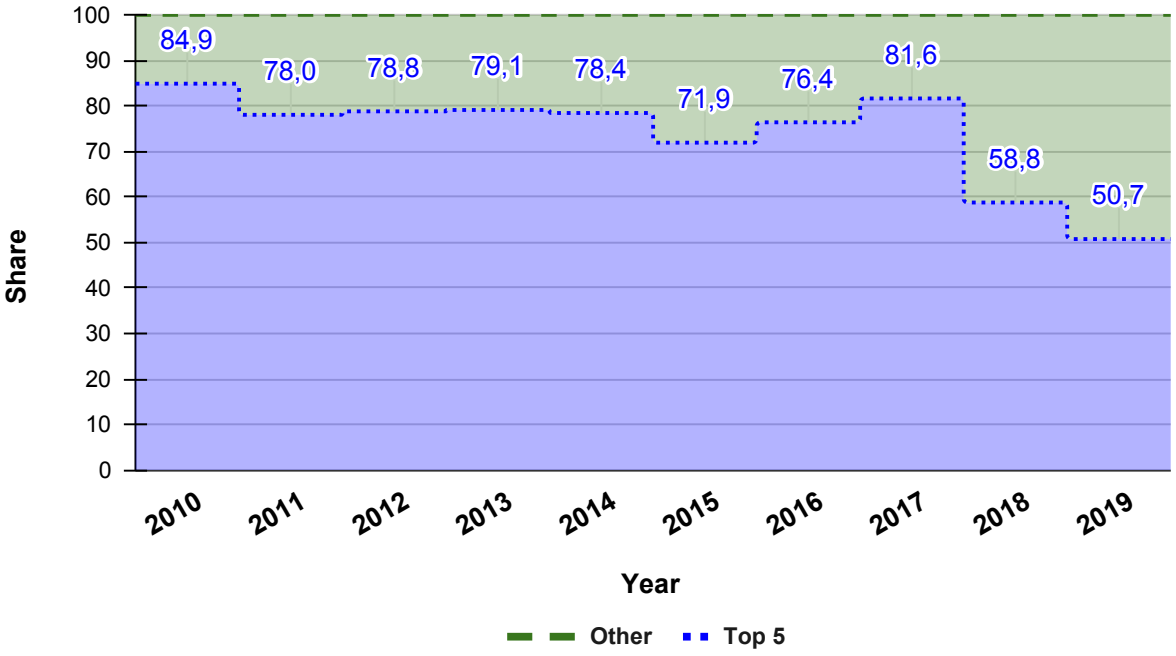


(a) (b)

Notes: The Figure shows the mean expenditure per national (panel 3.a) and regional (panel 3.b) intervention over the period 2007-2019 (blue line), as well as the average over the period (green line). Notice that the y-axes have different scales. The number of yearly interventions is derived – for each year t – using information from the corresponding annual report (published in year t+1). For years 2007, 2009, 2010, information from the 2013 annual report was used instead (due to the lack of information from the corresponding report). The number of interventions (used at the denominator) is reported in Figure 3. The yearly expenditure refers to the most updated figure for granted expenditures ('concessioni'). Notably, for the period 2014-2019 information from the 2020 report was used. For the period 2012-2013 information from the 2018 report was used. For 2011, the 2017 report was used. For 2010, the 2016 report was used. For 2008-2009, the 2014 report was used. For 2007, the 2013 report was used. Values for expenditures are in current EUR (not deflated). Similar figures are obtained using 'erogazioni' or alternative measure for expenditures (State Aid data, cf. Figure 1). Figure A.2. in Appendix A shows the same Figure including the years 2005 and 2006.

Source: Authors' elaborations based on MIMIT annual reports (2008-2020).

Figure 5. Share of expenditure for the top 5 national policies vis-à-vis other policies



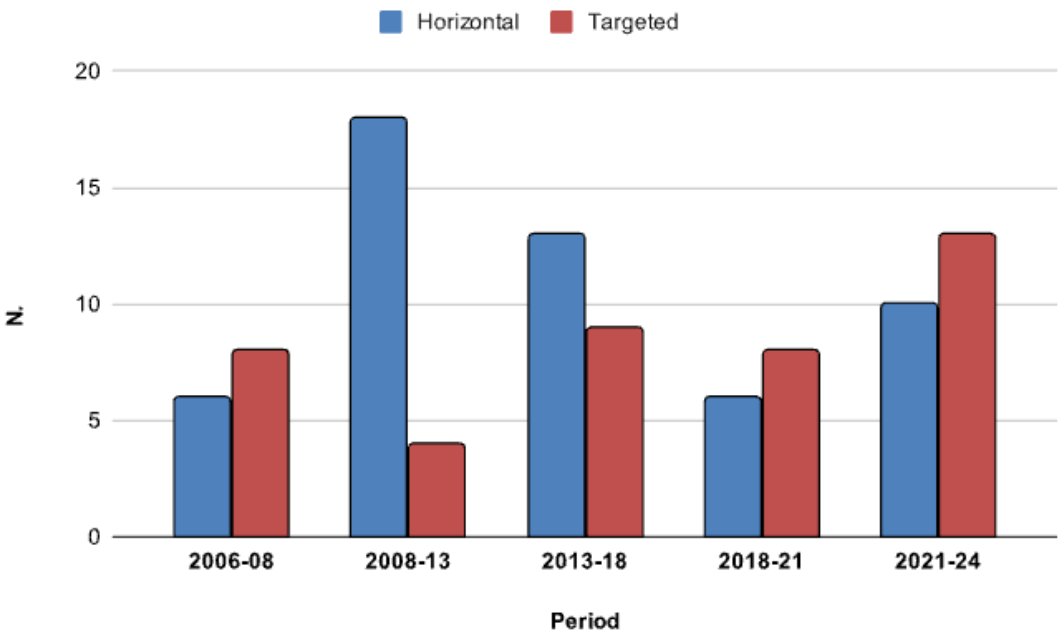
Notes: The Figure reports the share of national resources devoted to the largest 5 national measures in each period as compared to other policy measures active in the same period. The information on top measures is derived each year using information available in annual reports, see also Notes to Figure 4.

Source: Authors' elaborations based on MIMIT annual reports (2011-2020).

Leveraging the analytical framework presented in Section 2 and focusing only on national measures, this chapter uncovers a number of stylised facts about IIP across 2006 and 2024. First, mapped horizontal policy measures were dominant both in 2008-13 and in 2013-18. Conversely, the IIP mix was much more balanced in 2006-08, 2018-21 and in 2021-24 (see Figure 6 and next subsections). Also, as shown in Figure 7, mapped grants and subsidies were the most regularly used instruments within IIP. Following them in descending order come support/coordination instruments, tax expenditures, loans and guarantees, equity/VC. In addition, supply-oriented policy measures have been consistently and by far the most popular throughout the period of analysis.

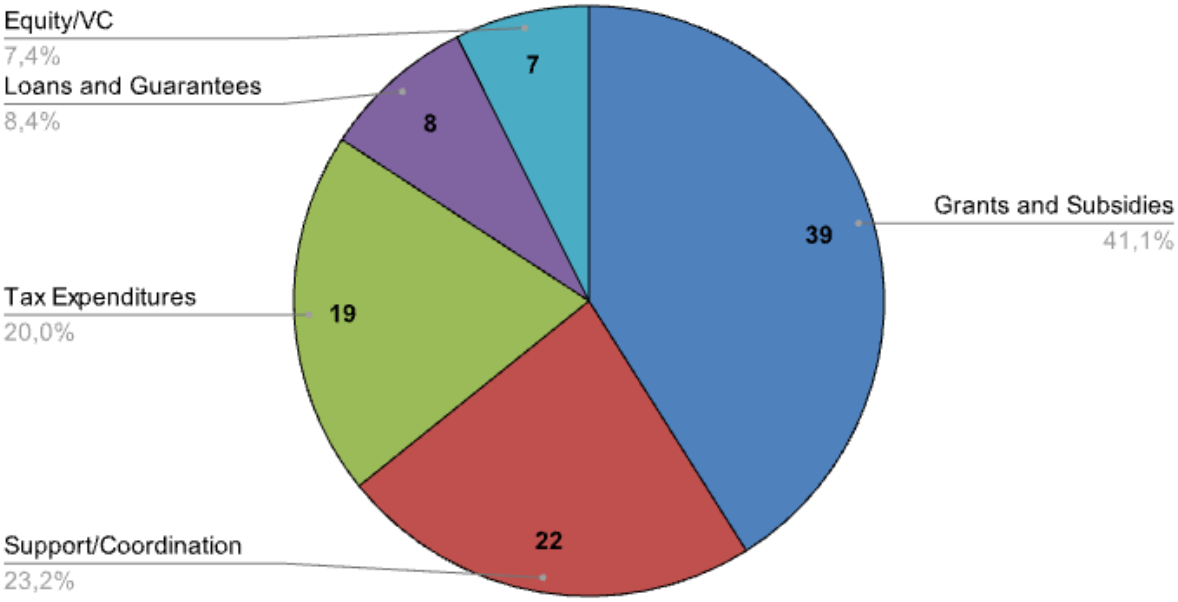
Building on this descriptive evidence, the next subsections deep dive into the main (national) policy tools implemented over the years and related information from the annual reports. Overall, the report identifies five 'eras' of IIP: 'Piano Industria 2015' (2006-08) (analysed in subsection 3.1); through the crisis (2008-13) (3.2); 'Piano Industria 4.0' (2013-2018) (3.3); 'Piano Transizione 4.0' (2018-21) (3.4); 'Piano Nazionale di Ripresa e Resilienza' (2021-24) (3.5).

Figure 6. Horizontal and targeted policy measures over the five IIP eras



Source: Authors' elaborations based on the policy mapping (MIMIT annual reports, 2008-2024).

Figure 7. Instrument types, distribution over the five IIP eras



Notes: The Figure reports the number of mapped policy measures across 2006-2024. The Figure does not account for the relative importance of each measure, e.g. in terms of expenditure.

Source: Authors' elaborations based on the policy mapping (MIMIT annual reports, 2008-2024).

3.1. PIANO INDUSTRIA 2015 (2006-2008)

Shortly after the beginning of the 'Prodi II' Government, Italy advanced its first industrial strategy in more than a decade: the so-called 'Piano Industria 2015'. Developed by Minister of Economic Development Pier Luigi Bersani, its main goal was to address the decreasing competitiveness of the Italian industrial structure by bringing manufacturing back to the core of national economic strategy and reviving its potential by providing support to strategic innovation - including through its integration with advanced services and new technologies. The five strategic domains initially identified by the strategy included: i) energy efficiency; ii) sustainable mobility; iii) new life technologies; iv) new technologies for Made in Italy; v) new technologies for cultural heritage – thus indicating the pursuit of a largely sectoral approach. From a policy mix perspective, the strategy relied on three main pillars:

- Industrial Innovation Projects ('PII'): a co-funding instrument with which core ministries (MISE, MIUR, Ministero dell'Innovazione) would support consortia of public, private, and research stakeholders in the implementation of industrial innovation projects selected on the basis of a set of strategic guidelines – including foreseen macroeconomic impact.
- Industrial districts ('Distretti produttivi'): the institutionalisation of legal personality for groups of SMEs that wish to cooperate with each other on the basis of a shared sectoral focus, in view of prospective organisational, financial, and fiscal benefits – such as their ability to bank individual as well as joint investment projects.

- Innovative finance ('Finanza innovativa'): the institutionalisation of two new public funds for the implementation of the strategy – the Fund for Competitiveness and Development (FCS; bringing together existing tax relief and credits under one umbrella) and the Fund for Enterprise Finance (FFI; helping businesses access financial markets).

These pillars were complemented by several key measures - including: the implementation of the triennial Research National Plan (PNR 2005-2007); the rationalisation of existing funding schemes for research (Fondo Investimenti per la Ricerca Scientifica e Tecnologica – FIRST); targeted tax credits (R&D and place-based); targeted investments inherited from the previous government (naval and maritime); and the organisation of a ministerial structure within MISE for industrial crisis management which will play a growing role throughout the following years (see Table B.1. in Appendix B).

Despite its ambitions, 'Industria 2015' was never implemented at full scale. Exceptional delays in the design and finalisation of the grant schemes that would have enabled the selection and financing of 'PIIs' led to the implementation of initiatives in only three of the original five domains (energy efficiency; sustainable mobility; new technologies for Made in Italy). As a result, while the funds made available by the programme were initially planned at €663M, only €23M were effectively provided to awarded consortia for a total of 30 projects (European Commission, 2015). Similarly, the second pillar of the strategy ('Distretti produttivi') failed to specify the focal criteria and potential benefits of SME aggregation and ended up subject to several amendments from following governments.

Overall, while 'Industria 2015' manifests the government's intention to play a proactive role in steering the rebirth of Italy's industrial prowess, the main regulatory and administrative means deployed for this goal (and the short life of the government) proved insufficient. The mismatch between the stated ambition of the strategy and the comparatively little resources allocated for achieving it (let alone spent) signals important capacity constraints.

3.2. THROUGH THE CRISIS (2008-2013)

The legislature following the 2008 national elections was characterised both by the absence of an explicit industrial strategy and by the lasting effects of a double-dip recession prompted first by the Global Financial Crisis (2007-2008) and then by the European Sovereign Debt Crisis (2009-2012). Under the leadership of Claudio Scajola and Paolo Romani ('Berlusconi IV') and Corrado Passera ('Monti') at the MISE, the two governments that governed Italy in this period pursued policies which - while perhaps fragmentary and contingent in conception - are nevertheless relevant today. Among many others, the most notable include the following (see also Table B.2. in Appendix B):

- Rebooting of Central Guarantee Fund ('Banca del Mezzogiorno-Mediocredito Centrale'): first established in 1996 to ease access to credit by providing public

guarantees on the loans that eligible Micro Small and Medium Enterprises (MSMEs) may ask of private banks, this instrument was indirectly brought closer to public control starting from 2009 (first through the ownership of Poste Italiane in 2011 and then through the development agency Invitalia in 2017) and assigned a wide set of policy goals - including financing of strategic investment projects, new businesses and internationalisation initiatives - with a focus on Southern regions.

- Rationalisation of the existing incentive system ('FCS – Fondo di Crescita Sostenibile'): first established in 1982 to support strategic R&I projects for industrial competitiveness, MISE's Technological Innovation Fund (FIT) was restructured and rebranded in 2012 in the effort to bring order to existing industrial policy instruments.
- Startup Act ('Decreto Crescita 2.0' and 'Smart&Start'): drawing on the recommendations of a high-level expert group, the Act provided Italy's first legal framework and subsidised loan programme for the recognition and support of innovative startups. In the following years, the Act would become the foundation for further support schemes.
- National Technology Clusters ('Cluster Tecnologici Nazionali'): starting from 2012, new public-private networks were identified and financially supported as pivotal stakeholders in supporting the coordination of industrial research, training and technological transfer in eight sectors - including, e.g., Aerospace, Agrifood, Manufacturing, and Life Sciences.
- Cassa Depositi e Prestiti (CDP)'s 'comeback': after its privatisation in 2003 - with the Ministry of Economy as the sole shareholder - Italy's main development bank took off during the years of the crisis and began assuming an active role to strengthen national capital markets both via indirect lending to SMEs and two new funds – the Strategic Investment Fund (sovereign wealth fund, from 2016 onwards CDP Equity) and the Italian Investment Fund (private equity fund co-invested by CDP Equity and other key national financial institutions)[59]. As of today, CDP acts as the state's major holding company.

Notwithstanding these efforts, the loss of productive capacity in the Italian manufacturing sector due to the impact of the double-dip recession between 2008 and 2013 was estimated by the Ministry of the Economy to be from 11% to 17% (MEF, 2016). Meanwhile, the number of successful applications to the Guarantee Fund increased almost by 4 times (+374.5%; from 12,940 in 2007 to 61,407 in 2012), including a major jump from 2009 to 2010 (+203.6%; from 24.958 to 50.074). While the intended focus of the Fund was on the South - wherein accessing credit is both more difficult and expensive also due to the small number of bank branches - their geographical distribution during 2007-2012 was skewed towards the North (47.2% vs. 21% South vs. 31.8% Centre) (MISE, 2013, pp.82-107). This data reflects pre-extant and well-consolidated asymmetries within the Italian 'two-tiered' productive structure: on the one hand, an export-led North strongly based on manufacturing SMEs; on the other hand, a consumption-led South strongly based on public employment (Di Carlo et al., 2024).

59 See also De Cecco e Toniolo (2014) and Bulfone and Di Carlo (2021).

The trends highlighted above illustrate the 'defensive character' of Italy's 'realised' industrial strategy in this period: i.e., a focus on ensuring the survival of the national industrial structure in the face of a dramatic financial crisis. At the same time, it is nevertheless important to stress that several measures enacted by then had contributed to the further evolution of the country's policy mix in the following years. Besides the ones previously highlighted (Startup Act, CTN), two additional measures were refinanced by subsequent governments and have survived until today: the (i) Aid to Economic Growth ('ACE'), a fiscal deduction offered to businesses in proportion to self-funded capital increases (which was abolished by the 2023 budget law); and (ii) the 'Nuova Sabatini', an interest deduction offered to businesses on bank loans targeting investments in selected capital goods (which is still included in the current policy mix).

3.3. PIANO INDUSTRIA 4.0 (2013-2018)

Following the national elections in 2013, the new legislature gradually developed a clear strategic intent with the so-called 'Piano Industria 4.0' - the impact of which is still evident in today's IIP. Developed under the leadership of Carlo Calenda ('Renzi', 'Gentiloni') and after the relatively stable mandates of Paolo Zanonato ('Letta') and Federica Guidi ('Renzi'), the strategy focused on supporting a widespread uptake of the key enabling technologies behind the so-called 'Fourth Industrial Revolution' (4.0) - such as additive manufacturing, augmented reality, cloud systems, Internet of Things, and data analytics (Martinelli, Mina, and Moggi, 2021). As these were expected to support considerable productivity increases in Italy's traditional industrial sectors through process and product innovation, the strategy aimed to provide an ample set of measures to support businesses in their adoption (see Table B.3. in Appendix B). They included:

- Incentives to investments ('Super-/Iper-ammortamento'; 'Nuova Sabatini'): tax deductions to all businesses investing in tangible (250%) or capital (140%) assets or technologies enabling the 4.0 transition, along with extra interest deductions (from 2.75% to 3.575%).
- Incentives for capacity building ('Nuovo credito R&S'; 'Credito formazione'; 'Patent box'): tax credits to all business investing in R&I (50%) and education (40%) or profiting from the use of patented technologies (up to a 50% discount on the business income tax rate).
- Structures for ecosystem coordination ('Competence Centre 4.0'; 'Accordi innovazione'): eight competitively selected public-private partnerships facilitating businesses' uptake of 4.0 through industrial R&D projects aimed at new products, processes or services.
- Targeted investments in critical infrastructures ('Strategia Italiana Banda Ultra Larga'): most significantly, via the set-up of a dedicated plan and governance for the realisation of public infrastructure providing ultra-broadband network connection nationally. This plan was entrusted to Infratel – the inhouse public company controlled by Invitalia.

Available evidence shows that the strategy has been an effective means to support the digital transformation of Italian firms, especially in manufacturing; and that these new investments have supported employment growth (Bratta et al., 2023)[60]. At the same time, the regional distribution of beneficiaries has been largely skewed towards the Northern regions (74.3% of R&D credit beneficiaries) rather than the Southern ones (8.0%) (ISTAT, 2018). While the automatic nature of some policy instruments under the strategy has made distributing benefits easier and more coherent, it remains unclear whether this has helped narrow or instead widened existing competitiveness gaps in the national economy (Cappellani et al., 2017).

3.4. PIANO TRANSIZIONE 4.0 (2018-2021)

The industrial policy adopted by governments following the 2018 national elections ('Conte I' and 'Conte II') was characterised by considerable continuity with the former one despite considerable political change. By mid-2020, the decision to build and expand on the pre-extant strategy was formalised with the presentation of 'Piano Transizione 4.0' - the two essential objectives of which were declared to be: i) stimulating private investments through wider tax expenditures; ii) ensuring the stabilisation of such measures for the near future. As a result, under the leadership of Luigi di Maio ('Conte I') and Stefano Patuanelli ('Conte II') at the MISE, the new strategy (see Table B.4. in Appendix B) expanded the previous one in three main respects:

- Rationalisation of 4.0 policy mix ('Nuovi crediti R&S'; 'Voucher consulenza'): revision and integration of the pre-extant incentive scheme structure – including through the inclusion of activities for sustainable 4.0 innovation and new instruments such as the 'consultancy voucher' (helping businesses contract personnel to support 4.0 organisational change).
- Expansion of the technological focus ('FNI'; 'Fondo IPCEI'; 'Fondo IA-B-IoT'; 'FTT'): several initiatives were dedicated to boosting national investment capacity in strategic stages of the innovation process (CDP's 'National Innovation Fund' - CDP Venture Capital - and private foundation Enea Tech's Tech Transfer Fund') or targeted technologies (Infratel's 'Fund for technologies applying AI, Blockchain, IoT'; or MISE's participation in 'Important Projects of Common European Interests' via the 'IPCEI Fund'). This included the rise of relevant strategic coordination efforts in the field of space & aerospace policy (as exemplified by the release of the new 'strategic document of national space policy').
- Integration of green transition ('PNIEC'; 'Green New Deal'; 'Superbonus 110%'): besides the 'greening' of pre-extant industry 4.0 measures, the design of the first ever National Integrated Plan for Energy and Climate ('PNIEC') fed into the creation of a new fund for the 'Green New Deal' (currently co-managed by Mediocredito Centrale and SACE) and ad-hoc incentives (such as the 'Superbonus 110%' - which aimed at boosting demand for energy efficiency restructuring and revitalising the building industry).

60 Bratta et al. (2020) point out that, while an econometric assessment of the additionality of the Industry 4.0 hyper-depreciation bonus is not possible, a demographic assessment of the firms that made use of it suggests that the measure had a non-negligible effect on technology investment propensity.

Since its foundation in late 2018, the IPCEI Fund has catalysed large forms of co-investments in key technologies for the green and digital transition at national and EU level (i.e., microelectronics, cloud services and infrastructures, electric batteries, hydrogen): indeed, Italy was one of the two countries (together with France) to participate in all of the ten IPCEIs notified up to September 2024. In its first five years of activity, CDP Venture Capital demonstrated high dynamism - opening 13 thematic funds and launching a National Network of 19 thematic Accelerators to facilitate matchmaking between (national or international) VC investors and startups. Enea Tech Foundation underwent several rounds of organisational review which halted the implementation of its own Technology Transfer Fund, independently from the gradual uptake of a tighter focus on biomedical, IT, green and circular economy, agri-tech and deep-tech. From a green transition perspective, the coherence of the implementation of the 'Green New Deal' Fund also remains opaque due to the high number of stakeholders involved (MISE, MCC, SACE, CDP to the least) and lack of clarity on the modalities of selection for the supported projects.

Overall, while remaining within the scope of the former strategy's 'horizontal' industrial policy approach, the new one presents a timid but relevant number of targeted policies. At the same time, the impact of these efforts on the national industrial structure remains unclear or at least highly fragmented. Moreover, the public debate in this domain has been largely overhauled by 'Superbonus 110%' - a measure which imposed enormous costs on public finances without achieving the targeted reductions in carbon emissions (Capone and Stagnaro, 2024).

3.5. PIANO NAZIONALE DI RIPRESA E RESILIENZA (2021-2024)

The beginning of the 2020s' was characterised by another crisis for the Eurozone – this time caused first by the outbreak in March 2020 of the Covid-19 pandemic and its lasting effects during 2021, and then by the energy and geopolitical crisis sparked by the direct conflict between Russia and Ukraine from February 2022. In this context, a consistent and varied set of measures adopted by the national governments ('Conte II' and 'Draghi') aimed at supporting the recovery of the industrial sectors affected by these two crises (see Tables B.5., B.6. and B.7. in Appendix B). In parallel, the adoption of 'NextGenerationEU' by the European Commission expanded Member States' financial capacity through the formation of the Recovery Resilience Facility (RRF) and the related implementation of National Recovery and Resilience Plans (NRRPs).

While the Italian NRRP is not specifically focused on industrial policy, its scope includes several policy instruments with direct implications for long-term national economic development and, therefore, illustrate how subsequent Italian governments conceived industrial strategy. Adopted in July 2021 following the approval of the European Council, Italy's NRRP was elaborated at the MISE first by Stefano Patuanelli ('Conte II') and then Giancarlo Giorgetti ('Draghi'). It has six missions, three of which relate to industrial policy: 'Digitalisation, innovation and competitiveness'; 'Green & ecological transition'; and 'Education and Research'.

After the election of a new government in 2022 ('Meloni' - with Adolfo Urso at the Ministry of Made in Italy, MIMIT), the NRRP was then amended in December 2023 and integrated with a new mission dedicated to REPowerEU - the EC's plan to push for energy independence from Russian fossil fuels. Currently, its key industrial policy characteristics can be summarised as follows:

- Expansion of pre-extant policy tools ('Transizione 4.0'; 'Piano 1 Giga/5G'; IPCEI Fund): the NRRP renews the focus on previous technological strategies - 4.0, ultra-broad band networks, space policy - while broadening the scope of the companies that can benefit from them; the set of subsidised intangible investments; and the allocated investment. Moreover, it identifies new areas of international cooperation through the IPCEI Fund.
- Diversification of the green energy investment mix ('Rinnovabili'; 'Idrogeno'; 'GTF'): the NRRP expands the commitment of IIPP to the green transition through multiple investments in different energy technologies - including, most notably, the large-scale deployment of renewable energy sources (photovoltaic, wind, storage) and increased investment in the development of national hydrogen. While most measures focus on deployment, minimal resources are also allocated to targeted R&I in these areas.
- Higher investment in R&I and technology transfer ('Ecosistemi'; 'Campioni nazionali'): the NRRP expands governmental support to foundational and applied research through the provision of sizeable funding to universities, private-university partnerships, prospective 'national champions' in R&I on key enabling technologies, and innovation ecosystems centred around 'territorial R&I leaders'. These measures ultimately aim to strengthen the integration of the applied research and industry communities, yet are largely horizontal.

Importantly, the NRRP was complemented by the so-called "Fondo Complementare al PNRR (PNC)", aimed at integrating, with national resources, the interventions of the NRRP for a total of 30.6 billion euros for the years from 2021 to 2026 (see Table B.6. in Appendix B).

From a strategic perspective, the NRRP shows a gradual rebalancing of horizontal and targeted policies - the latter becoming increasingly as prominent as the former. Nevertheless, these two types of policies identify different goals: on the one hand, the focus on strengthening the R&I and technological endowment of Italian industry; on the other hand, the focus on wide investments in infrastructures that are bound to play a key role in the green and digital transition. In this sense, despite the structuring of the NRRP around key 'missions', its underlying strategy design can be defined as firmly technology-focused, and therefore in continuity with earlier trends within Italian industrial policy. As this work is written more than halfway through NRRP's implementation, progress has been two-faced. On the one hand, as of August 2024 Italy was the second beneficiary country in Europe for the ratio between resources received vs. allocated through the RRF - i.e., €102.5MLD vs. €194.4MLD (63%) - just after France (77%) and much before Spain (30%) (PdC, 2024). On the other hand, the country's ability to disburse promptly the resources

received through the RRF still lagged behind: as of October 2024, only €53.5MLD were spent (27.5% of the total NRRP allocation) – half of which were invested in major fiscal measures, such as Superbonus 110% (€13.9MLD) and Transizione 4.0 (€13.4MLD) (UPB, 2024).

Besides the NRRP, the Meloni government has also deployed a new plan called 'Transizione 5.0'. The plan builds on the legacy of the pre-extant policy mix ('Industria 4.0' & 'Transizione 4.0') to provide businesses with key fiscal incentives to support their investment in the 'Twin Transition' - i.e., green and digital - via €6.3MLD of resources from REPowerEU. The key policy changes included a redesign and expansion of the eligibility of the measure for companies of diverse sizes and sectors; the inclusion of carbon emission reduction as a key conditionality for receiving the tax credit; the inclusion of investments related to advancing firms' energetic self-sufficiency; and a higher allocation of subsidies to investments in workforce reskilling (Governo, 2024a). Other key developments included the publication of a new AI strategy (AGID, 2024) and an imminent hydrogen strategy (MASE, 2024). Moreover, an important policy change was the creation of a unified special economic zone (SEZ) for the whole 'Mezzogiorno' - i.e., South of Italy - in lieu of the many pre-extant ones. While the purpose of the SEZ is to create a dedicated channel for streamlining bureaucratic procedures and providing ad-hoc fiscal incentives, its constitution also re-centralises its governance and may preclude the development of a new strategy for the development of the Mezzogiorno[61].

Lastly, a final policy innovation consisted in the publication by the MIMIT in October 2024 of "Made in Italy 2030" - a 'green paper' aimed at positioning the central role of IIP in helping the country face today's green, technological, and geopolitical transitions (MIMIT, 2024). The green paper provided a wide-ranging analysis of the Italian industrial structure and its ability to withstand ongoing global transformations, arguing for the need of the Italian state to adopt a 'strategic' role in the economy. The green paper also marked the opening of a 4-month period of public consultation that aimed to gather insights and perspectives from economic and societal stakeholders. The views should then inform the development of a new 'white paper' which would articulate the principles and strategic goals of a long-term IIP.

4. SUMMARY OF THE MAIN FINDINGS

This section analyses the information reported above by summarising the evolution of IIP in the last 18 years. Overall, the review leads to six main descriptive insights.

Insight no. 1: During 2006-24, IIP largely lacked a proper strategic design

The five 'eras' analysed in this report show that the underlying vision of the policymaker for IIP rarely managed to become an ambitious collective strategy

61 Further details on the development of such a strategy are expected. See Governo (2024b).

for the long-term transformation and strengthening of the Italian industrial and innovation ecosystem. In the case of Piano Industria 2015 (2006-08), a glaring implementation gap inhibited the sectoral vocation of the approach. Through the crisis (2008-13), IIP gained a 'defensive' character which struggled in shielding the country's productive backbone from profound financial distress. The only discontinuity lies in the Piano Industria 4.0 (2013-2018) through which IIP assumed a technological orientation that has not been challenged but expanded in Piano Transizione 4.0 (2018-21) and NRRP (2021-24). Still, place-based and mission-oriented aspects remain mostly underdeveloped in all strategies despite strong trends in the opposite direction across OECD countries (OECD, 2024). Also, IIP total expenditure appeared consistently fragmented in a very high number of interventions, with a very low average amount of expenditure per intervention, especially at the regional level.

Insight no. 2: During 2006-24, IIP mostly opted for horizontal policy measures

The five 'eras' also show that horizontal policy measures are mostly prevalent within IIP. With reference to the measures listed in Tables B.1. to B.5. in Appendix B, horizontal policy measures were dominant both in the 2008-13 era (18 horizontal policies vs. 4 targeted ones) and the 2013-18 (13 vs. 9). Conversely, the IIP mix was much more balanced in the 2006-08 (6 vs. 8), as well as in 2018-21 (6 vs. 8) and in 2021-24 (10 vs. 13) (see also Figure 6). Yet, it is important to note that some of the major targeted policies pursued in those time frames were either not fully implemented (2006-08), unfunded strategic plans (2018-21), or focused on infrastructure investments (2021-24). All considered, while there is an evident rise of a more targeted approach within IIP - e.g., in sectors such as TLC, energy, aerospace, and semiconductors - the horizontal approach has been quantitatively (number of measures) and qualitatively (size of expenditure) widespread during 2006-24.

Insight no. 3: During 2006-24, IIP mostly opted for subsidy/guarantee instruments

The five 'eras' show that grants and subsidies are the most regularly used instruments within IIP (39 instruments out of 95 mapped; 41,1% of the total policy mix). Following them in descending order comes support/coordination instruments (22/95; 23,2%), tax expenditures (19/95; 20%), loans and guarantees (8/95; 8.4%), equity/VC (7/95; 7.4%) (see also Figure 7). Thus, IIP seems to be historically relying on measures that are easier to administer due to either their rigid procedural dimension (e.g., grants/subsidies, loans/guarantees) or automatic distribution (e.g., tax expenditures). Vice versa, measures that require stronger administrative capacity and active engagement with the industrial ecosystem (e.g., support/coordination and equity/VC) are much less prominent. These metrics must be taken with caution nonetheless, as they do not reveal the size of the resources allocated to instrument types. For example, a key outlier is the Central Guarantee Fund - which plays an extremely relevant role in the national policy mix due to its considerable resourcing since the aftermath of the financial crisis. For this reason, it is more precise to identify not only subsidies but also guarantees as key beacons of IIP.

Insight no. 4: During 2006-24, IIP privileged supply-oriented measures

The five 'eras' show that supply-oriented policy measures have been consistently and by far the most popular throughout the period of analysis. Overall, the Tables B.1. to B.5. in Appendix B identify a total of 75 supply-oriented measures vis-à-vis 17 governance-oriented and 3 demand-oriented measures. While governance-oriented measures are evenly distributed through the 'eras', demand-oriented measures appear only in the last two - including the 'Superbonus 110%' for the energy efficiency of built environment (2018-21) and two NRRP investments linked to the twin transition: public investment in ultra-broad band networks and electric buses (2021-24). Moreover, the large majority of supply-oriented measures targeted the 'within' channel (64) rather than the 'between' channel (11) - aiming to improve company productivity across the board instead of affecting the allocation of resources between companies. The persistence of public and political struggles around the approval of stricter competition laws is further evidence of this point.

Insight no. 5: During 2006-24, IIP witnessed considerable institutional layering

One of the most interesting aspects of IIP is the frequency with which 'flagship initiatives' initially promoted as transformative are quickly 'forgotten' once moved to implementation. A byproduct of this trend is that those initiatives are rarely discontinued or renewed intentionally before their natural end - thus often consuming their budget regardless of the emerging challenges or the effective results. On the one hand, this trend has a clear negative impact both on the long-term coherence of IIP as well as on the accountability of the public spending that underpins it. On the other hand, it also entails that there is a limited grasp of the potential hidden in the initiatives already underway, yet rarely followed in the public debate. This review helped identify critical examples of such cases - e.g., the ever-growing role of the Guarantee Fund (since the double-dip recession onwards), the layering of (non-)sectoral technology transfer initiatives (e.g. National Technology Clusters, Competence Centres 4.0, new NRRP partnerships), and the most recent development in the Italian VC space (CDP Venture Capital's Network of Accelerators). Crucially, this also applies to the number of actors creating IIP: from ministries (MEF, MIMIT, MUR) to state-owned companies, banks, and subsidiaries (CDP, Invitalia, Infratel) to the many technology transfer centres previously mentioned. Reconstructing the complex governance architecture of IIP is a difficult, yet fundamental task in its own account.

Insight no. 6: During 2006-24, IIP was rarely (if ever) properly evaluated

It follows from the previous insight that the fifth striking aspect of IIP is the persistent lack of any proper evaluation mechanism - both at the level of individual measures and policy mixes. Over the last 18 years, there has been little to no assessment of the impact achieved by most of the many measures implemented over the last 20 years. A key exception is the 2012 Startup Act, for which annual monitoring and reporting was mandated by law (see Menon et al., 2018). Yet, the

largely dominant approach seems to entail the neglect of continuous policy learning as a critical precondition for successful IIP implementation. Such neglect has recently been pointed out in a shared report published by the OECD and MIMIT, in which strategies to strengthen the ministry's analytical and evaluation capabilities are explored in depth (OECD, 2023).

Overall, while a full assessment of Italy's IIP between 2006 and 2024 lies beyond the scope of this chapter, it is important to note that each period was shaped not only by the headline national measures discussed above but also by a relevant number of additional micro-interventions, including those introduced at regional and municipal levels. Although individually modest in scale, these measures were significant in aggregate spending. Yet, their strategic relevance has rarely been systematically analysed or questioned. In this respect, building on the initial effort undertaken in this work, it is crucial to further explore IIP in order to assess its effectiveness, both at the individual and aggregate levels. Such an analysis would offer the opportunity to identify and better allocate a large pool of public resources, either to strengthen a more integrated IIP or to free up fiscal space for alternative policy interventions. However, this would require clear strategic intent, which is currently lacking in Italy's IIP. The next section focuses on this gap and provides recommendations to address it.

5. POLICY RECOMMENDATIONS

The analysis reported in this chapter suggests that, as of today, IIP appears to have inherited a range of weaknesses accumulated during the last 18 years (if not before): a narrow and undiversified policy toolbox; a high degree of policy and project fragmentation; a dearth of coordination within and beyond the public sector; a lack of nation-wide strategic focus and of contextual adaptation to regional and sectoral differences; and a persisting implementation gap evident in the limited spending capacity of the state. While it is worth reflecting on the underlying reasons behind these trends, it would be behind the scope of this paper to explore them in greater depth. Vice versa, this section identifies a set of policy recommendations to address these weaknesses in order to directly stir the debate concerning the future of IIP. Based on the analytical framework, this work suggests three sets of recommendations.

Strategy design and scope

As shown above, IIP has rarely if ever been systemic in its conception during the last 18 years. This applies both at any time (any single government's vision) and as a whole (how the policy instruments layered over time onto each other interact with each other). Instead, several smaller technology-focused strategies emerged in distinctive areas, e.g., space tech; ultra-broadband networks; AI; and hydrogen. Yet, it is debatable whether any of these can be elevated from the status of 'guidance' for national stakeholders to that of industrial 'strategy' capable to articulate a vision for

the future of the Italian industrial and innovation ecosystem and of reorienting the extant policy mix accordingly. As argued by the OECD, effective industrial strategies have shared objectives and provide a clear direction for societal change (Criscuolo et al., 2022).

While IIP is 'siloed' in a myriad of technology-focused strategies, this work suggests recalibrating IIP design towards a more holistic mission-oriented and place-based approach. Following other OECD countries (such as France)[62] this includes the development of ambitious, long-term national roadmaps with key stakeholders and the elevation of the search and discovery of Italy's future comparative advantage as a key public priority. Crucially, this task should build on top of rather than neglect the extant policy mix.

Recommendation no. 1: Elevate the shared development of an integrated industrial strategy for the transformation of the Italian industrial and innovation ecosystem as a national priority.

- 1A. Engage private and societal stakeholders (both at national / macro-regional level) in the evidence-based identification of broad, ambitious, long-term industrial priorities.
- 1B. Build upon the results of this report to diagnose and simplify the extant policy mix as inherited from previous strategic cycles and evaluate its potential / build upon it.
- 1C. Learn from competitor countries (e.g., France, Germany, and UK) the diversity of contemporary industrial strategy to inspire the design of a distinctive Italian approach.

Policy instrumentation

Even if IIP had a clear strategic focus, this precision would amount to nothing without a strong connection to a coherent policy instrumentation. In this paper, it emerged how IIP tends to make very limited use of the breadth and diversity that the contemporary industrial policy toolbox manifests across OECD countries. Yet, the most concerning bit of IIP does not lie in its narrow approach to design, but in its lack of accountability. For example, IIP has accumulated a considerable amount of investment funds that claim to be 'strategic' for the progress of both horizontal (e.g., FFI, FSI, FII) and vertical targets (e.g., FCS+, FNI, GTF, Fondo IA). Yet, there is still very limited strategic visibility and awareness of how this money is allocated; whether and how they reflect the intended policy goal; and whether and how they contribute to the advancement of any given sectoral or technology roadmap. For this reason, there seems to be much potential in the opportunity to reform the

62 The approach behind the 'France 2030' Industrial Strategy is detailed in Gouvernement (2024).

extant policy mix in order to maximise the public value it can generate, rather than in a dramatic and likely unfeasible overhaul. This can be done by means of conditionalities: namely, requirements attached to a given policy that are used by governments to maximise the value generated by public support to a third party – for example, a private company benefiting from a subsidy (Mazzucato and Rodrik, 2023).

Conditionalities are extremely diverse both in what type of behaviour they target (e.g., access to the resulting products and services; direction of investment; profit-sharing; profit reinvestment) and how they are governed (e.g., fixed versus negotiable conditions). Nevertheless, their ultimate goal is to embed reciprocity in public-private partnerships, thus indirectly also creating greater accountability for how public money is disbursed, as well as coherence about its ends. As conditionalities gain greater momentum worldwide in the effort of governments to steer private companies towards the green transition, it seems that IIP can also benefit from their use.

Recommendation no. 2: Rewire the extant IIP mix through a conditionality-based approach to engender greater accountability and coherence in the implementation of industrial policy.

- 2A. Simplify the public funding infrastructure to industrial and innovation policy across national ministries, public agencies and development banks to create new synergies.
- 2B. Ensure that each public fund adopts clear evaluation criteria and is bolstered by transparent, day-to-day feedback mechanisms among all stakeholders involved.
- 2C. Embed strategic conditionalities on the funds that private companies receive in line with the intended public value generated by their industrial and innovation efforts.

Operating channels

While a clear strategic focus and a strong conditionality-based approach would be essential to a more effective IIP, even a better design would falter if not bolstered by reliable implementation mechanisms. It is beyond the scope of this paper to identify the relative merits of supply-, demand-, and governance-oriented measures relative to the context of IIP. However, the analysis points out how the complex, multi-layered combination of ministries, development agencies, banks, technology transfer offices, and public-private partnerships scattered across the country can hinder the implementation of IIP. On the one hand, the large diversity of these organisations provides IIP with a wider range of tools and the capacity to intervene at different levels of granularity (sectoral, geographical, technological, thematic) than if the government was alone. On the other hand, it remains difficult to seize and

make the most of such 'firepower' without an understanding of the administrative capabilities – or the lack thereof – which may underpin these organisations (Kattel and Mazzucato, 2018). In this perspective, a thorough assessment of the available capacities and expertise across the current IIP governance infrastructure would be paramount to its effective implementation both in the short and in the long run.

Administrative capabilities can be deliberately nurtured and cultivated through continued investment over time (Kattel, 2022). However, in the short term, IIP should first and foremost be designed within the broader context of those available to the government at the time of its design in order for it to credibly maintain the intended strategic focus. For this reason, the last set of recommendations suggesting an approach to mapping out such administrative capabilities and start investing in their gradual development both through organisational growth and reskilling, as well as through better interorganisational coordination across the whole of the IIP governance infrastructure. Without such investment, there is a high likelihood that even a compelling policy design may fail to deliver its intended results.

Recommendation no. 3: Map the underlying governance infrastructure of contemporary IIP to invest in the strengthening of administrative capabilities and, thus, effective implementation.

- 3A. Develop a systemic view of the IIP governance infrastructure to better understand 'who is doing what' and the capacities and capabilities available to the government.
- 3B. Perform a gap assessment and evaluation of the IIP governance infrastructure to allocate investments in organisational growth and reorient the policy mix accordingly.
- 3C. Refocus cooperation among the key stakeholders involved in IIP implementation around the day-to-day delivery of key governmental strategic priorities.

6. CONCLUSIONS

This paper has analysed how contemporary Italian Industrial Policy (IIP) is affected by structural yet urgent challenges. An increasing number of countries are adopting industrial and innovation strategies more ambitious and explicit than ever (mission-oriented and/or place-based); fuelled by thick mixes of demand- and supply-oriented measures; and bolstered by strong engagement with private, research, societal stakeholders (Millot and Rawdanowicz, 2024). At the EU level, the NRRP has brought a renewed commitment to targeted and ambitious investments in infrastructures and strategic sectors. Against this backdrop, the approach underpinning Italy's IIP remains rooted in a traditional framework:

largely horizontal, predominantly supply-side, and heavily reliant on grants and subsidies. Between 2006 and 2024, Italian IIP has been marked by relatively modest resource allocations compared to other major EU economies, yet an exceptionally high number of policy interventions - particularly at the regional level. Considering today's rapidly evolving geopolitical and economic landscape, there is an urgent need to reassess whether this fragmented policy model is adequate to drive sustained improvements in business sector performance and to reignite productivity growth.

While the analysis focuses on the period between 2006 and 2024, its policy recommendations remain relevant for IIP measures adopted in the latter half of 2024 and the first half of 2025. First, the initial implementation phase of the 'Transizione 5.0' plan has been marked by a notably slow uptake of tax credits intended to support firms' investments in green and digital technologies - only €573 million out of the allocated €6.3 billion had been claimed as of March 2025 (Innovation Post, 2025a). This highlights persistent difficulties faced by the Italian state in designing and enforcing effective strategic conditionalities (Innovation Post, 2025b). Second, the recent measures aimed at enhancing the resilience of strategic supply chains appear to be motivated more by the urgency to protect industrial districts amid geopolitical instability than by a comprehensive long-term vision for national industrial transformation (MIMIT, 2025a; MIMIT, 2025b). In this context, forward-looking IIP will increasingly require stronger alignment and coordination with EU-level industrial policy - both in terms of strategic framework design (Draghi, 2024) and the identification of priority sectors (European Policy Analysis Group, 2024).

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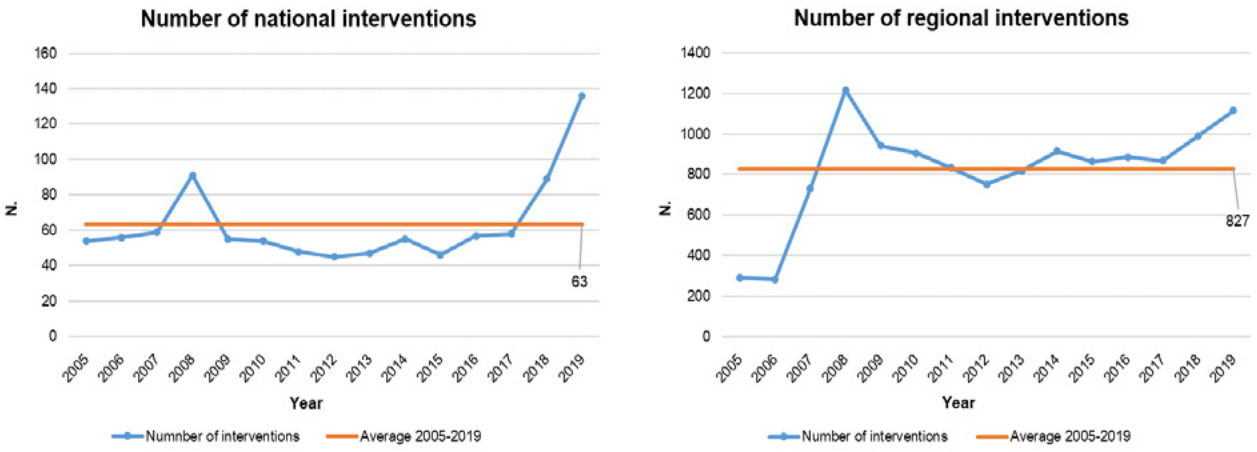
APPENDIX A - IIP ANALYSIS: ADDITIONAL FIGURES

Figure A.1. Number of policy interventions over 2005-2019, national and regional

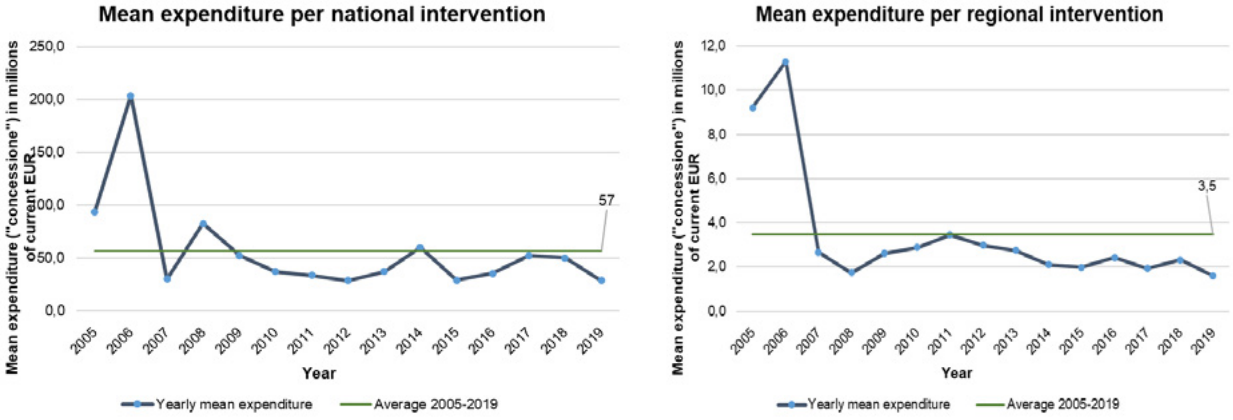


(a) (b)

Notes: The Figure shows the number of national (panel 3.a) and regional (panel 3.b) policy interventions over the period 2005-2019 (blue line), as well as the average number of interventions active during the period (orange line). Notice that the y-axes have different scales. The number of yearly interventions is derived – for each year t – using information from the corresponding annual report (published in year t+1). For years 2007, 2009, 2010, information from the 2013 annual report was used instead due to the lack of information from the corresponding reports. For some reports, the evolution of the number of interventions is also accounted for: using the most updated values for each year, the figures remain similar.

Source: Authors' elaborations based on MIMIT annual reports (2008-2020).

Figure A.2. Mean expenditure per intervention over 2005-2019, national and regional

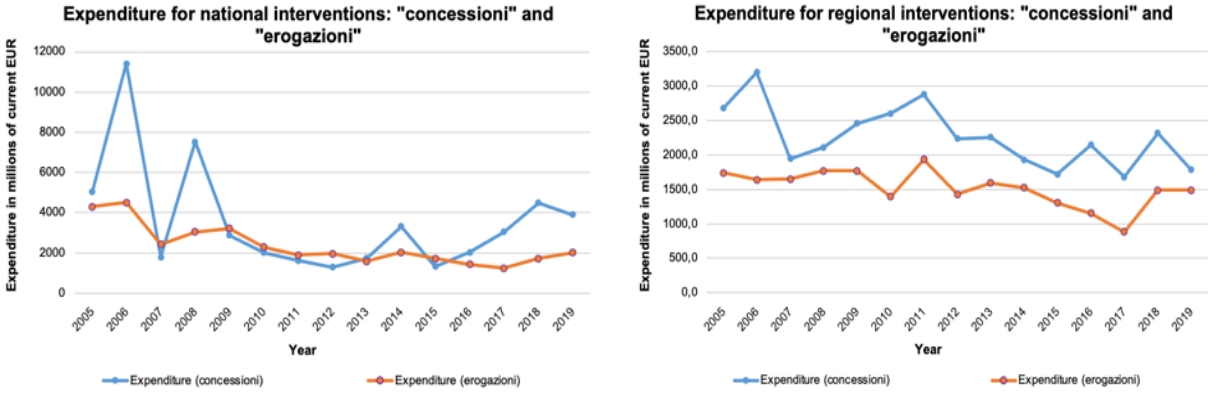


(a) (b)

Notes: The Figure shows the mean expenditure per national (panel 3.a) and regional (panel 3.b) intervention over the period 2005-2019 (blue line), as well as the average over the period (green line). Notice that the y-axes have different scales. The number of yearly interventions is derived – for each year t – using information from the corresponding annual report (published in year t+1). For years 2007, 2009, 2010, information from the 2013 annual report was used instead due to the lack of information from the corresponding report. The number of interventions (used at the denominator) is reported in Figure A.1. The yearly expenditure refers to the most updated figure for granted expenditures ('concessioni'). Notably, for the period 2014-2019 information from the 2020 report was used. For the period 2012-2013 information from the 2018 report was used. For 2011, report 2017. For 2010, report 2016. For 2008-2009, report 2014. For 2007, report 2013. Values for expenditures are in current EUR (not deflated). Similar figures are obtained using 'erogazioni' or alternative measure for expenditures (State Aid data, cf. Figure 1).

Source: Authors' elaborations based on MIMIT annual reports (2008-2020).

Figure A.3. Expenditure in 2005-2019: 'concessioni' and 'erogazioni', national and regional interventions

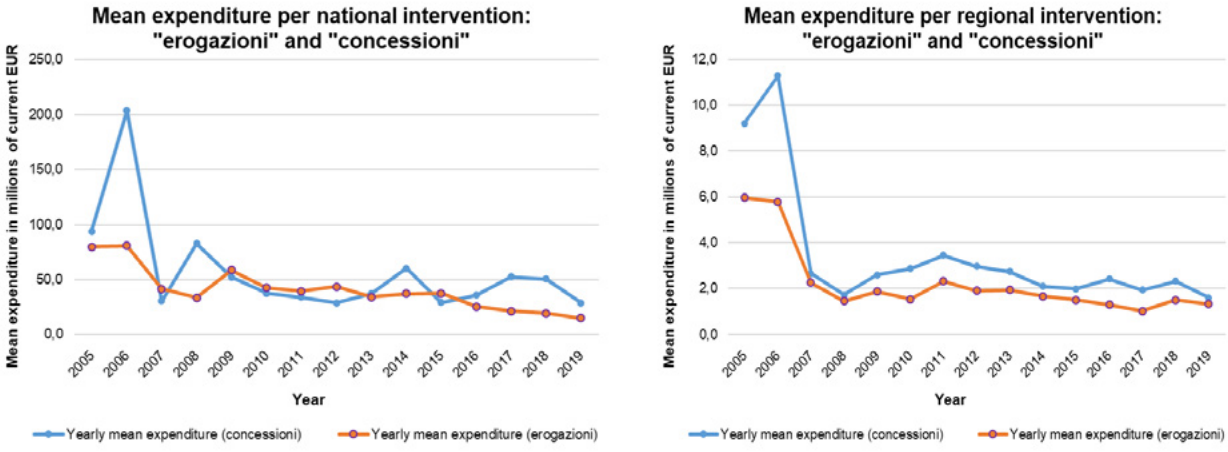


(a) (b)

Notes: The Figure shows the expenditure for national (panel 3.a) and regional (panel 3.b) interventions over the period 2005-2019 (blue line), as well as the average over the period (green line). Notice that the y-axes have different scales. The number of yearly interventions is derived – for each year t – using information from the corresponding annual report (published in year t+1). For years 2007, 2009, 2010, information from the 2013 annual report was used instead due to the lack of information from the corresponding report. The number of interventions (used at the denominator) is reported in Figure A.1. The yearly expenditure refers to the most updated figure for granted expenditures ('concessioni'). Notably, for the period 2014-2019 information from the 2020 report was used. For the period 2012-2013 information from the 2018 report was used. For 2011, report 2017. For 2010, report 2016. For 2008-2009, report 2014. For 2007, report 2013. Values for expenditures are in current EUR (not deflated).

Source: Author's elaborations based on MIMIT annual reports (2008-2020).

Figure A.4. Mean expenditure per intervention over 2005-2019: 'concessioni' and 'erogazioni', national and regional levels



(a) (b)

Notes: The Figure shows the mean expenditure per national (panel 3.a) and regional (panel 3.b) intervention over the period 2005-2019 (blue line), as well as the average over the period (green line). Notice that the y-axes have different scales. The number of yearly interventions is derived – for each year t – using information from the corresponding annual report (published in year t+1). For years 2007, 2009, 2010, information from the 2013 annual report was used instead due to the lack of information from the corresponding report. The number of interventions (used at the denominator) is reported in Figure A.1. The yearly expenditure refers to the most updated figure for granted expenditures ('concessioni'). Notably, for the period 2014-2019 information from the 2020 report was used. For the period 2012-2013 information from the 2018 report was used. For 2011, report 2017. For 2010, report 2016. For 2008-2009, report 2014. For 2007, report 2013. Values for expenditures are in current EUR (not deflated). Similar figures are obtained using 'erogazioni' or alternative measure for expenditures (State Aid data, cf. Figure 1).

Source: MIMIT annual reports (2008-2020).

APPENDIX B - IIP ERAS: TABLES

Table B.1. IIP highlights: from 2006 to 2008

STRATEGY	NAME: PIANO INDUSTRIA 2015			DESIGN: SECTORAL		
Channel	**Instrument**	**Type**	**Criteria**	**Law**	**Exp [mld€]***	**Management**
Horizontal policies						
Supply (W)	Credito d'imposta aree svantaggiate	Tax expenditure	Place	296/06 (c.271-79)	0.75	N/A
	Credito d'imposta R&S	Tax expenditure	R&D	296/06 (c.280-284)	0.37	N/A
	FCS (Fondo per la Competitività e Sviluppo)	Grant/Subsidy	N/A	296/06 (c.841)	N/A	MISE
	FIRST (Fondo Investimenti Ricerca Scientifica & Tecn)	Grant/Subsidy	R&D	296/06 (c.870)	0.600	MIUR
	Bando ISI (Miglioramento condizioni lavoro)	Grant/Subsidy	Labour	81/08 (11, c.5)	0.780	INAIL
	FFI (Fondo per la Finanza d'Impresa)	Loan/ Guarantee	N/A	296/06 (c.847)	N/A	N/A
Targeted policies						
Supply (W)	Ricerca in campo navale	Grant/Subsidy	R&D	12/06 (5, c.3)	N/A	N/A
	Investimenti imprese marittime	Grant/Subsidy	Sectoral	80/06 (c.34-octries)	N/A	N/A
	ZFU (Zone Franche Urbane)	Grant/Subsidy	Place	296/06 (c.341)	0.802	N/A
	Innovazione industria cantieri	Grant/Subsidy	Sectoral	296/06 (c.1040)	0.075	MIT
Supply (B)	Struttura per le crisi d'impresa	Support/ Coordination	Size/age	296/06 (1, c.852)	0.0003	MISE
Governance	PNR 2005-2007	Support/ Coordination	R&D	CIPE 18/03/2005	N/A	CIPE
	PII (Bandi Industria 2015)	Grant/Subsidy	R&D	296/06 (c.841-845)	1.02	MISE
	Distretti Produttivi	Support/ Coordination	Place	296/06 (c.366-372)	N/A	N/A

Notes: Expenditure (in billions of EUR) amounts refer to planned expenditure for 'Credito d'imposta aree svantaggiate'; for 'Credito d'imposta R&S', the expenditure refers to 'erogazioni' for the year 2010. For the FIRST, values refer to the additional resources allocated by l.296/2006 (c. 874) for 2007 and 2008. For Bando ISI, the value refers to 'concessioni' for the years 2015-2019. Values are not deflated. For ZFU, amount refers to 'concessioni' in 2014 and 2017. Innovazione Industria cantieri refers to l.296/2006 (c. 1041) for 2007-2009. 'Struttura crisi d'impresa' refers to l.296/2006 (c.852). PII (Bandi Industria 2015) refers to l.296/2006 (c. 841). *Expenditure levels for policy measures are not directly comparable for lack of consistent information across data sources (see also footnote 53).

Sources: MIMIT annual reports, 2008-2024. European Commission (2008).

Table B.2. IIP highlights: from 2008 to 2013

STRATEGY	NAME: THROUGH THE CRISIS					
Channel	**Instrument**	**Type**	**Criteria**	**Law**	**Exp [mld€]***	**Management**
Horizontal policies						
Supply (W)	Internazionalizzazione imprese	Grant/Subsidy	N/A	133/08 (6, c.2a)	0.98	SIMEST
	Agevolazioni R&S industriale	Grant/Subsidy	R&D	DM 6/08/2010	N/A	N/A
	ACE (Aiuto crescita economica)	Tax expenditure	N/A	DL 201/11	N/A	N/A
	Brevetti+	Tax expenditure	Technology	GURI 179/11	N/A	Invitalia
	Riordino incentivi – FCS (Fondo Crescita Sostenibile)	Grant/Subsidy	N/A	DL 83/12 (23)	2.574*	MISE/MCC
	Agevolazioni imprese a forte consumo di energia elettrica	Grant/Subsidy	Green	DL 83/12 (39)	2.574*	N/A
	Agevolazioni misure ricerca scientifica e tecnologica	Grant/Subsidy	R&D	DL 83/12 (60-63)	2.574*	N/A
	Italian Startup Act	Grant/Subsidy	Size/Age	DL 179/12		MISE
	Smart&Start (Start up)	Loan/ Guarantee	Size/Age	DM 6/03/2013	0.167	Invitalia
	Bando Investimenti Innovativi	Loan/ Guarantee	Technology	DM 29/07/2013	0.465	MISE
	Nuova Sabatini	Loan/ Guarantee	N/A	DL 69/13	1.394	MISE
	Voucher digitalizzazione PMI	Grant/Subsidy	Digital	DL 145/13	0.490	MISE
Supply (B)	FII (Fondo Ital. Investimento)	Equity/VC	N/A	N/A	N/A	CDP
Governance	Contratti di sviluppo	Support/ Coordination	R&D	112/08 (43)	2.782	MISE
	Contratti di rete	Support/ Coordination	N/A	99/09	N/A	N/A
	Contratti di innovazione	Support/ Coordination	Technology	DM 14/12/09	N/A	N/A
	PNR 2011-13	Support/ Coordination	R&D	N/A	N/A	MIUR
	Gestione Riconoscimento Incentivi Rinnovabili	Support/ Coordination	Green	DM 06/07/2012	N/A	N/A

STRATEGY	NAME: THROUGH THE CRISIS					
Channel	**Instrument**	**Type**	**Criteria**	**Law**	**Exp [mld€]***	**Management**
Vertical policies						
Supply (W)	Progetti R&S industriale in aree del PNR 2015- 2020	Grant/ Subsidy	R&D	DL 83/12	N/A	N/A
Supply (B)	Banca del Mezzogiorno - Mediocredito Centrale (Fondo di Garanzia)	Loan/ Guarantee	Place	662/96	0.085	N/A
	FSI (Fondo Strategico Italiano)	Equity/VC	N/A	DL 34/11 (7)	N/A	CDP
Governance	CTN (Cluster Tecn. Nazionali)	Grant/ Subsidy	Technology	DD 257/ric 30/05/12	N/A	N/A

Notes: Expenditure (in billions of EUR) amounts refer to: "concessioni" 2011-2019 for "Internazionalizzazione imprese"; "concessioni" 2015-2016 for measures marked with *; "concessioni" 2014-2015 for "Smart&Start"; "concessioni" 2014-2015 for "Bando Investimenti Innovativi".; "concessioni" 2014-2019 for "Nuova Sabatini"; "concessioni" 2018-2019 for "Voucher digitalizzazione PMI"; "concessioni" 2012-2019 for "Contratti di Sviluppo"; "concessioni" 2010-2013 for "Banca del Mezzogiorno - Mediocredito Centrale", "Fondo di Garanzia". **Expenditure levels for policy measures are not directly comparable for lack of consistent information across data sources (see also footnote 53).

Sources: MIMIT annual reports, 2007-2020.

Table B.3. IIP highlights: from 2013 to 2018

STRATEGY	NAME: PIANO INDUSTRIA 4.0			DESIGN: TECHNOLOGY-FOCUSED		
Channel	**Instrument**	**Type**	**Criteria**	**Law**	**Exp [mld€]***	**Management**
Horizontal policies						
Supply (W)	Credito R&S	Tax expenditure	R&D	DL 145/13 (3)	0.6	MISE
	Patent box (4.0)	Tax expenditure	R&D	190/14 (c.37-45)	N/A	MISE
	CDP Equity	Equity/VC	N/A	N/A	N/A	CDP
	Sostegno PMI esportatrici	Equity/VC	N/A	DM 07/09/16	0.227	SIMEST
	Super-ammortamento (4.0)	Tax expenditure	Technology	208/15 (c.91)	N/A	MISE
	Iper-ammortamento (4.0)	Tax expenditure	Technology	232/16 (c.9)	N/A	MISE
	Nuovo credito R&S (4.0)	Tax expenditure	R&D	232/16 (c.15)	N/A	MISE
	Centri di competenza 4.0	Support/ Coordination	R&D	232/16 (c.115)	0.072	MISE
	Accordi per l'innovazione 4.0	Support/ Coordination	R&D	DM 24/05/17	N/A	MISE
	Credito formazione 4.0	Tax expenditure	Technology	205/17 (c.46-56)	0.250	MISE
	Bando Investimenti Innovativi	Grant/Subsidy	Technology	DM 09/03/18	N/A	N/A
Supply (B)	Piano Made in Italy	Support/ Coordination	Sectoral	DL 133/14	N/A	ICE
	Strategia Banda Ultra Larga	Support/ Coordination	Digital	CIPE, 65/15 (1)	7	Infratel
Targeted policies						

STRATEGY	NAME: PIANO INDUSTRIA 4.0			DESIGN: TECHNOLOGY-FOCUSED		
Channel	**Instrument**	**Type**	**Criteria**	**Law**	**Exp [mld€]***	**Management**
Supply (W)	Credito Mezzogiorno	Tax expenditure	Place	208/15 (c.98-108)	N/A	N/A
	Incentivi fonti rinnovabili	Grant/Subsidy	Green	DM 23/06/16	N/A	N/A
	Credito settore cinematografico	Tax expenditure	Sectoral	DIM 04/08/17	N/A	N/A
	Resto al Sud	Loan/ Guarantee	Size/age	DL 91/17 (1)	0.778	Invitalia
	ZES (Zone econ. speciali)	Tax expenditure	Place	DL 91/17 (4-5, c.2)	N/A	N/A
	Promozione biometano e biocarburanti nei trasporti	Tax expenditure	Sectoral	DM 02/03/18	N/A	N/A
Governance	PNR 2015-2020	Support/ Coordination	R&D	N/A	N/A	MIUR
	SNSI 2015-2020	Support/ Coordination	Sectoral	N/A	N/A	MISE
	Nuovi CTN	Grant/Subsidy	Technology	DD 1610/ric 3/8/16	N/A	MISE

Notes: Expenditure (in billions of EUR) amounts refer to: DL 145/13 (3) for 2014-2016; "concessioni" for 2018-2019 for "Sostegno PMI esportatrici". For "Strategia Banda Ultra Larga", allocated resources (from report Strategia Banda Ultralarga). For Centri di competenza, allocated resources for "Bando 2018" (see source). For "Credito formazione 4.0", l. 205/17 (c.56) for 2019. DL 91/17 (1) for Resto al Sud, maximal amount of expenditure for 2017-2019. *Expenditure levels for policy measures are not directly comparable for lack of consistent information across data sources (see also footnote 53).

Sources: MIMIT annual reports, 2007-2020.

Table B.4. IIP highlights: from 2018 to 2021

STRATEGY	NAME: PIANO TRANSIZIONE 4.0			DESIGN: TECHNOLOGY-FOCUSED		
Channel	**Instrument**	**Type**	**Criteria**	**Law**	**Exp [mld€]***	**Management**
Horizontal policies						
Supply (W)	Voucher consulenza in innovazione	Grant/Subsidy	Technology	145/18 (c.228-31)	0.075	MISE
	Nuovi crediti beni strumentali	Tax expenditure	Technology	160/19 (c.184-197)	N/A	MISE
	Nuovi crediti R&S	Tax expenditure	Technology	160/19 (c.198-209)	N/A	MISE
	IncentivO Lavoro (IO Lavoro)	Grant/Subsidy	Labour	DD 52 11/02/20	0.3294	INPS
Supply (B)	FTT (Fondo Trasferimento Tec.)	Loan/ Guarantee	Technology	DL 34/20	0.5	Enea Tech F.
Governance	Capacity market (en. elettrica)	Support/ Coordination	Green	DM 28/06/19	N/A	MISE
Targeted policies						
Supply (W)	Fondo IA Blockchain IoT	Grant/Subsidy	Technology	145/18 (c.226)	0.045	Infratel
	Incentivo Occupazione Sud	Grant/Subsidy	Labour/ Place	DD 178/19	0.12	ANPAL
Supply (B)	FNI (Fondo Naz. Innovazione)	Equity/VC	Technology	145/18 (c.209)	1	CDP
	Fondo IPCEI	Support/ Coordination	Technology	145/18 (c.203)	0.160	MISE
	'Green New Deal' (FCS+)	Loan/ Guarantee	Green	160/19 (c.85-89)	N/A	MCC/SACE
Demand	Superbonus 110%	Tax Expenditure	Green	34/20 (c.119)	N/A	MEF
Governance	PNIEC (Piano Nz. En. e Clima)	Support/ Coordination	N/A	N/A	N/A	N/A
	DSPSN (Politica Spaziale Naz.)	Support/ Coordination	N/A	N/A	N/A	ASI

Notes: For "Voucher consulenza in innovazione", amount refers to allocation for 2019, 2020, 2021 (Decreto ministeriale 7 maggio 2019). For "IncentivO Lavoro (IO Lavoro)", Art. 11 DD 52 11/02/20. For "FTT", art. 42 of DL 34/20, for year 2020. For "Fondo IA Blockchain IoT", 15 millions EUR for each of the years 2019, 2020, 2021. For "Incentivo Occupazione Sud", art. 11 of DD 178/19. For FNI, approximately one billion euros (estimated as a state guarantee, of which 310 million euros allocated by decree in 2019) managed by Cassa Depositi e Prestiti. For IPCEI, 50 millions EUR for each of the years 2019, 2020 and 60 for 2021. *Expenditure levels for policy measures are not directly comparable for lack of consistent information across data sources (see also footnote 53).

Sources: MIMIT annual reports, 2007-2024.

Table B.5. IIP highlights: from 2021 to 2024

STRATEGY	NAME: PIANO NAZIONALE DI RIPRESA E RESILIENZA			DESIGN: TECHNOLOGY-FOCUSED		
Channel	**Instrument**	**Type**	**Criteria**	**Law**	**Exp [mld€]***	**Management**
Horizontal policies						
Supply (W)	M1-C2: 1.1 Transizione 4.0	Tax expenditure	Technology	DL 77/21	13.98	MIMIT
	M1-C2: 5 Filiere produttive	Grant/Subsidy	N/A	DL 77/21	1.98	SIMEST
	M1-C2: 6.1 Proprietà industriale	Grant/Subsidy	N/A	DL 77/21	0.03	N/A
	M4-C2: 1.3 Partenariati estesi	Grant/Subsidy	R&D	DL 77/21	1.61	N/A
	M4-C2: 1.4 Campioni nazionali	Grant/Subsidy	R&D	DL 77/21	1.60	N/A
	M4-C2: 1.5 Ecosistemi	Grant/Subsidy	R&D	DL 77/21	1.30	N/A
	M4-C2: 2.2 Partenariati Horizon	Support/ Coordination	R&D	DL 77/21	0.20	MUR
	M4-C2: 3.1 Accordi innovazione	Support/ Coordination	R&D	DL 77/21	1.58	N/A
	M4-C2: 3.2 Supporto start-up	Equity/VC	Size/age	DL 77/21	0.30	N/A
	M4-C3: 3.3 Dottorati innovativi	Grant/Subsidy	R&D	DL 77/21	0.60	N/A
Targeted policies						
Supply (W)	M1-C2: 4 Space economy	Grant/Subsidy	Technology	DL 77/21	1.29	N/A
	M1-C3: 4.2 Fondi per turismo	Grant/Subsidy	Sectoral	DL 77/21	1.79	MCC
	M2-C2: 3 Promozione idrogeno	Grant/Subsidy	Green	DL 77/21	3.19	N/A
	M2-C2: 5.1 Rinnovabili/Batterie	Grant/Subsidy	Green	DL 77/21	1.00	Invitalia
	M2-C2: 5.2 Idrogeno	Grant/Subsidy	Green	DL 77/21	0.45	N/A
	M2-C2: 5.4 GTF (Green Fund)	Equity/VC	Green	DL 77/21	0.25	N/A
	M4-C2: 2.1 Fondo IPCEI	Grant/Subsidy	N/A	DL 77/21	1.50	N/A
	Investimenti sostenibili 4.0	Grant/Subsidy	Place	DL 78/22	N/A	Invitalia

STRATEGY	NAME: PIANO NAZIONALE DI RIPRESA E RESILIENZA			DESIGN: TECHNOLOGY-FOCUSED		
Channel	**Instrument**	**Type**	**Criteria**	**Law**	**Exp [mld€]***	**Management**
Supply (B)	ZES Unica	Tax expenditure	Place	DL 124/23	N/A	N/A
Demand	M1-C2: 3 Reti ultra-veloci	Grant/Subsidy	Digital	N/A	6.31	MIMIT/Infratel
	M2-C2: 5.3 Bus e treni elettrici	Grant/Subsidy	Green	DL 77/21	3.60	N/A
Governance	PN RIC 2021-27	Support/ Coordination	R&D	N/A	N/A	N/A
	Revisione PNEC	Support/ Coordination	Green	N/A	N/A	N/A

Notes: *Expenditure levels for policy measures are not directly comparable for lack of consistent information across data sources (see also footnote 53).

Sources: MIMIT annual reports, 2007-2024.

Table B.6. IIP highlights: response to Covid-19 and Russo-Ukranian war

STRATEGY	NAME: MEASURES AGAINST COVID-19 AND UKRAINE CRISIS			
Channel	**Instrument**	**Type**	**Criteria**	**Law**
Horizontal policies				
Supply (W)	DL Cura Italia: Regimi di aiuti (ad hoc e non) Covid-19	Grant/Subsidy	COVID-19	DL18/20 (72-78-79-89)
	DL Liquidità: Garanzia per lavoratori autonomi, PMI e imprese capitalizzate	Loan/Guarantee	COVID-19	DL 23/20
	DL Rilancio: Regime sostegno lavoratori e coop Covid-19	Tax expenditure	COVID-19	DL 34/20
	DL Sostegni: Finanziamenti per grandi imprese in difficoltà	Loan/Guarantee	COVID-19	DL 41/21
	Polis (II) – Sportello Unico	Support/Coordination	COVID-19	DL 59/21
	DL Aiuti: Fondi ISMEA/ SACE	Loan/Guarantee	Sectoral	DL 50/22 (15, 20)
	DL Aiuti-bis: Sovvenzione bus	Grant/Subsidy	N/A	DL 115/22 (9, 3-4)
	DL Riordino	Support/Coordination	N/A	DDL 571/22

STRATEGY	NAME: MEASURES AGAINST COVID-19 AND UKRAINE CRISIS			
Channel	**Instrument**	**Type**	**Criteria**	**Law**
Targeted policies				
Supply (W)	DL Cura Italia: Garanzia statale a moratoria debito bancario	Loan/Guarantee	COVID-19	DL18/20 (56)
	DL Liquidità: Regime di aiuti per prestiti e sovvenzioni	Grant/Subsidy	COVID-19	DL 23/20
	DL Rilancio: Aiuti a capitale imprese medio-grandi	Loan/Guarantee	COVID-19	DL 34/20 (26-27)
	DL Rilancio: Quadro nazionale aiuti a settori per Covid-19	Grant/Subsidy	COVID-19	DL 34/20
	DL Agosto: Aiuti a imprese colpite da Covid-19	Grant/Subsidy	COVID-19	DL 104/20
	DL Ristori: Aiuti a sostegno del settore fieristico per Covid-19	Grant/Subsidy	COVID-19	DL 137/20
	DL Sostegni: Tax credit cultura	Tax expenditure	COVID-19	DL 41/21
	DL Sostegni: Indennizzo per start up impianti e fiere	Grant/Subsidy	COVID-19	DL 41/21
	DL Sostegni-Bis: Aiuti a capitale imprese medio-grandi	Loan/Guarantee	COVID-19	DL 73/21
	DL Sostegni-Bis: Risarcimento gestori di infrastrutture	Grant/Subsidy	COVID-19	DL 73/21
	DL Aiuti: Credito d'imposta per autotrasportatori	Tax expenditure	Sectoral	DL 50/22
	DL Aiuti: Sovvenzioni a imprese colpite dalla crisi ucraina	Grant/Subsidy	Ukraine war	DL 50/22
	DL Aiuti-ter: Fondo di garanzia SACE per gas naturale/energia	Loan/Guarantee	Ukraine war	DL 144/22

Table B.7. IIP highlights: 'Fondo Complementare al PNRR' (PNC), additional instruments

INSTRUMENTS
Ecosistemi per l'innovazione al Sud in contesti urbani marginalizzati
Interventi per le aree del terremoto del 2009 e 2016
Rinnovo delle flotte di bus, treni e navi verdi - Bus
Rinnovo delle flotte di bus, treni e navi verdi - Navi
Rafforzamento delle linee ferroviarie regionali
Rinnovo del materiale rotabile e infrastrutture per il trasporto ferroviario delle merci
Strade sicure – Messa in sicurezza e implementazione di un sistema di monitoraggio dinamico per il controllo da remoto di ponti, viadotti e tunnel (A24-A25)
Strade sicure – Implementazione di un sistema di monitoraggio dinamico per il controllo da remoto di ponti, viadotti e tunnel della rete viaria principale
Sviluppo dell'accessibilità marittima e della resilienza delle infrastrutture portuali ai cambiamenti climatici
Aumento selettivo della capacità portuale
Ultimo/Penultimo Miglio Ferroviario/Stradale
Efficientamento energetico
Elettrificazione delle banchine (Cold ironing)
Strategia Nazionale Aree Interne - Miglioramento dell'accessibilità e della sicurezza delle strade
Sicuro, verde e sociale: riqualificazione dell'edilizia residenziale pubblica
Piano di investimenti strategici sui siti del patrimonio culturale, edifici e aree naturali
Salute, ambiente, biodiversità e clima
Verso un nuovo ospedale sicuro e sostenibile
Ecosistema innovativo della salute
Polis - Case dei servizi di cittadinanza digitale
Accordi per l'Innovazione
Costruzione e miglioramento padiglioni e spazi strutture penitenziarie per adulti e minori
Contratti di filiera e distrettuali per i settori agroalimentare, pesca e acquacoltura, silvicoltura, floricoltura e vivaismo
Iniziative di ricerca per tecnologie e percorsi innovativi in ambito sanitario e assistenziale

03

DETERMINANTS AND HETEROGENEITY OF ITALY'S COMPETITIVENESS

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ABSTRACT

In this chapter, the authors investigate the apparent paradox between Italy's long-run productivity slowdown and the relative resilience of its exports by linking sectoral and regional patterns of "revealed" productivity to the scope and design of industrial policy. Using a multi-sector Ricardian model estimated on OECD trade and wage data, they recover sectoral productivity parameters and compare Italian industries with their counterparts in 16 advanced economies. They then combine these results with input–output evidence on European value-chain linkages and with disaggregated regional export and GVA data to uncover Italy's internal heterogeneity. The analysis reveals, first, that many Italian industries – notably leather, apparel, beverages, textiles, machinery and fabricated metals – are among the world's most productive, and that Italy's productivity profile is above the OECD average and closest to Germany and other coordinated market economies. Productivity is strongly associated with intensive use of intermediate inputs and higher wages, and more productive foreign sectors supply more inputs to Italian industries, underscoring the non-zero-sum nature of European industrial upgrading. Second, the authors show that Italy is a "composite economy": exports, and especially exports from the most competitive industries, are heavily concentrated in the North, while the South and Islands are structurally specialised in lower-productivity sectors and fossil-fuel-based exports. They conclude that effective industrial policy must therefore be both productivity- and place-based: incrementally removing obstacles in competitive value chains, especially in the North, while pursuing transformational, higher-risk sectoral strategies in the South and Islands, aligned with the green transition and geared towards building new, region-specific comparative advantages.

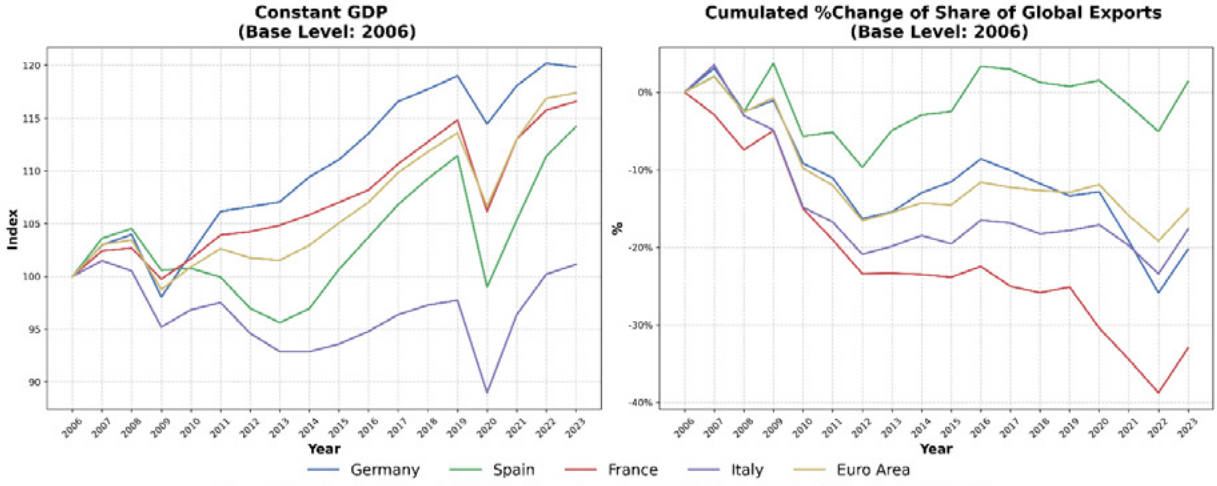
1. INTRODUCTION

Growth and productivity slowdowns are not phenomena exclusively impacting Italy. Such trends affect most developed economies and have been ongoing since the 1990s, while accelerating in the years following the Great Financial Crisis. A 2020 World Bank study (World Bank, 2020) estimates that, among advanced economies, productivity growth plunged to 0.8% over 2013-2018, just half of its long-term average. Among the many causes, a declining contribution from the ICT sectors, slow adoption of such technologies, and restrictive product market regulations in Europe have frequently been cited. Looking at the issue from a micro-level perspective, the literature has highlighted how this does not seem to be mostly explained by slowing productivity at the frontier (among highly productive firms), but rather by a slowdown in the diffusion process, as the productivity growth differential with laggards has grown (see, for example, Andrews et al., 2016).

However, while slowing growth has been a broad trend over the last 20 years, Italy has significantly underperformed other large Eurozone economies (growing at approximately one fourth the average, at around 0.3% per year), mainly due to weak labour productivity growth which expanded by a yearly average of less than 0.2% compared to nearly 0.9% for the Euro Area over 2000-2019 (Greco 2023). This can be attributed to both Total Factor Productivity growth and capital accumulation. Vast literature has studied the drivers of this underperformance. A non-exhaustive list would include underinvestment (especially in intangibles), slow technology adoption, a demographic of firms very skewed towards small and less productive businesses, and a high share of zombie firms[63]. Sectoral composition is generally found to have a limited role in explaining slower productivity growth compared to other Eurozone countries (Greco 2023), though it is more important in explaining differences in level of GDP. The major contribution is attributed to within sector productivity growth differentials[64].

Nonetheless, we believe that it is important to consider economic structure for at least two reasons. First, because it allows to reconcile Italy's macro underperformance with its relative resilience in trade. For example, as shown by Figure 1, while GDP growth has fallen behind substantially (first pane), Italian exports have been in line with the Eurozone trend, and, importantly, fared better than French and German ones. Indeed, as shown in the second pane, in 2023 Italian exports accounted for a ca. 17% lower share of global exports (compared to 2006 - roughly passing from 3.4% to 2.9%), in line with the average Eurozone decline.

Figure 1: Export performance in line with peers is at odds with macroeconomic weakness



Source: GDP data from World Bank and OECD National Accounts, constant 2015 US$. Exports data from IMF, Direction of Trade Statistics.
In the left pane, for each country, constant GDP is normalised to its level in 2006 (set to 100).
In the right pane, for each country, the cumulated %change is computed as the %change between the global share of exports in each year and in 2006

63 See Greco (2023) for a general discussion, and Bauer et al. (2020) for a more specific review on firm characteristics, notably the larger prevalence of small businesses (less productive on average), and of zombie firms.
64 Many drivers may be behind the latter, such as investments and technology adoption. For example, Nucci et al. (2023) present evidence of large productivity growth differentials among firms with different levels of digital adoption, notably in the manufacturing sector.

More precisely, while Italian exports underperformed those of other major Eurozone economies until the Great Financial Crisis, since 2010 they have reduced the negative growth differential, and in the period following the pandemic even outpaced their peers (see Bugamelli et al., 2018 for a detailed discussion in an historical context, and Centro Studi Confindustria (2023) for an account of post-pandemic resilience). Similarly, while industrial production contracted drastically following the Great Financial Crisis and the Sovereign Debt Crisis, Italy remains second in the EU, after Germany, accounting for about 14% of mining, quarrying and manufacturing production (Eurostat, DS_056120). In light of these contrasting developments, we thus want to assess today's structural productivity ("competitiveness") of Italian industries, in comparison with other OECD countries, to uncover the basis of its relative resilience.

Second, understanding economic structure is fundamental to inform industrial policy. In this chapter, we aim to analyse and empirically investigate the characteristics of Italy's productive structure at the national and regional levels. Understanding these structures can shed light on the North-South divide and provide evidence on how industrial policy approaches might differ between the two macro-regions. The Economics literature indeed emphasises that the development process is highly path-dependent and that opportunities are inherently linked to the underlying economic structure (Dosi, 2023).

Looking ahead, both aspects - structural competitiveness of Italian industries and sectoral specialisation at subnational level - are of interest as they are related to the pressing challenge of how Italy can harness its existing strengths and find new ones to recover its economic role in the world.

The remainder of the chapter is structured as follows. Part 2 presents a methodology to assess today's structural productivity of Italian industries by leveraging export data in a multi-sector Ricardian model. Part 3 presents the results. We show which Italian industries are among the world's most productive and most similar to Germany's in terms of their internal ranking. We rank each industry's productivity as well as present trends over the last years and some of the factors that correlate with this performance. We then move to a subnational analysis to show how exports are distributed across the country and to uncover the industrial specialisation of regions with a focus on competitiveness and productivity[65]. We provide evidence on the specialization of the South and Islands on less competitive industries. In light of geographical heterogeneity, in the last section we draw policy conclusions by leveraging two prevailing approaches to sector selection in the industrial policy (IP) literature, arguing in favour of transformational intervention to support the catching up of laggard regions.

65 We refer as revealed productivity to the values recovered via the model developed in Part 3. These are relative, in our case compared to the US at the industry level and can be seen as a measure of competitiveness. Revealed productivity measures a broad set of factors that make exports of a given country-industry successful, after having been controlled for other variables.

2. APPROACH AND METHODOLOGY

Identifying Italy's Comparative Advantages

In this section, we conduct a rigorous analysis of Italy's productivity and establish novel empirical facts. Previous research has leaned on measuring productivity at the level of firms, which potentially suffers from measurement problems and quintessentially views productivity as an unexplained residual after estimating a production function. In this chapter, we view productivities as sectoral and, instead of estimating production functions, we decompose sectoral bilateral trade flows into sectoral productivities. From export data, we want to understand how Italy compares to other advanced economies in terms of its sectoral productivities. In doing so, we avoid typical firm-level measurement issues: trade data are readily available and of high quality. We also approach productivity as a true fundamental of the economy rather than an unexplained residual. Rather than relying on firm-level productivity measures that can be prone to mismeasurements, we follow a theory-consistent approach to recover productivity parameters. We resort to a fundamental insight from trade economists: sectoral productivities are reflected in trade data. The rigidity of a country's labour market, its wage levels or trade costs affect all sectors. If we assume that all sectors use labour with the same intensity, export success in one sector is indicative of high productivities in this sector[66]. Movements in sectoral export shares, not levels, allow us to infer on productivities. This approach relates closely to the seminal work by Balassa (1965), who constructs comparative advantage measures from export data. We are recovering the fundamental productivity of a sector rather than calculating a proxy from export data. Before laying out our empirical results and establishing novel empirical facts, we begin by briefly reviewing the model. All details can be found in Appendix A1.

Theory: The multi-sector Ricardian Model

We now introduce the multi-sector Ricardian model commonly used by trade economists. Our measures of Italian productivity are based on this set up, which is Ricardian as it contends that differences in sectoral productivities drive trade. The model is empirically particularly attractive as it is highly tractable, easily implemented, and grants us an intuitive understanding of its key mechanisms.

The basic version of this model assumes several sectors, several countries, and only one factor of production, labour. Labour can move between sectors, but not across borders. This means that the model assumes that workers cannot migrate from Albania to Italy, but they can switch from tourism to car manufacturing within Italy. We allow wages to vary by sectors, implying switching costs between sectors, which are highly empirically plausible.

We make a standard assumption on the distribution of productivities. Imagine a

66 While this is inevitably a simplifying assumption, it follows Costinot, Donaldson, and Komunjer (2011) and it is necessary to recover sectoral productivities.

sector to be motor vehicles and a variety within that sector to be a German SUV or a British racing car. We assume a specific distribution from which productivities at the country-sector level are drawn, which arises from implementing only the best out of many ideas. Two parameters matter: for one, the trade elasticity, we assume a standard value from the literature. The second term denotes the average productivity within a sector. These are the values we will recover. Further standard assumptions and a discussion of additional factors and linkages are provided in Appendix 2.

Empirics: Recovering Sectoral Productivities

Following Costinot, Donaldson, and Komunjer (2011) and Donaldson and Hornbeck (2016), allowing for sectoral wage variation, trade flows take the gravity form shown in the Appendix.

This equation implies that country i exports more to country j in sector k if it has a higher productivity, z, lower trade costs, d, or lower wages, w, all relative to all other exporters. The Ricardian prediction is that countries export relatively more in sectors in which they are relatively more productive. If a country conquers large shares of faraway markets in a sector, it must be very productive in it. Country i further exports larger volumes to country j if country j spends a lot in a sector or if country i does not face a lot of competition when exporting to country j, reflected in a small denominator in the gravity equation.

From data on bilateral sectoral exports, we can estimate fundamental sectoral productivities. Using sectoral wage data, we separate wage variation from productivities and recover the latter from trade data. As Costinot, Donaldson, and Komunjer (2011), we use the OECD's STAN Bilateral Trade Database. Using data for 17 countries (Trade data are available for 152 countries, but sectoral wage data only for Belgium, Canada, Colombia, Costa Rica, Czechia, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Slovakia, Sweden, Turkey, the UK, and the US) and 34 industries for the year 2019, just before Covid disrupted global trade, we estimate this equation using the Poisson Pseudo Maximum Likelihood (PPML) estimator. This estimator is commonly used when analysing gravity equations (Santos Silva and Tenreyro (2006)). As a robustness check, we repeat this exercise on a global trade sample and find similar results. All details are presented in Appendix 2. We now present 8 results on Italy's current productivities.

3. INSIGHTS FROM THE ANALYSIS

We present the findings by organising them in Key Facts. We start from the results of the national level analysis and then move to the regional level, to uncover

specialisations. Finally, policy insights will be drawn by combining these Key Facts with the Economics literature on sector selection in the context of industrial policy.

ANALYSING ITALY'S PRODUCTIVITY

Fact #1: Several Italian industries are among the world's most productive.

Table 1 presents a ranking of Italian industries by productivity. We show results for 17 OECD countries and 30 industries, where the inclusion of both countries and industries is dictated by the availability of trade and sectoral wage data. In the 2nd column, we compare Italy's productivities within Italy. The values are relative to the United States, implying that Italy is most productive compared to the US in "Leather and related products" and "Wearing apparel". This comparison to a reference country is necessary as trade-recovered productivity is inherently a relative metric: when comparing two countries' trade with each other, we can infer which one is more productive in a given sector than the other. We refer to this rank as the internal productivity rank. This rank runs from 1 to 30 as it ranks the 30 sectors included in our data. In the 3rd column, industries are listed by the rank that Italy takes in this industry among OECD countries. Italy is the 2nd most productive country in the leather industries and the 4th most productive country in the beverages and wearing apparel industries. This rank runs from 1 to 17 as there are 17 OECD countries in our sample. We refer to this as the OECD productivity rank. In short, OECD rank refers to the position of the respective Italian industry compared to the same industry in other OECD economies. Internal rank refers to the position of the respective Italian industry compared to other Italian industries.

It is evident that the OECD and internal productivity ranks are strongly related. On average, an industry that is more productive by one internal productivity rank is more productive by 0.13 OECD productivity ranks. In Appendix Table 1, we show the recovered productivity values. In Appendix Table 2, we reproduce this exercise on Comtrade data for 161 countries to assess the robustness of our results and find similar results for Italy's internal productivity ranking[67].

67 As sectoral wage data are not available for this scope of countries, we need to assume that wages are constant within countries. As in Costinot, Donaldson, and Komunjer (2011) we then need to choose a reference sector and interpret all productivities as relative to that sector for wages to be separated from productivities. With the caveat of this interpretational difference, our results for the global trade sample are very similar to those presented above. Of Italy's 10 most productive industries, 8 are confirmed in the top 10 in the global sample; of Italy's 5 most productive industries, 4 are confirmed in the top 5 in the global sample. We therefore are confident that the first sample does not produce biased results and proceed with it below.

Table 1: Italy's sectors by productivity rank

INDUSTRY	INTERNAL RANK	OECD RANK
Leather and related products	1	2
Wearing apparel	2	4
Beverages	3	4
Textiles	4	6
Other non-metallic mineral products	5	6
Machinery and equipment n.e.c.	6	7
Tobacco products	7	5
Rubber and plastics products	8	8
Fabricated metal products, except machinery and equipment	9	6
Electricity, gas, steam and air conditioning supply	10	10
Motor vehicles, trailers and semi-trailers	11	9
Paper and paper products	12	7
Electrical equipment	13	8
Basic pharmaceutical products and pharmaceutical preparations	14	9
Basic metals	15	9
Wood and products of wood and cork, except furniture	16	9
Food products	17	8
Chemicals and chemical products	18	9
Furniture, other manufacturing	19	9
Publishing	20	8
Fishing and aquaculture	21	10
Audiovisual and broadcasting	22	10
Printing and reproduction of recorded media	23	9
Forestry and logging	24	7
Mining and quarrying except energy producing materials	25	7
Crop and animal production, hunting	26	8
Coke and refined petroleum products	27	8
Computer, electronic and optical products	28	10
Other transport equipment	29	9
Mining and quarrying of energy producing materials	30	5
Average across all sectors		8

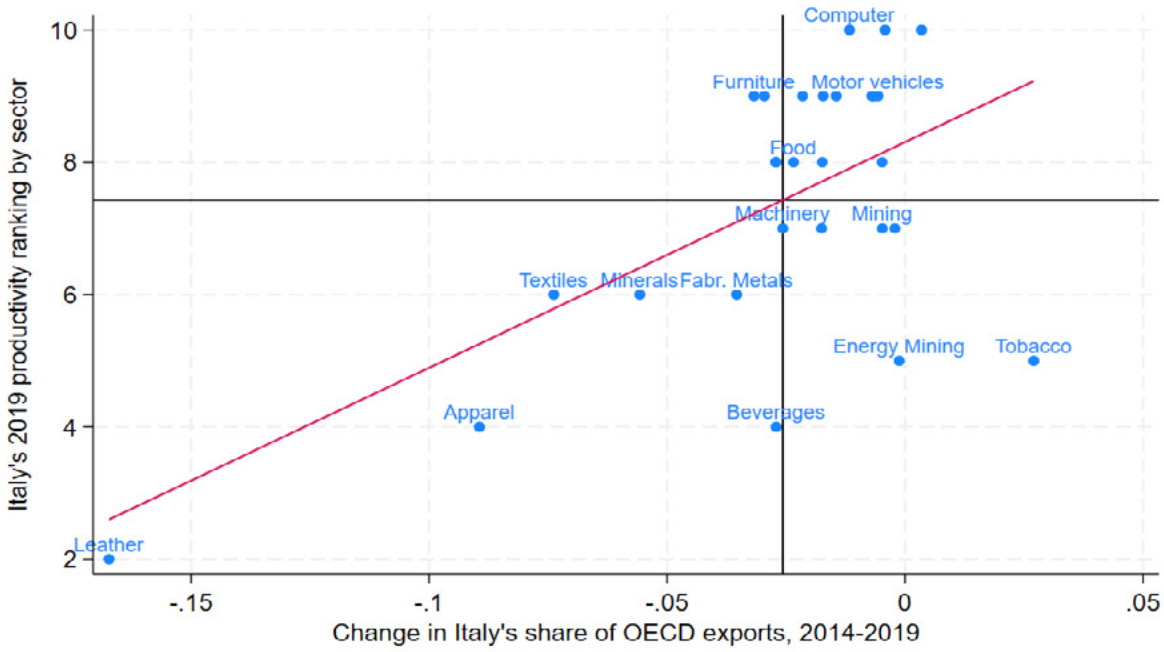
Notes: Productivities of Italian industries. Internal ranks refer to the position of the respective Italian industry compared to other Italian industries. OECD rank refers to the position of the respective Italian industry compared to the same industry among the OECD countries covered. Interpretation: Textiles are Italy's 4th most productive sector, where the comparison are other Italian industries. The Italian textile sector is ranked 6th among OECD countries, where the comparison are the textile groups of other countries.

What can we say about the trajectory of sectors in which Italy is among the most productive globally? In Figure 2a, we compare 2014 and 2019 trade data and compute Italy's share out of all OECD countries exports. We then contrast these data with Italy's 2019 global rank.

The black lines show the mean change in Italy's share of all exports - a decline of 2.5% - and Italy's mean rank compared to other countries - 7.4. Many factors may contribute to an average drop in Italy's export share, such as demographic and currency effects.

We therefore compare export share changes to the mean change in order to identify industries that perform relatively well. The red line shows predicted values for an OLS regression of export share changes on OECD productivity ranks. We see that, on average, the relationship is ascending, implying that Italy in 2019 was comparatively most productive in sectors in which it saw its export share decline.

Figure 2a: Productivity ranking versus export share growth



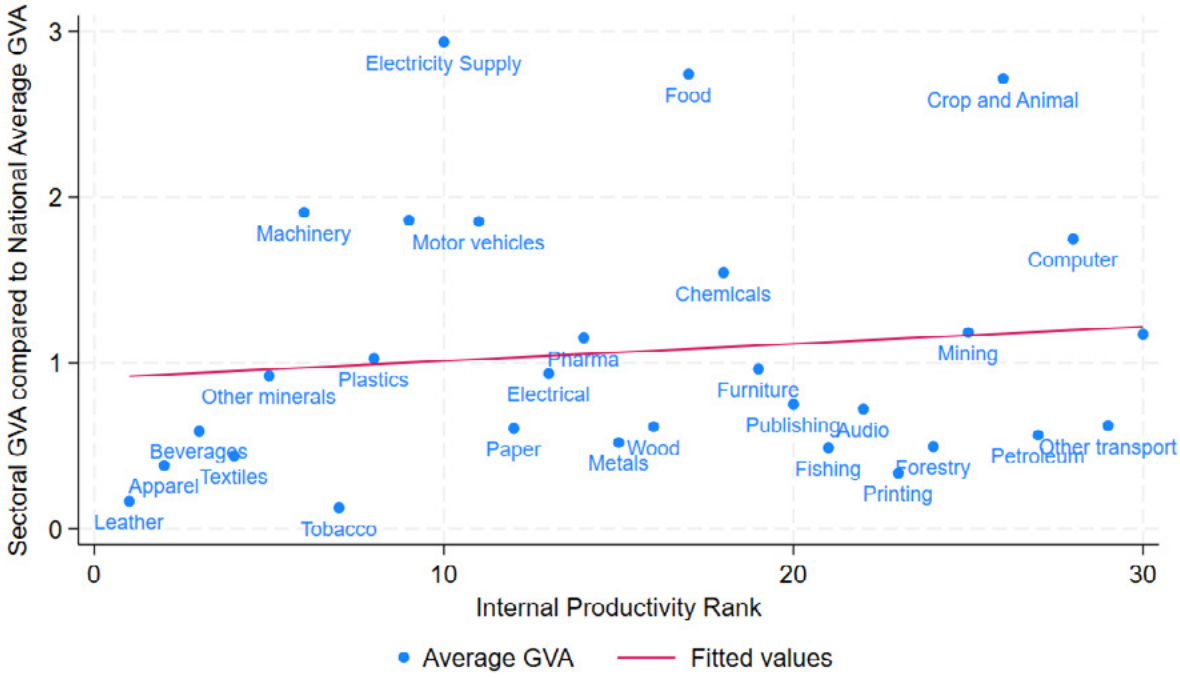
These are the industries in the bottom left quadrant, most notably the leather sector in the bottom left corner. In wearing apparel, beverages, textiles, non-metallic mineral products and fabricated metal products Italy ranked 4th or 6th in terms of productivity but saw its export share decline. In the bottom right quadrant, on the other hand, we see above-average productive industries in which Italy's export share performed better than the average industry. These are mining, tobacco products, paper and forestry. The top left quadrant only has four sectors (electrical equipment, rubber and plastic, furniture and basic metals) in which Italy is below-average comparatively productive and saw its export share decline marginally more than the average decline. Most sectors are in the top right quadrant of below-average comparatively productive sectors with export shares that performed better than the average: food, animal products, coke, printing, transport equipment, chemicals, pharmaceuticals, wood, motor vehicles, computers, and fishing. Among these, electricity, gas, steam and AC supply actually saw an export share rise.

Productivity figures in 2019 are a snapshot. Italy is comparatively productive in sectors in which it has high market shares in other countries. Comparing this snapshot to the evolution of trade over time allows for inferences on the trajectory which these sectors are on. The sectors in the bottom right quadrant appear particularly resilient: Italy is already relatively productive in them and is growing its

export share relative to the average. However, the bottom left sectors may require some catching up. Currently, Italy is relatively productive in them, yet it sees its export share shrink. We find most sectors to be in the top right quadrant of relatively unproductive industries with relatively well-performing export shares.

Is Italy productive in high or low value-added sectors? In Figure 2b, we compare each sector's internal productivity rank in Italy to the average ratio of a sector's gross value added (GVA) to the national average sectoral GVA across OECD economies. This comparison accounts for the fact that some countries may have high GVA across sectors. By comparing a sector's productivity rank within Italy to the average GVA as a ratio of the average national GVA, we control for average country-wide effects. We note that there is a weakly increasing relationship between a sector's internal productivity rank and its relative GVA: on average, Italy is therefore less productive in sectors that have, on average, relatively high GVA. This is well-illustrated by the fact that leather, wearing apparel, beverages, and textiles are among the sectors in which Italy is the most productive. However, these are, on average, relatively low GVA sectors.

Figure 2b: Productivity ranking versus relative sectoral GVA



Fact #2: Italy's sectoral productivities are above average among industrialised economies.

How do Italy's productivity rankings compare? When looking at the average rank by country, Italy has the 8th highest average rank out of 17 countries. Its average rank is slightly below the mean. Thus, in a sample of wealthy and industrialised

economies, Italy ranks slightly above average. Note that size effects do not drive these productivity findings. It is not the case that by virtue of exporting large shares a country is necessarily productive in it. Instead, this estimation strategy seeks to uncover productivities independent of size effects. In this sense, therefore, this average rank should be interpreted with caution as it attaches the same weight to each sector regardless of its size.

How does this finding relate to Italy's long-discussed productivity gap? We note, first, that relative productivities recovered from trade relationships are a different object from those estimated as a production function at the firm-level. Firm-level results may differ for numerous reasons: measurement issues abound and most approaches view productivity as a residual in the production function. Our approach, instead, views productivity as a fundamental determinant of economic activity. Italy's performance in our metric reflects its export success and the discrepancy with other measures indicates the complexity of measuring productivity.

Fact #3: Italy's internal productivity ranking is most similar to Germany's.

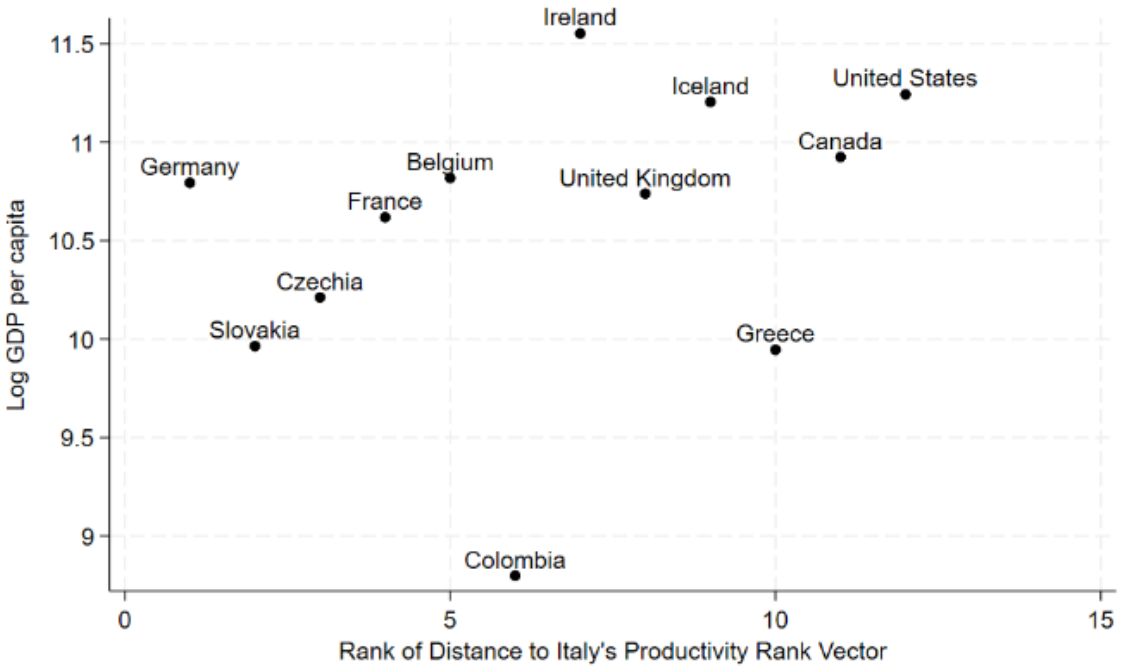
In light of significant linkages within industries and across borders in the Common Market, we would expect Italy to feature high productivity levels in industries similar to those in which its neighbours are highly productive. To test this hypothesis, we measure how similar a country's productivities are to Italy's. A small number indicates that another country has a productivity ranking similar to that of Italy.

The most similar countries to Italy in terms of the productivity ranking by industry are Germany, Slovakia, and Czechia. These are all industrialised countries, indicating that Italy is not simply highly productive in all industries along with other high-income countries, but that Italy's productivity profile, too, is very similar to other major European countries. In particular, it is closest to Germany: when comparing their respective top ten most productive industries, we find that 8 out of 10 overlap. We stress the gravity intuition behind this ranking. Italy is more similar to nearby countries than to distant countries. This is the first indication that production integration and regional collaboration may be important determinants.

The least similar countries to Italy in terms of its productivity ranking are Canada and Iceland. In the words of Varieties of Capitalism (Hall and Soskice, 2001), Italy is closest to coordinated market economies (CME) and very distant from liberal market economies (LME) in this comparison of productivity rankings. We will investigate below why Italy is similar to some and dissimilar to others.

To visualise this proximity to Italy in terms of its productivity ranking, in Figure 3 we present countries based on their distance ranking and GDP per capita, according to World Bank data. We find no significant relationship between productivity ranking similarity and GDP per capita. In particular, it is not the case that Italy is more similar to poorer countries in this sample.

Figure 3: Similarity to Italy's productivity ranking and GDP per capita



Appendix Figure A0 explains the methodology and repeats this graph for distance in terms of productivity levels rather than ranks. We find that Belgium, Slovakia, and Greece have the most similar productivity levels to Italy, whereas Iceland and Canada have the least similar productivity levels, as before. Thus, these two measures produce similar results: Italy is similar to nearby industrialised economies.

Fact #4: Productivity is strongly associated with higher input usage and higher wages.

What determines these sectoral productivities? To answer this question, we collect data on sectoral wages, use of intermediate inputs, consumption of fixed capital, employment, gross capital formation, gross operating surplus, hours worked, self-employment, and value added from the OECD Stan database, and project these onto the gravity-recovered productivities following Chor, 2010. The regression sample comprises all 30 industries and 17 countries, as we are constrained by the availability of the OECD data[68]. We regress these variables on the productivity parameters recovered above and include country and industry fixed effects. The country fixed effect controls for the average productivity level of a country, so we control for the fact that richer countries are more productive and also have larger capital stocks. Sector fixed effects control for a sector's average productivity level across countries. Some sectors may be more productive everywhere.

68 These countries are Belgium, Canada, Colombia, Costa Rica, Czechia, France, Germany, Greece, Iceland, Ireland, Italy, Japan, Slovakia, Sweden, Turkey, the UK, and the US.

Table 2 shows associations of different variables with sectoral productivities. Each column regresses productivity on one variable labelled on the left. We find a significant association of wages with productivities. This is particularly interesting given that we control for sectoral wages in our estimation strategy. Thus, higher wages are associated with higher productivities. We also find that more productive sectors use significantly more inputs. There is no relationship between productivity and capital, employment, operating surplus, hours worked, and self-employment. There is a weakly significant positive relationship with value added. While these results do not allow us to explain what drives sectoral productivities in Italy, they point to input usage as an important correlate, which we will investigate below.

Repeating Table 2 only for Italy, we find no significant results due to the smaller sample size. Fundamentally, however, we are interested in the average relationships in the data. We conclude that capital and labour inputs are not significantly associated with sectoral productivities. Instead, usage of inputs appears to be an important driver of productivity, resulting in weakly higher value added and significantly higher wages.

Table 2: Determinants of sectoral productivity across countries

	Productivity								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Wages	4.354***								
	(0.924)								
Inputs		0.363***							
		(0.052)							
Fixed Capital Consumption			274.876						
			(290.083)						
Employment				1.7e+04					
				(1.4e+04)					
Capital Formation					362.548				
					(377.541)				
Operating Surplus						0.525			
						(0.340)			
Hours worked							9517.318		
							(7889.698)		
Self-employment								2.8e+04	
								(1.6e+04)	
Value added									0.707*
									(0.234)
Observations	332	330	236	332	251	321	239	332	331
Fixed effects:									
Country	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES	YES	YES	YES

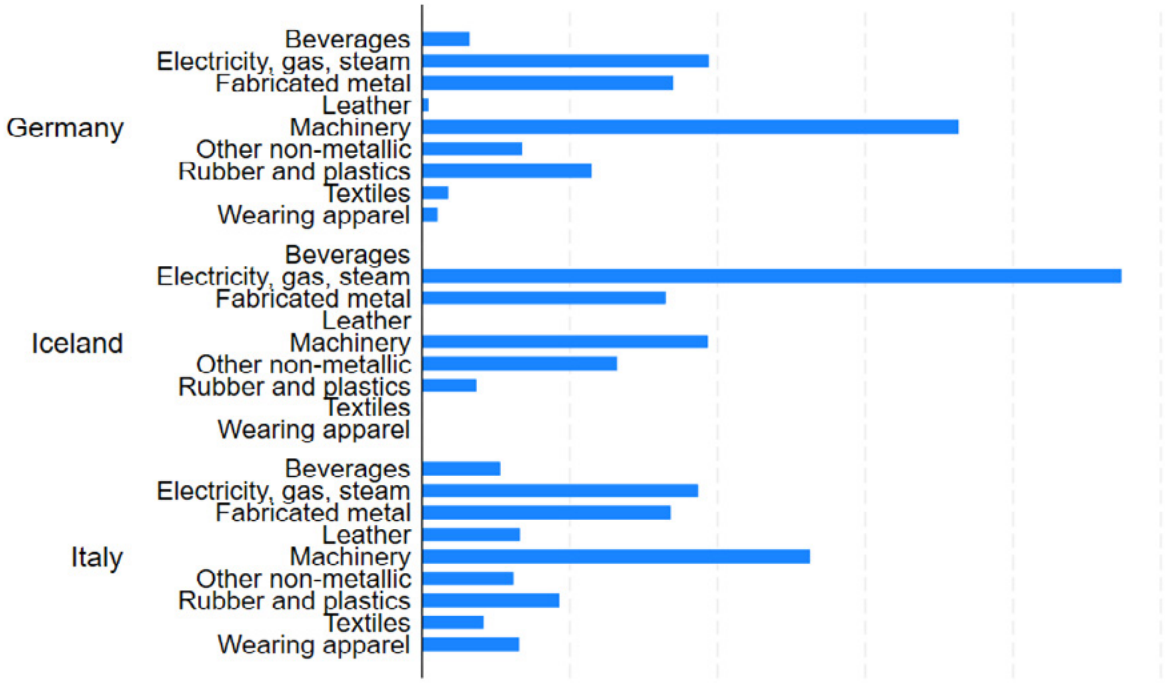
Notes: Standard errors in parentheses. Standard errors clustered at the country-industry level. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Fact #5: Italy is similar to countries that allocate inputs similarly.

What determines Italy's similarity and dissimilarity to other countries? Table 2 stresses inputs as the key determining factor for productivities. We then analyse how these inputs are allocated across industries within countries. Figure 4 compares Italy to Germany and Iceland, respectively the most and least similar countries in terms of their productivity profiles. The three industries receiving most inputs in both Germany and Italy are machinery, fabricated metal, and electricity. For Iceland,

however, electricity receives almost half of all inputs, with Germany and Italy allocating less than 20% to this industry. On the other hand, beverages, wearing apparel and textiles receive a combined 16% (6%) in Italy (Germany), but no inputs at all in Iceland. It therefore appears to be the case that Italy and Germany are most similar in terms of their relative productivities as they are also most similar in terms of their relative use of inputs. Naturally, these observations are two sides of the same coin: similar relative productivities imply a similar production structure as long as inputs are allocated efficiently to the most productive sectors. Figure 4 confirms this connection and thus supports the observed similarity in relative productivities between Germany and Italy.

Figure 4: Share of inputs allocated to industries in most similar (Germany) and least similar (Iceland) countries in terms of their productivity profiles (OECD data)



What are the implications of this finding? We saw above that input usage correlates highly with productivity. Here, we found that Italy has a similar productivity ranking as the countries that allocate inputs similarly across sectors. Two insights can be derived from this. First, differences in input usages for two countries that have similar productivity rankings raises questions on the allocation of inputs. Why is it that Italy's machinery sector lies halfway between Iceland and Germany in terms of its share of inputs while being the 7th most productive in the OECD sample? Second, when seeking to double down on existing comparative advantages or when pursuing productivity gains in desirable new industries, policymakers need to permit factors and inputs to adjust to these changes. While our insights do not provide a causal analysis, they suggest that rising productivity in one sector should be accompanied by shifts in input usage, and prohibiting these changes may hinder the desired productivity growth.

Fact #6: More productive sectors in other European countries provide more inputs to Italy's industries.

We noted above that Italy is more similar to nearby countries than to faraway countries. To analyse regional integration and sectoral linkages, we look at the EUREGIO database and the EU-wide input-output table they contain. Input-output (IO) data are a matrix showing the flows of goods and services as inputs from one sector to another. These matrices are typically constructed from national accounts and allow researchers to understand linkages between sectors both within and across countries. This allows us to identify how important a given industry in a region is in supplying intermediates to another using industry in the same or another region. These data permit this analysis both within Italy and from an Italian province to other European provinces. For example, the textiles and leather industry of Lombardy has the strongest links to the region of Vienna. Lombardy's manufacturing industry has the strongest links to Oberösterreich. In this way, we are able to ascertain how links to other sectors contribute to the recovered sectoral productivities.

We use all data on Italy's domestic and foreign supplying industries. Combining regions to countries, the EUREGIO data permit this analysis for 7 sectors: agriculture, mining, food, textiles, chemicals, electrical, and other manufacturing[69]. Controlling for both country and industry specifics, we would expect a positive correlation as more productive supplying industries should capture higher IO-weights in Italy. A higher IO-weight implies that a sector contributes more inputs to an Italian sector. Table 3 below confirms this prediction. For every sector, we find that higher productivities are associated with significantly higher IO-weights. The highest associations are found for Manufacturing and Mining.

Table 3: More productive sectors supply more inputs to Italy's using industries

	Manufacturing	Mining	Food	Chemicals	Textiles	Electrical
Productivity	1.938***	1.782***	1.719***	1.677***	1.337*	1.200*
	(0.481)	(0.488)	(0.498)	(0.477)	(0.511)	(0.531)
N	94	94	94	94	94	94
Fixed effects:						
Country	YES	YES	YES	YES	YES	YES
Industry	YES	YES	YES	YES	YES	YES

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Notes: Regression of country-sector logarithmic IO-weights on country-sector productivity, z_{ik}.

69 We combine input weights at the level of countries and industries with each country-industry pair's recovered sectoral productivity. Here, we form weighted averages over the more granular sectors in the trade data, where the weights are given by export shares. Thus, several sectors for which we recovered productivities are combined to one larger sector, at the level of granularity of the input-output table, each weighted by their respective export share. We then regress each supplying country-industry's productivity on the log weight this country-industry has for Italy's using industries. We include supplying country and supplying industry fixed effects. Country fixed effects in this case are country pair fixed effects, as we only study Italy. Thus, a fixed effect for Belgium effectively captures all bilateral determinants of input-output links, such as distance, language barriers, and legal and cultural similarity. Industry fixed effects control for the fact that some industries will inevitably require stronger linkages. One could imagine agriculture to require less inputs than manufacturing, for example.

What are the implications of this finding? We note that this shows the potential of industrial policy to be more than a zero-sum game. If Table 3 could be given a causal interpretation, then any policy that increases German productivities would increase the links Italian industries have with their German counterparts. We also saw in Table 2 that productivity similarity correlates with similarity in input usage. In this way, a European perspective on productivity-enhancing policies is warranted. A European perspective on industrial policy would seek to exploit strong sectoral links across the continent. On the one hand, a policy that successfully enhances a final producer's productivity should provide spillover effects to linked sectors. On the other hand, policymakers need to take into consideration that both sides of the link continue to be each other's efficient matches. Germany and Italy's car and machinery sectors are both highly productive and highly linked. If one of the countries was to pull ahead significantly, we may expect certain spillover effects, yet ought to worry that the strength of the link might suffer. Similarly, a switch of car producers in Germany fully to electric vehicles requires Italian suppliers to shift their profile and to compete with new competitors to continue the strong links with Germany's car sector which we view as inherently beneficial. Therefore, we suggest that a European industrial policy offers a chance to approach productivity gains not as a zero-sum game. We caution, however, that overly one-sided policies risk weakening existing ties through which innovation and best practices spread.

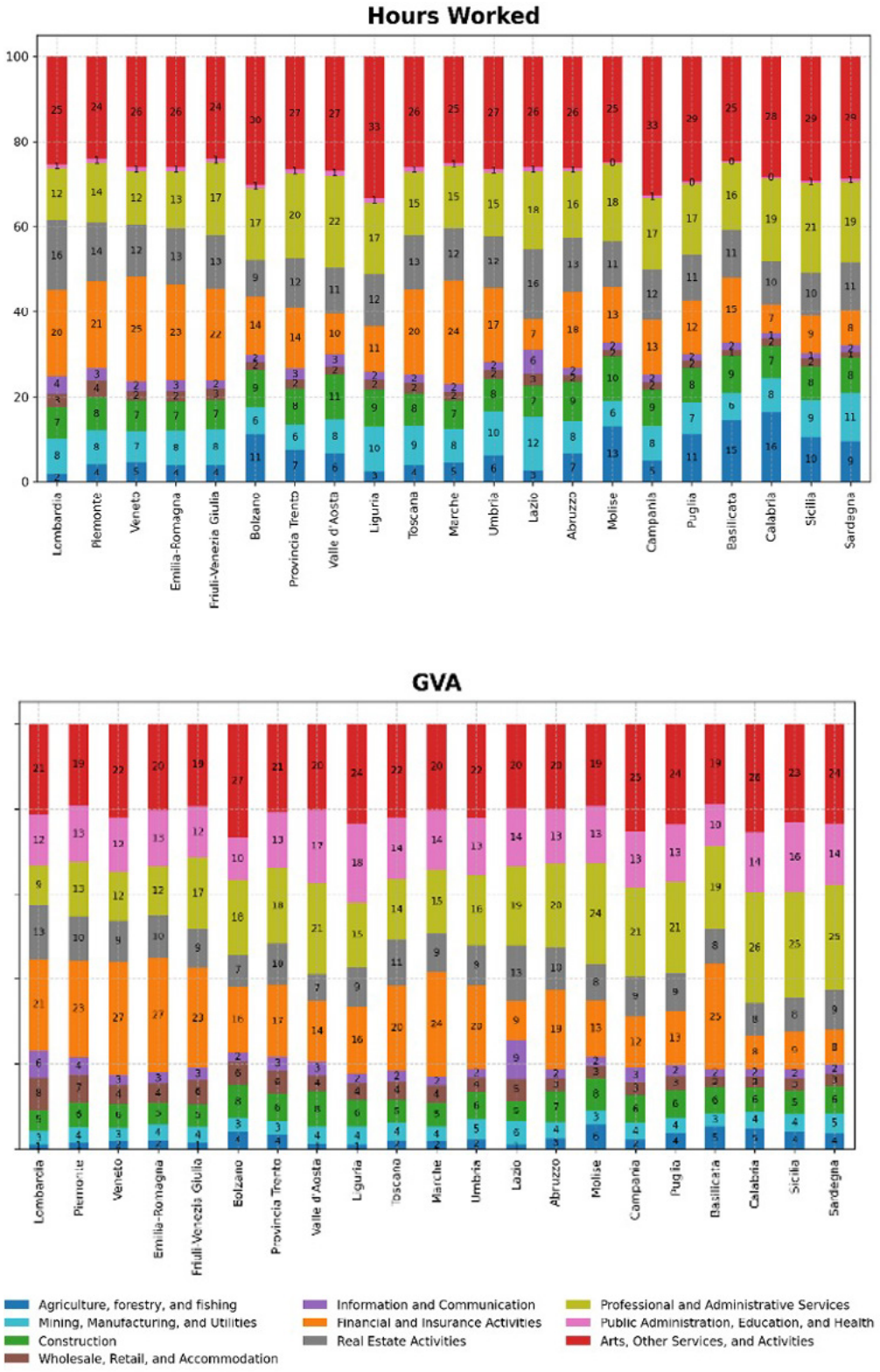
Exploring Italy's subnational heterogeneity

In the previous section we saw how Italy performs compared to other OECD countries for its exports' revealed productivity. However, this national view hides the vast geographical heterogeneity that characterises the country's productivity and export performance. In this section we delve into this by showing how Italy remains a complex, "composite economy" (Locke 1996).

Fact #7: There is no "one" Italian productivity level

Italian regions differ substantially in their economic structures. As shown in Figure 5, they are highly heterogeneous in the composition of labour and Gross Value Added across sectors, with a notably larger preponderance of finance in the North and of professional and administrative services and agriculture in the South.

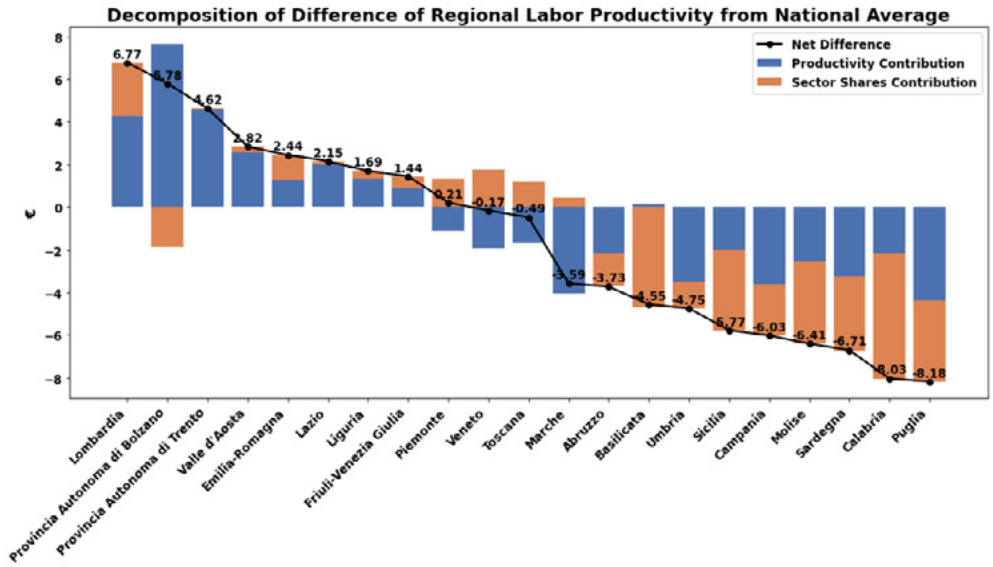
Figure 5: The distribution of Hours Worked and Gross Value Added across sectors by region is highly heterogeneous



Source: Authors' computations on Ardeco data (Nace 10 sectors), based on 2023 data.

These specialisations are crucial determinants of overall productivity levels. Intuitively, regional heterogeneity may reflect both specialisation in different sectors (e.g., a higher share of employment in sectors that tend to be very productive, such as ICT) and/or differences within each sector in regional vs national productivity (e.g., a regional manufacturing sector that is more productive than the national average productivity of the manufacturing sector). Figure 6 accounts for these effects by providing a decomposition of the differences between regional labour productivity from the national average in two components. The first - Sector Shares contribution - reflects different preponderance of a sector (in terms of share of hours worked) compared to the national average, while the second - Productivity contribution - measures differences in productivity for each sector (again from the national average)[70]. Each effect is computed for each region-sector pair and the respective regional-level component displayed in the chart is obtained by summing across all sectors within the region. In general, Southern regions are more specialised (in terms of share of hours worked) in sectors that are on average less productive. As shown, the productivity level of all Southern regions is dragged by such specialisation effects (the orange bars). For example, if Calabria was to replicate the average Italian sectoral composition, without any within-sector catch-up, that would translate to an increase of GVA of nearly €6 per hour (or > €9500 per employee).

Figure 6: Southern regions are specialised in sectors that on average are less productive (see sector shares contribution)



Source: Authors' computations on Ardeco data (Nace 10 sectors), based on 2023 data. Labor productivity is defined as Gross Value Added divided by the number of hours worked.The national average was just below €36 (2015 prices) in 2023.
See Appendix 1 for more details on the computations of the contributions.

70 See Appendix A2 for more details on computations.

Fact #8: Exports are also very heterogeneously distributed.

We will now provide further evidence on regional heterogeneity moving from sectors to a more granular industrial view using export data[71]. We explore heterogeneity along two dimensions: the first is related to the productivity analysis carried out in Section 2 and 3; while the second is related to measures of intensity of value added.

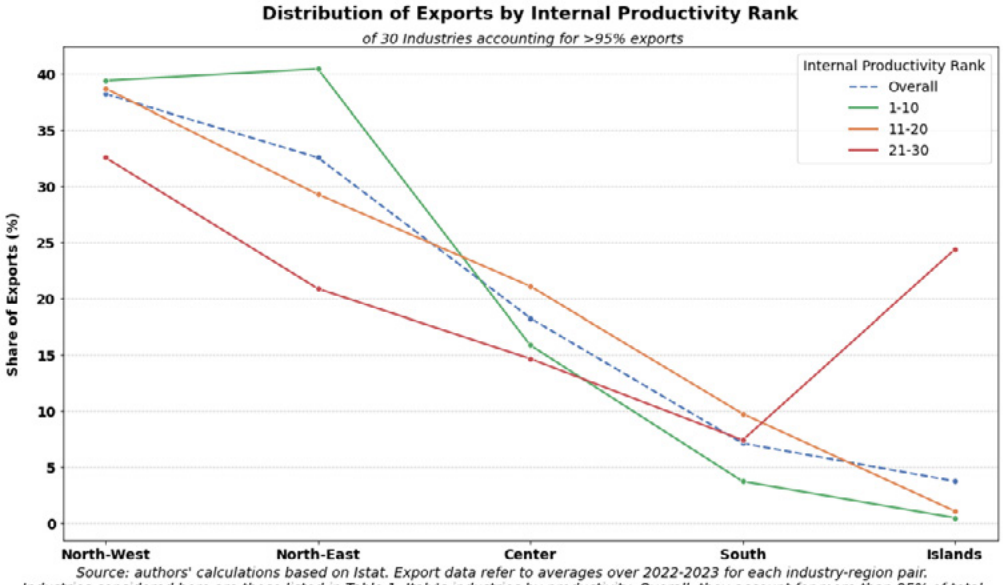
To start, in Section 3 industries have been classed based on an internal productivity rank (see Table 1), comparing the revealed productivity (recovered with the model described in Section 2) of each Italian industry with that of all other Italian industries. How are exports from these industries distributed geographically? Figure 7 addresses this question by plotting the share of exports of each macroregion both for total exports and for each tercile of industries grouped by rank (the first contains the 10 with highest internal rank, the second those in the 11-20 position, and the last those ranked 21-30). Two insights emerge. First, the total export distribution (the blue "Overall" line in the chart) is highly heterogeneous across macroregions, and much more skewed than the population distribution[72]. The North is clearly overperforming (compared to its population). For example, the North-West accounts for nearly 40% of exports, despite hosting just around 27% of the population. On the other hand, the share of exports of the Centre is roughly in line with its population share (ca. 20%), while the South and Islands are drastically underperforming. Second, the higher an industry's relative productivity ("measured by the internal rank"), the less likely exports are to come from the South and the Islands. This is illustrated, for example, by the comparison of the green and red line, representing the 10 "best" and 10 "worst" industries. The South accounts for a double export share for the latter group compared to the former (ca. 8% vs ca. 4%) while the difference is even more pronounced for the Islands. The relatively high share of exports in less productive industries originating from the Islands is explained by fossil fuels (coke and refined petroleum products), which account for more than 70% of their total exports (respectively more than 80% and 60% for Sardinia and Sicily), for amounts exceeding 18bn (75% of Italian coke and petroleum manufacturing exports). Overall, the Islands are still responsible for a very low overall export share (ca. 3.5%), as lower-productivity industries account for just over 10% of Italian exports (compared to respectively close to 40% and 50% from top and mid terciles).

A second readily available measure of industrial productivity (sourced from Eurostat's Structural Business Statistics) is GVA per hour worked. This is available at national level for the 30 industries considered so far. While significant regional heterogeneity in productivity within industries is poised to hide behind national averages, it is still useful to study the industrial composition of macroregions' exports, following the same logic as above. The idea is to observe whether exports from macroregions are biased towards high or low value-added industries. In order to ensure comparability with the previous analysis, industries are again ranked (this time based on GVA per hour worked) and divided into three terciles. Figure

71 Export data in this section refer to the average of 2022-2023 data. See Appendix 3 for more details.
72 The 5 macroregions account for respectively 27%, 20%, 20%, 23% and 11% of the population (the sum does not add to 100 because of rounding).

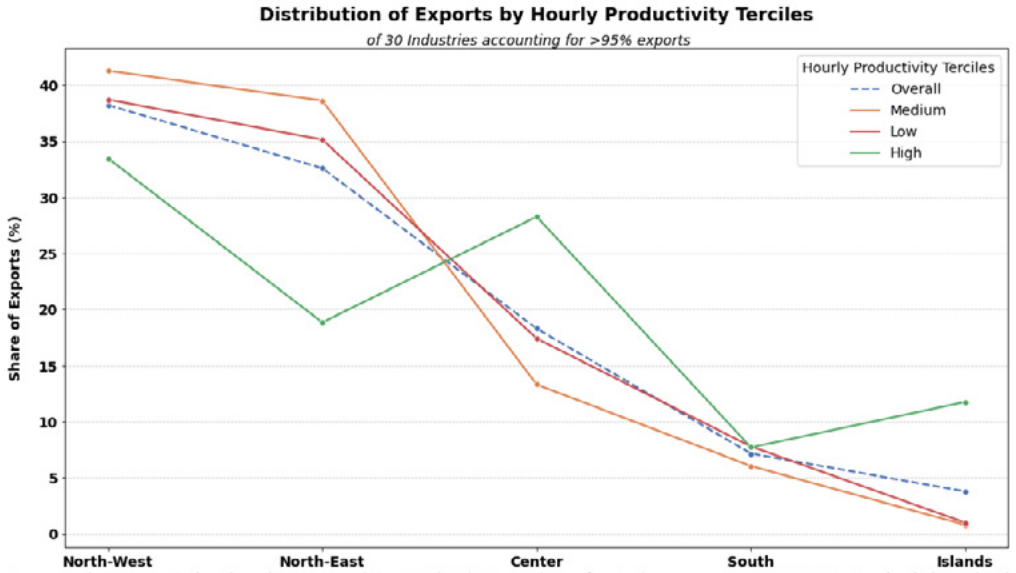
8 displays, for each of them, the distribution of exports across macroregions. The top 10 are represented by the green line ("High" hourly productivity), the mid 10 by the orange ("Medium") and the bottom 10 by the red one ("Low"). Of course the distribution of total exports (the blue "Overall" line) is the same as in Figure 7.

Figure 7: Exports are concentrated in the North, especially those of most productive industries



Source: authors' calculations based on Istat. Export data refer to averages over 2022-2023 for each industry-region pair. Industries considered here are those listed in Table 1: Italy's industries by productivity. Overall, they account for more than 95% of total exports.

Figure 8: High VA industries' exports are more evenly distributed, mainly to the benefit of Central regions

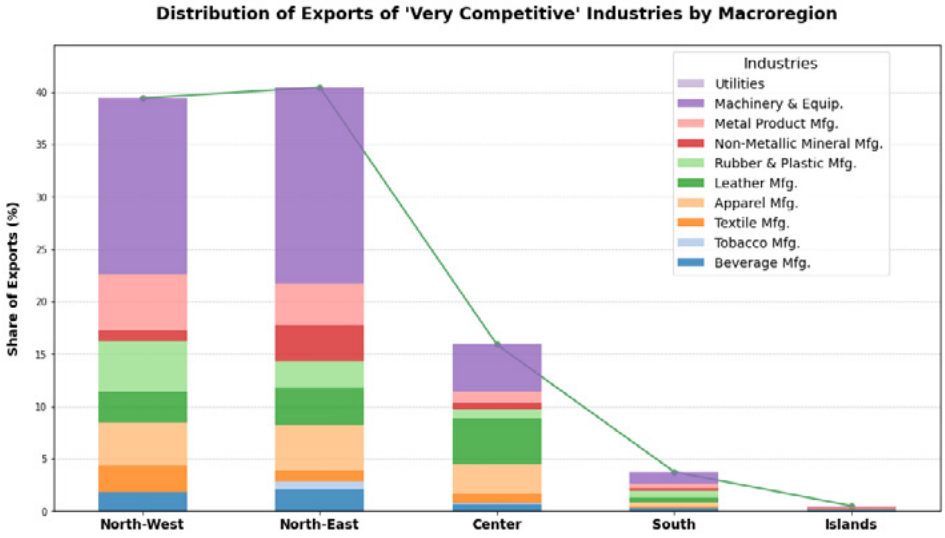


Source: Authors' computations based on Istat amd Eurostat (SBS). Export data refers to the average over 2022-2023 at region-industry level. Hourly productivity is calculated at national level as GVA per hour, and industries are grouped by terciles. Industries considered here are those listed in Table 1. Overall, they account for more than 95% of total exports in 2023.

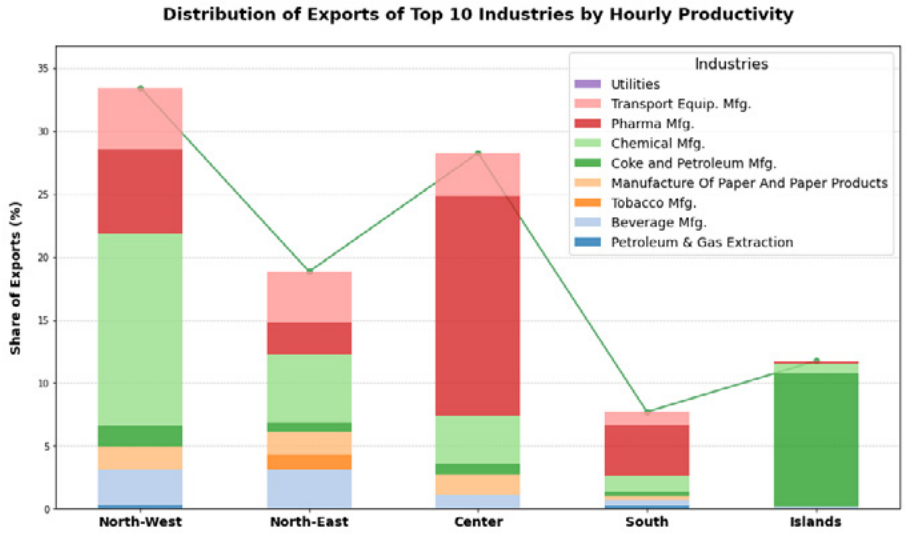
As can be seen, compared to the distribution of industries in which Italy is most productive (as measured by the internal rank), the distribution of high value added industries' exports is more even, mainly to the benefit of Central regions (which account for nearly 30% of high-value added exports, significantly more than the share of total exports, <20%), and, to a lesser extent, to that of the Islands.

How do individual industries contribute to such findings? The two panes of Figure 9 plot again the distribution of exports of, respectively, the 10 most productive and the 10 industries with highest value-added per hour worked (the two green lines from Figures 7 and 8). In addition, however, the contribution of each of the 10 industries belonging to such highest terciles is now displayed. As can be seen from Figure 9, machinery and equipment are the largest among the most productive industries, largely explaining the overperformance of Northern regions (although nearly all industries are overrepresented in this macroregion). On the other hand, the pharmaceutical industry explains the strong performance of central regions in high VA industries. The relatively good share of the Islands in the latter is instead entirely explained by fossil fuel exports, which, as has been noted above, represent more than 70% of their total exports.

Figure 9: Distribution of Exports of Top 10 industries by competitiveness and hourly productivity



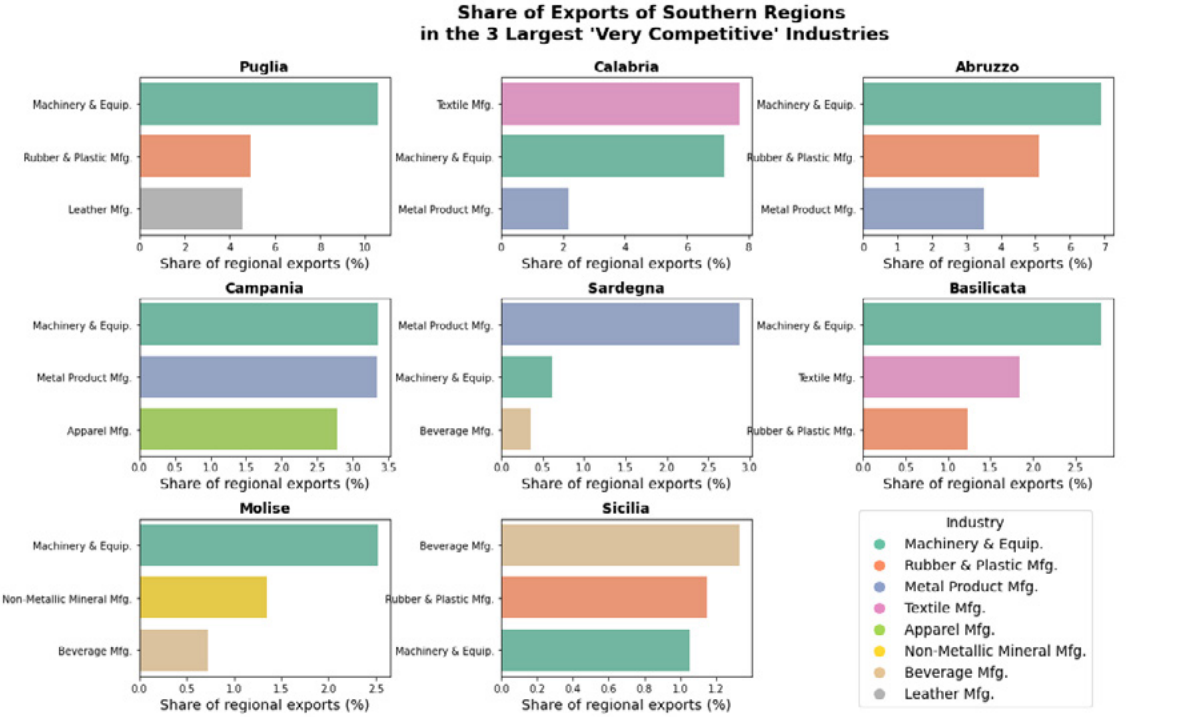
Source: Authors' computations based on Istat. Export data refers to the average over 2022-2023 at region-industry level. Industries considered here are those listed in Table 1. Overall, they account for more than 95% of total exports in 2023. 'Very competitive' industries are those falling into the 1-10 internal productivity ranking range.



Source: Authors' computations based on Istat and Eurostat (SBS). Export data refers to the average over 2022-2023 at region-industry level. Hourly productivity is calculated at national level as GVA per hour. Industries considered here are those listed in Table 1. Overall, they account for more than 95% of total exports in 2023.

Appendix 4 provides a similar breakdown by region. While findings from Figure 9 are somehow discouraging, nonetheless, as shown in Figure 10, all southern regions have some exports originating from the most competitive industries, although with high heterogeneity. Machinery and equipment is confirmed as the most prominent high-productivity industry, even among lagging behind regions.

Figure 10: All Southern regions and Islands have some exports originating from the most productive industries



Source: Authors' computations based on Istat. Export share data refer to the share average over 2022-2023.
Industries considered here are those listed in Table 1: Italy's industries by productivity. Overall, they account for more than 95% of total exports in 2023.
'Very Competitive' industries are those falling into the 1-10 internal productivity ranking range.

4. CONCLUSIONS

Two key conclusions emerge from this analysis. The first is that relative resilience of aggregate exports hides very different industrial trajectories, whose specificities should be considered when formulating policies. While Italian industries, overall, remain more productive than the OECD average (i.e. the average Italian industry ranks higher in terms of productivity than the average OECD industry), there is considerable variation among them. Furthermore, a simple descriptive assessment reveals that the relative resilience of exports in the years leading up to the pandemic was primarily driven by industries that managed to grow exports beyond the OECD average, though many of them are relatively unproductive compared to other Italian industries. Similarly concerning, some competitive industries are experiencing a decline in market share. The analysis also points to the importance of input linkages with European partner countries, suggesting that industrial policy is not a zero-sum game and that related

industries across borders can benefit from improved productivities.

Second, the regional analysis has shown that both sectoral and industrial structures vary greatly across regions. Exports' distribution is much more concentrated than population, to the benefit of Northern regions, and this is even more true for exports originating from the most productive industries. Thus, even if putting aside well-known within-industry regional differences (for example those linked to firm size, internationalisation, etc.), the sectoral and industrial structure contribute to lower productivity and lower competitiveness of the Centre and, even more, of the South and the Islands.

Policy Implications

The starting point for an industrial policy should always be clear policy goals (examples may include accelerating growth, creating good jobs, or enabling the green transition; see the chapter by Marengo and Moretti, in this volume). Subsequently, it should also consider the identification of sectors to target as well as the policy instruments required. Research points to two approaches which policymakers can immediately apply to identify possible areas of intervention (for a detailed discussion see Lin and Chang, 2009).

The first approach carries lower risks and builds on existing competitive sectors/industries (it is therefore targeted from this point of view), aiming at incremental improvements (Lin, 2014). Identifying difficulties and removing obstacles to the full exploitation of existing comparative advantages may be beneficial and be the least risky option for policymakers, as it implies building on assets and capabilities that are already efficiently produced in the local economy (Hausmann & Klinger, 2006). Our analysis suggests that limiting Italian industrial policy to this approach could be short-sighted. Figures 2a and 2b showed that Italy holds a comparative advantage in several industries with relatively low value-added and in which Italy has been losing market share. Further analysis of the factors driving these trends will be key.

The second approach differs in that it would tolerate a higher risk, providing support for industries for which there is less evidence of existing competitiveness. The difference between the two is given by the degree ofrisk-taking and transformative potential. However, there are some goals that may not be easily pursued with an incrementalist approach, justifying a deviation from existing comparative advantages and the attempt to build new ones.

Some (non-exhaustive) examples of these goals include:

- Fostering regional convergence, which may be hindered from slow and path-dependent development processes (see Asian Development Bank, 2016)[73]. In the presence of feedback between firms' knowledge accumulation, trade performances and growth dynamics, industrial policy would be needed to allow for a catch up (Dosi and Roventini, 2024).
- Accelerating the green transition would require creating new markets rather than

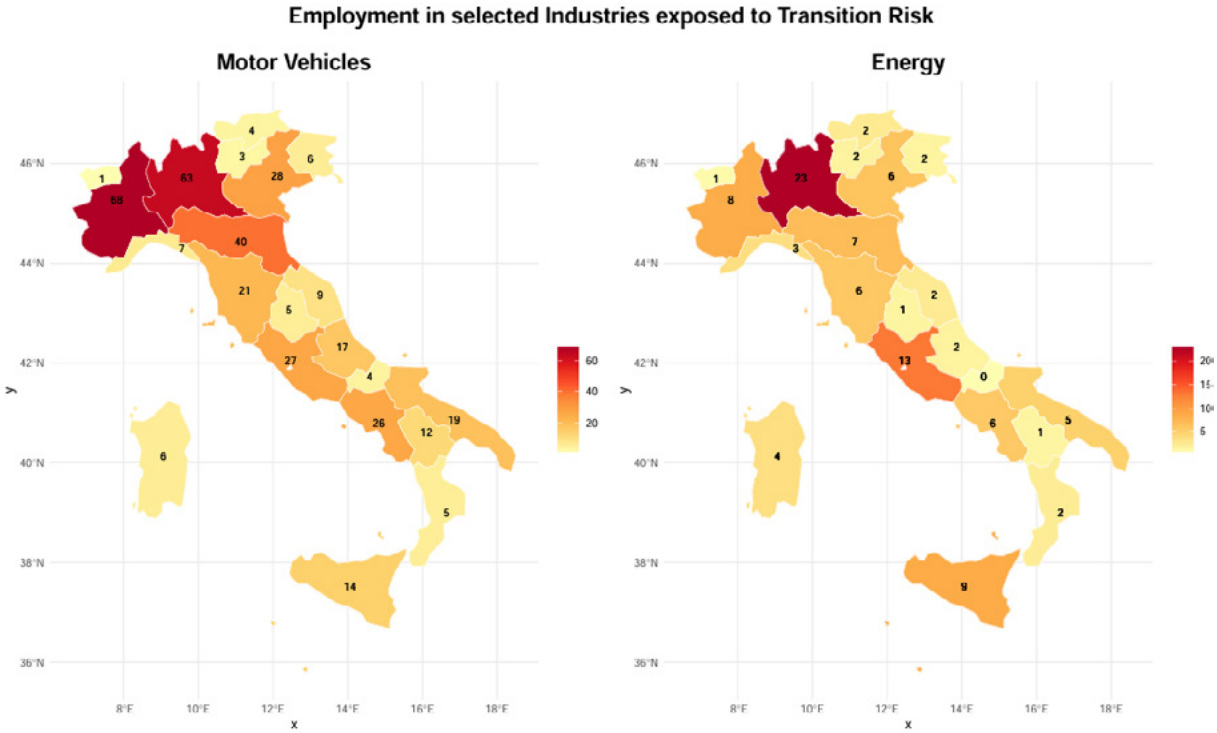
73 This was for example the basis of the recent resumption of place-based policies in the US under the Biden administration (McCann, 2023).

just fixing them (Mazzucato, 2016), stimulating new demand and overcoming coordination failures typical at the moment of the creation of a new industry. In this context, when great technological changes are needed, incrementalism would favour technological and sectoral lock-ins (Unruh, 2000).

- Managing supply chain or geopolitical risks, which could be present especially for some high-technological goods, may require breaking from existing specialisations (Agarwal, 2023 summarises this efficiency-risk exposure trade off).

In the context of a drive towards climate neutrality, greater global geopolitical instability, and Italy's overdue need for geographic economic convergence, several considerations stand out. The fact that most competitive industries are heavily concentrated in Northern regions means that an industrial policy that exclusively builds on existing comparative advantages may risk further exacerbating regional disparities and not promoting the change that laggard areas need. Thus, while both incremental and transformational approaches may be beneficial, and while the whole country would benefit from an effective industrial policy, it appears that an industrial policy for the South and Islands should allow for a higher degree of risk taking than in the rest of the country. industrial policy could thus be an opportunity for the South, as it would allow it to re-think and build a sectoral specialisation, perhaps exploiting the new emerging sectors. At the same time, other challenges, such as the green transition, necessarily require a transformation for the whole economy, but regional specificity should take centre stage to anticipate both risk (see Figure 11) and opportunities.

Figure 11: The transition towards a greener economy requires both widespread transformation and consideration of regional heterogeneity



Source: Eurostat, Structural Business Statistics. Employment data is from 2019 and is expressed in thousands. Industries included in the first chart are Manufacture of motor vehicles, trailers and semi- trailers; and Maintenance and repair of motor vehicles. Those included in the second are Mining of coal and lignite; Extraction of crude petroleum and natural gas; Manufacture of coke and refined petroleum products; Electricity, gas, steam and air conditioning supply.

We conclude that the transformation of the broader Italian economy should incorporate the implications of regional disparity. With many productive industries and export successes in the North, a more incrementalist approach may still work for these regions (although it may still not be sufficient: recall that - as shown by Figure 2b - Italy is less productive at sectors that have, on average, relatively high value added). In the South and the Islands, however, we believe well-measured risk taking and a more transformationalist approach to industrial policy presents the best expected payoffs.

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APPENDIX

1. Recovering Productivities

This appendix provides a deeper discussion of possible extensions to the multi-sector Ricardian model. Without altering the implications or tractability of the model, we could add a perfectly mobile factor of production, such as capital. The easiest way of doing this would be to assume that all sectors employ labour and capital in the same proportions. Labour mobility can be limited by assuming some switching costs between sectors or moving costs between countries. Keeping with Redding and Venables (2004), we essentially assign a name to an immobile and a mobile factor of production. Depending on the assumptions of our model, this may simply be labour and capital; it may alternatively be the case that land is immobile and labour partially mobile. The implications of the model remain the same.

The basic version also has no sectoral linkages. That is to say, each sector produces goods from using labour only, and not from combining labour with intermediate inputs of its own or another sector. This is mainly done to keep the model tractable and empirically straightforward. However, Donaldson and Hornbeck (2016) show that adding sectoral linkages is possible in this class of models, in that they assume the existence of two sectors, agriculture and manufacturing, which are linked to each other. While this set up is no longer tractable, the authors show that all model-implied measures correlate very strongly, implying that there is no reason to believe that these added complications generate additional insights or alter the implications of the main model.

Five key assumptions are required for this model. The first two are the assumptions on technology presented in the main text, namely on labour as the only factor of production and a Fréchet distribution for sectoral productivities. The model further assumes iceberg trade costs: the idea is that trade costs are captured by how much of the initially shipped amount melts on the way to the destinations. This essentially renders trade costs multiplicative. Markets are further perfectly competitive and buyers from any country shop around the world. They will purchase a good from the seller offering it at the lowest price in the buyer's country, which thus incorporates prices in the origin and trade costs. We further assume some standard utility functions, in particular a set up in which each country spends a fixed share of its income on a given sector. Finally, we assume balanced trade.

With regards to the productivity distribution, we assume that productivities of varieties within sectors are drawn independently from a Fréchet distribution. A sector could be car production; a variety within that sector could be a German SUV or a British racing car. A Fréchet distribution is an extreme value distribution, motivated by Eaton and Kortum (2002), which can be justified theoretically by assuming normally distributed ideas out of which only the best ideas are implemented. This distribution has a scale term, which by sector captures anything that affects the productivity of all producers in an industry-country pair. The scale

term represents average sectoral productivities. A second parameter, the trade elasticity θ, measures intra-industry heterogeneity. The size of this trade elasticity measures how tightly fundamental productivity levels are linked to aggregate trade flows. We can rely on empirical estimates of θ from the literature, such as 6.53 in Costinot, Donaldson, and Komunjer (2011). The sectoral productivities we recover are the scale parameters of this distribution.

Following Costinot, Donaldson, and Komunjer (2011) and Donaldson and Hornbeck (2016), where productivities are drawn from F_(i,k) (z)=1-exp(-z_i^k z^(-θ)) and allowing for sectoral wage variation, trade flows take the gravity form:

$$x_{ij,k} = \frac{z_i^k \left(w_i^k d_{ij}^k \right)^{-\theta}}{\sum_{i'=1}^{I} z_{i'}^k \left(w_{i'}^k d_{i'j}^k \right)^{-\theta}} \alpha_j^k w_j^k L_j$$

This equation implies that country i exports more to country j in sector k if it has a higher productivity, z_i^k, lower trade costs, d_ij^k, or lower wages, w_i^k, all relative to all other exporters. The Ricardian prediction is that countries export relatively more in sectors in which they are relatively more productive. If a country conquers large shares of faraway markets in a sector, it must be very productive in it. Country i further exports larger volumes to country j if country j spends a lot in a sector or if country i does not face a lot of competition when exporting to country j, reflected in a small denominator in the above equation.

We now discuss in detail the empirical approach to backing out sectoral productivities. First, in the OECD STAN trade data we use, we merge coal mining (D05) and petroleum and natural gas extraction (D06) into "Mining of energy producing materials" and mining of metal ores (D07) and other mining (D08) into "Mining except energy producing materials". This allows us to merge controls that vary at this slightly more aggregate level and reduces the number of industries to 30.

Now, recall the gravity equation presented in the main text. The right-hand side of the equation shows two terms varying at the same level, namely wages and productivities that are both origin-sector variation. To partial out productivities, we multiply both sides by $(w_i^k)^\theta$, assuming θ=6.53 as in Costinot, Donaldson, and Komunjer (2011) and using wage data from the OECD Stan database. Specifically, we construct unit wages by dividing the wage bill by the number of employees, for which coverage is better than for hours worked. The transformed left-hand side, $x_{ij,k} \left(w_i^k \right)^\theta$ can then be used to back out sectoral productivities by appropriately using fixed effects. After controlling for wages, origin-sector variation is exclusively assigned to sectoral productivities. This is precisely what we discussed at the beginning and in essence describes the link between data and theory. We run the following equation:

$$x_{ij,k} \left(w_i^k \right)^\theta = \exp\left(\alpha + \delta_j + \delta_j^k + \delta_i^k \right) \epsilon_{ij}^k,$$

where i is the exporter, j the importer, k the sector, δ_j an exporter fixed effect (Costinot, Donaldson, and Komunjer (2011) use an importer-exporter fixed effect, where the i dimension controls for wages, which is no longer necessary as we directly account for it.), δ_i^k an exporter-sector fixed effect and δ_j^k an importer-sector fixed effect. ϵ_{ij}^k is the error term. When comparing the two equations, one notes how δ_j^k relates to z_i^k. In keeping with the two-way fixed effects literature, δ_j^k identifies the ratio $\frac{z_i^k}{z_{i'}^k}$. Thus, we need to choose a reference country against whose productivities we compare the recovered values. Following Costinot, Donaldson, and Komunjer (2011), we choose the United States. The Ricardian information is contained in how large or small that number is relative to others. Trade costs, d_{ij}^k, will be in the error term. Finally, the levels of exports to j are determined by demand-side variables, too, namely the expenditure shares α_j^k and GDP in the destination, here simply $w_j^k L_j$ as we assumed that labour is the only factor of production. δ_j and δ_j^k account for these.

Further, while Costinot, Donaldson, and Komunjer (2011) use OLS to estimate this equation, we suggest estimating this equation non-linearly using PPML, in line with the gravity literature (Santos Silva and Tenreyro (2006)). Trade data routinely feature high shares of zeros, implying that the standard way of dealing with skewed data, namely taking the log, leads to dropping a substantial amount of important data. While Table 1 in the main text contains the industries and their rankings, internally and among OECD countries, we show in Table A1 the rankings, recovered productivities, and export shares.

Table A1: Italy's industries by productivity, all details

INDUSTRY	PRODUCTIVITY	EXPORT SHARE	INTERNAL RANK	OECD RANK
Leather and related products	2.677	0.055	1	2
Wearing apparel	1.864	0.003	2	4
Beverages	0.861	6.536	3	4
Textiles	0.541	2.125	4	6
Other non-metallic mineral products	0.444	0.085	5	6
Machinery and equipment n.e.c.	0.309	5.868	6	7
Tobacco products	0.270	0.324	7	5
Rubber and plastics products	0.252	0.210	8	8
Fabricated metal products, except machinery and equipment	0.213	5.014	9	6
Electricity, gas, steam and air conditioning supply	0.209	1.311	10	10
Motor vehicles, trailers and semi-trailers	0.200	8.186	11	9
Paper and paper products	0.196	2.951	12	7
Electrical equipment	0.193	3.422	13	8
Basic pharmaceutical products and pharmaceutical preparations	0.182	0.039	14	9
Basic metals	0.166	0.023	15	9
Wood and products of wood and cork, except furniture	0.147	5.017	16	9
Food products	0.132	4.460	17	8

INDUSTRY	PRODUCTIVITY	EXPORT SHARE	INTERNAL RANK	OECD RANK
Chemicals and chemical products	0.114	6.714	18	9
Furniture, other manufacturing	0.105	5.921	19	9
Publishing	0.103	0.028	20	8
Fishing and aquaculture	0.076	0.051	21	10
Audiovisual and broadcasting	0.069	0.183	22	10
Printing and reproduction of recorded media	0.063	1.470	23	9
Forestry and logging	0.062	0.054	24	7
Mining and quarrying except energy producing materials	0.056	5.095	25	7
Crop and animal production, hunting	0.052	2.633	26	8
Coke and refined petroleum products	0.028	1.996	27	8
Computer, electronic and optical products	0.024	6.681	28	10
Other transport equipment	0.023	2.200	29	9
Mining and quarrying of energy producing materials	0.000	17.236	30	5

Notes: Productivities of Italian industries. Internal ranks refer to the position of the respective Italian industry compared to other Italian industries. OECD rank refers to the position of the respective Italian industry compared to the same industry among the OECD countries covered. Interpretation: Textiles are Italy's 4th most productive sector, where the comparison are other Italian industries. The Italian textile sector is ranked 6th among OECD countries, where the comparison are the textile groups of other countries.
We now present additional results. Table A1 repeats the above on Comtrade data for 161 countries. We assume that wages equalise within countries as in Costinot, Donaldson, and Komunjer (2011) and choose a reference sector (Coal, lignite and peat) against which productivities are measured. The results confirm those found for the restricted sample of OECD countries.

Table A2: Italy's industries by productivity, global trade data. Internal rank only

CATEGORY	PRODUCTIVITY	INTERNAL RANK
Leather products	2.896.313	1
Wearing apparel; fur	2.448.144	2
Tobacco products	1.065.906	3
Textiles	728.421	4
Other non-metallic mineral products	599.223	5
Machinery and equipment n.e.c.	466.794	6
Manufacture of fabricated metal products, except machinery and equipment	456.809	7
Basic metals products	423.549	8
Other transport equipment	413.245	9
Food products and beverages	372.880	10
Rubber and plastics products	310.554	11
Electricity, gas and steam	299.126	12
Other mining and quarrying products	273.217	13
Products of other service activities	239.513	14
Paper and paper products	231.387	15
Furniture; manufacturing n.e.c	226.780	16
Motor vehicles and trailers	218.883	17
Electric machinery & apparatus	215.144	18
Wood & wood products excluding furniture; straw	211.521	19
Publishing, printing and reproduction of recorded media	198.869	20
Chemicals & chemical products	194.107	21

CATEGORY	PRODUCTIVITY	INTERNAL RANK
Manufacture of coke, refined petroleum products and nuclear fuel	100.734	23
Medical & precision instruments	84.161	24
Radio, TV and communication	51.273	25
Office and computing machinery	42.902	27
Uranium and thorium ores	41.153	28
Products of other business activities	34.227	29
Crude petroleum & natural gas	27.593	30
Leisure, cultural & sport products	8.135	31
Metal ores	6.562	32
Coal, lignite and peat	1.000	33

Notes: Productivities of Italian industries. Internal ranks refers to the position of the respective Italian industry compared to other Italian industries. These results hold for a sample of 161 countries, confirming Italy's internal rank recovered from the OECD data. We do not show results for global ranks here as we cannot correct for sectoral wages in this global analysis due to lack of data. In the absence of this data, we would confound wages and productivities. The internal ranks, however, continue to be interpretable as before as long as wages and labour market frictions affect all sectors in Italy.

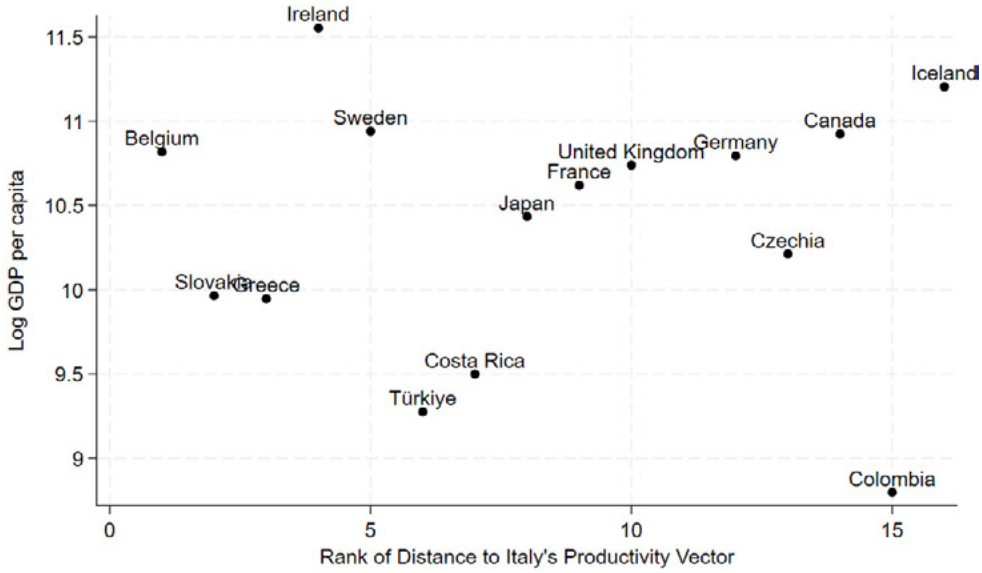
We now return to the main data set of OECD countries used for Table 1 in the main text and Appendix Table 1 above. From these data, we construct Euclidean distances in which we compare Italy's productivity ranking to that of other OECD countries. This is based on Italy's internal productivity ranking in the K-dimensional space, where K=30 is the number of industries. Specifically, we define the productivity ranking distance of a country i to Italy, d_i^{IT}, as:

$$d_i^{IT} = \left(\sum_k \left(z_i^k - z_{IT}^k \right)^2 \right)^{\frac{1}{2}}$$

which is equivalent to Euclidean distance in the three-dimensional space for K=3 and mechanically at 0 for i=IT as Italy's distance to its own productivity profile is precisely 0. We calculate d_i^{IT} for the rank difference to partial out that high income industrialised countries will be similar to each other by virtue of being highly productive at almost everything.

We also repeat this graph for distance in terms of productivity levels rather than ranks. Note that we drop the United States from this graph. While productivity ranks are well-defined, as we compare countries to each other, this makes no sense for productivity levels, which are relative to the United States. This measure captures a different notion of similarity. If a country has a similar internal ranking of productivities but is more productive than Italy at everything, it will have high distance when computing it on levels, but low distance when computing it on productivity ranks. Thus, this second measure, based on productivity levels, conflates internal ranks and level effects.

Figure A0: Similarity to Italy's productivity values and GDP per capita



2. Decomposition of difference of Regional Labor Productivity from National Average

Regional heterogeneity may reflect both specialisation in different sectors (some more and some less productive) and/or differences for each sector in regional vs national productivity. While our main analysis has focused on trade (to uncover revealed productivity), here we use value added data to account for and explain observed productivity across regions.

Productivity is here defined as Gross Value Added divided by the number of employees, and differences in this metric from the national average can provide a useful benchmark for the regional divide. Indeed, such differences may depend on the relative importance of the various sectors (measured by the share of employment), and/or on differences in productivity within sectors[74].

In formulas, we can define:

$$\mathrm{Prod}_{\mathrm{Region_r}} = \frac{\mathrm{Tot\ GVA_r}}{\mathrm{Tot\ Employees_r}}$$

Where r denotes a given region. We are interested in explaining:

$$\mathrm{Gap_r} = \mathrm{Prod}_{\mathrm{Region_r}} - \mathrm{Prod}_{\mathrm{National}}$$

One could show that it is possible to split:

$$\mathrm{Gap_r} = \mathrm{Productivity\ Contribution_r} + \mathrm{Sector\ Shares\ Contribution_r}$$

74 Figure 6 is based on an alternative definition of productivity, which is GVA divided by total hours worked. The procedure for computing the components is, however, equivalent.

where:

$$\text{Productivity Contribution}_{r} = \sum_{s} \text{Component Prod}_{r,s}$$

where s denotes a given sector and:

$$\text{Component Empl}_{r,s} = \text{Sectoral Avg Productivity}_{s} \times \text{Empl Share Diff}_{r,s}$$

where *employment share diff* and *productivity diff* represent – for each sector - regional differences, respectively in share of regional employment and GVA/ employment, from national averages.

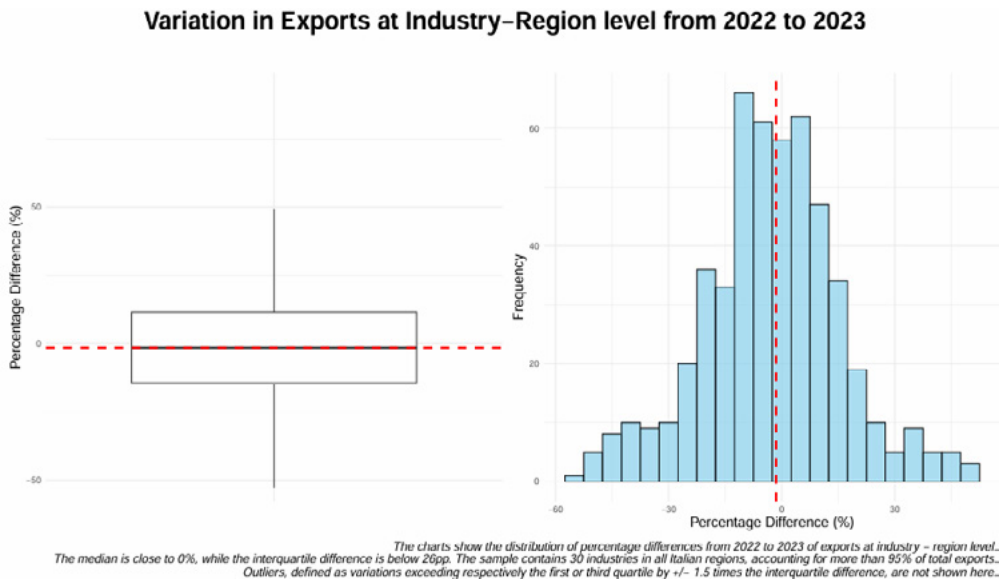
Applying this to the Italian case, Northern regions emerge as overperformers, led by the autonomous province of Bolzano and by Lombardy. On the other hand, Southern regions are all underperforming. In terms of contributions, the within sector productivity effect is prevalent among the first group, while the sectoral share one is especially important for explaining the underperformance of the second. This is especially pronounced in the case of Basilicata, where it accounts for almost all the underperformance, in connection with relatively "small" (in terms of share of hours worked) real estate, finance and insurance, information and communication sectors.

This analysis underlines the double challenge of both fostering structural change towards more productive sectors, as well as the within sector transformation towards higher value-added industries and more productive firms.

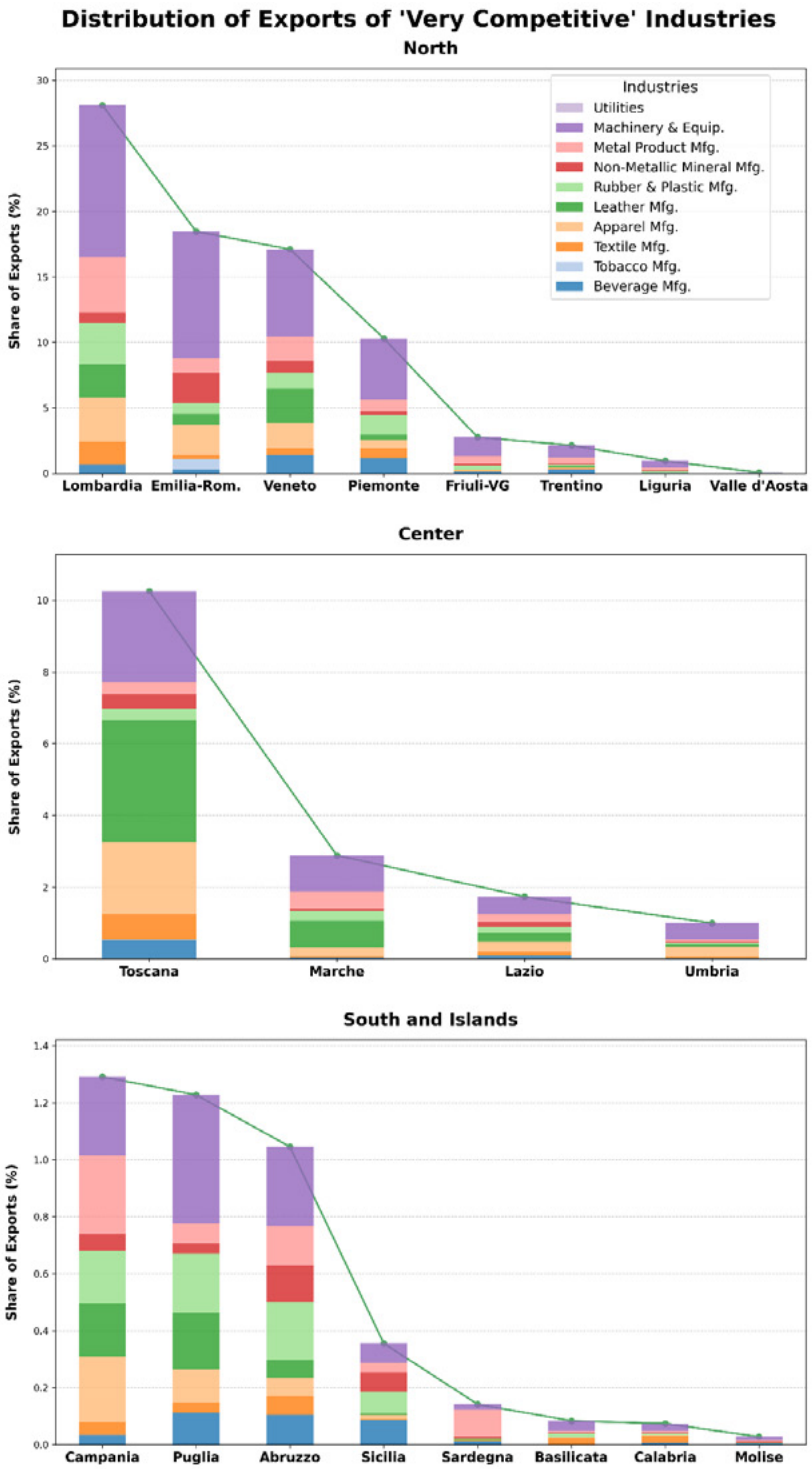
3. Constructing the sample for Regional Exports Analysis

The 2022-2023 period is marked by relatively minimal changes in exports, as illustrated in the chart below. To mitigate the effects of volatility that could arise from analysing a single year, the analysis above considers averages over the two years.

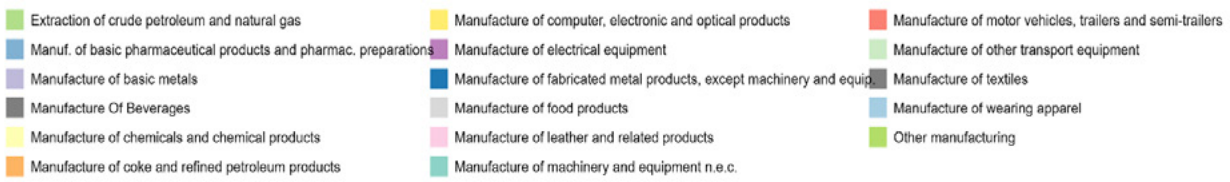
Figure A1: Variation in Exports at Industry-Region level from 2022 to 2023

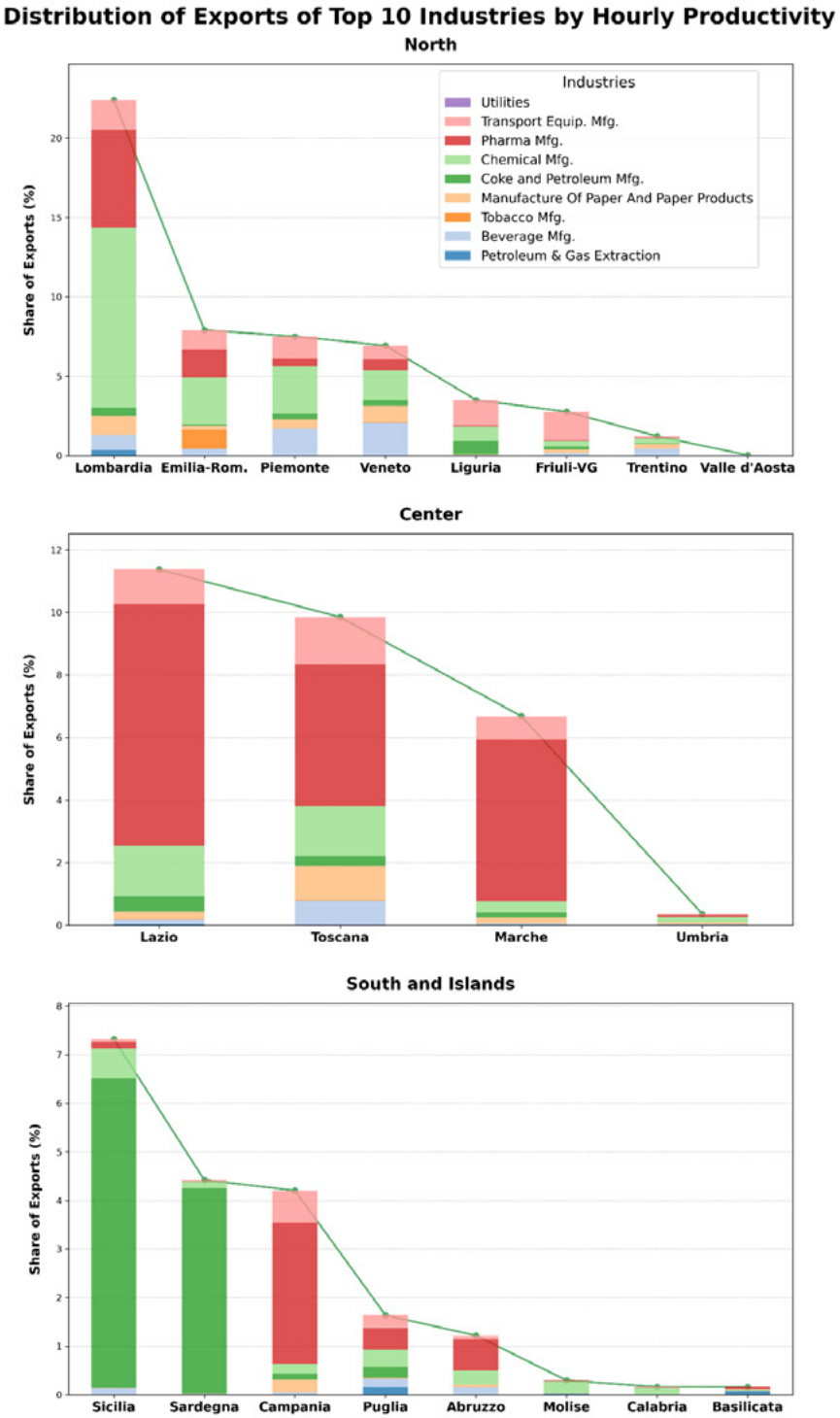


4. Additional graphs on the Composition of Exports



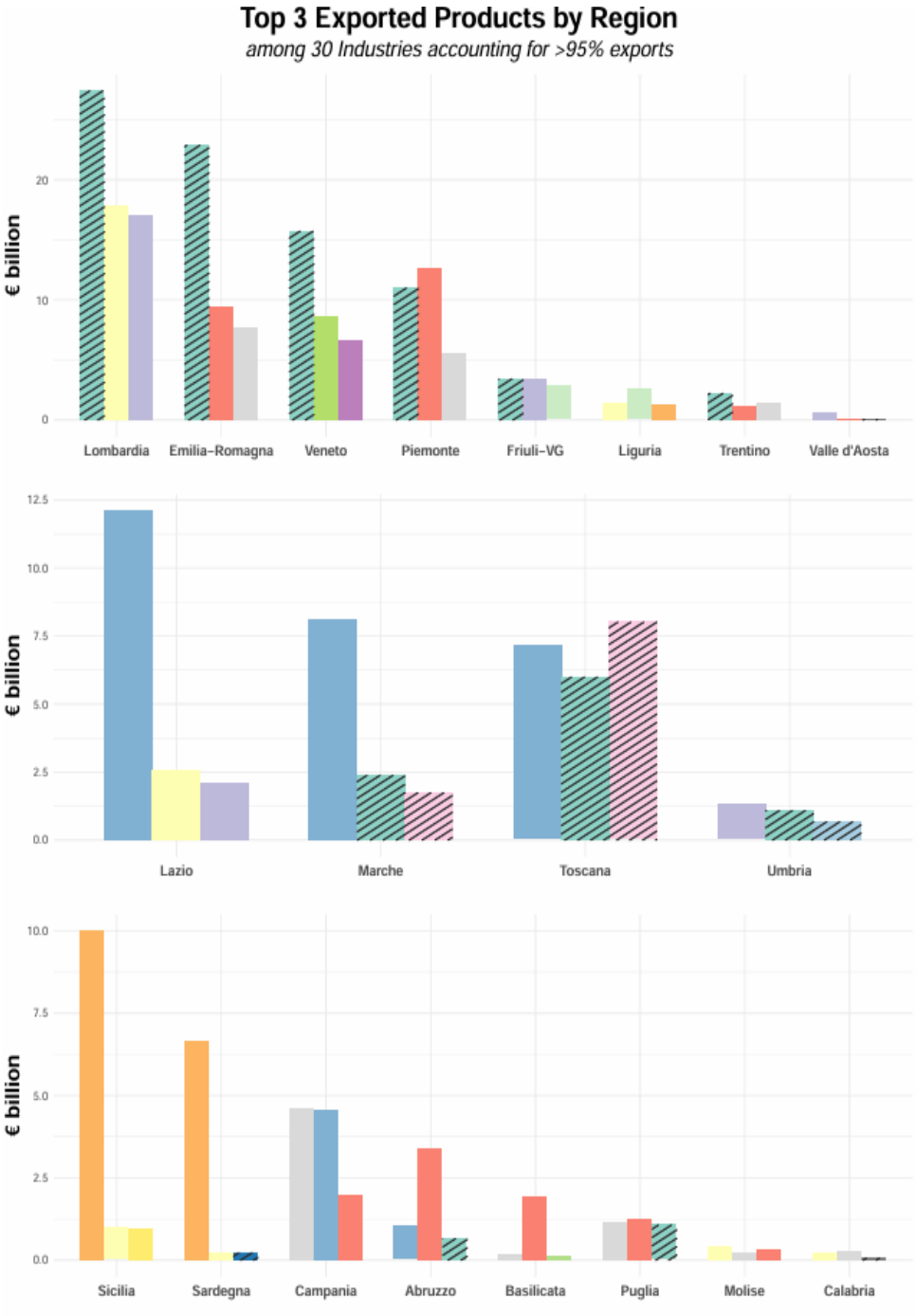
Source: Authors' computations based on Istat. Export data refers to the average over 2022-2023 at region-industry level. Industries considered here are those listed in Table 1. Overall, they account for more than 95% of total exports in 2023. 'Very Competitive' industries are those falling into the 1-10 internal productivity ranking range.





Source: Authors' computations based on Istat amd Eurostat (SBS). Export data refers to the average over 2022-2023 at region-industry level. Hourly productivity is calculated at national level as GVA per hour. Industries considered here are those listed in Table 1. Overall, they account for more than 95% of total exports in 2023.

Extraction of crude petroleum and natural gas
Manuf. of basic pharmaceutical products and pharmac. preparations
Manufacture of basic metals
Manufacture Of Beverages
Manufacture of chemicals and chemical products
Manufacture of coke and refined petroleum products
Manufacture of computer, electronic and optical products
Manufacture of electrical equipment
Manufacture of fabricated metal products, except machinery and equip.
Manufacture of food products
Manufacture of leather and related products
Manufacture of machinery and equipment n.e.c.
Manufacture of motor vehicles, trailers and semi-trailers
Manufacture of other transport equipment
Manufacture of textiles
Manufacture of wearing apparel
Other manufacturing



Source: authors' calculations based on Istat. Averages of 2022–2023 data for each industry–region pair. Industries considered here are those listed in Table 1: Italy's industries by productivity. Overall, they account for more than 95% of total exports. Dashed bars represent industries falling into the 1–10 ranking range, following the methodology explained in the text.

04

THE MICRO-FOUNDATIONS OF ITALY'S EXISTING AND LATENT COMPARATIVE ADVANTAGES

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ABSTRACT

In this chapter, the authors investigate the firm-level foundations of Italy's international competitiveness and the geography of existing and potential industrial strength, with a view to informing a more tailored and inclusive industrial policy. Using detailed firm-level microdata from Istat and other sources, they combine an analysis of export performance, which reflects existing comparative advantages, with a mapping of High-Growth Firms (HGFs) to capture "latent competitive advantage". The analysis yields four results. First, export activity is strongly concentrated in Northern regions. Second, exporting firms systematically differ from non-exporters: they are larger, more diversified, and more innovative. Third, sectoral dynamics are shifting: Pharmaceuticals, Machinery, and Chemicals are the most export-oriented sectors, while Food and Other Transport Equipment record the fastest growth, even as several traditional specialisations - Beverages, Textiles, Wearing apparel, Leather, Other non-metallic mineral products, and Machinery and equipment - show signs of weakening. Fourth, HGFs (which drive over 80% of Italy's employment growth) are more evenly distributed across regions and sectors, including in low-tech domains: alongside expected hubs, Campania and provinces such as Bari, Teramo, Pescara, and Catania emerge with high HGF shares. High-tech manufacturing, however, remains concentrated in the North and knowledge-intensive activity clusters in Milan and Rome. The chapter concludes that industrial policy should be place- and sector-sensitive, differentiating support for established exporters and for emergent specialisations, and cognisant of each local industry's (potential) position in global value chains.

1. INTRODUCTION

This chapter examines Italy's position in global trade and the characteristics of its comparative advantages (see the chapter by Marczinek and Pacchiardi, Table 1, in this volume). We investigate the micro-level dynamics that drive Italy's export performance and industrial competitiveness. To do so, we use a dataset built by integrating information at the firm level sourced from the Statistical register of active enterprises (Asia) by the Italian National Institute of Statistics (Istat) and several linked frames with information on export, employment, and economic accounts[75].

On this basis, we provide actionable and detailed data that can inform both a more incrementalist industrial policy (strengthening existing comparative advantages) and a more transformational approach (building new comparative advantages).

In this chapter, therefore, we shift focus to the micro-foundations of Italy's competitiveness, offering a granular analysis of firm-level characteristics and sectoral trends that underpin the country's industrial structure. To this end, the chapter unfolds

75 Moreover, this dataset was enriched with data on patents held by companies sourced from Moody's Orbis Intellectual Property Database. This chapter has been completed using the information available as of July 2025.

in two parts. First, we analyse the characteristics of Italian manufacturing exporters, with particular attention to firms operating within the most competitive sectors identified by Marczinek and Pacchiardi in this volume, as well as those belonging to the country's largest exporting industries. This allows us to highlight where public action can intervene to capitalise on certain trends or reverse others to safeguard and support Italy's current strengths in the face of evolving global value chains. Second, we broaden the scope of analysis to investigate also where Italy's "latent competitive advantage" might lie. We look at the country's High-Growth Firms (HGFs), mapping their geographic and sectoral distribution, to provide new insights into the types of economic activities that are gaining momentum across Italy's diverse territory. This approach allows us to identify promising domains in both high-tech and low-tech manufacturing, as well as in knowledge-intensive and less-knowledge-intensive services, offering a novel map of Italy's economic capabilities across regions. The results offer useful information for public action as HGFs are present throughout the country and can signal emerging specialisations that public policy can further promote.

Taken together, these analyses offer a unique and nuanced portrait of the substrate of the Italian economy. In doing so, they provide actionable intelligence for the design of industrial policies capable of both strengthening Italy's current industrial fabric and creating new comparative advantages in response to evolving global challenges.

2. CHARACTERISTICS AND DETERMINANTS OF ITALY'S EXPORT PERFORMANCE

This first part of our chapter investigates the micro-foundations of Italy's industrial competitiveness. Specifically, we focus on the population of exporting manufacturing firms - the backbone of Italy's position in global trade. We provide a firm-level perspective that helps tease out the characteristics that drive export performance and offer insights for policymakers to target industrial policy.

We first provide an analysis of the overall characteristics and trends among Italian exporters, highlighting the evolution in the number and proportion of exporting firms, country and product diversification, as well as their size. We then proceed with two comparative approaches. The first contrasts firms operating in sectors with global comparative advantage (as per Marczinek and Pacchiardi, in this volume) against those without. The second distinguishes between firms in sectors that have the highest export value in Italy and those in the remaining sectors. Our insights come from both a snapshot view and a temporal one. We highlight the characteristics of target companies compared to the "control group" but also show how the groups have changed over time (between 2017 and 2022).

Three key findings emerge. First, export activity in Italy is overwhelmingly concentrated in the North, with the South playing only a marginal role compared

to its share of national firms and population. Second, even in the North a different specialisation is emerging with the Northeast being more present in the highest comparative advantage sectors and the Northwest in the more traditional and higher export value sectors. Third, successful exporters tend to be larger firms and those that are more prone to innovation - measured both through intellectual property and skilled labour indicators. Together, these insights not only reinforce the importance of place- and sector-sensitive industrial policies but also underline the value of a micro-analytical perspective in understanding macroeconomic trade outcomes.

2.1. METHODOLOGY AND DATA

The analyses rely on a dataset built by integrating - through record linkage at the firm level - the structural information (e.g., number of employees, industry, geographical localization, firm age, etc.) sourced from the Statistical register of active enterprises (Asia) by the Italian National Institute of Statistics (Istat) with several special frames (also from Istat) that comprise information on: export (e.g. export value, number of exporting country, number of products exported), employees (e.g., education level, field of study); structural business statistics concerning some economic accounts (e.g., turnover, value added). In this last case, since data are at the local unit level of the company, we reported all data at the firm company level in line with all other information of our main dataset. Finally, the dataset was enriched with companies' patent data sourced from Moody's Orbis Intellectual Property Database.

The analyses in Section 2: i) are focused on the manufacturing sector, specifically divisions 10-32 (NACE Rev.2 classification), by excluding division 33; ii) relate to 2022 (latest available year of data[76] for cross-section analyses), and to 2017-2022 for metrics showing the evolution over time[77].

In Table 1 we report the description of the indicators used in the analyses.

Table 1: Variables description for the analyses on manufacturing industries

INDICATOR	DESCRIPTION
N. exporting firms	Number of exporting firms (absolute values)
Exporters prevalence	Exporting firms / total firms (%)
Size of exporting firms	Average n. employees (absolute values)
Export intensity	Export value / turnover (%)
Country diversification	Number of exporting countries (average per firm)
Product diversification (a)	Number of exported products (average per firm)
C4 concentration ratio	Export of the top-4 exporting firms / total value export (%)
Export	Export value (billion euro)

a) According to the Combined Nomenclature nc8 (8-digits) of the National Italian Statistics Institute (Istat)
Note: The data source of all indicators is the Statistical register of active enterprise (Asia) and related frame of export and structural business statistics of the National Italian Statistics Institute (Istat). Data of this Register are available for the period 2017-2022. Manufacturing (from 10 to 32 of the Nace rev.2 classification 2-digit)

76 This analysis was carried out based on data available as of June 2025.
77 2017 is the first year of the harmonised statistical series of the frame "Export" from Asia-Istat.

2.2. CHARACTERISTICS OF ITALIAN EXPORTING COMPANIES

In this section we analyse the performance of Italy's manufacturing exporters between 2017 and 2022. The findings reveal a modest rise in the prevalence of exporting firms, strong regional and sectoral disparities, and a clear link between innovation and export predisposition as well as size and exports.

By 2022, close to 60 thousand manufacturing companies (17.6 percent of Italy's manufacturing firms) were exporting to at least one country. Between 2017 and 2022, while the overall number of firms in manufacturing shrank (-5.5%), exporting firms were less affected (-3.4%), suggesting a greater resilience. As highlighted by Arrighetti et al. (2024), this could hint at the start of a gradual rebalancing of Italy's manufacturing towards the most competitive firms, which could improve aggregate productivity. In this regard, we estimated that the firm level labour productivity premium of being an exporter corresponds to almost 20% (see Appendix).

These companies' export intensity also increased, with their share of export value over total turnover growing from 37.8 % to 41 %. Looking at product and market diversification, exporters on average sell abroad 10 products in 11 markets. Looking at the market structure, we notice that exports are strongly concentrated: the top-4 exporting firms, corresponding to 0.01% of all exporting firms, represent 7 percent of exports, and this has been growing over time (+0.3 percentage points over the period). Finally, a clear feature of exporting firms is that they are significantly larger: with an average 41 employees they are eight times bigger than the average non-exporting company. While the direction of causality is not clear, this figure hints at the long tail of micro-companies with no exporting capacity that characterise the Italian productive substrate (more on this in Part II of this chapter).

Figure 1: Profile of the average Italian manufacturing exporter (in parenthesis change 2017-22)

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

We find, however, that great heterogeneity lies within these numbers, especially across sectors. The Exporters Prevalence - the share of exporting firms relative to total firms - ranges from 57.1% in Basic Pharmaceuticals to just 6.6% in Wood and Related Products (Fig. 2). Although this prevalence correlates positively with average firm size by sector, the latter appears to be only a minor explanation (R-squared 0.284; Fig 3). This suggests that policy interventions could operate on different channels, both facilitating firms' access to foreign markets and increasing their propensity to export. A first policy focus could thus be identifying the "potential" exporting firms, namely the firms that, although in possession of all the characteristics for exporting, do not export. Unioncamere-Centro Studi Tagliacarne estimated them to be 5.600 enterprises[78]. At the same time, however, since in Italy the number of exporting firms is higher than in Germany, France, Spain and other EU countries, a second policy priority should be to increase the average export intensity, which is instead lower compared to the other main EU countries (Arrighetti et al., 2024). Policymakers should carefully adapt policies to the specific situation and productive structure of each sector. For instance, as Fig. 3 shows, promoting sectors with "Few and Small Exporters" will likely require different policy approaches compared to those with "Many and Large" or "Many and Small". For instance, policies can differ if the target is to increase the number of exporting firms, on the one hand, or increase the firm size, on the other.

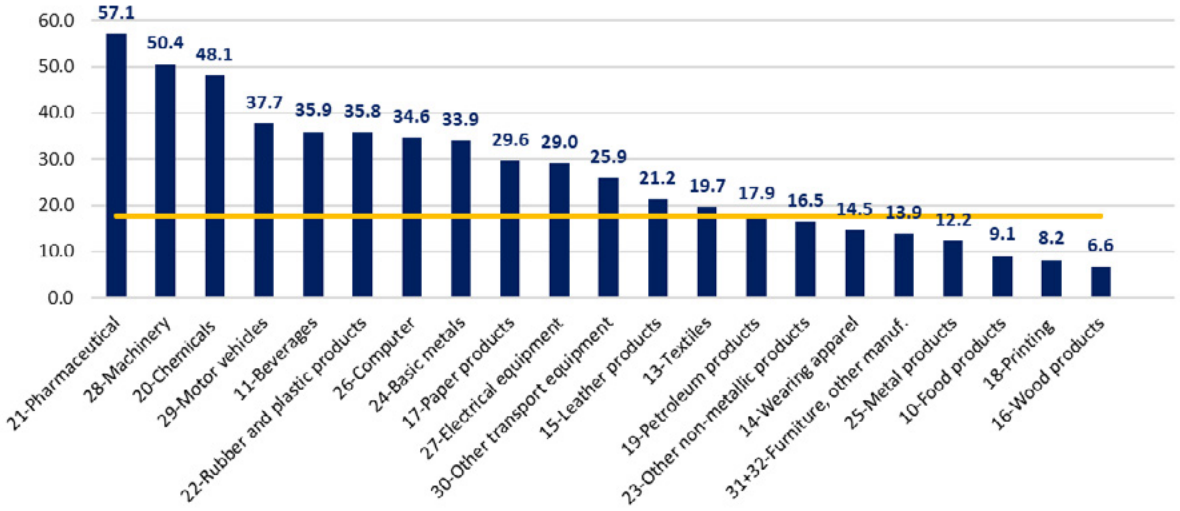
For example, the 2009 "Contratto di Rete" Decree helped companies overcome size constraints by promoting cross-firm cooperation. Similarly, Italy's National Recovery and Resilience Plan's "Industrial policy for supply chains and internationalization" measure aimed at supporting the internationalization of small and medium-sized firms by leveraging a fund managed by SIMEST[79]. More recently, this was further strengthened by the "Export Action Plan" launched by Italy's Ministry of Foreign Affairs and International Cooperation developed with industry associations, the system of Chambers of commerce, large publicly owned companies, and the financial sector. Unioncamere launched the SEI Project (Support for Italy's Export), which represents the Chamber of Commerce system's methodology for approaching international markets and increasing the number of exporting companies. The project provides information, training, guidance, and support services through a web platform (www.sostegnoexport.it)[80].

78 Unioncamere (the Italian Union of Chambers of Commerce. For details on this study, see https://www.unioncamere.gov.it/sites/default/files/articoli/2025-05/Presentazione%20def%2015_5_25_DADM%20%281%29.pdf

79 See Law 394/81.

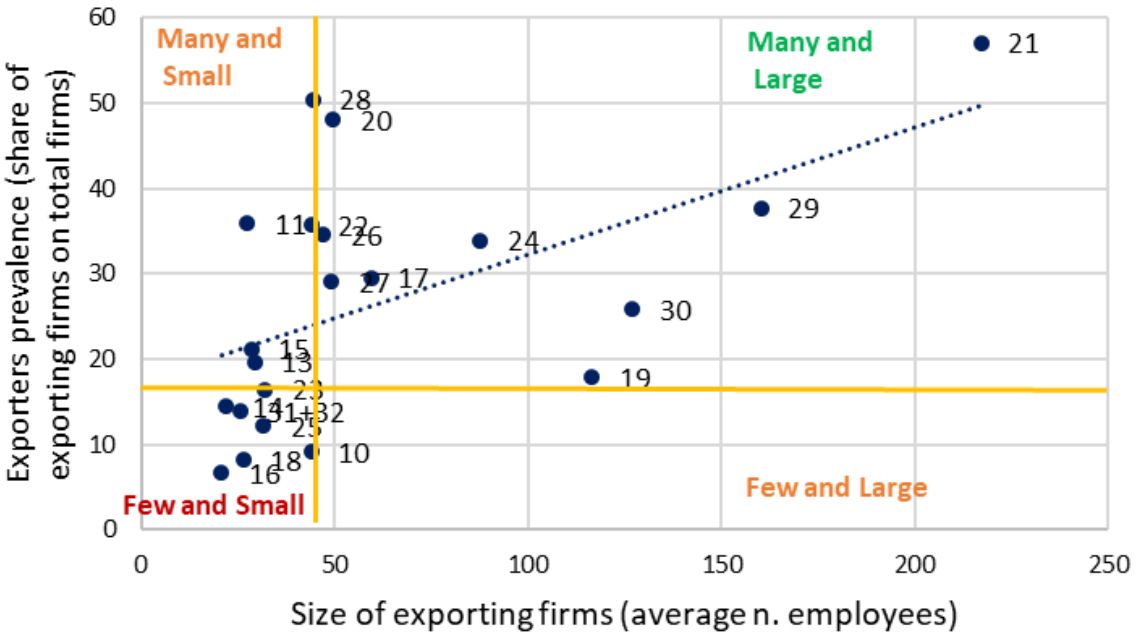
80 Since 2021, the programme has assisted over 10,500 enterprises with the help of export promoters from local Chambers of Commerce, delivering more than 62,000 specialised services.

Figure 2: Exporters Prevalence by sector



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Figure 3: Exporters Prevalence and Average Firm Size by sector



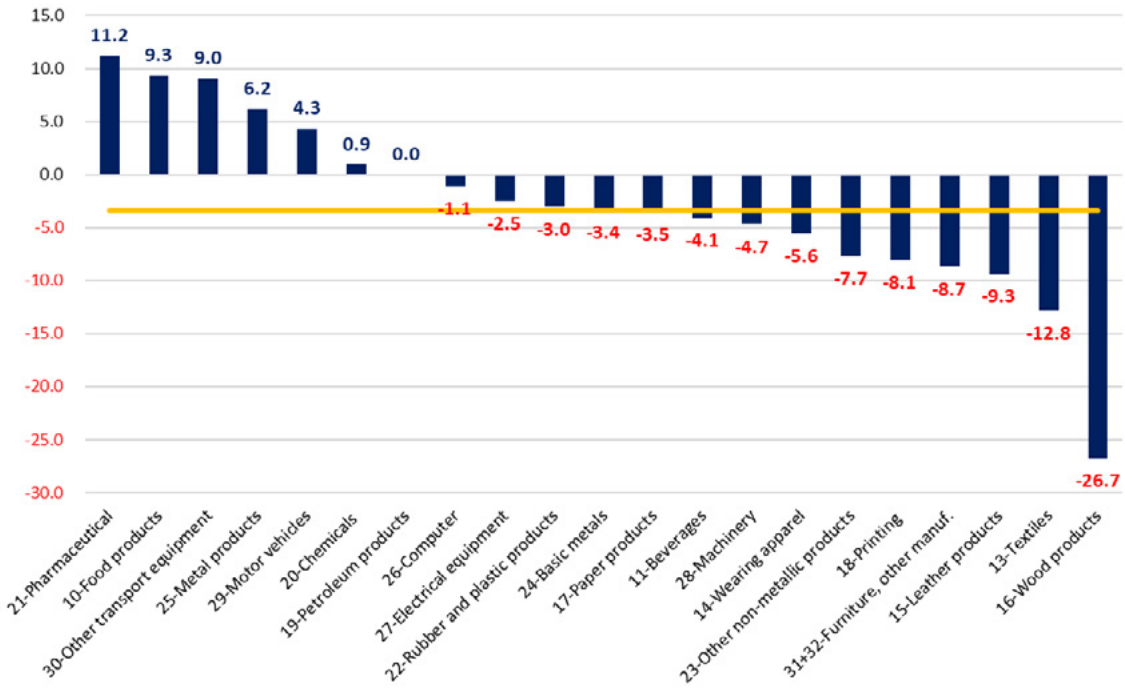
NB. The numbers indicates the sector corresponding to 2-digit Nace Rev.2 Classification.
Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

To inform policies it is important to consider not only this snapshot view but also a more dynamic perspective. In which sectors have exporters increased or decreased? Figure 4 also shows significant heterogeneity. Between 2017 and 2022, the number of exporters grew by 11.2% in Basic Pharmaceuticals but declined by 26.7% in Wood Products. These two industries represent the extremes in a not very high but statistically significant correlation between export shares and exporters'

growth by sector (0.403, $p < 0.10$; Fig. 5). Importantly, note that the change in the number of exporters should not be interpreted as an indicator of trends in export volumes as the two appear uncorrelated (the correlation is 0.32, not statistically significant $p<0.10$): for instance, basic metals saw the highest growth in export but a decline in the number of exporters. We thus also look at changes (2022 vs. 2017) in industry concentration - share of export value attributable to the top four firms in each industry (C4 ratio) - and find that most industries (14 out of 22) saw an increase in concentration (Pharmaceutical +8 percentage points), while a few experienced clear decreases (notably Chemicals and Coke and Refining Petroleum products: around -7/8 percentage points). This trend could be at least partially explained by the occurrence of several external shocks over the period, which may have benefited the most productive companies (Melitz, 2003) to the detriment of the rest - those that are possibly less equipped in terms of financial resources, adaptability, and commercial networks.

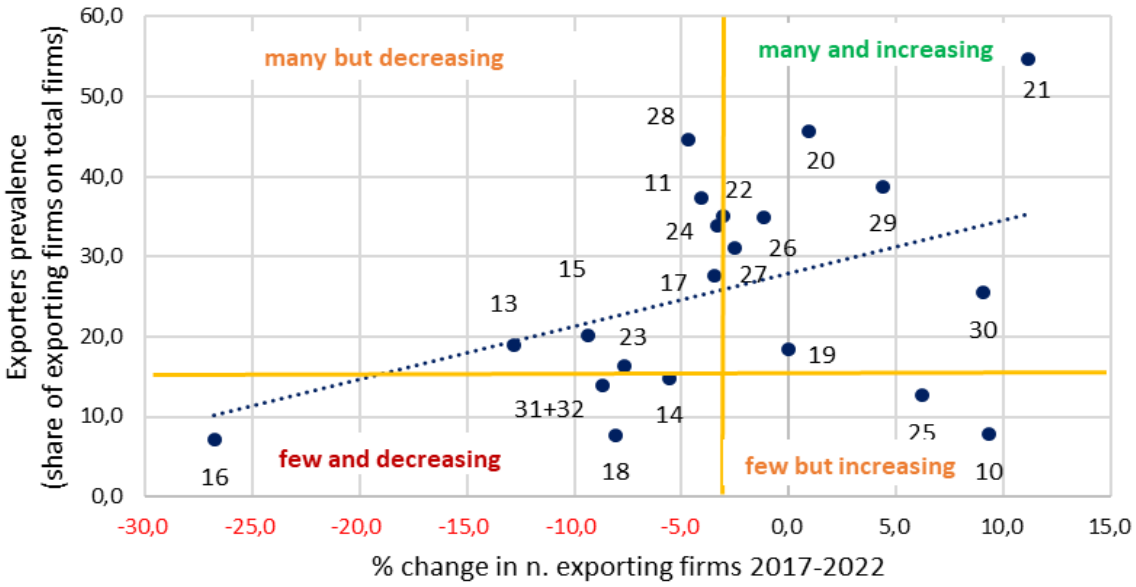
Table 2 summarises the key metrics discussed so far. The main insight for policymakers is that the landscape of Italy's export industry is varied, and industrial policy should take this into account. The weight of exports varies significantly across sectors and so do the competitive dynamics that result in lower or higher concentration of value among the top firms. This helps policymakers in at least two ways. On the one hand, it calls into question the value of "horizontal" industrial policies, which by definition would not take into consideration the state of each industry. On the other hand, it provides evidence that helps them diagnose the current state of each industry, also vis-à-vis the others, and thus target industrial policies more appropriately.

Figure 4: Evolution of Italian exporters, by industry (% change in number of companies)



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Figure 5: Exporters prevalence versus % change in number of exporting firms



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Table 2: Summary metrics for all Italian exporters

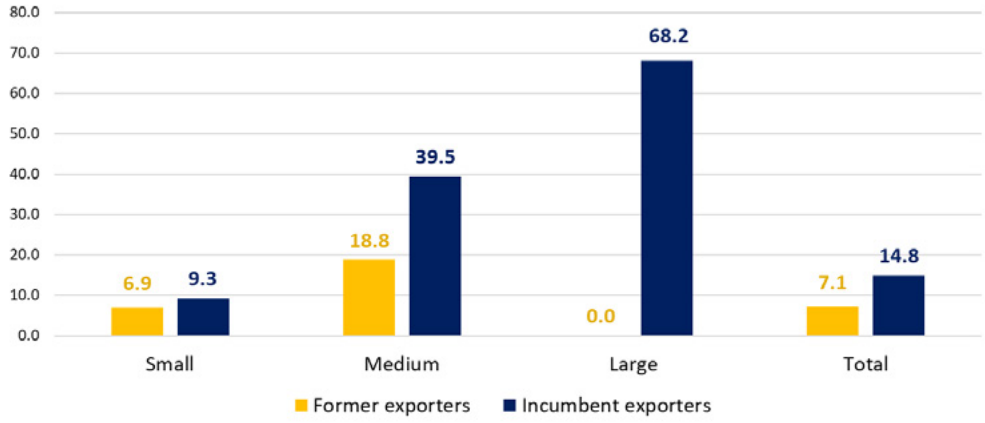
Industries	Exporting firms			Export value		Export diversification		Export concentration	
	Number	Share of total	% change 2017-22	Billion euro	% change 2017-22	Countries	Products	Share top-4 firms (C4)	C4 change P.P.
10-Food products	4,526	9.1	9.3	30,174	56.9	10	8	9.0	0.8
11-Beverages	1,240	35.9	-4.1	7,948	37.0	12	9	23.5	5.4
12-Tobacco products	5	50.0	-16.7	1,090	46.9	21	27	100.0	0.0
13-Textiles	2,262	19.7	-12.8	8,412	5.8	12	15	7.0	-5.3
14-Wearing apparel	4,129	14.5	-5.6	14,350	22.3	8	20	26.1	6.3
15-Leather and related products	2,812	21.2	-9.3	15,661	5.7	8	11	27.2	5.6
16-Wood and related products	1,397	6.6	-26.7	2,014	33.0	5	5	15.0	1.2
17-Paper and paper products	1,003	29.6	-3.5	8,311	44.9	10	6	19.1	-1.9
18-Printing and reproduction of recorded media	1,081	8.2	-8.1	1,335	17.4	4	4	26.3	3.8
19-Coke and refining petroleum products	55	17.9	0.0	16,049	57.2	15	9	88.9	-6.2
20-Chemicals and chemicals products	2,027	48.1	0.9	27,073	28.8	16	13	16.4	-7.8
21-Basic pharmaceutical	279	57.1	11.2	29,982	54.7	20	13	55.4	8.4
22-Rubber and plastic products	3,384	35.8	-3.0	20,009	27.8	12	8	9.2	-2.2
23-Other non-metallic mineral products	2,762	16.5	-7.7	11,263	33.0	8	6	12.9	0.8
24-Basic metals	1,119	33.9	-3.4	37,125	62.4	12	8	21.2	0.3
25-Fabricated metal products	8,559	12.2	6.2	28,825	36.2	8	6	3.7	0.5
26-Computer, electronic and optical products	1,720	34.6	-1.1	10,827	30.8	15	14	27.0	3.8
27-Electrical equipment	2,485	29.0	-2.5	22,218	27.6	15	13	16.9	-1.6
28-Machinery and equipment n.e.c.	9,675	50.4	-4.7	76,461	20.4	17	15	5.0	0.0
29-Motor vehicles, trailers and semi-trailers	937	37.7	4.3	36,363	-1.2	14	16	49.7	-4.3
30-Other transport equipment	713	25.9	9.0	21,096	61.7	11	15	60.7	1.2
31+32-Furniture, other manufacturing	6,039	13.9	-8.7	24,454	40.1	9	8	16.4	1.2
Total manufacturing	**58,209**	**17.6**	**-3.4**	**451,038**	**31.1**	**11**	**11**	**7.2**	**0.3**

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Next, we investigate whether the firms that show resilience in continuing to export have different characteristics from those that stopped exporting. We are particularly interested in whether more innovative companies are more likely to maintain a

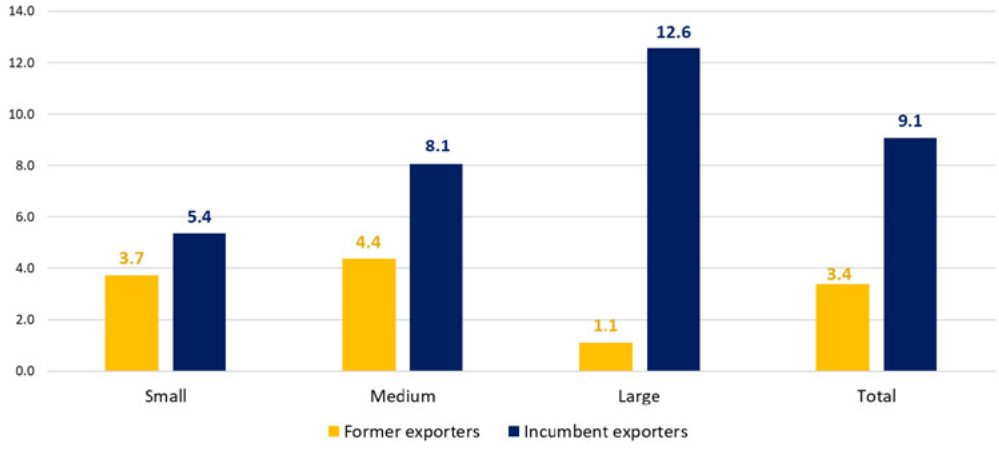
presence in foreign markets[81]. We find confirmation by comparing firms that exported consistently between 2017 and 2022 - labelled "Incumbent Exporters" - with those that ceased exporting in 2021–2022 - labelled "Former Exporters" (Fig. 6 and 7). We assessed innovation levels both in terms of output (using patents) and in terms of human capital (share of employees with STEM degrees). The results reveal a significant correlation: Incumbent exporters are twice as likely to hold patents (14.8 vs 7.1%) and have almost three times as many STEM graduates (9.1 vs 3.4%). These findings are consistent across all firm size classes, suggesting that size alone does not explain the observed differences. We obtain further substantiation of this when we compare Regular Exporters with Occasional Exporters (Figure 8)[82]. In the Appendix 2 we also provide an econometric analysis that confirms the positive relationship between innovation (measured by patents) and the capability of being a regular exporter.

Figure 6: Share of firms with patents among Incumbent Exporters and Former Exporters



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat and Moody's data

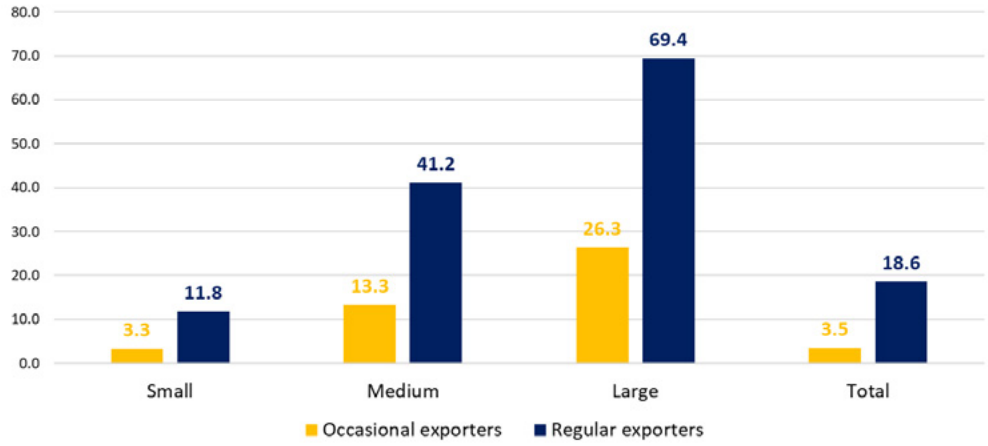
Figure 7: Share of graduates with STEM degrees among employees of Incumbent Exporters and Former Exporters



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat

81 We specify that we do not investigate causal effects. For further work on the relationship between innovation and exports, see Altomonte et al., 2013, Dosi et al., 2015, more recently for Italy Cugno et al., 2025.
82 We compared Occasional Exporters - firms that exported between one and four years in the 2017–2022 period—with regular exporters, who exported in five or all six years. Among regular exporters, 18.6% held patents, compared to just 3.5% of occasional exporters.

Figure 8: Share of firms with patents among Occasional Exporters and Regular Exporters



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat and Moody's data

This data suggests to policymakers that companies with higher innovation levels are more resilient when prone to competing in international markets. As markets become more competitive, companies with a technological edge are better placed to compete, while the others are more likely to exit the market - a trade-version of the creative destruction process (Schumpeter 1950; Aghion et al. 2021). Thus, the most relevant horizontal industrial policy for strengthening Italy's competitiveness remains interventions to promote the technological upgrading of Italy's industrial base, as this is likely to increase its resilience in the face of global competition.

2.3. TRENDS WITHIN THE MOST COMPETITIVE AND THE HIGHEST-EXPORT VALUE SECTORS

In this section we turn to analysing more specifically the trends within those sectors that matter the most for Italy's industrial policy and strategic positioning. In particular, we identify characteristics and developments for the sectors where Italy has the highest comparative advantages (as per the chapter by Marczinek and Pacchiardi, in this volume) as well as in those that weigh the most in terms of export value (i.e., billions of euros exported). In both analyses, we compare these target sectors to the remaining ones to extrapolate their defining features.

Table 3 shows the categorisation of higher (top quartile) and lower comparative advantage sectors (Higher-CA and Lower-CA), based on the results from Marczinek and Pacchiardi, in this volume (Table 1). Table 4 then summarises how the key metrics discussed above for all exporters differ between Higher-CA and Lower-CA sectors. The insight for policymakers is that, while Higher-CA sectors do show strengths, some trends are emerging that may call into question their long-term resilience.

First, note that Higher-CA sectors include close to 40 % of exporting firms and contribute 30 % of exports (134 billion euros). As expected, these sectors have the

highest exporters' prevalence (24.7 vs. 14.9 percent) and export intensity (49.4 vs. 41.3 percent). They also appear to have a more evenly distributed presence in export markets: they show higher diversification both in terms of export countries (+20 percent) and products (+50 percent), as well as lower concentration - more and smaller companies represent a greater part of export value (the top four exporters make up less than five percent, compared to over 10 percent for the other sectors). This is evidence, as underlined by Arrighetti et al. (2024), of the dynamism of parts of Italy's industrial system, characterised by a high product differentiation (often quality-based) together with a high capability of integrating with global value chains – also with specialised intermediate goods.

At the same time, across the period some developments indicate a shifting scenario. The number of firms in Higher-CA sectors has decreased more than in the others (-6.6 vs -1.2 percent). Although this has led to a mathematical increase in the Exporters Prevalence, this is entirely due to a lower denominator. Indeed, export value in these sectors has increased at half the pace of all the others (+19.4 vs +36.8 percent). Overall, these trends suggest a potential ongoing rebalancing away from these comparative advantages, consistent with the cautionary evidence presented by Marczinek and Pacchiardi, in this volume (figure 2a). Table 5 summarises the strengths and weaknesses we have identified for these sectors.

Table 3: Manufacturing sectors divided into higher and lower comparative advantage (Higher-CA, Lower-CA)

HIGHER-CA	LOWER-CA
11-Beverages	10-Food products
13-Textiles	12-Tobacco products
14-Wearing apparel	16-Wood and related products
15-Leather and related products	17-Paper and paper products
23-Other non-metallic mineral products	18-Printing and reproduction of recorded media
28-Machinery and equipment n.e.c.	19-Coke and refining petroleum products
	20-Chemicals and chemicals products
	21-Basic pharmaceutical
	22-Rubber and plastic products
	24-Basic metals
	25-Fabricated metal products
	26-Computer, electronic and optical products
	27-Electrical equipment
	29-Motor vehicles, trailers and semi-trailers
	30-Other transport equipment
	31+32-Furniture, other manufacturing

Source: elaboration on Marczinek and Pacchiardi, in this volume

Table 4: Key metrics for Higher-CA and Lower-CA sectors

INDICATOR NAME	INDICATOR DESCRIPTION	STRUCTURAL (2022)		CHANGE(A) 2017-22	
		Higher-CA	Lower-CA	Higher-CA	Lower-CA
N. exporting firms	Number of exporting firms (absolute values)	22,880	35,329	-6.6	-1.2
Exporters Prevalence	Exporting firms / total firms (%)	24.7	14.9	0.9	0.4
Size of exporting firms	Average n. employees (absolute values)	34	45	3	3
Export intensity	Export value / turnover (%)	49.4	41.3	-2.5	0.4
Country diversification	Number of exporting countries (average per firm)	12	10	2	-2
Product diversification	Number of exported products (average per firm)	14	9	1	0
C4 concentration ratio	Export of the first 4 most exporting firms / total export (%)	4.6	10.3	0.9	0.0
Export	Absolute values (billion euro)	134,095	316,943	19.4	36.8

(a) Change 2017-2022: export prevalence, export intensity and C4 concentration in percentage points; n. exporting firms and export in % change; size, country diversification and product diversification in difference of absolute values

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Table 5: Strengths and weaknesses of Higher-CA sectors compared to Lower-CA ones

STRENGTHS	WEAKNESSES
Higher exporter prevalence	Decrease in number of exporting firms
Higher country and product diversification	Decrease in the export intensity
Rise in country and product diversification	Lower growth of export value

Source: Centro Studi Guglielmo Tagliacarne

We also conduct a similar analysis for those industries where Italy might not have a comparative advantage but that, nevertheless, contribute most in terms of export value (Tables 6, 7, 8). These sectors are indicated in Table 6 and they comprise heavier manufacturing and higher R&D-based industries. Note that "Machinery and Equipment n.e.c." is the only sector among the top quartile comparative advantage sectors that also appears in the top quartile by export value. Overall, top quartile export sectors represent 53 percent of total manufacturing export. Compared to the remaining sectors, on average they export more (higher export intensity) and to more countries. They also appear to have a higher concentration within the top exporters, which might be explained by the very nature of these heavy-manufacturing sectors. Companies in these sectors also tend to be bigger on average (48 vs. 36 employees). Over time (2017-22), the starker differences between

higher-EV sectors and lower-EV ones appear in export intensity (+0.5 vs -1.6) and in the total number of exporting firms (+1.8 vs -7.0). All in all, these sectors thus show a stable-to-improving performance, with most key metrics looking up and only a lower export prevalence, driven entirely by the overall growth in the number of companies (denominator).

Table 6: Manufacturing sectors divided into Higher and Lower Export Value (Higher-EV, Lower-EV)

INDUSTRIES	EXPORT 2022 (BLN EURO)	SHARE OF TOTAL EXPORT
28-Machinery and equipment n.e.c.	76,461	17.0%
24-Basic metals	37,125	8.2%
29-Motor vehicles, trailers and semi-trailers	36,363	8.1%
10-Food products	30,174	6.7%
21-Basic pharmaceutical	29,982	6.6%
25-Fabricated metal products	28,825	6.4%
High-Exp industries	**238,928**	**53.0%**
Low-Exp industries	**212,110**	**47.0%**
Total manufacturing	**451,038**	**100.0%**

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Table 7: Key metrics for Higher-EV and Lower-EV sectors

INDICATOR NAME	INDICATOR DESCRIPTION	STRUCTURAL (2022)		CHANGE(A) 2017-22	
		Higher EV	Lower EV	Higher EV	Lower EV
N. exporting firms	Number of exporting firms (absolute values)	24,656	35,590	1.8	-7.0
Exporters prevalence	Exporting firms / total firms (%)	17.3	17.9	0.3	0.5
Size of exporting firms	Average n. employees (absolute values)	48	36	2.4	3.3
Export intensity	Export value / turnover (%)	45.3	41.5	0.5	-1.6
Country diversification	Number of exporting countries (average per firm)	12	10	0	0
Product diversification	Number of exported products (average per firm)	10	11	1	0
C4 concentration ratio	Export of the first 4 most exporting firms / total export (%)	11.8	10.2	0.1	1.9
Export	Absolute values (billion euro)	238,928	212,110	30.6	31.8

(a) Change 2017-2022: export prevalence, export intensity and C4 concentration in percentage points; n. exporting firms and export in % change; size, country diversification and product diversification in difference of absolute values.

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Table 8: Strengths and weaknesses of Higher-EV sectors compared to Lower-EV ones

STRENGTHS	WEAKNESSES
Higher intensive margin	Lower (slightly) country diversification
Higher country diversification	
Increase in number of exporting firms	
Increase in extensive margin	

Source: Centro Studi Guglielmo Tagliacarne

Finally, we compare the geographic distribution of these two sets of companies: those in higher-CA sectors and those in higher-EV sectors. The analysis is summarised in Figure 9 and Table 9. The first insight that emerges clearly is that, overall, Northern Italy continues to play a disproportionately dominant role in manufacturing exports. Approximately 70 percent of the country's exporting firms are based in the North, which also accounts for nearly 80 percent of total manufacturing export value. By contrast, Southern Italy - home to 30 percent of the nation's firms and one-fifth of its GDP - contributes only about 10 percent of exporting firms and even less in export value (see Table 9).

These spatial asymmetries become even more pronounced when we examine the distribution of firms in sectors characterised by particularly strong export performance. High-CA activity is overwhelmingly concentrated in the North, where its share of total export value exceeds 80%. A similar pattern holds for the industries with the highest absolute export values (High-EV). Notably, Southern Italy is all but absent in these strategic segments: only 2.8% of Higher-CA and 5.1% of Higher-EV export value originates from there.

Interestingly, two distinct specialisations also appear in the North. The Northeast demonstrates particular strength in Higher-CA sectors. Although it accounts for a smaller proportion of these exporting firms than the Northwest (30.3% vs. 34.0%), it generates a significantly larger share of total export value (46.0% vs. 37.5%). This suggests a higher average export intensity and a stronger orientation towards sectors with global comparative advantages. Note also that the average size of these exporting companies is 30-percent smaller in the Northeast than in the Northwest, suggesting a greater incidence of SMEs. By contrast, the Northwest dominates in Higher-EV industries, accounting for nearly half of all High-EV firms and export value - 50 percent more than its overall share of firms and GDP.

The conclusion for policymakers is that each macro region in the country plays a different role in Italy's productive system and in driving Italy's export performance. Although the Northwest has the most exporting firms, the Northeast and its SMEs have been driving the specialisation in those Higher-CA sectors identified in Markzinec and Pacchiardi (in this volume). This also means it is more exposed to the market fluctuations and trade disruptions in these industries. The Northwest,

instead, appears more solidly rooted in traditional heavy industry - likely in part as a legacy of post-war industrial policies and their spillovers - but less comparatively productive, since almost none of them are among Italy's Higher-CA sectors. Finally, the analysis confirms that the South is currently almost entirely cut off from both the Higher-CA and the Higher EV value chains (in particular, from Higher-CA sectors). This is an aspect policymakers must pay close attention to as they consider the redistributive implications of industrial policies that may favour existing specialisations and thus, as our maps show, bring close to no direct benefits to Southern regions. In light of this, the second part of this chapter will provide a different lens to identify potential new areas of specialisation to develop a more comprehensive industrial policy for the benefit of the whole country's economy.

Figure 9: Geolocalization of exporting firms in Higher-CA and Higher-EV
(The points are the exporting firms and the heat map indicates the euro value of their export)

Figure 9.a Higher-CA industries

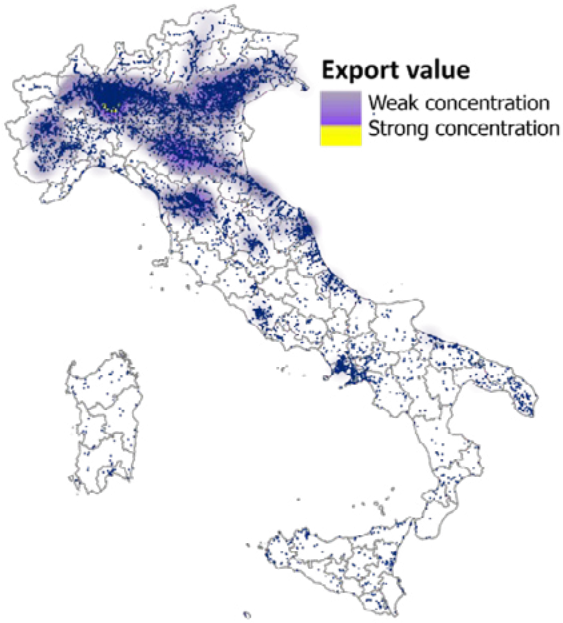
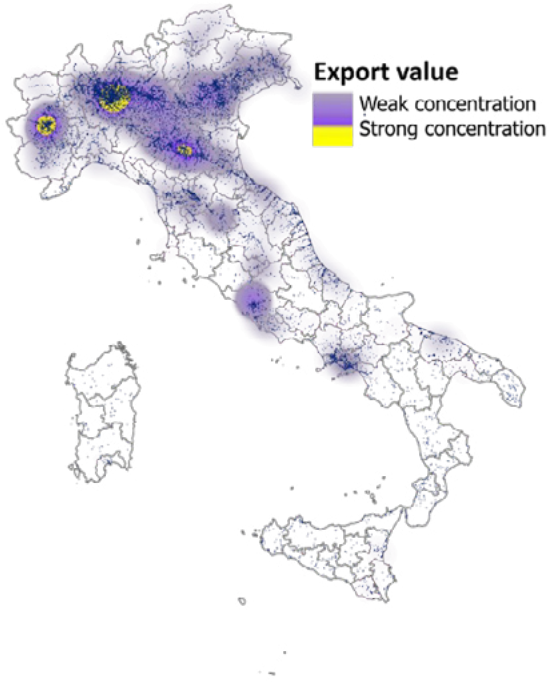


Figure 9.b Higher-EV industries



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Table 9: Distribution of Higher-CA and Higher-EV industries by Italian macro-region

	TOTAL INDUSTRIES		HIGHER-CA INDUSTRIES		HIGHER-EV INDUSTRIES	
	N. of exporting firms	Export value	N. of exporting firms	Export value	N. of exporting firms	Export value
North-West	39,7	43,2	34,0	37,5	44,7	46,6
North-East	29,9	34,5	30,3	46,0	32,3	34,9
Center	18,7	15,0	24,3	13,7	11,1	13,4
South and Islands	11,7	7,3	11,4	2,8	12,0	5,1
Italy	100,0	100,0	100,0	100,0	100,0	100,0
Italy (values*)	58.209	451.038	22.880	134.095	25.095	238.928

* Export value in billion euros.

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

3. INVESTIGATING ITALY'S LATENT COMPETITIVE ADVANTAGE: THE LANDSCAPE OF HIGH-GROWTH FIRMS

In the first part of this chapter we have shown the geographical distribution and characteristics of Italy's exporting companies. We have also shown how the key sectors (both the most competitive ones and those that contribute most exports) have been evolving. We confirmed that Italy's exports are heavily concentrated in the North of the country. This is true both for the most competitive sectors and for those with the highest value contribution. We also identified the characteristics associated with higher exporting companies, suggesting the potential scope for horizontal industrial policies that upgrade firms along these characteristics to increase their competitiveness.

By highlighting these features, however, the first part of the chapter also points to the limits of looking solely at exporters to inform industrial policy, especially for regions of the country that currently do not have an export propensity. In other words, export statistics show which Italian companies and industries are already competitive but say little to policymakers about where new industries could develop.

In this section we thus introduce the concept of latent competitive advantage (LCA). We show potential emerging sector specialisations for each Italian province on the basis of the concentration of high-growth firms (HGFs), following the OECD definition of the concept. We argue that, while Italy's North has been the clear leader in export-oriented industries, a new Italian industrial policy should also build on the pockets of specialisation that instead exist in other regions and that are creating value already today. This approach provides a key industrial policy tool as it offers insights for national and local policymakers on the emerging strengths in economic activity in their local areas, which could be built upon via public intervention.

If an incremental industrial policy may be appropriate for Italy's Northern regions, a more transformative one is needed for the Centre and the South. However, the latter should not be agnostic about the existing geographical specialisation. Instead, it should be strategically targeted, building new specialisations in those geographies that are already displaying the required capabilities for a certain sector or subsector. Importantly, our analysis shows that HGFs in Italy are present across sectors, from high-tech manufacturing to less-knowledge intensive services. Consistent with recent academic literature (Breznitz 2020), this suggests that industrial policy could focus on building different comparative advantages for different regions. While not all regions can and should - in the short term - aim to compete at the technological frontier, this analysis shows they can still create value locally if they find those market niches that allow them to continue growing at high rates.

3.1. APPROACH, DATA, AND METHODOLOGY

We measure HGFs by following the OECD definition. We consider HGFs those "enterprises with average annualised growth in employees (or in turnover) greater than 20% a year, over a three-year period, and with ten or more employees at the beginning of the observation period" (OECD, 2009). All analyses were carried out on the manufacturing and services sectors[83].

More specifically, our calculation is comprised of two steps. In the first step, based on the data sourced from the Statistical register of active enterprises (Asia) by Istat, we bounded the universe of enterprises under analysis according to the following parameters in line with OECD (2007, 2009): i) firms with 10 or more employees in 2019 - the beginning of our observation period since it corresponds to three years before the last available year (2022); ii) firms with a turnover higher than 4 times Italy's GDP per capita in 2019 – corresponding to 120,817 euro. In the second step, within the universe bounded above, we identified HGFs as those firms with average annualised growth in turnover greater than 20% a year, over a three-year period. All the figures and data in this section, therefore, refer to companies that qualify as HGFs as per the definition above by the year 2022.

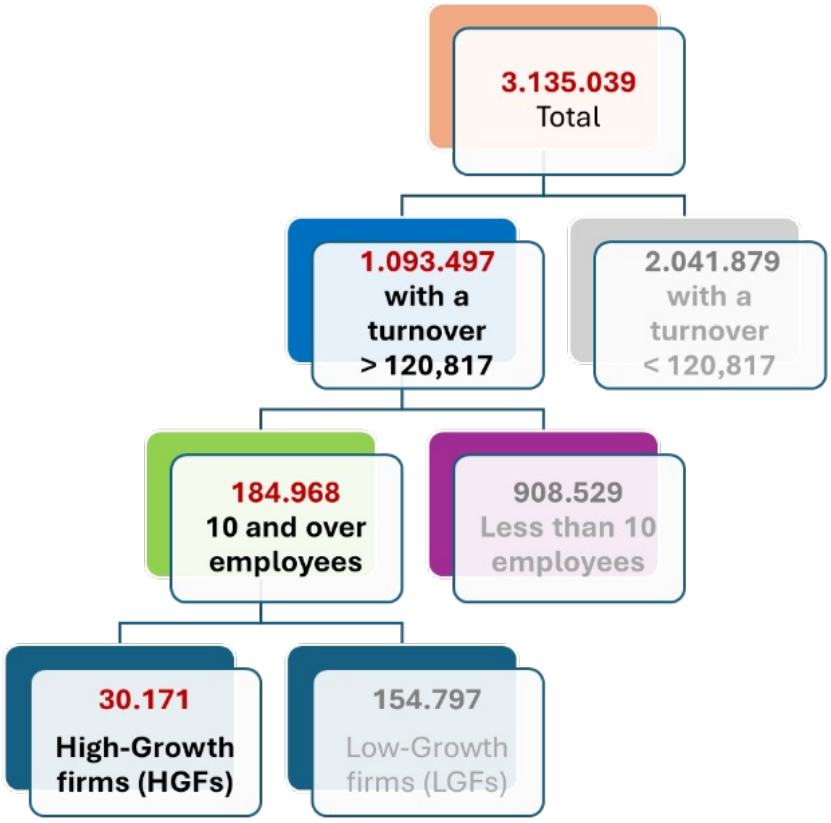
3.2. GENERAL FINDINGS

We start by highlighting a few general characteristics of Italy's HGFs that surface from the analysis.

The first is the extent to which Italy's productive structure is skewed towards micro enterprises. Figure 10 shows, through a "waterfall" chart, how the population of relevant companies for the analysis reduced as we applied the parameters of the OECD definition of HGFs.

83 Section C (manufacturing), and G and the following (services) of the Nace Rev.2 classification. Thus, the analyses exclude the following industries (in parenthesis the section of Nace Rev.2 classification): Agriculture, forestry and fishing (section A); Mining and quarrying (section B); Electricity, gas, steam and air conditioning supply (section D); Water supply; sewerage, waste management and remediation activities (section E); Construction (section F).

Figure 10: Italy's companies – mostly micro-enterprises, 2022



Note: the total refers to manufacturing and services active firms in 2019 and still active in 2022. They are the reference of our analyses for identifying the HGFs.

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

There are over three million enterprises in Italy. However, only one third of them has revenues greater than €120,817 (four times Italy's GDP per capita in 2019). Even fewer have more than 10 employees, bringing the total of non-micro companies down to only around 180,000. In other words: 95 percent of Italian enterprises are micro-companies. Of the remaining 5 percent, one in six (16.3%) would qualify as HGF. This compares to around an 8% average in a 2009 OECD study on HGF (OECD 2009) in a comparable target firm population[84].

Second, we find that these HGFs contribute disproportionately to employment growth. The 1% of Italian companies that qualify as HGFs generated 81% percent of the growth in employment in all Italian firms over the years 2019-2022 (+632,000 out of +780,000)[85].

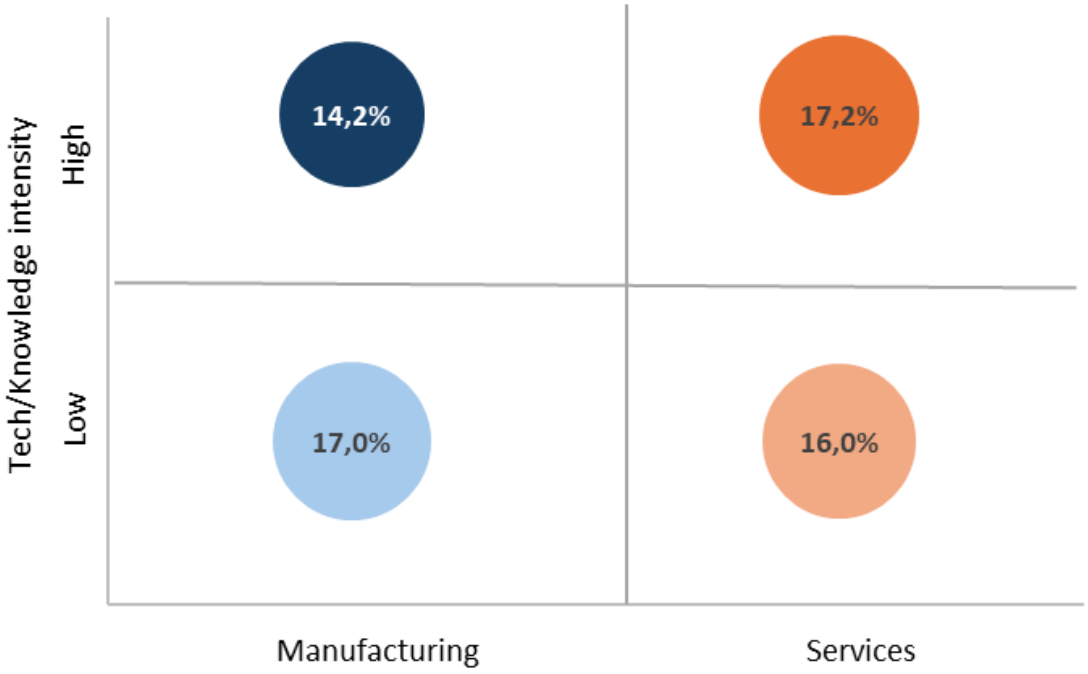
This is roughly consistent with the literature on HGFs, which finds that these companies contribute 60-80% of employment growth (Anyadike Danes et al. 2009;

84 In the 2009 OECD study, the definition of HGF does not take into account the threshold of the revenue set to fourfold of the GDP per capita.
85 All sectors excluding primary sector corresponding to the section A of Nace Rev.2 classification.

Brown et al. 2014). Our analysis confirms that this set of companies deserves the attention of Italian policymakers who intend to design policies to strengthen Italy's industrial base and who want to support the companies that contribute the highest positive externalities to the economy at large.

Third, a key finding that can inform industrial policy is that Italian HGFs are found across sectors and types of activities (in both services and manufacturing and in higher and lower tech and knowledge intensive fields). Figure 11 shows this distribution.

Figure 11: Share of Italian HGFs by level of technology and knowledge intensity



Note: Low Tech/Knowledge Intensity includes Low-Medium Low technology intensity manufacturing and Less Knowledge Intensive Services; High Tech/Knowledge Intensity includes High-Medium High technology intensity manufacturing and High Knowledge Intensive Services. The size of the bubble refers to the share of High-Growth firms on the total of firms with 10 or more employees and a turnover more than 120,817 euro, for each of the four sub-categories.

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

This insight is particularly important for structuring industrial policy: it shows that value can be created (as HGFs do) across value chains. This provides significant opportunities for regions currently endowed with capabilities that do not allow them to compete at the technological frontier. This finding suggests that these regions can today build a comparative advantage in sectors or stages of production that may require less complexity, but still create wealth and value that can enable future investment to upgrade the regions' capabilities. In fact, it should be noted that the sectors with the highest relative incidence of HGFs are those in medium low-tech manufacturing, as Table 10 shows. Notably, medium-low tech manufacturing has around 30% more HGFs than the rest of manufacturing (19.5% vs around 14%), possibly reflecting the weight of what is typically referred to as "Made in Italy" sectors.

Table 10: Incidence of High Growth Firms (HGF) and Low-Growth Firms (LGF) by level of technology and knowledge intensity

	NUMBER OF FIRMS			% DISTRIBUTION		
	HGF	LGF	Total	HGF	LGF	Total
Manufacturing	**10,734**	**54,935**	**65,669**	**16.3**	**83.7**	**100.0**
High-technology	230	1,462	1,692	13.6	86.4	100.0
Medium-high-technology	1,991	11,920	13,911	14.3	85.7	100.0
Medium-low-technology	4,869	20,110	24,979	19.5	80.5	100.0
Low technology	3,644	21,443	25,087	14.5	85.5	100.0
Services	**19,437**	**99,862**	**119,299**	**16.3**	**83.7**	**100.0**
Knowledge-intensive services (KIS)	5,006	24,098	29,104	17.2	82.8	100.0
Less knowledge-intensive services (LKIS)	14,431	75,764	90,195	16.0	84.0	100.0
Total	**30,171**	**154,797**	**184,968**	**16.3**	**83.7**	**100.0**

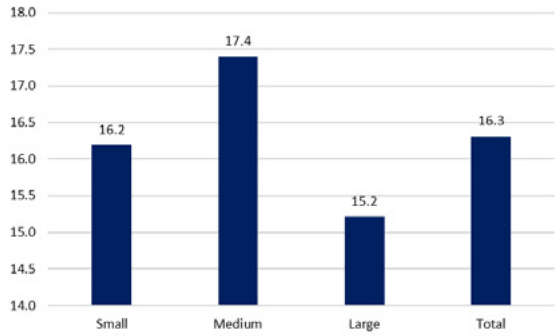
N.B. The analyses refer to the total universe of manufacturing and services firms with 10 or more employees and a turnover of more than 120,817 euro.

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

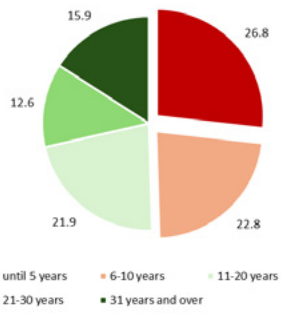
Finally, several general characteristics of Italian HGFs emerge that are relevant for industrial policy considerations. Consistently with the literature, for instance, Italian HGFs are distributed across firm size (Figure 12.a). While smaller HGFs are by far more numerous (85.5% of HGFs belong to the size class 10-49 employees, see Appendix 1, Figure A1), in relative terms the likelihood of a company being high-growth is roughly the same (15-17 %): specifically, HGFs are 16.2% of the small enterprises, 17.4% of the medium firms and 15.2% of the large enterprises (Figure 12.a). Age, instead, appears much more correlated with propensity to be high-growth, as evident from Figure 12.b. Note, however, that over 50% of HGFs are not new companies but are older than 10 years. This observation is consistent with the literature and contrasts with the popular narrative that sees high growth as a feature of young start-ups. It is also important for policymakers as they think of the target beneficiaries of industrial policies.

Figure 12: HGF by size class and by age group

12.a Size class
(HGFs as % of the corresponding total firms)



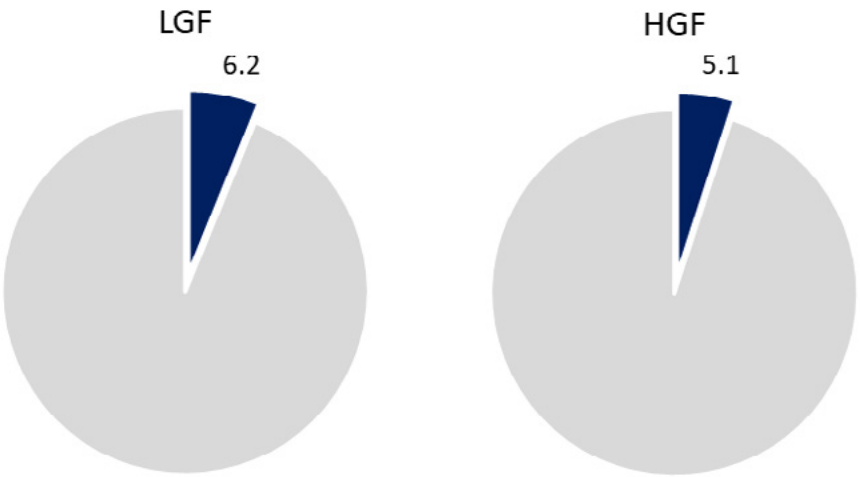
12.b Age group
(% distribution)



N.B. In Figure 12.a the shares are calculated, in each size class, on the total universe of manufacturing and services firms with 10 and more employees and a turnover more than 120,817 euro.
Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Interestingly, little difference emerges in the incidence of HGF within exporting companies (15.5%) and non-exporting companies (16.6%), suggesting that export propensity, at the individual firm level, might be more of an indicator of target market availability rather than purely of firms' competitiveness. From an innovation perspective, instead, the picture is more nuanced (see Figures 13 and 14). HGFs are less present among firms with patents (13.7% vs 16.5% among firms without patents) but significantly more present among firms with patents in EU strategic technologies (14.9% vs 13.3% among firms without patents in EU strategic technologies), and especially net-zero technologies (15.1% vs 13.6%)[86]. This is confirmed when looking at the distribution of the number of patents. Similarly, HGFs tend to have slightly less graduates among their employees but, conversely, have relatively more graduates in STEM subjects. In short, these data points suggest HGFs may have fewer patents and graduates but perhaps have the "right ones" to be competitive. Indeed, the analysis in relative terms shows that only 5.1% of HGFs hold patents in Strategic technologies in contrast to 6.2% for LGFs (Figure 13). However, if we look only at the firms with patents, we discover that 23.9% of HGFs hold patents in Strategic technologies (16.5% non-Net-Zero and 7.4% Net-Zero) in contrast to a lower share of LGFs (21.7%, respectively composed of 15.1% and 6.6%) (Figure 14). This evidence is suggestive of the role HGFs can play as channels through which innovation, and thus productivity, spreads throughout the economy. It also hints at their potential role in anticipating sectoral growth by revealing emerging entrepreneurial opportunities within a given industry (Cucculelli and Menghini, 2014; Kirzner, 1997).

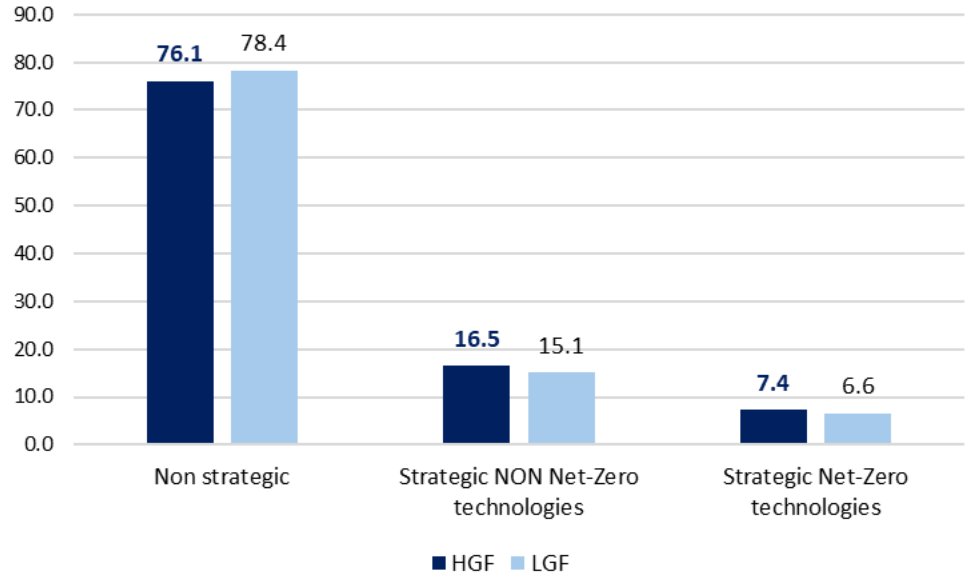
Figure 13: % of LGFs and HGFs holding patents



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat and Moody's data

86 Deep-tech including net-zero technologies, defined as those included in the EU STEP programme and net-Zero Industry Act. The list of the strategic technologies is available in Gentile et al. (2025).

Figure 14: Distribution of firms with patents in Non-strategic, Strategic and Net-Zero Technologies on total firms with patents, HGF vs LGF



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat and Moody's data

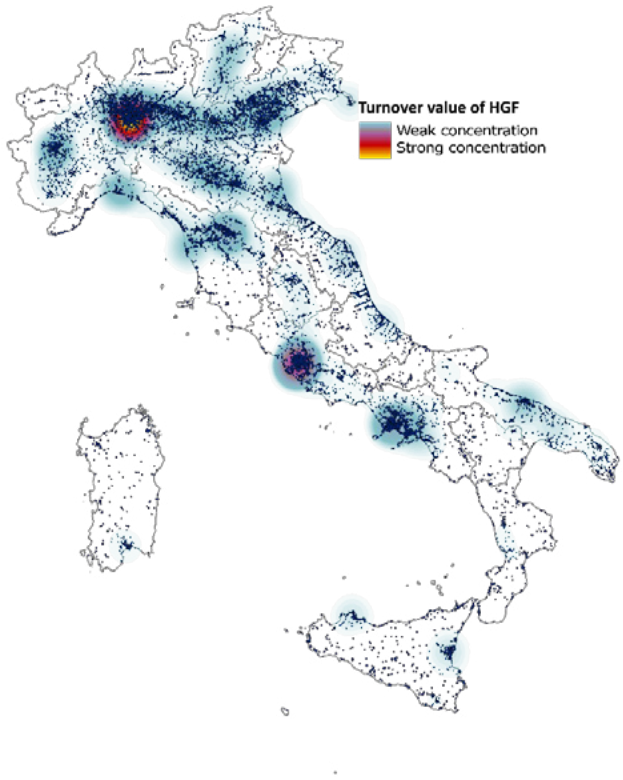
3.3. FINDINGS BY GEOGRAPHY

When looking at the geographical distribution of these companies, we observe that HGFs are present across the country, albeit with different types of activities and knowledge/technology intensity.

First, it is important to note that HGFs are more evenly distributed than the exporters shown in the first part of this chapter (see figure 15 vs previous figure 9). Notably, we find that in relative terms (HGFs divided by total non-micro enterprises) there are more HGFs in the South than in the North (Figure 16). This relative prevalence of HGFs in the South, for instance, is 30% higher than in the Northeast and this is more the case within manufacturing (24 vs 15 percent). Note that these results change when we calculate the share of HGFs over the total population of firms rather than over non-micro firms (see Figure A4 in Appendix 1). Thus, these statistics should only be interpreted as evidence of industrial dynamism across the country rather than as a signal of better performance of the South[87].

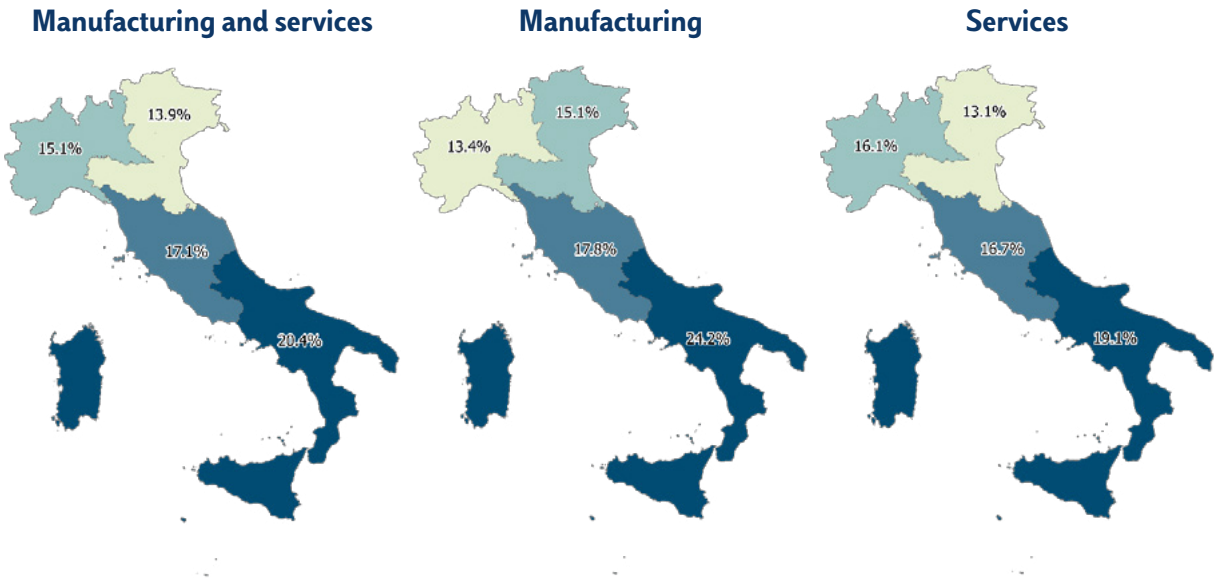
87 It is important to note that these percentages should be interpreted as "prevalence of HGFs among non-micro enterprises." They take as reference value (denominator) the population of companies as defined by those above the size cutoffs described in the methodology section. In regions where the cutoffs eliminate a higher proportion of the companies' population, this can inflate the relative prevalence of HGFs compared to this prevalence over the total population. See Appendix 1, Figure A4 for the same picture using the total population of relevant firms without the size cutoff.

Figure 15: Geographical distributions of Italian HGFs, turnover value



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Figure 16: Italian HGFs by macro region: % share over total non-micro firms

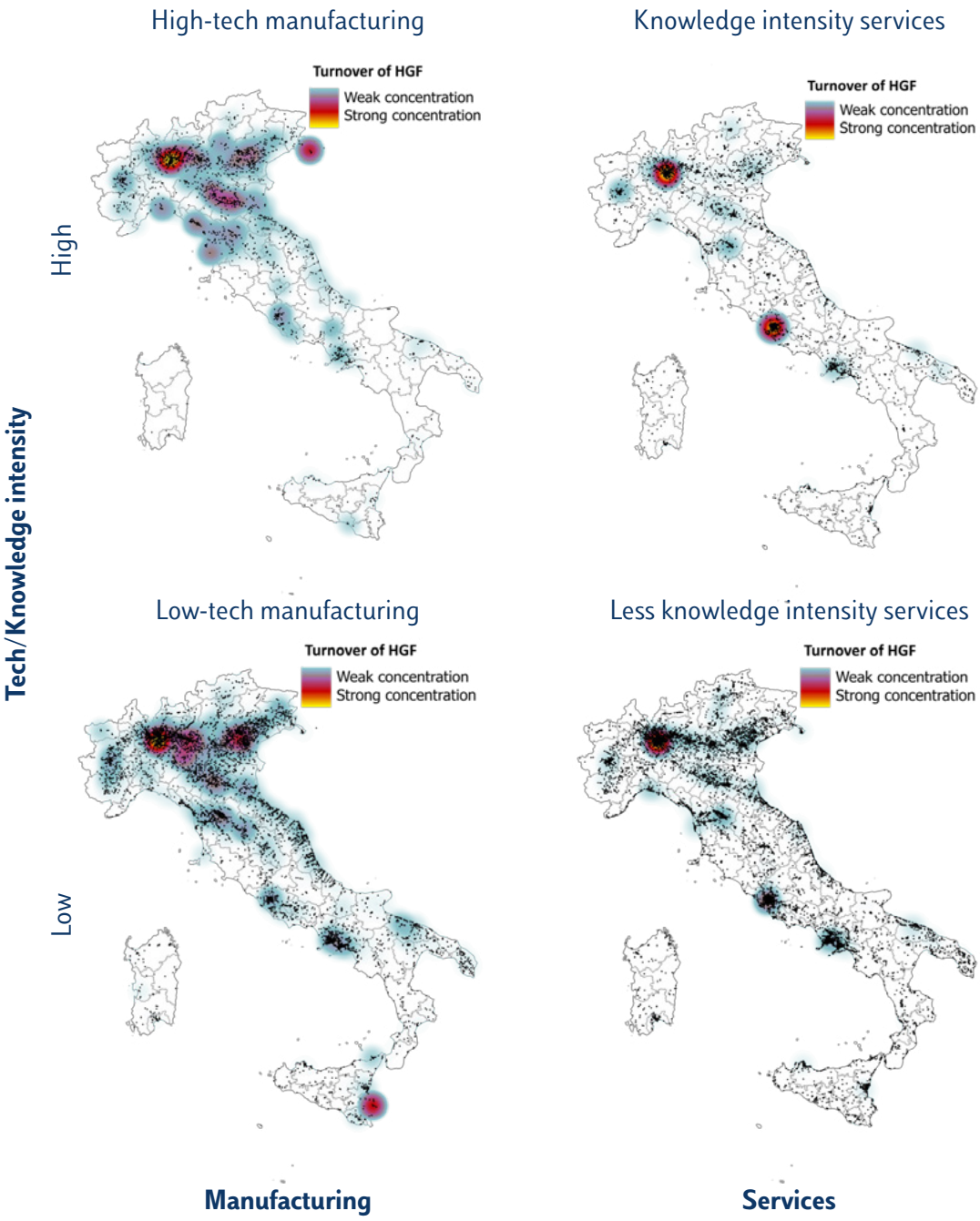


N.B. The shares are calculated, in each macro region, on the total universe of manufacturing and services firms with 10 and more employees and a turnover more than 120,817 euro.

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

At the same time, there are signs of a geographical specialisation. As the following chart highlights (Figure 17), the distribution is more uniform for low-tech manufacturing and less knowledge-intensive services, while more skewed towards the North for high-tech manufacturing (HTM) and knowledge-intensive services (KIS). As expected, KIS are particularly concentrated within metropolitan areas, with Milan and Rome standing out as the capitals of KIS.

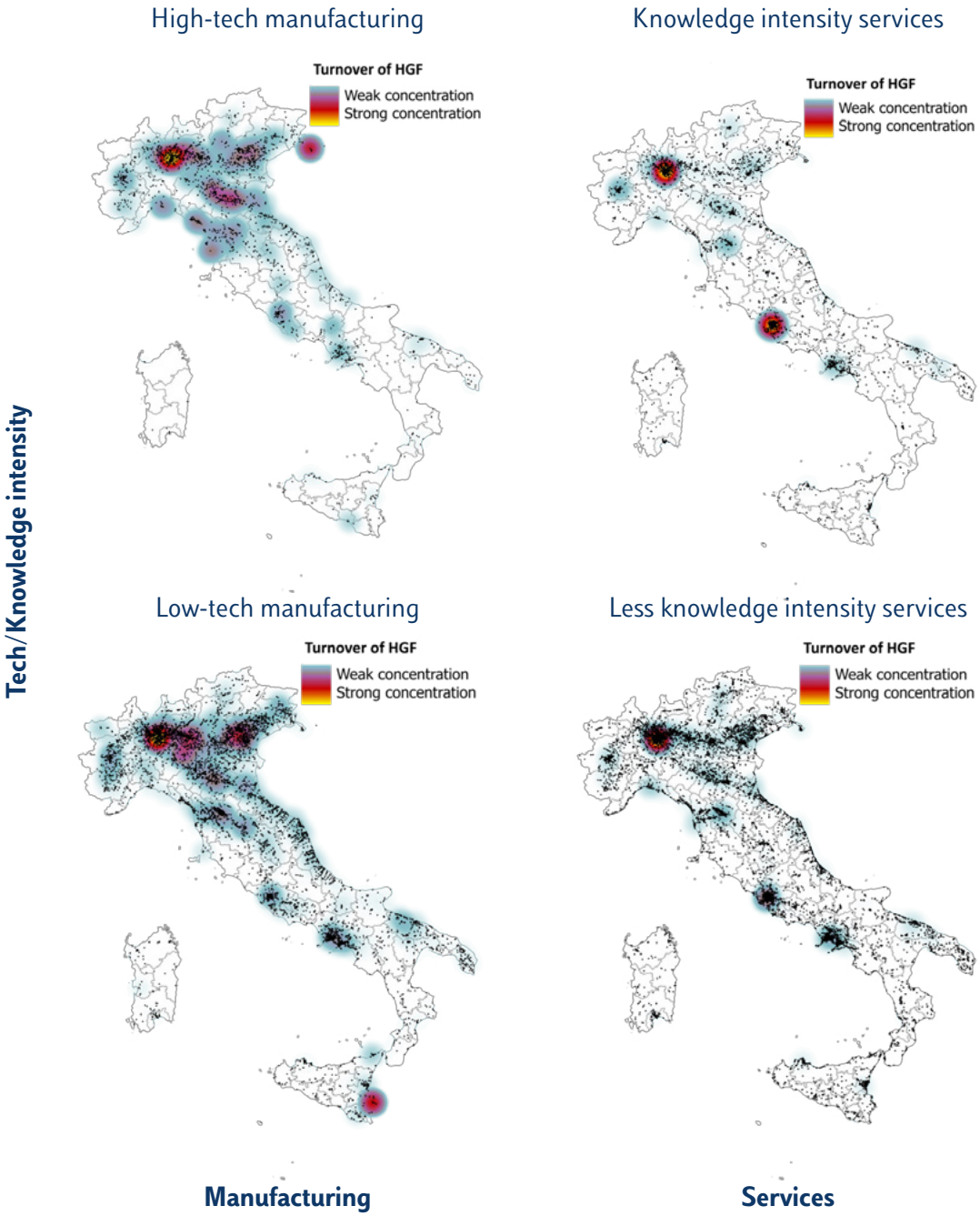
Figure 17: Geographical distribution of Italian manufacturing and services HGFs by level of technology and knowledge intensity, turnover value



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

It is interesting to note that when we run the same analysis on the basis of export values, the distribution is once again more skewed towards the North, even among HGFs (Figure 18 below).

Figure 18: Geographical distribution of Italian manufacturing and services HGFs by level of technology and knowledge intensity, export value



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Two important policy considerations emerge from these analyses. The first is that while HGFs are present everywhere, different areas have different activity-type

specialisations. Industrial policy must take this into account. If policymakers are interested in building domestic capabilities in a certain sector, they should carefully consider in which part of that sector's value chain each area of the country is best positioned to compete. While it is not realistic that all parts of Italy swiftly upgrade to competing at the technology frontier, some might indeed be well placed to compete in high-end manufacturing and advanced services. The others, however, do not need to be left out of the strategy. They can, at least initially, focus on those parts of the value chain that require less specialised capabilities. As our analysis shows, sustained growth can be created across specialisations, thus suggesting possibilities for value creation across regions.

The second insight is that, even among high-growth firms, those in the South have a lower propensity to export. Policymakers should investigate further whether this is due to sector specialisation - as some sectors may be generally more integrated in international value chains - or whether there are instead within-sector differentials that institutional interventions can help close.

Moving to the more local level (NUTS 3), the granularity of the data allows us to identify, for each Italian province, the concentration of HGFs both in manufacturing and services. Figure 19 plots each province by its incidence of manufacturing HGFs (HGF-M) and services HGFs (HGF-S).

Figure 19: Italian provinces by concentration of manufacturing and services HGFs

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

The figure shows that generally there is a positive relationship in the core: for about two thirds of the provinces, those with higher concentration of HGF-M also have more HGF-S. However, on both sides there are important outliers. Milan is confirmed as the clear HGF-S leader, with a 40-60% lead over the next two provinces (Bolzano and Rome) and well above the trend line. On the manufacturing

front, Arezzo, Prato, Gorizia, Fermo, Pesaro and Urbino clearly outperform the rest. Note that one Southern province - Teramo - also appears among the manufacturing high-performers. Finally, many Southern provinces are among those with the lowest concentration of both HGF-M and HGF-S. Details are included in Appendix 1 (Figure A5 and A6).

For policymakers, however, it is key to know not just how many HGFs are present in a certain location but, most importantly, what these companies do. In our last analysis, thus, we dig one level deeper and identify the sector specialisation of each province, both in terms of HGF-M and HGF-S (Appendix 1, Figure A7 and A8). These results can be the first critical step to inform locally targeted industrial policies that build on latent competitive advantges in each territory. These tables tell policymakers the most vibrant sectors in each territory. Although subject to careful interpretation, these tables suggest in which type of economic activity each area possesses the necessary capabilities and institutions to compete. To be sure, this is a preliminary analysis that requires further investigation to solidify the policy implications. Most likely, an in-depth study is required for each territory. However, we believe this is the first insightful step to guide policy interventions.

4. CONCLUSIONS AND POLICY IMPLICATIONS

This chapter has examined the firm-level dynamics that underpin Italy's international competitiveness, offering a microeconomic complement to the macro-level analysis presented in the chapter by Marczinek and Pacchiardi, in this volume. Using detailed data on Italy's companies, we have shown what lies behind Italy's well-known geographical productivity heterogeneity.

The first analysis of the chapter focused on the characteristics and trends of Italy's exporting firms, a reflection of Italy's existing comparative advantages. Besides confirming that export activity remains highly concentrated in the North of the country, we also showed that exporting firms tend to be larger, more diversified, and more innovative than non-exporters. By looking specifically at firms in high comparative advantage sectors and those in high export value sectors, we took stock of how these sectors have been evolving. We were also able to point to the areas of specialisation of each macro region, showing the different activities taking place in the Northeast and Northwest.

This first analysis, however, also showed the limitations of export data in informing Italy's industrial policy. Part 2 thus introduced a second analytical lens: high-growth firms as indicators of latent competitive advantage. Although HGFs are also primarily located in the North, their distribution is notably less concentrated than that of exporters. Moreover, we identified HGFs across manufacturing and services sectors, in both high- and low-tech/knowledge domains. This broader footprint

suggests that potential for economic dynamism exists also beyond the current core of Italy's export industries, and that policymakers would need to design industrial policies accordingly. Tailoring policies to leverage these firms is critical as HGFs today contribute 80% of employment growth in Italy.

Three key policy implications emerge. First, the pronounced territorial heterogeneity in firm characteristics and sectoral specialisation warns about the asymmetric effects that seemingly neutral, horizontal industrial policies may have. Tailoring policy tools to local conditions is essential to avoid reinforcing existing disparities. Second, the less geographically concentrated distribution of HGFs suggests that untapped potential may lie in a wider range of territories and industries. This provides grounds for a place-based policy design that targets not just established exporters but also emerging firms that are showing high-growth potential (e.g., by providing financial and organizational-managerial capital; see Cucculelli and Menghini, 2014). However, further analysis of the determinants of HGF performance may help to identify structural characteristics of HGFs as a base for building more targeted industrial policy actions.

Third, the regional diversity in economic specialisations points to the different roles Italy's territories can play in global value chains. While not all regions can realistically compete today at the technological frontier in all sectors, carefully designed policies can help regions leverage their relative strengths and create value locally by finding their own place in global production networks.

Together, these findings can support a more fine-grained industrial strategy, informed by evidence on Italy's current economic structure. Our insights show that such a strategy should acknowledge the structural disparities of Italy's economy to then leverage the latent potential it hides.

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APPENDIX 1
Further insights into High Growth Firms (HGFs)

Figure A1: Distribution of HGF by size class compared to LGF

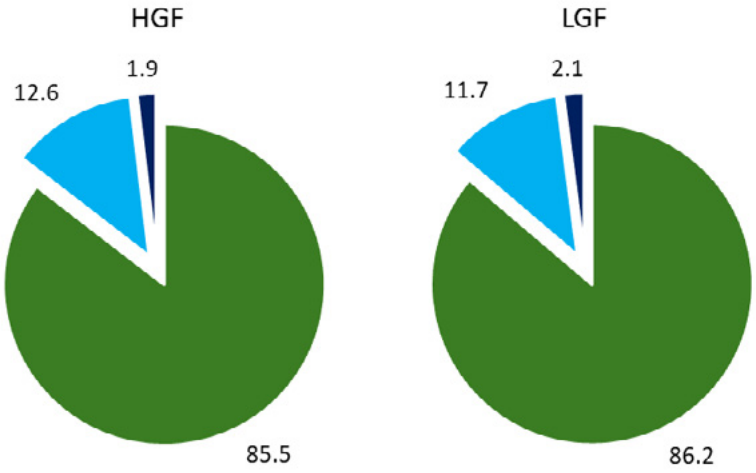
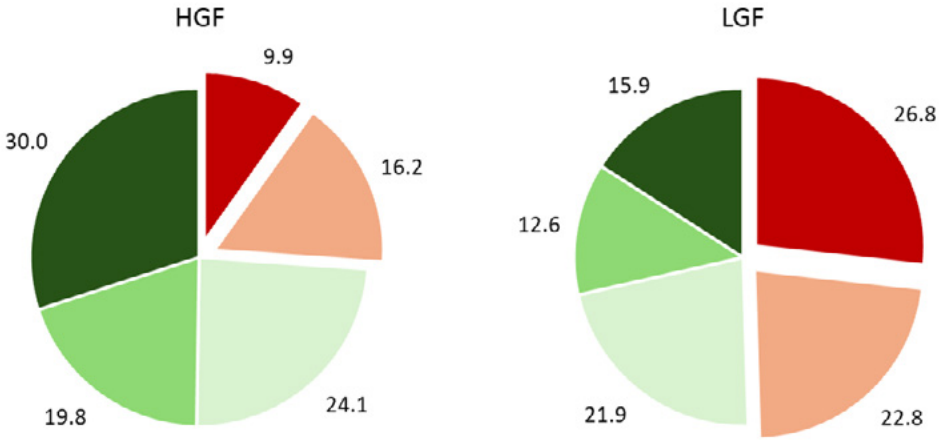
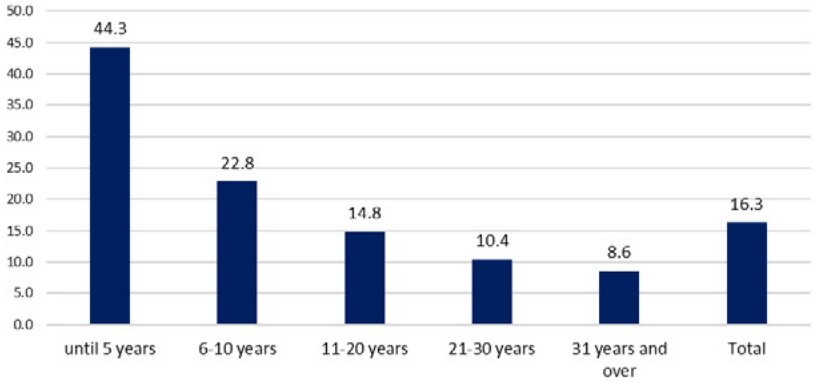


Figure A2: Distribution of HGF by company age group compared to LGF



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

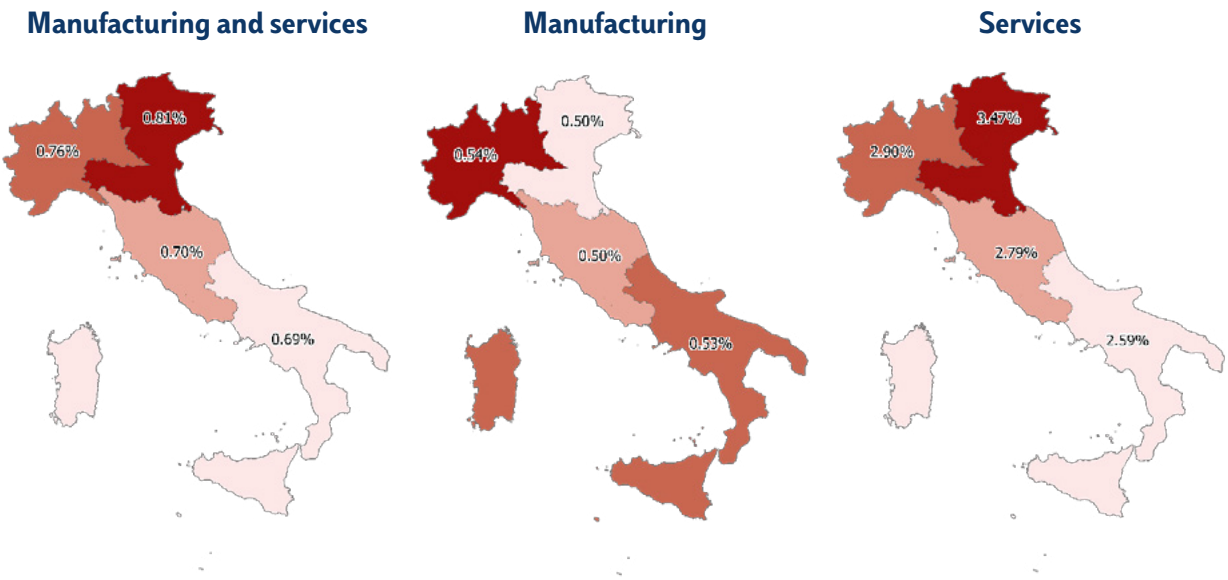
Figure A3: Prevalence of HGF by age group



N.B. The shares are calculated, in each macro region, on the total universe of manufacturing and services firms with 10 and more employees and a turnover more than 120,817 euro.

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Figure A4: Italian HGFs by macro region: % share using total population of relevant firms as denominator



N.B. The shares are calculated on all manufacturing and services firms of ASIA register (only by excluding the primary sector corresponding to section A of Nace rev.2 classification since this is not included in Asia register).

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Figure A5: Provincial ranking by share of HGF on total companies (manufacturing and services)

RANK	PROVINCES	% HGF ON TOTAL FIRMS	NR. HGF	NR. OTHER FIRMS	NR. TOTAL FIRMS
1	Arezzo	1.06%	263	24,541	24,804
2	Reggio nell'Emilia	1.03%	364	34,873	35,237
3	Vicenza	1.03%	650	62,612	63,262
4	Brescia	0.96%	894	92,346	93,240
5	Bergamo	0.94%	703	73,965	74,668
6	Milano	0.94%	2,936	310,632	313,568
7	Pesaro e Urbino	0.93%	255	27,036	27,291
8	Teramo	0.93%	201	21,348	21,549
9	Pordenone	0.92%	175	18,823	18,998
10	Modena	0.90%	474	52,203	52,677
11	Treviso	0.89%	566	62,892	63,458
12	Bari	0.89%	708	79,069	79,777
13	Prato	0.86%	227	26,122	26,349
14	Verona	0.85%	581	68,009	68,590
15	Macerata	0.85%	207	24,250	24,457
16	Bolzano/Bozen	0.84%	337	39,570	39,907
17	Chieti	0.83%	200	23,797	23,997
18	Napoli	0.83%	1,510	179,807	181,317
19	Venezia	0.83%	492	58,765	59,257
20	Padova	0.83%	628	75,034	75,662
21	Trento	0.81%	293	35,763	36,056
22	Gorizia	0.81%	59	7,239	7,298
23	Ravenna	0.80%	209	25,785	25,994
24	Fermo	0.80%	114	14,096	14,210
25	Barletta-Andria-Trani	0.80%	189	23,449	23,638
26	Cremona	0.80%	167	20,788	20,955
27	Salerno	0.80%	570	70,966	71,536
28	Perugia	0.80%	368	45,893	46,261
29	Forlì-Cesena	0.79%	231	28,860	29,091
30	Caserta	0.76%	359	46,939	47,298
31	Piacenza	0.76%	148	19,379	19,527
32	Udine	0.76%	260	34,133	34,393
33	Massa-Carrara	0.76%	108	14,183	14,291
34	Pescara	0.75%	190	25,000	25,190
35	Pisa	0.75%	238	31,510	31,748
36	Cuneo	0.75%	296	39,334	39,630
37	Lecco	0.74%	170	22,777	22,947
38	Catania	0.74%	452	60,977	61,429
39	Isernia	0.73%	41	5,558	5,599
40	Caltanissetta	0.73%	90	12,245	12,335
41	Alessandria	0.73%	186	25,409	25,595

RANK	PROVINCES	% HGF ON TOTAL FIRMS	NR. HGF	NR. OTHER FIRMS	NR. TOTAL FIRMS
42	Mantova	0.73%	185	25,324	25,509
43	Lucca	0.73%	224	30,668	30,892
44	Avellino	0.72%	177	24,396	24,573
45	Parma	0.72%	237	32,710	32,947
46	Ancona	0.72%	232	32,126	32,358
47	Livorno	0.72%	165	22,872	23,037
48	Lecce	0.70%	357	50,677	51,034
49	Pistoia	0.69%	152	21,800	21,952
50	Ragusa	0.69%	128	18,519	18,647
51	Rovigo	0.69%	98	14,194	14,292
52	Monza e della Brianza	0.69%	447	64,778	65,225
53	Campobasso	0.68%	90	13,126	13,216
54	Como	0.68%	276	40,364	40,640
55	Firenze	0.68%	584	85,421	86,005
56	Trieste	0.67%	92	13,552	13,644
57	Sondrio	0.67%	78	11,562	11,640
58	Latina	0.66%	234	35,017	35,251
59	Cagliari	0.66%	204	30,671	30,875
60	Frosinone	0.66%	191	28,753	28,944
61	Potenza	0.66%	138	20,789	20,927
62	Roma	0.66%	2,236	337,193	339,429
63	Sassari	0.66%	209	31,558	31,767
64	Siena	0.66%	129	19,556	19,685
65	Varese	0.65%	378	57,530	57,908
66	Rimini	0.65%	205	31,376	31,581
67	Biella	0.65%	73	11,173	11,246
68	Matera	0.65%	71	10,907	10,978
69	Torino	0.64%	1,027	158,730	159,757
70	Bologna	0.64%	523	81,387	81,910
71	Palermo	0.64%	402	62,665	63,067
72	Taranto	0.62%	178	28,346	28,524
73	Genova	0.62%	374	59,862	60,236
74	Benevento	0.62%	104	16,722	16,826
75	Siracusa	0.62%	121	19,469	19,590
76	La Spezia	0.62%	92	14,819	14,911
77	Lodi	0.59%	71	11,883	11,954
78	Ascoli Piceno	0.59%	93	15,627	15,720
79	Novara	0.57%	132	22,857	22,989
80	Belluno	0.57%	69	11,984	12,053
81	Valle d'Aosta/Vallée d'Aoste	0.56%	52	9,227	9,279
82	Brindisi	0.55%	119	21,331	21,450
83	L'Aquila	0.55%	106	19,030	19,136
84	Vercelli	0.55%	54	9,713	9,767

RANK	PROVINCES	% HGF ON TOTAL FIRMS	NR. HGF	NR. OTHER FIRMS	NR. TOTAL FIRMS
85	Catanzaro	0.55%	111	20,195	20,306
86	Trapani	0.54%	125	23,138	23,263
87	Crotone	0.52%	43	8,195	8,238
88	Terni	0.51%	74	14,454	14,528
89	Verbano-Cusio-Ossola	0.51%	51	10,007	10,058
90	Foggia	0.51%	166	32,600	32,766
91	Agrigento	0.51%	106	20,829	20,935
92	Asti	0.50%	66	13,052	13,118
93	Ferrara	0.48%	101	20,950	21,051
94	Messina	0.47%	171	35,846	36,017
95	Viterbo	0.46%	90	19,330	19,420
96	Oristano	0.46%	37	8,039	8,076
97	Enna	0.43%	33	7,601	7,634
98	Cosenza	0.43%	167	38,584	38,751
99	Sud Sardegna	0.42%	64	15,047	15,111
100	Reggio di Calabria	0.42%	115	27,255	27,370
101	Grosseto	0.42%	65	15,412	15,477
102	Pavia	0.42%	138	32,877	33,015
103	Rieti	0.40%	32	8,004	8,036
104	Vibo Valentia	0.39%	33	8,376	8,409
105	Nuoro	0.38%	44	11,490	11,534
106	Imperia	0.36%	52	14,425	14,477
107	Savona	0.35%	71	20,252	20,323
	ITALY	**0.74%**	**30,171**	**4,072,199**	**4,102,370**

N.B. The total firms (and the residual "other firms") corresponds to manufacturing and services firms of the ASIA register.

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Figure A6: Provincial ranking by the number of HGF (manufacturing and services)

RANK	PROVINCES	HGF		NR. OTHER FIRMS	NR. TOTAL FIRMS	% HGF ON TOTAL FIRMS
		NR. HGF	% OF TOTAL ITALIAN HGFS			
1	Milano	2,936	9.73%	310,632	313,568	0.94%
2	Roma	2,236	7.41%	337,193	339,429	0.66%
3	Napoli	1,510	5.00%	179,807	181,317	0.83%
4	Torino	1,027	3.40%	158,730	159,757	0.64%
5	Brescia	894	2.96%	92,346	93,240	0.96%
6	Bari	708	2.35%	79,069	79,777	0.89%
7	Bergamo	703	2.33%	73,965	74,668	0.94%
8	Vicenza	650	2.15%	62,612	63,262	1.03%
9	Padova	628	2.08%	75,034	75,662	0.83%
10	Firenze	584	1.94%	85,421	86,005	0.68%
11	Verona	581	1.93%	68,009	68,590	0.85%

RANK	PROVINCES	HGF		NR. OTHER FIRMS	NR. TOTAL FIRMS	% HGF ON TOTAL FIRMS
		NR. HGF	% OF TOTAL ITALIAN HGFS			
12	Salerno	570	1.89%	70,966	71,536	0.80%
13	Treviso	566	1.88%	62,892	63,458	0.89%
14	Bologna	523	1.73%	81,387	81,910	0.64%
15	Venezia	492	1.63%	58,765	59,257	0.83%
16	Modena	474	1.57%	52,203	52,677	0.90%
17	Catania	452	1.50%	60,977	61,429	0.74%
18	Monza e della Brianza	447	1.48%	64,778	65,225	0.69%
19	Palermo	402	1.33%	62,665	63,067	0.64%
20	Varese	378	1.25%	57,530	57,908	0.65%
21	Genova	374	1.24%	59,862	60,236	0.62%
22	Perugia	368	1.22%	45,893	46,261	0.80%
23	Reggio nell'Emilia	364	1.21%	34,873	35,237	1.03%
24	Caserta	359	1.19%	46,939	47,298	0.76%
25	Lecce	357	1.18%	50,677	51,034	0.70%
26	Bolzano/Bozen	337	1.12%	39,570	39,907	0.84%
27	Cuneo	296	0.98%	39,334	39,630	0.75%
28	Trento	293	0.97%	35,763	36,056	0.81%
29	Como	276	0.91%	40,364	40,640	0.68%
30	Arezzo	263	0.87%	24,541	24,804	1.06%
31	Udine	260	0.86%	34,133	34,393	0.76%
32	Pesaro e Urbino	255	0.85%	27,036	27,291	0.93%
33	Pisa	238	0.79%	31,510	31,748	0.75%
34	Parma	237	0.79%	32,710	32,947	0.72%
35	Latina	234	0.78%	35,017	35,251	0.66%
36	Ancona	232	0.77%	32,126	32,358	0.72%
37	Forlì-Cesena	231	0.77%	28,860	29,091	0.79%
38	Prato	227	0.75%	26,122	26,349	0.86%
39	Lucca	224	0.74%	30,668	30,892	0.73%
40	Ravenna	209	0.69%	25,785	25,994	0.80%
41	Sassari	209	0.69%	31,558	31,767	0.66%
42	Macerata	207	0.69%	24,250	24,457	0.85%
43	Rimini	205	0.68%	31,376	31,581	0.65%
44	Cagliari	204	0.68%	30,671	30,875	0.66%
45	Teramo	201	0.67%	21,348	21,549	0.93%
46	Chieti	200	0.66%	23,797	23,997	0.83%
47	Frosinone	191	0.63%	28,753	28,944	0.66%
48	Pescara	190	0.63%	25,000	25,190	0.75%
49	Barletta-Andria-Trani	189	0.63%	23,449	23,638	0.80%
50	Alessandria	186	0.62%	25,409	25,595	0.73%
51	Mantova	185	0.61%	25,324	25,509	0.73%
52	Taranto	178	0.59%	28,346	28,524	0.62%
53	Avellino	177	0.59%	24,396	24,573	0.72%

RANK	PROVINCES	HGF		NR. OTHER FIRMS	NR. TOTAL FIRMS	% HGF ON TOTAL FIRMS
		NR. HGF	% OF TOTAL ITALIAN HGFS			
54	Pordenone	175	0.58%	18,823	18,998	0.92%
55	Messina	171	0.57%	35,846	36,017	0.47%
56	Lecco	170	0.56%	22,777	22,947	0.74%
57	Cremona	167	0.55%	20,788	20,955	0.80%
58	Cosenza	167	0.55%	38,584	38,751	0.43%
59	Foggia	166	0.55%	32,600	32,766	0.51%
60	Livorno	165	0.55%	22,872	23,037	0.72%
61	Pistoia	152	0.50%	21,800	21,952	0.69%
62	Piacenza	148	0.49%	19,379	19,527	0.76%
63	Potenza	138	0.46%	20,789	20,927	0.66%
64	Pavia	138	0.46%	32,877	33,015	0.42%
65	Novara	132	0.44%	22,857	22,989	0.57%
66	Siena	129	0.43%	19,556	19,685	0.66%
67	Ragusa	128	0.42%	18,519	18,647	0.69%
68	Trapani	125	0.41%	23,138	23,263	0.54%
69	Siracusa	121	0.40%	19,469	19,590	0.62%
70	Brindisi	119	0.39%	21,331	21,450	0.55%
71	Reggio di Calabria	115	0.38%	27,255	27,370	0.42%
72	Fermo	114	0.38%	14,096	14,210	0.80%
73	Catanzaro	111	0.37%	20,195	20,306	0.55%
74	Massa-Carrara	108	0.36%	14,183	14,291	0.76%
75	L'Aquila	106	0.35%	19,030	19,136	0.55%
76	Agrigento	106	0.35%	20,829	20,935	0.51%
77	Benevento	104	0.34%	16,722	16,826	0.62%
78	Ferrara	101	0.33%	20,950	21,051	0.48%
79	Rovigo	98	0.32%	14,194	14,292	0.69%
80	Ascoli Piceno	93	0.31%	15,627	15,720	0.59%
81	Trieste	92	0.30%	13,552	13,644	0.67%
82	La Spezia	92	0.30%	14,819	14,911	0.62%
83	Caltanissetta	90	0.30%	12,245	12,335	0.73%
84	Campobasso	90	0.30%	13,126	13,216	0.68%
85	Viterbo	90	0.30%	19,330	19,420	0.46%
86	Sondrio	78	0.26%	11,562	11,640	0.67%
87	Terni	74	0.25%	14,454	14,528	0.51%
88	Biella	73	0.24%	11,173	11,246	0.65%
89	Matera	71	0.24%	10,907	10,978	0.65%
90	Lodi	71	0.24%	11,883	11,954	0.59%
91	Savona	71	0.24%	20,252	20,323	0.35%
92	Belluno	69	0.23%	11,984	12,053	0.57%
93	Asti	66	0.22%	13,052	13,118	0.50%
94	Grosseto	65	0.22%	15,412	15,477	0.42%
95	Sud Sardegna	64	0.21%	15,047	15,111	0.42%
96	Gorizia	59	0.20%	7,239	7,298	0.81%

RANK	PROVINCES	HGF		NR. OTHER FIRMS	NR. TOTAL FIRMS	% HGF ON TOTAL FIRMS
		NR. HGF	% OF TOTAL ITALIAN HGFS			
97	Vercelli	54	0.18%	9,713	9,767	0.55%
98	Valle d'Aosta/ Vallée d'Aoste	52	0.17%	9,227	9,279	0.56%
99	Imperia	52	0.17%	14,425	14,477	0.36%
100	Verbano-Cusio-Ossola	51	0.17%	10,007	10,058	0.51%
101	Nuoro	44	0.15%	11,490	11,534	0.38%
102	Crotone	43	0.14%	8,195	8,238	0.52%
103	Isernia	41	0.14%	5,558	5,599	0.73%
104	Oristano	37	0.12%	8,039	8,076	0.46%
105	Enna	33	0.11%	7,601	7,634	0.43%
106	Vibo Valentia	33	0.11%	8,376	8,409	0.39%
107	Rieti	32	0.11%	8,004	8,036	0.40%
	ITALY	**30,171**	**100.00%**	**4,072,199**	**4,102,370**	**0.74%**

N.B. The total firms (and the residual "other firms") corresponds to manufacturing and services firms of ASIA register.

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

In the following two tables the top-3 sectors (2-digit Nace Rev.2) are identified by ranking the sectors j based on the local prevalence of HGFs (i.e. for each province i the share of HGF in sector j on total firms of the same sector j) divided by the corresponding national prevalence for that same sector j. Analytically:

$$\frac{\frac{HGF_{ij}}{tot_{ij}}}{\frac{HGF_{ITAj}}{tot_{ITAj}}}$$

Figure A7: Top-3 sectors with highest concentration of HGF-M for each Italian province

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Torino	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	30-fabbricazione di altri mezzi di trasporto	29-fabbricazione di autoveicoli, rimorchi e semirimorchi
Vercelli	20-fabbricazione di prodotti chimici	17-fabbricazione di carta e di prodotti di carta	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche
Novara	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	10-industrie alimentari
Cuneo	17-fabbricazione di carta e di prodotti di carta	15-fabbricazione di articoli in pelle e simili	11-industria delle bevande
Asti	11-industria delle bevande	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature	24-metallurgia
Alessandria	32-altre industrie manifatturiere	17-fabbricazione di carta e di prodotti di carta	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Valle d'Aosta/Vallée d'Aoste	24-metallurgia	28-fabbricazione di macchinari ed apparecchiature n.c.a.	32-altre industrie manifatturiere
Imperia	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	31-fabbricazione di mobili	25-fabbricazione di prodotti in metallo (esclusi macchinari e attrezzature)
Savona	28-fabbricazione di macchinari ed apparecchiature n.c.a.	30-fabbricazione di altri mezzi di trasporto	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche
Genova	11-industria delle bevande	20-fabbricazione di prodotti chimici	
La Spezia	24-metallurgia	20-fabbricazione di prodotti chimici	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi
Varese	11-industria delle bevande	15-fabbricazione di articoli in pelle e simili	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia
Como	17-fabbricazione di carta e di prodotti di carta	31-fabbricazione di mobili	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia
Sondrio	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	30-fabbricazione di altri mezzi di trasporto	32-altre industrie manifatturiere
Milano	11-industria delle bevande	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature	18-stampa e riproduzione di supporti registrati
Bergamo	32-altre industrie manifatturiere	18-stampa e riproduzione di supporti registrati	23-fabbricazione di altri prodotti della lavorazione di minerali non metalliferi
Brescia	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia
Pavia	11-industria delle bevande	17-fabbricazione di carta e di prodotti di carta	20-fabbricazione di prodotti chimici
Cremona	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	10-industrie alimentari	24-metallurgia
Mantova	24-metallurgia	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio	10-industrie alimentari
Bolzano/Bozen	10-industrie alimentari	32-altre industrie manifatturiere	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche
Trento	15-fabbricazione di articoli in pelle e simili	17-fabbricazione di carta e di prodotti di carta	22-fabbricazione di articoli in gomma e materie plastiche
Verona	10-industrie alimentari	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia
Vicenza	32-altre industrie manifatturiere	13-industrie tessili	11-industria delle bevande

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Belluno	32-altre industrie manifatturiere	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi
Treviso	12-industria del tabacco	11-industria delle bevande	32-altre industrie manifatturiere
Venezia	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	15-fabbricazione di articoli in pelle e simili	10-industrie alimentari
Padova	18-stampa e riproduzione di supporti registrati	15-fabbricazione di articoli in pelle e simili	24-metallurgia
Rovigo	17-fabbricazione di carta e di prodotti di carta	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi	22-fabbricazione di articoli in gomma e materie plastiche
Udine	15-fabbricazione di articoli in pelle e simili	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	17-fabbricazione di carta e di prodotti di carta
Gorizia	17-fabbricazione di carta e di prodotti di carta	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia	10-industrie alimentari
Trieste	11-industria delle bevande	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	31-fabbricazione di mobili
Piacenza	10-industrie alimentari	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio	20-fabbricazione di prodotti chimici
Parma	11-industria delle bevande	23-fabbricazione di altri prodotti della lavorazione di minerali non metalliferi	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche
Reggio nell'Emilia	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	24-metallurgia	11-industria delle bevande
Modena	23-fabbricazione di altri prodotti della lavorazione di minerali non metalliferi	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi
Bologna	12-industria del tabacco	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi	17-fabbricazione di carta e di prodotti di carta
Ferrara	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio	22-fabbricazione di articoli in gomma e materie plastiche	29-fabbricazione di autoveicoli, rimorchi e semirimorchi
Ravenna	11-industria delle bevande	24-metallurgia	20-fabbricazione di prodotti chimici
Forlì-Cesena	28-fabbricazione di macchinari ed apparecchiature n.c.a.	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Pesaro e Urbino	31-fabbricazione di mobili	17-fabbricazione di carta e di prodotti di carta	22-fabbricazione di articoli in gomma e materie plastiche
Ancona	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	18-stampa e riproduzione di supporti registrati	22-fabbricazione di articoli in gomma e materie plastiche
Macerata	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi	31-fabbricazione di mobili	13-industrie tessili
Ascoli Piceno	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	18-stampa e riproduzione di supporti registrati	24-metallurgia
Massa-Carrara	17-fabbricazione di carta e di prodotti di carta	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature	24-metallurgia
Lucca	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche
Pistoia	30-fabbricazione di altri mezzi di trasporto	18-stampa e riproduzione di supporti registrati	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio
Firenze	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	13-industrie tessili
Livorno	17-fabbricazione di carta e di prodotti di carta	20-fabbricazione di prodotti chimici	28-fabbricazione di macchinari ed apparecchiature n.c.a.
Pisa	13-industrie tessili	24-metallurgia	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature
Arezzo	32-altre industrie manifatturiere	22-fabbricazione di articoli in gomma e materie plastiche	20-fabbricazione di prodotti chimici
Siena	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	22-fabbricazione di articoli in gomma e materie plastiche
Grosseto	28-fabbricazione di macchinari ed apparecchiature n.c.a.	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia	15-fabbricazione di articoli in pelle e simili
Perugia	18-stampa e riproduzione di supporti registrati	28-fabbricazione di macchinari ed apparecchiature n.c.a.	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio
Terni	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	30-fabbricazione di altri mezzi di trasporto	13-industrie tessili
Viterbo	17-fabbricazione di carta e di prodotti di carta	22-fabbricazione di articoli in gomma e materie plastiche	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio
Rieti	18-stampa e riproduzione di supporti registrati	30-fabbricazione di altri mezzi di trasporto	13-industrie tessili

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Roma	22-fabbricazione di articoli in gomma e materie plastiche	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature
Latina	24-metallurgia	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	11-industria delle bevande
Frosinone	11-industria delle bevande	30-fabbricazione di altri mezzi di trasporto	17-fabbricazione di carta e di prodotti di carta
Caserta	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	28-fabbricazione di macchinari ed apparecchiature n.c.a.
Benevento	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	23-fabbricazione di altri prodotti della lavorazione di minerali non metalliferi	28-fabbricazione di macchinari ed apparecchiature n.c.a.
Napoli	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature	15-fabbricazione di articoli in pelle e simili	20-fabbricazione di prodotti chimici
Avellino	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi	18-stampa e riproduzione di supporti registrati	32-altre industrie manifatturiere
Salerno	18-stampa e riproduzione di supporti registrati	28-fabbricazione di macchinari ed apparecchiature n.c.a.	10-industrie alimentari
L'Aquila	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	22-fabbricazione di articoli in gomma e materie plastiche	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia
Teramo	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	31-fabbricazione di mobili
Pescara	20-fabbricazione di prodotti chimici	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	31-fabbricazione di mobili
Chieti	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi
Campobasso	18-stampa e riproduzione di supporti registrati	24-metallurgia	17-fabbricazione di carta e di prodotti di carta
Foggia	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio	31-fabbricazione di mobili
Bari	11-industria delle bevande	31-fabbricazione di mobili	28-fabbricazione di macchinari ed apparecchiature n.c.a.
Taranto	15-fabbricazione di articoli in pelle e simili	13-industrie tessili	22-fabbricazione di articoli in gomma e materie plastiche
Brindisi	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	28-fabbricazione di macchinari ed apparecchiature n.c.a.	11-industria delle bevande
Lecce	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia	24-metallurgia	15-fabbricazione di articoli in pelle e simili

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Potenza	25-fabbricazione di prodotti in metallo (esclusi macchinari e attrezzature)	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature
Matera	15-fabbricazione di articoli in pelle e simili	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche	22-fabbricazione di articoli in gomma e materie plastiche
Cosenza	30-fabbricazione di altri mezzi di trasporto	11-industria delle bevande	23-fabbricazione di altri prodotti della lavorazione di minerali non metalliferi
Catanzaro	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche	28-fabbricazione di macchinari ed apparecchiature n.c.a.
Reggio Calabria	13-industrie tessili	28-fabbricazione di macchinari ed apparecchiature n.c.a.	24-metallurgia
Trapani	24-metallurgia	28-fabbricazione di macchinari ed apparecchiature n.c.a.	
Palermo	30-fabbricazione di altri mezzi di trasporto	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	28-fabbricazione di macchinari ed apparecchiature n.c.a.
Messina	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	14-confezione di articoli di abbigliamento; confezione di articoli in pelle e pelliccia
Agrigento	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	20-fabbricazione di prodotti chimici	28-fabbricazione di macchinari ed apparecchiature n.c.a.
Caltanissetta	28-fabbricazione di macchinari ed apparecchiature n.c.a.	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche	20-fabbricazione di prodotti chimici
Enna	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	28-fabbricazione di macchinari ed apparecchiature n.c.a.	
Catania	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche	18-stampa e riproduzione di supporti registrati	28-fabbricazione di macchinari ed apparecchiature n.c.a.
Ragusa	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche	31-fabbricazione di mobili	10-industrie alimentari
Siracusa	19-fabbricazione di coke e prodotti derivanti dalla raffinazione del petrolio	22-fabbricazione di articoli in gomma e materie plastiche	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche
Sassari	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi	17-fabbricazione di carta e di prodotti di carta	22-fabbricazione di articoli in gomma e materie plastiche
Nuoro	28-fabbricazione di macchinari ed apparecchiature n.c.a.	22-fabbricazione di articoli in gomma e materie plastiche	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature
Cagliari	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	15-fabbricazione di articoli in pelle e simili	22-fabbricazione di articoli in gomma e materie plastiche

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Pordenone	11-industria delle bevande	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi	31-fabbricazione di mobili
Isernia	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	18-stampa e riproduzione di supporti registrati
Oristano	23-fabbricazione di altri prodotti della lavorazione di minerali non metalliferi	10-industrie alimentari	
Biella	13-industrie tessili	17-fabbricazione di carta e di prodotti di carta	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi
Lecco	11-industria delle bevande	24-metallurgia	30-fabbricazione di altri mezzi di trasporto
Lodi	18-stampa e riproduzione di supporti registrati	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio	10-industrie alimentari
Rimini	11-industria delle bevande	30-fabbricazione di altri mezzi di trasporto	23-fabbricazione di altri prodotti della lavorazione di minerali non metalliferi
Prato	30-fabbricazione di altri mezzi di trasporto	18-stampa e riproduzione di supporti registrati	13-industrie tessili
Crotone	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature	22-fabbricazione di articoli in gomma e materie plastiche	10-industrie alimentari
Vibo Valentia	20-fabbricazione di prodotti chimici	31-fabbricazione di mobili	16-industria del legno e dei prodotti in legno e sughero (esclusi i mobili); fabbricazione di articoli in paglia e materiali da intreccio
Verbano-Cusio-Ossola	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi	13-industrie tessili	32-altre industrie manifatturiere
Monza e della Brianza	21-fabbricazione di prodotti farmaceutici di base e di preparati farmaceutici	10-industrie alimentari	29-fabbricazione di autoveicoli, rimorchi e semirimorchi
Fermo	20-fabbricazione di prodotti chimici	27-fabbricazione di apparecchiature elettriche ed apparecchiature per uso domestico non elettriche	26-fabbricazione di computer e prodotti di elettronica e ottica; apparecchi elettromedicali, apparecchi di misurazione e di orologi
Barletta-Andria-Trani	29-fabbricazione di autoveicoli, rimorchi e semirimorchi	11-industria delle bevande	18-stampa e riproduzione di supporti registrati
Sud Sardegna	30-fabbricazione di altri mezzi di trasporto	33-riparazione, manutenzione ed installazione di macchine ed apparecchiature	

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Figure A8: Top-3 sectors with highest concentration of HGF-S for each Italian province

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Torino	51-trasporto aereo	91-attività di biblioteche, archivi, musei ed altre attività culturali	95-riparazione di computer e di beni per uso personale e per la casa
Vercelli	61-telecomunicazioni	70-attività di direzione aziendale e di consulenza gestionale	88-assistenza sociale non residenziale
Novara	60-attività di programmazione e trasmissione	58-attività editoriali	72-ricerca scientifica e sviluppo
Cuneo	92-attività riguardanti le lotterie, le scommesse, le case da gioco	60-attività di programmazione e trasmissione	90-attività creative, artistiche e di intrattenimento
Asti	61-telecomunicazioni	69-attività legali e contabilità	80-servizi di vigilanza e investigazione
Alessandria	61-telecomunicazioni	52-magazzinaggio e attività di supporto ai trasporti	45-commercio all'ingrosso e al dettaglio e riparazione di autoveicoli e motocicli
Valle d'Aosta/Vallée d'Aoste	90-attività creative, artistiche e di intrattenimento	72-ricerca scientifica e sviluppo	45-commercio all'ingrosso e al dettaglio e riparazione di autoveicoli e motocicli
Imperia	90-attività creative, artistiche e di intrattenimento	95-riparazione di computer e di beni per uso personale e per la casa	88-assistenza sociale non residenziale
Savona	80-servizi di vigilanza e investigazione	90-attività creative, artistiche e di intrattenimento	69-attività legali e contabilità
Genova	91-attività di biblioteche, archivi, musei ed altre attività culturali	50-trasporto marittimo e per vie d'acqua	52-magazzinaggio e attività di supporto ai trasporti
La Spezia	74-altre attività professionali, scientifiche e tecniche	80-servizi di vigilanza e investigazione	88-assistenza sociale non residenziale
Varese	95-riparazione di computer e di beni per uso personale e per la casa	75-servizi veterinari	90-attività creative, artistiche e di intrattenimento
Como	72-ricerca scientifica e sviluppo	92-attività riguardanti le lotterie, le scommesse, le case da gioco	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse
Sondrio	86-assistenza sanitaria	80-servizi di vigilanza e investigazione	88-assistenza sociale non residenziale
Milano	51-trasporto aereo	75-servizi veterinari	73-pubblicità e ricerche di mercato
Bergamo	95-riparazione di computer e di beni per uso personale e per la casa	52-magazzinaggio e attività di supporto ai trasporti	58-attività editoriali
Brescia	75-servizi veterinari	90-attività creative, artistiche e di intrattenimento	78-attività di ricerca, selezione, fornitura di personale
Pavia	90-attività creative, artistiche e di intrattenimento	72-ricerca scientifica e sviluppo	88-assistenza sociale non residenziale
Cremona	80-servizi di vigilanza e investigazione	95-riparazione di computer e di beni per uso personale e per la casa	72-ricerca scientifica e sviluppo
Mantova	78-attività di ricerca, selezione, fornitura di personale	61-telecomunicazioni	69-attività legali e contabilità
Bolzano/Bozen	58-attività editoriali	69-attività legali e contabilità	72-ricerca scientifica e sviluppo

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Trento	63-attività dei servizi d'informazione e altri servizi informatici	77-attività di noleggio e leasing operativo	82-attività di supporto per le funzioni d'ufficio e altri servizi di supporto alle imprese
Verona	80-servizi di vigilanza e investigazione	77-attività di noleggio e leasing operativo	96-altre attività di servizi per la persona
Vicenza	92-attività riguardanti le lotterie, le scommesse, le case da gioco	58-attività editoriali	61-telecomunicazioni
Belluno	73-pubblicità e ricerche di mercato	61-telecomunicazioni	69-attività legali e contabilità
Treviso	73-pubblicità e ricerche di mercato	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	74-altre attività professionali, scientifiche e tecniche
Venezia	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	90-attività creative, artistiche e di intrattenimento	59-attività di produzione cinematografica, di video e di programmi televisivi, di registrazioni musicali e sonore
Padova	55-alloggio	95-riparazione di computer e di beni per uso personale e per la casa	90-attività creative, artistiche e di intrattenimento
Rovigo	95-riparazione di computer e di beni per uso personale e per la casa	69-attività legali e contabilità	74-altre attività professionali, scientifiche e tecniche
Udine	91-attività di biblioteche, archivi, musei ed altre attività culturali	78-attività di ricerca, selezione, fornitura di personale	69-attività legali e contabilità
Gorizia	88-assistenza sociale non residenziale	80-servizi di vigilanza e investigazione	74-altre attività professionali, scientifiche e tecniche
Trieste	68-attività immobiliari	50-trasporto marittimo e per vie d'acqua	93-attività sportive, di intrattenimento e di divertimento
Piacenza	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	77-attività di noleggio e leasing operativo	90-attività creative, artistiche e di intrattenimento
Parma	53-servizi postali e attività di corriere	87-servizi di assistenza sociale residenziale	80-servizi di vigilanza e investigazione
Reggio nell'Emilia	69-attività legali e contabilità	77-attività di noleggio e leasing operativo	72-ricerca scientifica e sviluppo
Modena	78-attività di ricerca, selezione, fornitura di personale	80-servizi di vigilanza e investigazione	87-servizi di assistenza sociale residenziale
Bologna	91-attività di biblioteche, archivi, musei ed altre attività culturali	53-servizi postali e attività di corriere	87-servizi di assistenza sociale residenziale
Ferrara	68-attività immobiliari	71-attività degli studi di architettura e d'ingegneria; collaudi ed analisi tecniche	63-attività dei servizi d'informazione e altri servizi informatici
Ravenna	92-attività riguardanti le lotterie, le scommesse, le case da gioco	78-attività di ricerca, selezione, fornitura di personale	87-servizi di assistenza sociale residenziale
Forlì-Cesena	53-servizi postali e attività di corriere	80-servizi di vigilanza e investigazione	55-alloggio

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Pesaro e Urbino	92-attività riguardanti le lotterie, le scommesse, le case da gioco	80-servizi di vigilanza e investigazione	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse
Ancona	61-telecomunicazioni	71-attività degli studi di architettura e d'ingegneria; collaudi ed analisi tecniche	73-pubblicità e ricerche di mercato
Macerata	85-istruzione	61-telecomunicazioni	69-attività legali e contabilità
Ascoli Piceno	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	59-attività di produzione cinematografica, di video e di programmi televisivi, di registrazioni musicali e sonore	45-commercio all'ingrosso e al dettaglio e riparazione di autoveicoli e motocicli
Massa-Carrara	60-attività di programmazione e trasmissione	86-assistenza sanitaria	95-riparazione di computer e di beni per uso personale e per la casa
Lucca	53-servizi postali e attività di corriere	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	61-telecomunicazioni
Pistoia	53-servizi postali e attività di corriere	87-servizi di assistenza sociale residenziale	61-telecomunicazioni
Firenze	80-servizi di vigilanza e investigazione	87-servizi di assistenza sociale residenziale	53-servizi postali e attività di corriere
Livorno	50-trasporto marittimo e per vie d'acqua	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	63-attività dei servizi d'informazione e altri servizi informatici
Pisa	69-attività legali e contabilità	72-ricerca scientifica e sviluppo	63-attività dei servizi d'informazione e altri servizi informatici
Arezzo	73-pubblicità e ricerche di mercato	90-attività creative, artistiche e di intrattenimento	69-attività legali e contabilità
Siena	72-ricerca scientifica e sviluppo	77-attività di noleggio e leasing operativo	90-attività creative, artistiche e di intrattenimento
Grosseto	60-attività di programmazione e trasmissione	53-servizi postali e attività di corriere	71-attività degli studi di architettura e d'ingegneria; collaudi ed analisi tecniche
Perugia	60-attività di programmazione e trasmissione	78-attività di ricerca, selezione, fornitura di personale	87-servizi di assistenza sociale residenziale
Terni	91-attività di biblioteche, archivi, musei ed altre attività culturali	68-attività immobiliari	93-attività sportive, di intrattenimento e di divertimento
Viterbo	91-attività di biblioteche, archivi, musei ed altre attività culturali	87-servizi di assistenza sociale residenziale	58-attività editoriali
Rieti	61-telecomunicazioni	88-assistenza sociale non residenziale	77-attività di noleggio e leasing operativo
Roma	51-trasporto aereo	78-attività di ricerca, selezione, fornitura di personale	80-servizi di vigilanza e investigazione
Latina	91-attività di biblioteche, archivi, musei ed altre attività culturali	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	87-servizi di assistenza sociale residenziale

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Frosinone	81-attività di servizi per edifici e paesaggio	49-trasporto terrestre e trasporto mediante condotte	90-attività creative, artistiche e di intrattenimento
Caserta	80-servizi di vigilanza e investigazione	87-servizi di assistenza sociale residenziale	85-istruzione
Benevento	91-attività di biblioteche, archivi, musei ed altre attività culturali	73-pubblicità e ricerche di mercato	90-attività creative, artistiche e di intrattenimento
Napoli	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	75-servizi veterinari	50-trasporto marittimo e per vie d'acqua
Avellino	60-attività di programmazione e trasmissione	80-servizi di vigilanza e investigazione	87-servizi di assistenza sociale residenziale
Salerno	85-istruzione	53-servizi postali e attività di corriere	51-trasporto aereo
L'Aquila	80-servizi di vigilanza e investigazione	87-servizi di assistenza sociale residenziale	77-attività di noleggio e leasing operativo
Teramo	60-attività di programmazione e trasmissione	58-attività editoriali	68-attività immobiliari
Pescara	92-attività riguardanti le lotterie, le scommesse, le case da gioco	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	55-alloggio
Chieti	87-servizi di assistenza sociale residenziale	78-attività di ricerca, selezione, fornitura di personale	53-servizi postali e attività di corriere
Campobasso	60-attività di programmazione e trasmissione	61-telecomunicazioni	88-assistenza sociale non residenziale
Foggia	85-istruzione	88-assistenza sociale non residenziale	80-servizi di vigilanza e investigazione
Bari	50-trasporto marittimo e per vie d'acqua	53-servizi postali e attività di corriere	80-servizi di vigilanza e investigazione
Taranto	53-servizi postali e attività di corriere	80-servizi di vigilanza e investigazione	87-servizi di assistenza sociale residenziale
Brindisi	92-attività riguardanti le lotterie, le scommesse, le case da gioco	72-ricerca scientifica e sviluppo	69-attività legali e contabilità
Lecce	75-servizi veterinari	91-attività di biblioteche, archivi, musei ed altre attività culturali	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse
Potenza	68-attività immobiliari	95-riparazione di computer e di beni per uso personale e per la casa	88-assistenza sociale non residenziale
Matera	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	95-riparazione di computer e di beni per uso personale e per la casa	81-attività di servizi per edifici e paesaggio
Cosenza	87-servizi di assistenza sociale residenziale	95-riparazione di computer e di beni per uso personale e per la casa	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Catanzaro	53-servizi postali e attività di corriere	87-servizi di assistenza sociale residenziale	95-riparazione di computer e di beni per uso personale e per la casa
Reggio Calabria	53-servizi postali e attività di corriere	92-attività riguardanti le lotterie, le scommesse, le case da gioco	87-servizi di assistenza sociale residenziale
Trapani	95-riparazione di computer e di beni per uso personale e per la casa	77-attività di noleggio e leasing operativo	93-attività sportive, di intrattenimento e di divertimento
Palermo	50-trasporto marittimo e per vie d'acqua	53-servizi postali e attività di corriere	85-istruzione
Messina	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	95-riparazione di computer e di beni per uso personale e per la casa	68-attività immobiliari
Agrigento	63-attività dei servizi d'informazione e altri servizi informatici	85-istruzione	87-servizi di assistenza sociale residenziale
Caltanissetta	85-istruzione	47-commercio al dettaglio (escluso quello di autoveicoli e di motocicli)	71-attività degli studi di architettura e d'ingegneria; collaudi ed analisi tecniche
Enna	85-istruzione	77-attività di noleggio e leasing operativo	82-attività di supporto per le funzioni d'ufficio e altri servizi di supporto alle imprese
Catania	58-attività editoriali	80-servizi di vigilanza e investigazione	60-attività di programmazione e trasmissione
Ragusa	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	60-attività di programmazione e trasmissione	87-servizi di assistenza sociale residenziale
Siracusa	61-telecomunicazioni	68-attività immobiliari	74-altre attività professionali, scientifiche e tecniche
Sassari	90-attività creative, artistiche e di intrattenimento	88-assistenza sociale non residenziale	81-attività di servizi per edifici e paesaggio
Nuoro	74-altre attività professionali, scientifiche e tecniche	86-assistenza sanitaria	77-attività di noleggio e leasing operativo
Cagliari	61-telecomunicazioni	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	91-attività di biblioteche, archivi, musei ed altre attività culturali
Pordenone	95-riparazione di computer e di beni per uso personale e per la casa	69-attività legali e contabilità	90-attività creative, artistiche e di intrattenimento
Isernia	82-attività di supporto per le funzioni d'ufficio e altri servizi di supporto alle imprese	72-ricerca scientifica e sviluppo	74-altre attività professionali, scientifiche e tecniche
Oristano	68-attività immobiliari	81-attività di servizi per edifici e paesaggio	86-assistenza sanitaria
Biella	95-riparazione di computer e di beni per uso personale e per la casa	77-attività di noleggio e leasing operativo	69-attività legali e contabilità
Lecco	69-attività legali e contabilità	77-attività di noleggio e leasing operativo	46-commercio all'ingrosso (escluso quello di autoveicoli e di motocicli)

PROVINCIA	1ST SECTOR	2ND SECTOR	3RD SECTOR
Lodi	75-servizi veterinari	69-attività legali e contabilità	82-attività di supporto per le funzioni d'ufficio e altri servizi di supporto alle imprese
Rimini	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	59-attività di produzione cinematografica, di video e di programmi televisivi, di registrazioni musicali e sonore	53-servizi postali e attività di corriere
Prato	80-servizi di vigilanza e investigazione	87-servizi di assistenza sociale residenziale	90-attività creative, artistiche e di intrattenimento
Crotone	50-trasporto marittimo e per vie d'acqua	81-attività di servizi per edifici e paesaggio	85-istruzione
Vibo Valentia	53-servizi postali e attività di corriere	82-attività di supporto per le funzioni d'ufficio e altri servizi di supporto alle imprese	88-assistenza sociale non residenziale
Verbano-Cusio-Ossola	88-assistenza sociale non residenziale	93-attività sportive, di intrattenimento e di divertimento	49-trasporto terrestre e trasporto mediante condotte
Monza e della Brianza	72-ricerca scientifica e sviluppo	88-assistenza sociale non residenziale	51-trasporto aereo
Fermo	63-attività dei servizi d'informazione e altri servizi informatici	93-attività sportive, di intrattenimento e di divertimento	86-assistenza sanitaria
Barletta-Andria-Trani	90-attività creative, artistiche e di intrattenimento	93-attività sportive, di intrattenimento e di divertimento	82-attività di supporto per le funzioni d'ufficio e altri servizi di supporto alle imprese
Sud Sardegna	79-attività dei servizi delle agenzie di viaggio, dei tour operator e servizi di prenotazione e attività connesse	88-assistenza sociale non residenziale	87-servizi di assistenza sociale residenziale

Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

APPENDIX 2
Innovation and export capabilities: an econometric analysis

In this Appendix we investigate more deeply the relationship between innovation and exporting explained in Figure 8. Specifically, through econometric analyses we test if this relationship is statistically significant. In doing so, we estimate the probability of firms being regular exporters depending on whether they hold patents, while controlling for several potential confounding factors. Since the dependent variable is binary, we use a probit model (Wooldridge 2010; pp. 453–459), as follows:

$$\text{Prob}(\text{EXP REGULAR} = 1)_i = \Phi(\beta_0 + \beta_1 \text{PAT}_i + \beta_2 \text{C}_i + \varepsilon_i)$$

where EXP REGULAR is a binary dependent variable taking value 1 if the firm is a regular exporter (exported in five or all six years in the 2017-22 period) and 0 = occasional exporter (exported between one and four years in the 2017-2022 period); PAT is the main (binary) independent variable valued 1 if the firm has patents. C is

a vector of control variables: Industry (2-digit Nace Rev.2 classification), Geography (Italian Regions NUTS-2), and Size class (category variable: 1 = small. 2 = medium. 3 = large) in the case of the regression on all firms. Φ is a standard normal cumulative distribution function. Finally, ε_i is the normally distributed random error with zero mean and constant variance $N(0.\sigma\text{^}2)$ that captures any other unknown factors. To know the effects of any explanatory variable on the response probability P(Y=1|x) we calculated the marginal effects (average marginal effects). The marginal effect indicates «the effect on conditional mean of Y of a change in one regressor, say, x_j» (Cameron & Trivedi, 2010; p. 343). The dataset refers to the universe of the firms (source: Istat frame Export and Moody's for data on patents) that exported in at least one year in the 2017-22 period.

Tab. A1 – The effect of Innovation on Export regularity
Dependent variable: EXP REGULAR

	ALL FIRMS	SMALL FIRMS	MEDIUM FIRMS	LARGE FIRMS
	(A)	(B)	(C)	(D)
PAT	0.253***	0.275***	0.110***	0.070***
	(0.006)	(0.007)	(0.008)	(0.014)
Industry	Y	Y	Y	Y
Geography	Y	Y	Y	Y
Size class	Y			
Obs.	81,170	71,377	8,443	1,213

The table displays average marginal effects. Standard errors in parentheses. *** p < 0.01. ** p < 0.05. * p < 0.1.

The results (Table A1) show that also when controlling for industry, size and geographical location the relationship between innovation and export capabilities is confirmed: firms holding patents have a 25.3% higher probability (marginal effect: 0.253, Column A) of being regular exporters than the other firms (i.e. not holding patents). By disentangling the analysis by size class (Column B,C, D), we find that this effect is more pronounced in small firms (the probability increases to 27.5%) than in medium (11.0%) and large firms (7.0%). However, in all cases the coefficients are statistically significant at 1% (p<0.01).

APPENDIX 3
The productivity premium of exporting firms

To estimate the productivity premium we use a log-linear model through Ordinary Least Square (OLS) regression. Analytically:

$$\ln \mathrm{LP}_i = \beta_0 + \beta_1 \mathrm{EXP} + \beta_2 \mathrm{C}_i + \varepsilon_i$$

where the dependent variable is the labour productivity in log terms (lnLP) of the firm i and EXP is the main independent variable corresponding to a dummy taking value 1 if the firm exports. We control for a series of firm's structural characteristics: Industry (nine sectors), Geography (regions NUTS-2), Size (number of employees), Age (the numbers of years since its establishment), Human capital (share of graduated employees in STEM disciplines), and Family (1 = if the firm is a family-owned firm). In addition, since digital and green innovation can affect labour productivity (dos Santos et al., 2025), we include other two binary variables: Digital

innovation (1 = if the firm invested in 4.0 technologies) and Green innovation (1 = if the firm invested in eco-innovation). All these control variables are included in vector C. The error term is εi. The dataset comes from a survey carried out by Centro Studi Guglielmo Tagliacarne-Unioncamere in 2023 on 2,000 manufacturing firms with a number of employees between 5 and 499.

Tab. A1 – The productivity premium of being an exporter

Dependent variable: *lnLP*		
	(A)	**(B)**
EXP	0.194***	0.166***
	(0.029)	(0.028)
Industry	Y	Y
Geography	Y	Y
Size	Y	Y
Age	Y	Y
Human capital	Y	Y
Family	Y	Y
Digital innovation		Y
Green innovation		Y
F-statistics	22.46**	23.68***
R2	0.260	0.283
Obs.	2,074	2,074

Standard errors in parentheses. *** p < 0.01. ** p < 0.05. * p < 0.1.

According to the results displayed in Table A2, we find that, controlling for structural characteristics, exporting firms have a higher labour productivity (productivity premium) of 19% compared to firms that do not export (Model A). When we control for digital and green innovation, the productivity premium is 16.6% (Model B). In both cases, the productivity premium is statistically significant at 1%.

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DESIGNING INDUSTRIAL POLICY: KEY QUESTIONS AND A POLICY MENU FOR POLICYMAKERS

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88 The views expressed in this chapter are the authors' alone and do not represent those of any of the institutions for which they work.
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ABSTRACT

In this chapter, the authors argue that rethinking Italian industrial policy requires more precise intellectual tools than those that have guided interventions over the last two decades. The chapter provides a practical framework to help policymakers design sophisticated industrial policies that reflect the country's complexity. Rather than prescribing which sectors to promote, the piece clarifies the key questions policymakers must answer to align interventions to their economic and societal/ strategic objectives, account for specific sectors' characteristics, and select suitable instruments for implementation. The chapter advances three claims. First, effective industrial policy starts from explicit objective-setting, distinguishing purely economic goals from wider strategic or societal aims. Second, policy design should rest on an in-depth analysis of the targeted sector, in particular of its value chain and institutional requirements for each stage of production. Third, the "national", "horizontal", and even "sectoral" frames are too coarse for Italy's heterogeneous economy: matching stages of production to each geography's capabilities can help diversify industrial policy to ensure it opens new frontiers of wealth creation across the country. Instrument choice should then reflect the capabilities to be built, the level of state capacity, and the conditionalities required when relying on private intermediaries, while remaining mindful of EU State Aid constraints. The chapter concludes by stressing the importance of rigorous monitoring and evaluation for constantly refining industrial policy interventions.

INTRODUCTION

This chapter offers a practical framework for policymakers aiming to design industrial policies. Governments that decide to support a specific sector face complex design choices. This framework does not suggest which sectors governments should promote, but it helps identify the key questions policymakers must answer to design industrial policies that align with the chosen sector's industrial needs and the government's objectives, and to deploy the most suitable tools.

The framework revolves around six questions.

1) What is the goal of the industrial policy being proposed?

2) Which stage of production within the chosen sector should the industrial policy target?

3) What are the best suited sources of funding and implementation channels?

4) Which policy instruments are best fit to achieve the objectives?

5) Does the intervention represent "state aid" under European regulations?

6) How will we know that the policy is having its desired effects?

1. STRATEGY DESIGN. WHAT IS THE GOAL OF THE PROPOSED INDUSTRIAL POLICY?

Governments may choose to intervene in markets and support specific industries for a variety of reasons (Criscuolo et al., 2022; Juhász, Lane, and Rodrik, 2023). In any case, they should clearly articulate the rationale for such interventions, which are typically driven by their posture (proactive or protective) and their ambition (economic goals or societal goals).

Figure 1.1 industrial policy priorities matrix

		POSTURE	
		Proactive	**Protective**
AMBITION	**Economic goal**	Increase productivity, growth, innovation, and (quality) employment, closing territorial inequalities	Preserve (quality) employment or competitive advantages
	Societal goal	Drive societal transformations (e.g., space race, green transition, pandemic response, armed conflicts)	Limit industrial dependency, achieve autonomy / resilience

Based on this simplified matrix, we identify at least four reasons to pursue a sectoral industrial policy. Note that these are not necessarily mutually exclusive and may reflect parallel competing priorities[89].

1. Inequality and economic decline → industrial policy to increase productivity, innovation, equitable growth, and (quality) employment

2. Strategic challenges or missions → industrial policy to address major societal goals (e.g., climate transition, health, digitalisation)

3. Geopolitical risks → industrial policy to achieve autonomy / resilience

4. Anaemic growth and international competition → industrial policy to protect / preserve (quality) employment and standards of living

Some of these objectives may at times be compatible but they often involve trade-offs along both axes. Avoiding industrial dependency on a certain sector can, at least in the short term, slow down the achievements of social goals. Importing solar panels from China, the cheapest and largest producer, is a faster way to reduce CO2 emissions in Europe than aiming to produce solar panels locally (McWilliams, Tagliapietra, Tasi 2024). Similarly, allocating resources to achieving a non-economic

89 Partially based on McNamara 2022, "The Politics of European industrial policy", and Di Carlo and Schmitz 2023, "Europe first? The rise of EU industrial policy promoting and protecting the single market."

goal such as the space race or healthcare provision can crowd out investments from other productive sectors, thus reducing GDP growth, at least in the short term.

Policymakers must be clear about their objectives, and realistic about the trade-offs they entail.

2. STRATEGIC POSITIONING. WHICH STAGE OF PRODUCTION WITHIN THE SECTOR SHOULD INDUSTRIAL POLICY TARGET?

The second question looks at strategic positioning. Industrial sectors are not monolithic. Their value chains are complex and often fragmented, with different companies and countries specialising in different stages of production (Breznitz 2020). In choosing a priority sector, policymakers must dig into the next level of detail and understand:

- **The constraints that the sector is facing** (e.g. cost or access to financial capital, lack of expertise and human capital, lack of scale, limited access to inputs or markets, lacking supporting infrastructure or regulatory environment, or other public goods).
- **Where public resources can best be used** to build or increase a comparative advantage in different parts of the sector or develop a new industry.

Different stages of production require different enabling factors and face specific constraints. Policymakers may wonder why such focus is necessary and whether instead it will limit their industrial policy ambitions. The reason lies in the micro-economics and network economics of industrial specialisation. Building a comparative advantage requires concentrating resources to reach scale and building the necessary ecosystems of skills to become better than others at certain processes. Distributing resources and efforts builds little scale and does not support the agglomeration of competences necessary to compete globally. Aiming for autarky is always a theoretical possibility, but the more a country leans towards autarky the more it trades off the benefits from other countries' specialisations (Ricardo 2015, 1817).

We leverage existing literature (Breznitz 2020) that suggests identifying four main stages of production, with concepts that are flexible enough to be applied coherently across a variety of industries and can thus help policymakers choose an industrial policy focus[90].

90 This section is explicitly based on the categories provided in Breznitz 2020. Although the original book focuses on innovation models, the concept of stages of production is generally insightful when discussing industrial policy targeting and flexible enough to apply across sectors.

Stage 1: New product invention. This is the stage most commonly associated with "innovation". It comprises the processes of fundamental discoveries that are turned into innovations and enter the market for the first time. This stage is fundamentally centred around new technologies or radically new ideas of how to use existing technologies to create new markets. This is the stage where knowledge at the technology frontier is generated.

Silicon Valley is the most prominent example, but other models exist which are not necessarily based on nimble start-ups but, for instance, on highly innovative corporates—often multilateral corporations (MNCs) —with significant R&D capacity. Either way, this stage demands and generates specific skills and employment. Given the focus on R&D, the skills required are those of highly educated and specialised talent. These people, often competing on a global scale, can demand high salaries. Stage 1 therefore generates high-quality and well-paid employment. On the flip side, however, the high specialisation of the tasks means the relative quantity of jobs created is low and so are the trickle-down employment effects on the surrounding economy. In other words, the few highly qualified people involved in these activities benefit greatly but the rest of the community is left out (if not worse off due to rising costs of living). The cases of San Francisco and Israel are telling of the inequalities that emerge in economies focused mostly on this stage of production and innovation.

Stage 2: Product design and creation. This is the stage where companies focus on turning a product idea into a proper product, which can be produced at scale and profitably. To be clear, this stage takes place across most advanced industries and independently of which type of company has come up with the idea in the first place—it can be a start-up or a corporate. Either way, companies often rely on other firms which specialise in "design, product development and production engineering" (Breznitz 2020) to turn the project into a reality. Taiwanese firms focused on this stage are perhaps the most prominent example, notably in the semiconductor industry. This second type of companies therefore do not necessarily "invent" anything but create their comparative advantage by innovating the way things can be made. As such, the skills they require and employment they generate is less niche, and broader, compared to Stage 1, spanning from engineering talent to graduates from other disciplines, to manufacturing labour (Breznitz 2005).

Stage 3: Product improvement. This is the stage usually associated with the concept of "incremental innovation" (Hall and Soskice 2001). Here companies focus on improving and redefining the critical components of a product, thus delivering incremental gains in productivity, efficacy, and utility. A prominent example is the continuous innovation that has powered the evolution of the car from its early forms (Fordism) through the latest generation of vehicles. Germany's auto industry and, more broadly, its highly productive SMEs (mittelstand) are a perfect example of this comparative advantage built in this stage. Similarly, the ecosystem of Italy's

SMEs historically focused on supplying moving components to the German automotive industry also fits in this category. In this model, companies do not focus on R&D, which is instead often shared and co-financed via public institutions or private consortia (see Fraunhofer institute). Another key example of this stage is the pure-foundry chips manufacturers that developed in Taiwan in the late 1980s. These companies did not participate in the design of chips but became the world's leading manufacturers of the technology, so much so that today the world depends on Taiwan (and some other Asian countries that followed the same model) for the production of advanced chips. The human capital needed and employment generated, thus, is more technical in nature and, again, spans a broader spectrum of education levels, as is true for most manufacturing activities.

Stage 4: Production and assembly. The final stage refers to the ultimate creation or assembly of products conceived and designed elsewhere. Comparative advantage here is built on constantly improving the price-quality ratio. Innovations in the systems of production and organisation allow for the incremental improvement or maintenance of high quality and low costs even as final products become increasingly complex and require assembling parts from an increasing number of component suppliers. The best contemporary example of this stage is China and, particularly, the area around Shenzhen (Breznitz 2020). Here, since the 1980s several companies have sprung up and co-located to create a dense network of materials and component suppliers. They focus on manufacturing a wide range of products for the world's largest brands (MNCs), following their specific and challenging requirements. Their advantage is built not on advanced R&D but on tight local supply chains and production efficiency, incrementally and constantly improved over time. Although originally low labour costs certainly contributed to the region's success, its resilience as the world's production capital speaks to the importance of the other institutional elements (Breznitz 2020). Predictably, this stage has much lower human capital sophistication requirements. In turn, it is labour intensive, thus generating significant employment opportunities, especially for those with less advanced skill sets.

Note of course that these stages should be thought of as "archetypal models". In reality, many industrial and innovation clusters may be at the intersection of some of them. However, typically the features of one of the stages are *prevalent* and it is important for policymakers to recognize them. This allows them to identify the institutions needed and the policy measures that are most appropriate to support such specialisation. The table below summarises the four stages and their

characteristics.

Table 2.1: Four archetypal stages of production

	1. New product invention	2.Product design and creation	3.Product Improvement	4.Production and Assembly
Description	R&D for discovering new technologies or creating new markets	Design, prototype development and production engineering	Improve, expand, and redefine a product or its components through incremental innovation	Final creation / delivery of goods and services
Type of skills and institutions needed	Highly qualified technical talent; VC or R&D funding; advanced higher education	Across skills spectrum; bank credit; university + technical and design schools	Across skills spectrum; banks + PE; university + technical schools; central/shared R&D capabilities	Non-advanced education; large capital investments; technical and basic education
Employment intensity and type	Low intensity, very high competence	Medium-high intensity, medium-high competence	Medium-high intensity, medium-high competence	High intensity; middle-low competence
Global example	Silicon Valley	Taiwan's electronics and semiconductors	Germany's auto industry + mittelstand; Taiwan's pure-play chips foundries	China's Shenzhen and India's IT Service Industry
Italian Example	Turin's diesel innovation community Emilia Romagna's Motor Valley	Riviera del Brenta shoe design Livenza Furniture	Brescia, Cuneo, Asti ICE automotive components	Prato textile district

Source: authors' elaborations based on Breznitz 2020.

Acknowledging this general structure has three fundamental implications for policymakers. First, it shows that there are different opportunities for building comparative advantage and that, even for developed economies, not all require advanced R&D and new product invention (Stage 1). Second, it stresses the importance of targeting industrial policies to the specific stage(s), not simply to a sector. Finally, it suggests that within one country and one sector, different regions might be better positioned to specialise at different stages.

Policymakers must therefore assess the capabilities of each country or region at every stage of production and determine where it is feasible (and needed) to develop a comparative advantage, as well as which enabling factors industrial policy should prioritize. We identify six elements that can help understand whether a region can excel at one (or more) stages:

1. Human capital availability: Each stage requires different types and quantity of human capital. Policymakers must evaluate whether the right workforce is

present and what changes to the education system must be promoted to supply it. Broadly speaking, as we move from Stage 1 to 4, the role of the highly educated and specialised workforce (post-graduate trained) decreases, while technical skills become more important. Education systems, comprising both purely academic education and "on-the-job" learning, should be developed on this basis. In the Italian context, policies should prioritise research universities, ITS, or technical schools depending on the stage of focus.

2. Financial capital availability: Public intervention is warranted when commercial capital is provided in insufficient quantity or at unsuitable terms / too high a cost. Different stages of development require distinct types of capital and financing models. For instance, in industries requiring significant R&D and early-stage product development (Stage 1), firms typically need non-traditional finance. Venture capital (VC) or highly subsidised government funding, such as grants or low-interest loans, can be necessary, especially during the initial stage where research and invention are crucial.

This is because Stage-1 activities often do not generate immediate profits to cover traditional credit repayments. Thus, they must be supported through financing tools that allow for equity participation and / or for the state to take on the early-stage risk. Stages 2 and 3 are more aligned with standard financing tools, such as corporate debt or equity. Small-mid cap private equity can also be relevant at these stages. Stage 4 is similar but is also more likely to require more complex project financing to enable investments in production facilities with the economies of scale that contribute to cost competitiveness.

3. Infrastructure and other necessary public goods: The competitiveness of a region in each sector and stage may be greatly advanced by the availability of specific public goods. The main example is physical infrastructure. Semiconductor foundries, for example, need access to large and reliable water supplies. For data centres, reliable electricity and connectivity connections are essential. Intangible public goods can be as important. Germany's and Taiwan's Stage-3 comparative advantage is also enabled by shared/public R&D institutes, which take on the research risk. These institutions act as an "intellectual infrastructure". The Fraunhofer Institute in Germany and ITRI in Taiwan pursue industry-relevant R&D and then license the discoveries to local companies, enabling an allocation of risk which allows more traditional companies to still innovate and maintain their Stage-3 comparative advantage.

4. Access to inputs: Regions must also be endowed with (or have comparatively cheap/easy access to) the key production inputs required at a certain stage. These differ vastly by stage and sector but governments should clearly identify them before embarking on targeted industrial policies. Importantly, while some input access is the result of natural endowments, it would be wrong to believe they are all always a given. Public policy can facilitate access through infrastructure projects, trade deals, and more. For example, Germany's export-driven growth in the two decades before 2020 was facilitated also by cheap natural gas imports from Russia—the result of

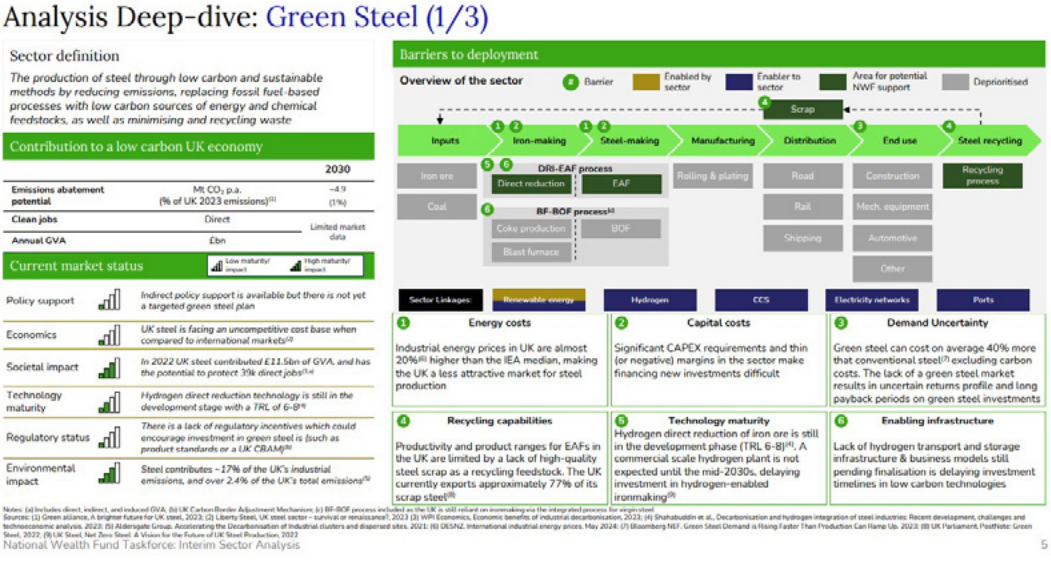
both infrastructure investments (Nord Stream) and bilateral trade agreements (Di Carlo, Hassel, Höpner 2022).

5. Access to markets: Equally important for creating comparative advantage is to ensure regions are well-positioned to sell the products they produce. As in point 3, this is a combination of natural endowments and policy outcome. To provide one example, one of the enabling factors of Israel's spectacular ICT-driven growth in the 1990s is explained by the country's strong linkages with US technology markets, which provided a large demand for the technologies produced in the country (Breznitz 2007). These links were both historical and policy driven.

6. Current distance from technological frontier: Finally, policymakers should look at the competitive landscape. They should understand whether in that stage within the target sector there are clear market-leading companies or countries and how advanced the technology or know-how they have in comparison with the best companies in the domestic region is. In other words, is it realistic for the region to achieve capabilities that are comparable to the best-in-class or is the gap too wide to fill? In some ways this evaluation might cover some of the aspects in points 1-5. However, a micro comparison of the best firm in the domestic economy versus the best global firm would be an insightful place to start.

To be sure, the stages of production and elements to analyse we introduced above should be considered a guiding framework, to be then adjusted for the specific case and information available. In practice, data or other constraints may mean that the analysis cannot cover thoroughly all the six elements above. Similarly, the archetypal stages of production we described can be turned into industry-specific steps in the value chain. As an example, Figure 2.2. shows how this type of approach was employed by the task force of the British National Wealth Fund.

Figure 2.1. An example of sectoral analysis by the Task Force of the UK National Wealth Fund



Source: Green Finance Institute 2025.

In summary, thus, once policymakers have decided to focus on a certain sector, designing the right industrial policies requires diagnosing the target industry, figuring out where the bottlenecks and opportunities lie along the stages of production, and intervening to build a comparative advantage. Growth and welfare creation opportunities lie in all the stages, but they might be very different across regions. Policymakers should fine-tune policies by region and by stage, subject to the strategic objectives of question 1.

3. METHOD OF IMPLEMENTATION. WHAT ARE THE RIGHT SOURCES OF FUNDING AND IMPLEMENTATION CHANNELS?

When designing an industrial policy, decision-makers need to determine the sources of funding and the implementation channels (Buti and Papakonstantinou 2022).

Source of funding: The funding can be mainly (or fully) public funding, mainly private funding, or a blend of private and public resources. In the case of instruments that leverage mainly private funding, these are typically catalysed by tax or other regulatory incentives (for example, tax credits on R&D or capital expenditure by firms). Finally, when the industrial policy instrument is based on a mix of direct public and private funding the role of public capital is typically to anchor/mobilise private investments, for example by providing equity, debt, or sovereign guarantees to a project. There are also instruments that do not require funding or that generate government revenues. These are typically more passive instruments such as tariffs or specific levies aimed at changing market behaviours (e.g., carbon tax schemes).

Implementation channel: Much of the debate on industrial policy focuses on the strategic objectives of these interventions. The choice of the implementation channel is, however, equally critical and often overlooked. Policymakers can look at three questions to choose which channel is most appropriate:

- **First: capabilities.** Should the public administration have in house, or could it realistically build in house, the full capabilities needed to manage directly the instrument, or could this be most effectively managed by a third party, such as companies or financial intermediaries?
- **Second: discretionality and flexibility.** Would the instrument benefit from some degree of discretionality in how it is applied (e.g., technology neutral tax credits or flexible loan structures) or should the policy be entirely prescriptive (e.g. technology prescriptive tax credits or pre-set financing solutions)? When flexibility is needed, can decisions be delegated to third parties (e.g., beneficiary companies, financial intermediaries)?
- **Third: timing.** What is the implementation channel that allows for the deployment of the tool within a timeframe that is consistent with the goals of the policy?

In light of these considerations, there are several channels that can be chosen:

1. Directly managed by public administration

Governments own the implementation of industrial policies but their level of direct responsibility in managing policies can differ. Public administrations are always responsible for monitoring performance, defining and adjusting budget allocations, as well as ensuring the correct application of the law through their departments and agencies. However, they may choose to adopt a more active or a more passive role in deploying specific policy tools. In some cases, there is no alternative to public administrations directly managing the instrument. Policy instruments based on taxes, levies (e.g., trade tariffs, fiscal incentives) or direct subsidies (e.g., consumer subsidies, regional development grants) should normally be managed directly by public authorities. Similarly, public procurement is by definition managed by public institutions. These tools are typically fast to deliver and can drive changes in behaviour among consumers and corporates (e.g., there is evidence that reducing the costs of electric vehicles increases demand). On the other hand, the risk of this approach is that governments could be overly rigid and prescriptive. Public administrations are best suited to implement policies with well-set, predetermined criteria (e.g., regions, sectors, or technologies that can receive a subsidy) rather than flexibly adapt their offer to market evolution (e.g., a state-supported VC fund can flexibility deploy capital using its own discretion in assessing potential investees).

For other instruments, however, policymakers can choose whether and how the implementation could be delegated to third parties. Policy instruments that require specialist financial skills (e.g., investment and financing) or industrial technological skills (e.g., human capital formation) are normally best delivered by intermediaries which already have these capabilities. For example, when providing credit guarantees to SMEs, public administrations set high-level criteria for the type of beneficiaries and the intended outcomes but delegate the deployment of the instrument to financial intermediaries (normally private or public banks), which will assess the creditworthiness and manage relationships with the borrowers.

2. Via public financial intermediaries

Policy instruments that involve investment or financing decisions (grants, loans, equity, guarantees) require specialist commercial and legal skills, independent judgement, and long-term horizons. In these cases, typically the most effective option is for governments to set high-level objectives and then delegate implementation to arms-length bodies that insulate investment decisions from political pressure and short-term priorities. Using intermediaries also facilitates the attraction and retention of people with specialist knowledge and a proven industrial or financial track record. The case of public venture capital policies in Europe, for instance, is one where governments have heavily relied on public intermediaries (Moretti 2024).

Policy instruments can be deployed via public financial institutions that can be national (such as Cassa Depositi e Prestiti, SACE, or Invitalia in Italy) or European (e.g., the European Investment Bank). The value of supranational institutions is the ability to support transnational projects that lack a national sponsor or funding body, such as cross-border high-speed train connections or cross-border energy grid interconnections.

3. Via private intermediaries

Policymakers can also decide to delegate the implementation of industrial policy tools to private intermediaries. These can be financial intermediaries or industrial intermediaries. In the case of private financial intermediaries, these can be specialised or generalist intermediaries. An example of tools managed by generalist intermediaries are SMEs support loans provided by commercial banks with capital provided by or guaranteed by a public institution. These interventions tend to be most effective as counter cyclical tools, such as in times of commercial credit contraction, but they are typically less tailored to drive innovation (new business model or technology). Specialised intermediaries (such as private equity or credit funds), instead, are most effective where the objective is to support more niche markets (innovative industries and technologies) through more sophisticated financial instruments. When properly designed, with full alignment of objectives and incentives (and appropriate conditionality, see box below), these intermediaries can be a powerful tool to create new markets and flexibly deploy capital.

Box 1. Conditionality in Industrial Policy

The concept of industrial policy inherently includes some form of conditionality (Bulfone et al. 2024). Public support is granted with the expectation that recipients will take specific actions in return. There are however two ways to look at conditionality (Mazzucato 2022, Mazzucato and Rodrik 2023).

In a traditional sense, conditionality means that public institutions set criteria for accessing public resources and ensure that with these resources firms do something they would not have done otherwise. For example, an export subsidy should lead to an export increase and R&D tax credit should result in more R&D intensity. Similarly, the definition of eligibility criteria for accessing public support is one of the most critical policy design elements as it requires balancing selectiveness, flexibility, and incentives to change firms' behaviour. For example, the KfW energy efficient refurbishment and construction programme in Germany provides loans to businesses to build or restore buildings. The higher the energy-efficiency of the building after the intervention, the better conditions are to repay the loan.

However, in recent years, policymakers have been encouraged to set higher standards for firms seeking access to public resources, requiring them to

demonstrate that their use of these resources provides "public value". While this concept is still evolving, three key questions guide its application:

- Does the policy push firms to pursue socially beneficial goals, such as net zero emissions or affordable access to essential products and services?
- Are risks and rewards fairly shared between public and private sectors? For example, "when companies benefit from public investments in the form of subsidies, guarantees, loans, bailouts, or procurement contracts, conditions can be attached to help shape innovation and direct growth so that it achieves the greatest public benefit" and that the risk assumed by the government is rewarded (Mazzucato 2022, p.3).
- Are conditions designed with an understanding of private intermediaries' business models ("informed conditionality")? For example, European governments investing in private VC funds negotiate specific terms for the governance of the funds and their use of capital (e.g., requirements to invest locally). These are typically balanced in light of the portfolio diversification and operational needs of standard VC funds. Failing to set conditions informed by the intermediaries' business models risks can lead to poor outcomes, like adverse selection, that undermine policy goals (Moretti 2024).

4. INDUSTRIAL POLICY INSTRUMENTS MENU. WHICH POLICY INSTRUMENTS ARE BEST FIT TO ACHIEVE THE OBJECTIVES?

This section presents a critical overview of the industrial policy tools available to public institutions. We offer a menu of nineteen instruments, grouped into ten categories, commonly used in Italy and across the EU. This classification aligns with existing literature (Evenett et al., 2024) and builds on the framework developed by Criscuolo et al. (2022).

For each instrument, we outline:

a) the conditions under which it is appropriate—or less appropriate—to use,
b) whether it is best suited to horizontal or vertical policy contexts,
c) whether it primarily targets supply, demand, or governance.

Table 4.1 below summarises this menu of tools, while Table A.1 in the annex provides concrete examples from Italy and other EU member states.

Effective industrial policies typically rely on a combination of instruments to influence market behaviours. Policymakers should not view this menu as a list from which to select a single tool, but rather as a guide to understanding the full set of options and identifying appropriate combinations. Because these instruments can

potentially distort markets, their use must be guided by a clear strategic rationale—as discussed in previous sections—and must comply with EU State aid rules, which are addressed in the next section.

Table 4.1. Industrial Policy instrument summary table

INSTRUMENT	DESCRIPTION	USE THIS WHEN	DO NOT USE THIS WHEN	BEST MANAGED BY	INSTRUMENT CHOICE	OPERATING MODEL
TRADE FINANCE						
Trade Finance	Insurance and/or working capital loans to firms to mitigate against trade-related risks	Firms' growth or access to critical inputs is constrained by clearly identified trade risks (political, currency, credit)	The domestic industry has a structural competitive gap vs peers	Public trade finance agencies	Horizontal	Supply (within)
FISCAL INCENTIVES						
R&D Tax Credits	Reduce the tax liability of firms for eligible investments or expenditures	Firms are underinvesting in R&D for experimental development or face structural lack of innovation	Direct funding is more effective for targeting narrowly defined R&D priorities Pre-commercial fundamental research is needed	Tax administrations	Horizontal (predominantly) or Vertical	Supply (within)
Capex Tax Credits		Firms' structure and size (i.e. SMEs) constrain their ability to invest and grow. Firms need to bridge a technology-driven competitiveness gap Firms face a mismatch between short term investment costs and societal goals (e.g. energy efficiency)	Specific sectors or technologies need targeted support	Tax administrations	Horizontal (predominantly) or Vertical	Supply (within)
GRANTS AND SUBSIDIES						
Grants for R&D	Provision of cash or in-kind equivalent to eligible firms	Supporting pre-commercial product development projects with the potential to lead to subsequent investments and revenue generation	Supporting basic research (which can take place outside firms)	Public implementing agency	Horizontal or Vertical	Supply (within)
Subsidies for Regional Development		Promoting economic activity in underdeveloped regions	Unclear path to commercial sustainability One off interventions with limited resources as they are unlikely to drive change at scale	Public implementing agency	Vertical	Supply (within)
Sectoral Subsidies		Supporting industries deemed strategically important for national economic development facing unfair external competition	Specific sectors or technologies need targeted support	Public implementing agency	Vertical	Supply (within)

INSTRUMENT	DESCRIPTION	USE THIS WHEN	DO NOT USE THIS WHEN	BEST MANAGED BY	INSTRUMENT CHOICE	OPERATING MODEL
Consumer Subsidies	Financial aid to reduce the price of goods and services to consumers	Consumers need incentives for behavioural and societal changes, complementing supply side instruments	The supply of targeted products is underdeveloped	Public trade finance agencies	Horizontal	Supply (within)
ACCESS TO CREDIT						
Debt	Offer credit to firms	Providing counter cyclical capital across firms in times of crisis, Anchoring strategic projects in capital intensive sectors Supporting investment in underdeveloped regions Drive societal goals by changing citizens and firms' behaviour	Firms or projects are not commercially sustainable	Financial intermediaries	Horizontal and vertical	Supply (within)
Credit Guarantees	Mitigate risk for financial intermediaries providing credit to firms			Financial intermediaries		Supply (within)
ACCESS TO EQUITY						
Direct Equity Investments	Capitalise firms, directly or via intermediaries	Equity in high externality projects is not provided by private sources notwithstanding valid commercial case (e.g. lack of strategic alignment) Anchor strategic assets with public participation	Difficult to articulate how a public participation would add value to the firm or the broader ecosystem Assets are distressed	Public Financial intermediaries	Vertical	Supply (within)
Indirect Equity Investments		Supporting Frontier investments that are higher risk for private finance Facilitating firms' access to a broader range of non-banking funding options by deepening and broadening local private equity markets	Firms can transition away from public support	Public Financial intermediaries	Vertical	Supply (within)
COORDINATION TOOLS						
FDI Attraction Offices	Provide investment facilitation advisory	Promoting investment opportunities to foreign firms. Need to improve access to inputs in key sectors. Tech transfer from foreign firms is highly beneficial for local firms.	Incompatible with strategy to support local industry.	Public trade finance agencies	Horizontal	Supply (within)
Technology Transfer Policies and Research-Industry Links Finance	Connect firms and research	Strong research and industrial capabilities but lack of alignment between Research Supply and Industry Demand	Goals and stage of research is misaligned with industry needs.	Public trade finance agencies	Horizontal	Supply (within)

INSTRUMENT	DESCRIPTION	USE THIS WHEN	DO NOT USE THIS WHEN	BEST MANAGED BY	INSTRUMENT CHOICE	OPERATING MODEL
FDI Screening	Public authority to authorise, set conditions for, or prohibit investments	Strong security or national competitiveness case against investments	Lack of clear evidence supporting "national security" arguments.	Public trade finance agencies	Horizontal	Supply (within)
PUBLIC PROCUREMENT						
Innovative Public Procurement	Procurement of pre-production or pre-scaling innovative solutions	Promotes and direct innovation at an early production stage	Private finance already supports innovative solutions.	Public administration	Vertical	Demand
PRICE ASSURANCE						
Price Assurance Mechanisms	Commitments to purchasing a product at a certain price on a fixed date	Stabilise nascent markets and facilitate long-term market maturity and investments	Products in structurally not competitive sectors	Public administration	Vertical	Supply (within)
LOCAL CONTENT						
Local Content Incentives	Incentivise local input production	Promoting the development of domestic supply chains.	Protect products where the country does not have a realistic path to commercial competitiveness Excessively increase costs for businesses. Highly distort trade and likely WTO litigation.	Public administration	Vertical	Supply (within)
HUMAN CAPITAL						
Upskill and Reskill Policies	Training to workers	Addressing skills gaps and preparing the workforce for future job demands.	Stand-alone measures without broader strategy	Public administration or private contractors	Horizontal	Supply (within)
Talent Attraction Policies	Attract the highest-skilled workers	Evidence of brain drain Lack of human capital		Public administration	Horizontal	Supply (within)

4.1. TRADE FINANCE

Trade policy is an exclusive competence of the European Union but governments can deploy financial instruments that make it easier for importers and exporters to transact[91]. These instruments provide firms with insurances and/or working capital loans to mitigate against specific trade-related risks (e.g., delayed payments, political risk, breach of contract, confirming bank risk, currency volatility, transfer and convertibility risks).

Trade finance instruments are horizontal tools best suited to promote firm growth in challenging markets. They are not designed to support specific sectors or technologies, nor to close competitiveness gaps. However, they are increasingly being used to help firms secure access to critical inputs, such as raw materials needed for the green transition[92].

These instruments are usually administered by dedicated public trade agencies or banks with the technical expertise to assess, price, and manage trade risks. Although they rely on public funding, they have historically incurred very low losses and require limited public administrative capacity, as they are delivered through specialised intermediaries. In Italy, SACE and SIMEST provide trade finance solutions.

4.2 FISCAL INCENTIVES

Governments can reduce the tax liability of firms by providing tax credits against certain costs (investments, expenditures, depreciations) or, more rarely, by exempting certain portions of profits from taxation (i.e., Italy's old patent box regime from 2014).

Fiscal incentives are typically designed as horizontal instruments, available to a wide range of firms whose investments or spending meet defined criteria. For example, in Italy, investments in eligible 4.0 or 5.0 assets can qualify for tax credits[93]. However, they can also take more vertical forms, targeting specific locations (e.g., Special Economic Zones in Southern Italy), sectors (e.g., creative industries), or technologies.

Tax credits are typically applied on R&D costs or Capital expenditure (CapEx).

- **R&D tax credits** aim to boost innovation-led productivity growth. Over the past two decades, OECD countries have increasingly relied on tax-based incentives to stimulate private investment in R&D. These instruments are most effective when firms across sectors and regions are systematically underinvesting in experimental development—for example, during early-stage product

91 Trade tariffs and quotas are critical industrial policy tools; however, they are not considered in this chapter as they are an exclusive EU competence.
92 See for example the UK's Critical Minerals Supply Finance by UKEF.
93 Tax credits based on firm size (e.g. SMEs) are considered horizontal under OECD classifications as they aim at improving the entire business environment.

development—or when structural barriers, such as firm size, limit innovation capacity. However, R&D tax credits tend to be less effective than direct funding tools—such as grants or concessional loans—when targeting specific innovation priorities or supporting early-stage, pre-commercial research (OECD, 2023).

- **Capex tax credits** are typically best used in three cases: (i) when firms' size or location constrain their ability to invest and grow (i.e. SMEs), (ii) when firms across sectors are facing a technology-driven competitiveness gap or a technological transformation; and (iii) when firms face a mismatch between short-term investment costs and societal goals (e.g. energy efficiency). Increasingly, Capex tax credits are subject to outcome conditions which require companies to achieve certain performance results to be eligible to benefit or continue benefiting from a tax incentive (Italy's Transition 5.0 sets thresholds of energy consumption reduction to access the credit) (OECD, 2022).

Fiscal incentives allow governments to deploy resources swiftly and at scale and are among the most widely used instruments in industrial policy, alongside grants and subsidies. They require some administrative and industrial capabilities to be designed and managed (e.g. disbursements, verifications) effectively. Tax credits can be designed with a broad or narrow focus, but beneficiary firms must always have substantial skin in the game and credits must be fully budgeted in advance.

4.3 GRANTS AND SUBSIDIES

Through Grants and Subsidies, governments provide cash or in-kind support to firms that meet certain eligibility criteria within the constraints of EU State aid rules (see next section). These instruments include:

- **R&D grants** for pre-commercial product development projects with the potential to lead to subsequent investments and revenue generation.
- **Subsidies for regional or sectoral development** partially cover CapEx or OpEx for firms operating in undeveloped regions or specific sectors (microprocessors, automotive, tourism). These are often combined with subsidised capital tools or fiscal incentives.[94]
- **Consumer subsidies** (demand side), which cover a part of the price of a product.

Supply-side subsidies can be used to enhance innovation-driven competitiveness (R&D Grants), or to address regional underdevelopment by supporting, for example, new industrial clusters. Sectoral subsidies may also have different objectives. They can support traditional sectors undergoing significant transformation (e.g. automotive), to build in-country industrial capacity (e.g. microprocessors), or drive societal transformation (e.g. renewable energy generation). While subsidies may appear as a simple and quick tool to deploy, effectively designing and implementing these instruments (i.e. eligibility criteria, maximum subsidy thresholds) requires significant administrative capacity and industrial expertise.

94 There is growing literature suggesting that sectoral subsidies can support the development of key industries when combined with policies that encourage cross-border technology transfer and learning-by-doing (Goldberg, Juhász, Lane et al, 2024).

Policymakers should design these instruments based on an in-depth understanding of the sectors and regions they aim to support. This should include understanding in what stage of production the targeted firms are, whether the beneficiaries have sufficient skin in the game, and what the path is to commercial sustainability of the target firms (i.e. once the subsidy expires).

Demand-side subsidies have become more common in recent years and can be used to quickly boost the demand of a product (e.g. electric vehicles). However, to be effective as an industrial policy tool they need to support products that are locally produced rather than imported, they need to affect goods where demand is sensitive to pricing, and they need to lead to further investments and cost reduction. The effects of such 'induced innovation' are only felt in the long run.[95]

4.4 ACCESS TO CREDIT

Governments can facilitate access to credit for firms either directly, by providing loans, or indirectly, by offering guarantees or capital to financial intermediaries such as banks, which then extend credit to firms.

- Debt, which is typically offered on slightly more favourable terms (or significantly more favourable concessional terms in case of State aid eligible tools) than those available from commercial banks (lower or adjustable interest rates, longer tenor grace periods, or repayment schedules, larger volumes) while meeting EU State aid rules.
- Credit Guarantees or on-lending to financial institutions incentivise the provision of credit to firms by reducing financial intermediaries' own risk exposure.
- Policymakers can activate access to credit tools with different objectives:
- To provide counter-cyclical capital to the private sector during crises, as seen during the COVID-19 pandemic or the Eurozone crisis of the 2010 - this is a horizontal instrument. To anchor large strategic projects and lower the cost of capital in innovative capital-intensive sectors (e.g. microprocessors, green hydrogen) or in established sectors undergoing transformation (e.g. automotive) - this is a vertical instrument.
- To support productivity and investments across firms in underdeveloped regions - this is a horizontal instrument provided at typically concessional terms and qualifies as State aid. [96]
- To advance societal goals by changing citizens and firms' behaviour with preferential access to credit (e.g. energy efficiency in construction)[97] - this is a horizontal instrument and likely requires concessional terms.

Debt instruments, including concessional ones, are however unlikely to be best suited to drive innovation, R&D, or early-stage product development.

95 The case of solar panels is a good example of how consumer subsidies can induce innovation in the longer term (Gerarden 2018).
96 For example, in the case of Italy's Contratti di Sviluppo managed by Invitalia.
97 Le Plan Climat, largely executed through BPIfrance, and Germany's KfW Energy Efficient Refurbishment and Construction Programs have been notable in advancing the green transition swiftly. See Mazzucato and Rodrik 2023.

Providing credit always necessitates deep market and credit risk experience. These instruments are most effectively administered by independent public financial institutions, which can evaluate each transaction individually and operate independently of government influence.

4.5 ACCESS TO EQUITY CAPITAL

Public institutions can promote industrial development with equity participations. They can serve three objectives:

- Supporting startups or innovative projects in the early stages of production with Venture Capital.
- Facilitating firms' access to a broader range of non-banking funding options by deepening and broadening local private equity markets. This in turn can help firms mobilise more private capital thanks to the signalling and anchoring effect of the public support.
- Give governments participation rights in assets considered strategic for national competitiveness or security.

Public investors should carefully articulate how a state-supported participation would add value to the firm and the broader ecosystem, and what the project's long-term financial sustainability outlook is. Public investors have historically not proven to be best suited to manage distressed assets (with limited exceptions in highly regulated cases like bank restructuring). Like the provision of credit, deploying equity capital requires significant market and financial capabilities and expertise. These instruments are most effectively administered by financial institutions operating at arm's length from the government and provided under market conditions. States should build robust monitoring capacity and design it based on a thorough understanding of market needs, but they do not need to build the capabilities in house to deploy these instruments.

When the investment is aimed at creating innovative markets and supporting new technologies, policymakers should deploy capital with a view of catalysing private capital and demonstrating the commercial case for investing in a new sector or products. In this case, the best way to deploy equity capital is indirectly via intermediaries such as Private Equity or Venture Capital funds (Moretti 2024).

4.6 COORDINATION TOOLS

According to the traditional literature on industrial economics, governments intervene to fix coordination failures (Juhász, Lane, and Rodrik 2023; Criscuolo et al. 2022). The latter occur when the "viability of a new business depends on simultaneous investments in related fields, with the effect that no firm risks an investment unless someone guarantees the necessary complementary investments" (Altenburg and Rodrik 2017). Coordination policies seek to maximise the benefits of agglomeration and complementary activities. Hence, coordination policies mainly operate throu-

gh a governance channel: rather than nudging firms or consumers to make some investment decisions, these instruments coordinate stakeholders.

In a broad sense, many of the policy tools in this menu can be used to address coordination failures. Subsidies for both sectoral and regional development indeed fix a coordination failure when they aim not only to provide financial support to companies, but rather make the most of their interactions, and position the region along global value chains. However, in this subsection we highlight three tools that are exclusively used for coordination. These instruments are typically deployed directly by public administrations and, while they require in-house capabilities, they typically fall within their core competencies.

- **Foreign Direct Investment (FDI)** attraction offices facilitate investment opportunities for foreign firms, providing the necessary technical and legal counselling to operate in the domestic market. The objective is not so much to encourage foreign firms to 'invent' new things, but to insert them in the local industrial ecosystem. As such, a good design of FDI attraction policies must first think of the complementarities and capabilities offered by foreign firms which will make the most positive impact on domestic markets.
- **Technology transfer policies** foster links between research institutions and the industry, aiming to bolster innovation and productivity growth. They are used in production Stages 2 and 3 to promote both product design and incremental innovation. Tech-transfer can be managed by a wide variety of actors. Many government venture capital agencies provide tech-transfer services, like CDP Venture Capital in Italy or Vinnova in Sweden. In other countries such as Germany, applied research institutes like the Fraunhofer-Gesellschaft play the biggest role in transferring technology across industries.
- **FDI screening** is considered the quintessential protective policy tool. Governments directly prevent FDI when it threatens non-economic goals like security, industrial dependency, or public health. There is normally a very high bar required to impose FDI restrictions. However, they are highly political instruments and discretionary in nature.

4.7 PUBLIC PROCUREMENT

Through public procurement, public administrations purchase goods and services. In macroeconomic policy, it has traditionally been used to promote counter-cyclical measures and stimulate demand, insofar as it accounts for around 10 to 15% of GDP in most OECD countries. As such, it is mostly a demand-side instrument. Yet, public procurement in some sectors can also generate positive spillovers and fuel innovation. For instance, public procurement in the US military has leveraged the development of key technologies for civilian purposes, from the internet to GPS (Mazzucato 2013).

Innovative public procurement allows public administrations to purchase promising innovative products and services from startups in earlier stages of production,

helping them to enter the market. There are two types of innovative public procurement.

- With **Pre-Commercial Procurement (PCP)**, the public administration signs a purchase contract of a new product that has not yet been commercialised. The public administration, as the first and only consumer, can steer the development of new solutions directly towards its needs by asking the developer to include certain features in its product before it enters the market (European Commission 2022). For startups, PCP can be an interesting option since they count on a stable consumer that gives them notable publicity, pulling in more investors.
- Through **Public Procurement of Innovative Solutions (PPI)**, the public sector uses its purchasing power to act as an early adopter of innovative solutions which are not yet available on a large-scale commercial basis (European Commission, 2022). The logic behind PPIs is very similar to that of PCPs.

In many countries innovative public procurement has been introduced by intermediary public agencies, as is the case with CDTI in Spain or the Federal Procurement Agency in Austria. Most prominently, the case of the American innovation agency DARPA is a paradigmatic example of the role that innovative public procurement, in this case through the Department of Defence, can have in "pulling" ground-breaking innovation and developing new industries and technologies.

4.8 PRICE ASSURANCE MECHANISMS

Through price assurance mechanisms, governments commit to purchasing a product at a certain price on a fixed date. There are two main purposes of price assurance mechanism:

- In highly volatile sectors (energy, agriculture, mining), they stabilise both prices and revenues. Using feed-in-tariffs or contracts for difference, producers are protected against losses, which allows them to have a more certain business environment to make investments or increase their production. This version of price assurance mechanisms corresponds to a more protective posture.
- In less established industries, off-take contracts can ensure revenue stability for entrepreneurs before their product is launched or well established in the market. In this sense, the price assurance mechanism can be viewed as a proactive measure to encourage innovation and bolster economic growth.

Price assurance mechanisms have an immediate effect on producers, encouraging them to make investment decisions. As such, they operate through the 'within-supply' channel, targeting both SMEs and large companies, as well as startups and more established companies. They are most effective when supporting innovative industries or products (e.g., green hydrogen). However, when used in sectors that

are structurally not competitive (or loss making), they distort markets, protecting less efficient firms and stifling productivity growth.

4.9 LOCAL CONTENT INCENTIVES

Local content incentives either mandate or nudge firms to purchase inputs from domestic suppliers. They usually come in the form of requisites to benefit from a subsidy or a tax break scheme.

This instrument is highly protectionist in nature, as it seeks to reduce dependency on third countries in the upstream value chain. It can thus allow for the development of domestic industries along the full value chain, spurring job creation at the expense of severely distorting trade. When poorly designed, such measures push the most productive foreign firms out of the market, while making inputs more expensive for domestic firms.

For those reasons they are forbidden, albeit with few exceptions, by the rules of the World Trade Organization (WTO), which also makes them the object of long-lasting litigation with third countries.

These instruments are not overly complex to design and manage, and they are typically managed by public administrations. Often, tax credits are preferred, given the relatively small administrative capacity and resource use needed to implement them.

4.10 HUMAN CAPITAL FORMATION (HCF)

HCF policies are used to fill a shortage in the skills capabilities of a country, a region, or a sector of the economy. Most often, they target labour-intensive firms in the latest stages of production: training programmes are set up for workers to learn how to use new types of machinery or software, or develop their organisational skills. In the field of innovation, policies for "brain regain" (e.g., Rientro Cervelli in Italy) attract high-skilled workers who may prove to be particularly valuable to meet non-economic goals or accelerate knowledge transfer from foreign firms at the technology frontier. Such policies were, for instance, critical to the development of Taiwan's semiconductor industry (Breznitz 2007). In general, HCF policies increase wages and labour-productivity. Yet, when poorly designed they can provide little remedy to societal challenges such as the polarisation of the labour market (Rodrik 2021).

Implementing HCF policies is normally delegated to specialised public entities. Quite often, publicly funded agencies deliver the policy, such as Aikuiskoulutustuki in Finland, which is responsible for delivering a large subsidy programme for workers to participate in up-skilling training. The private sector may sometimes be more effective and cost-efficient. In Denmark, in 2007 the Confederation of industrial companies together with trade unions and employee associations set up IKUF, a fund that provides grants to employees to participate in training programmes. Depending on the design and the resources of the policy, effects can be felt in the short and medium term.

5. STATE AID. DOES THE INTERVENTION REPRESENT "STATE AID" UNDER EUROPEAN REGULATIONS?[98]

This section offers a visual framework to guide policymakers in understanding whether the policy intervention they are planning falls under State aid regulations. It then summarises the modalities and characteristics of aid that is exempt from being notified to the European Commission and the legal basis of different types of aid. Finally, it provides an overview of the Important Projects of Common European Interest (IPCEI) instrument, which has been gaining prominence as a way for member states to fund large projects in strategic industries.

5.1 WHAT COUNTS AS STATE AID?

State aid refers to any transfer of public resources to certain undertakings or activities which, by granting a selective economic advantage, distorts (or threatens to distort) competition by affecting trade between Member States.

Article 107 of the Treaty on the Functioning of the European Union (TFEU) establishes the general prohibition of State aid (paragraph 1). It declares certain types of aid compatible with the internal market (paragraph 2) and indicates the aid which may be considered compatible with the internal market on the basis of a discretionary assessment performed by the European Commission (paragraph 3).

To understand whether an industrial policy falls under State aid regulations, policymakers ought to ask themselves six questions. If the answer to all six of them is affirmative, then the policy can be considered State aid. If at least one of them is answered with a "no", then the industrial policy is not considered State aid. The decision tree of Figure 5.1 below provides a visual representation of these questions.

1. **Is the beneficiary of the policy an undertaking?** An undertaking is any entity engaged in an economic activity, regardless of its legal status and the way in which it is financed.

2. **Is the measure granted by State resources?** Public/state resources include all resources of the public sector, not only coming from the State, but also coming from intra-State entities (e.g. decentralized, regional or local) or from public authorities, as well as resources coming from the European Union (e.g. structural funds, NRRP resources), if the national authorities have discretionary power in the use of such resources. Other than the transfer of State funds, the State's forgoing of revenues (e.g. reductions in taxes or contributions) can also constitute aid.

98 The following section was written in collaboration with Assonime, the Association of Businesses. We thank Miriam Cassella, Paola Parascandolo, Andrea Stringhetti. Special acknowledgement goes to Director General Stefano Firpo, who supported this collaboration.

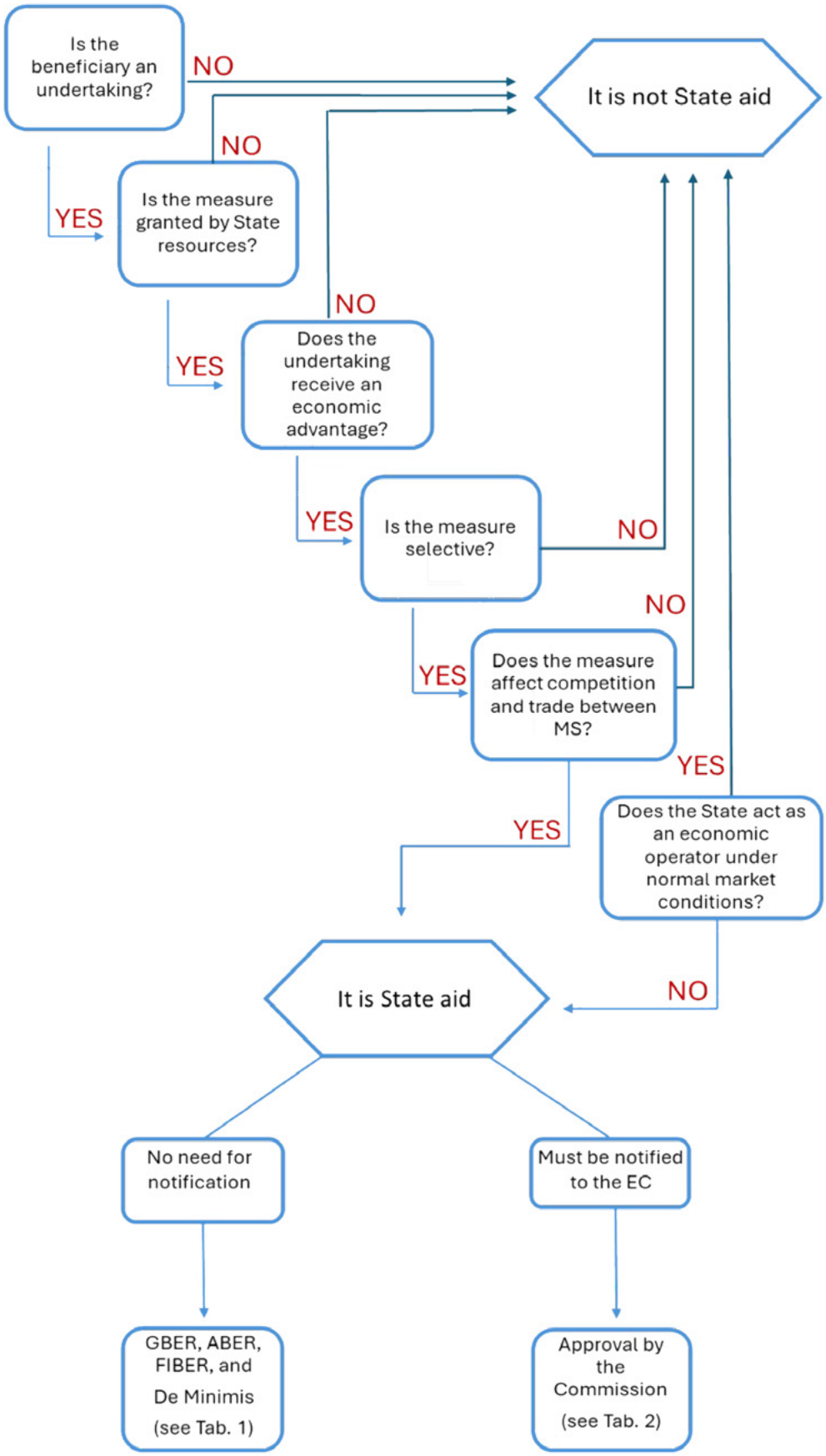
3. **Does the undertaking receive an economic advantage?** An economic advantage is any reduction in the charges that normally weigh on the company or any compensation for the costs inherent to the economic activity.

4. **Is the measure selective?** Only measures that grant an advantage selectively to certain undertakings, or categories of undertakings, or to certain economic sectors constitute aid. General measures which are effectively open to all undertakings operating within an EU country on an equal basis are not State aid (e.g. R&D tax credits, Transition 5.0 tax credits).

5. **Does the measure affect competition and trade between Member States?** To constitute aid, the measure must distort (or threaten to distort) competition and trade. A measure granted by the State is considered to distort or threaten to distort competition when it is liable to improve the competitive position of the recipient compared to other undertakings with which it competes. However, the likelihood of distortion of competition must not be merely hypothetical.Public support may be considered capable of affecting trade between Member States even if the recipient does not directly participate in cross-border trade (e.g. by increasing local supply, the aid may make it more difficult for operators from other Member States to access the market).

6. **Does the State act as an economic operator under normal market conditions?** States may act as economic operators. If the State (or public bodies or public undertakings) carries out economic transactions under normal market conditions, the advantage conferred on the counterparties does not constitute State aid. If, on the other hand, public authorities (or undertakings) provide goods or services at a price below market rates or invest in an undertaking in a manner that is inconsistent with the market economy operator test, State aid is involved. In the case of public investments, to determine whether a public body's investment constitutes State aid, it is necessary to assess whether, in similar circumstances, a private investor of a comparable size operating in normal conditions of a market economy would have been prompted to make the investment in question.

Figure 5.1: The State aid decision tree



5.2 IS NOTIFICATION TO THE EUROPEAN COMMISSION NEEDED?

As a general rule, any policy that is considered State aid must be notified to the European Commission. However, there are some important exceptions.

First, there are three regulations that establish a list of economic sectors, conditions, limits, and maximum aid intensities under which State aid is exempt from notification:

- **General Block Exemption Regulation** No. 651/2014 (GBER), last amended by Regulation 2023/1315,
- **Agricultural Block Exemption Regulation** No. 2022/2472 (ABER), last amended by Regulation 2023/2607,
- **Fishery Block Exemption Regulation** No. 2022/2473 (FIBER), last amended by Regulation 2023/2603.

Second, **de minimis** aid is not subject to notification because, being less than a certain amount, it is considered not capable of distorting competition and trade between Member States and therefore lacks one of the requirements necessary to be classified as aid. The total amount of de minimis aid, on the basis of the general regulation, is currently 300,000 euros per single undertaking over a period of three years. There are four de minimis regulations:

- General de minimis regulation No. 2023/2831,
- De minimis regulation for the agricultural sector No. 1408/2013, as amended by regulation 2019/316,
- De minimis regulation for the fisheries and aquaculture sector No. 717/2014, last amended by regulation 2023/2391,
- De minimis regulation for services of general economic interest 2382/2023.

Given the different features of the GBER and the de minimis regulation, the type of policies that can invoke one or another regulation are also very different. For instance, the GBER is only applicable in cases where the maximum aid limit is a percentage of the eligible costs, whereas, according to the de minimis regulation, the total amount of the aid granted to a single undertaking is 300,000 euros over any period of three years. Also, for any State aid to avoid notification under the GBER, it must have an "incentive effect" - that is, it must produce a positive effect that would be missing if the same activity for which the aid is granted could be carried out without it. By contrast, the "incentive effect" condition is not required by the de minimis regulation.

To understand when to invoke which regulation, Table 5.1 below provides a more complete comparison between the main features of the GBER and the de minimis regulations.

Table 5.1: Comparison of features of the General Block Exemption Regulation (GBER) and the de minimis Regulation

GBER	DE MINIMIS
The maximum aid limit is a percentage of the eligible costs	The total amount of the minimis aid granted to a single undertaking is 300,000 euros over any period of 3 years[99]
The aid must have an incentive effect[100] (in some specific cases this is "presumed")	No incentive effect required
The beneficiary of the aid is the legal entity	The beneficiary of the aid is the single undertaking[101]
Specific rules for each exempted activity (exemption thresholds, maximum aid intensities, eligibility conditions)	Same rules for undertakings in all sectors (excluding primary production of agricultural products and of fisheries and aquaculture products)
The size of the beneficiary is relevant for eligibility and aid intensity	The size of the beneficiary is not relevant
Operating aid typically excluded[102]	Operating aid permitted
Undertakings in difficulty are excluded (except for very specific cases)	Undertakings in difficulty are eligible (except for loans and guarantees)

5.3 WHAT HAPPENS WHEN THE EUROPEAN COMMISSION IS NOTIFIED?

The European Commission assesses the compatibility of the notified aid measures under the general State aid rules and principles (Article 107(3)(c)) and under the specific criteria set out in the Guidelines relating to the sectors concerned:

- Guidelines on State aid for climate, environmental protection and energy (2022/C 80/01),
- Framework for State aid for research and development and innovation (2022/C 414/01),
- Guidelines on State aid for rescuing and restructuring non-financial undertakings in difficulty (2014/C 249/01),

99 Regulation 2023/2831. The maximum amount is set at EUR 750,000 in the SGEI de minimis regulation no. 2023/2832; EUR 20,000 (or EUR 25,000 in compliance with specific conditions) in the Agricultural de minimis regulation no. 1408/2013; EUR 30,000 (or EUR 40,000 in compliance with specific conditions) in the Fisheries and aquaculture de minimis regulation no. 717/2014.
100 The incentive effect (necessary for aid under the GBER and aid approved following notification) consists in producing a positive effect that would be missing if the same activity for which the aid is granted could be carried out without the aid. Aid is considered to have an incentive effect if the beneficiary has submitted a written application for the aid to the Member State concerned before work on the project or activity starts.
101 Under de minimis rules, all entities operating in the same Member State and controlled directly or indirectly by the same entity according to the criteria identified in Art. 2, par. 2 of Regulation 2023/2831/EU, are considered a single undertaking.
102 Operating aid is aid for expenses that the company must in any case bear in order to carry out its ordinary activity. In this case, the incentive effect would be missing.

- Guidelines on regional State aid (2021/C 153/01),
- Guidelines on State aid to promote risk finance investments (2021/C 508/01),
- Guidelines on State aid in the agriculture, forestry sectors and in rural areas (2022/C 485/01),
- Criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of Important Projects of Common European Interest (IPCEI) (2021/C 528/02),
- Guidelines on State aid for broadband networks (2023/C 36/01),
- Guidelines on State aid to airports and airlines (2014/C 99/03).

The following table shows, for each category of aid (column A), the relevant articles of the GBER which exempt the aid from notification (column B), and the Commission guidelines under which notified aid can be assessed to be compatible (column C). In column C, where no specific Guidelines are indicated, there are no specific evaluation rules and the Commission's assessment is based on the general principles.

Table 5.2: Exemption under the GBER vs notification of aid measures

A. Categories of aid exempted from notification under the GBER	**B. General eligibility conditions Chapter I and specific conditions Chapter III of the GBER**	**C. If the general eligibility conditions (Chapter I) and the specific conditions (Chapter III) are not met => Notification to the Commission + Commission assessment of the compatibility of the aid based on the general principles and, where they exist, on the following specific guidelines**
Regional aid	Sec. 1 (Articles 13-16)	Guidelines on regional State aid (2021/C 153/01)
Aid for SMEs	Sec. 2 (Articles 17-19d)	
Aid for European territorial cooperation	Sec. 2a (Articles 20-20a)	
Aid for access to finance for SMEs	Sec. 3 (Articles 21-24)	Guidelines on State aid to promote risk finance investments (2021/C 508/01)
Aid for research, development and innovation	Sec. 4 (Articles 25-30)	Framework for State aid for research and development and innovation (2022/C 414/01)
Training aid	Sec. 5 (art. 31)	
Aid for disadvantaged workers and for workers with disabilities	Sec. 6 (Articles 32-35)	
Aid for environmental protection	Sec. 7 (Articles 36-49)	Guidelines on State aid for climate, environment, and energy 2022 (2022/C 80/01)
Aid to make good the damage caused by certain natural disasters	Sec. 8 (Article 50)	

A. Categories of aid exempted from notification under the GBER	B. General eligibility conditions Chapter I and specific conditions Chapter III of the GBER	C. If the general eligibility conditions (Chapter I) and the specific conditions (Chapter III) are not met => Notification to the Commission + Commission assessment of the compatibility of the aid based on the general principles and, where they exist, on the following specific guidelines
Social aid for transport for residents of remote regions	Sec. 9 (Article 51)	
Aid for broadband infrastructure	Sec. 10 (Articles 52-52d)	Guidelines on State aid for broadband networks (2023/C 36/01)
Aid for culture and heritage conservation	Sec. 11 (Articles 53-54)	
Aid for sports and multifunctional recreational infrastructures	Sec. 12 (Article 55)	
Aid for local infrastructures	Sec. 13 (Article 56)	
Aid for regional airports	Sec. 14 (Article 56a)	Guidelines on State aid to airports and airlines (2014/C 99/03)
Aid for ports	Sec. 15 (Articles 56b-56c)	
Aid involved in financial products supported by the Invest EU Fund	Sec. 16 (Articles 56d-56f)	

5.4 IMPORTANT PROJECTS OF COMMON EUROPEAN INTEREST

IPCEIs (Important Projects of Common European Interest) are innovative cross-border projects in strategic sectors of European industry, involving at least four Member States. Under Article 107 (3)(b) of the TFEU, IPCEIs constitute one of the forms of State aid that may be compatible with the internal market, with their own distinct legal treatment.

In IPCEIs, the project must represent a major, concrete, and identifiable contribution to the achievement of the objectives and strategies of the Union and must have a significant impact on sustainable growth. For example, the project must have particular relevance for: the European Green Deal, the Digital Strategy, the European Data Strategy, the new Industrial Strategy for Europe, NextGenerationEU, the European Health Union, the new European Research and Innovation Area, the new European plan for the Circular Economy, the achievement of climate neutrality by 2050.

The project must be designed to address serious systemic or market failures, which would prevent the project from being implemented on the same scale and in the same manner without the aid, or the societal challenges that could not otherwise be addressed and solved. The project must be of particularly significant size or scope or

must involve a very significant level of technological and/or financial risks.

The benefits of IPCEIs must not be limited to the funding Member States. Instead, they must have broader relevance and application in the Union economy and society through clearly defined and concrete positive spill-over effects (e.g. systemic effects on multiple levels of the value chain, or on upstream or downstream markets, alternative uses in other sectors). All Member States must have a real possibility to participate in the project.

Member States identify the project of interest, select the participating companies (preferably following open calls), and agree on the governance of the project and the financial support. The project must involve, except in specific cases, significant co-financing by the beneficiaries of State aid.

Research, development and innovation projects must be highly innovative or constitute an important added value in terms of R&D&I in light of the state of the art in the sector concerned. Projects comprising first industrial deployment must allow for the development of a new product or service with high research and innovation content or the deployment of a radically innovative production process. Since they are not covered by the previous projects, infrastructure projects in the fields of environment, energy, transport, health, and digital technology must be of major importance for the Union strategies in these sectors or contribute significantly to the internal market.

The proposal must concern an individual project. Integrated projects are eligible. They refer to groups of individual projects integrated into a common structure or programme (the individual components of the integrated project may relate to separate levels of the supply chain but must be complementary and provide significant added value towards the achievement of the objective of European interest).

Since IPCEIs are financed by national budgets, the public support by Member States to IPCEIs and the companies participating in them constitutes State aid and must be notified to the Commission for assessment and approval. The assessment is carried out on the basis of the criteria identified in the European Commission Communication 2021/C 528/02.

With the latest amendment to the General Block Exemption Regulation (GBER), adopted by Regulation (EU) 2023/1315, the implementation of certain projects involving beneficiaries in several Member States has been simplified by increasing the aid intensities and notification thresholds for IPCEI-related research and development projects.

6. POLICY EVALUATION. HOW DO WE KNOW THE INDUSTRIAL POLICY IS OBTAINING THE DESIRED EFFECTS?

Finally, policymakers must establish clear mechanisms and governance structures to assess whether the instruments they deploy are delivering results. Industrial policy is inherently interventionist and often produces asymmetric effects across economic actors. This makes robust monitoring and evaluation essential, as the legitimacy

of industrial policy ultimately depends on demonstrating that its trade-offs were justified in terms of broader economic benefit.

Evaluating industrial policy is notoriously difficult (Juhász, Lane, Rodrik 2023). Nonetheless, policymakers should at least consider four key aspects for structuring such evaluations: methodology, type of evidence, governance, and timing.

6.1 METHODOLOGY

The public policy literature and practice (HM Treasury 2020) have identified three main types of policy evaluation, which reflect different foci:

- **Process evaluation** analyses the activities involved in the policy and, broadly, how the policy was delivered. Although it is not designed to estimate its impact, it can be very useful to maintain a record of how things were done, why, and what the perceived obstacles to implementation were.
- **Impact evaluation:** estimates the changes triggered by the policy made. It looks at whether the policy effects have created a scenario that is different from a world in which the policy had not taken place. A fundamental aspect of conducting impact valuation is to identify clearly ex-ante what the policy's objectives, expected beneficiaries / targets are, and the indicators that would reflect the expected change. Context also matters and the methodology must reflect changes in circumstances to ensure the analysis captures the true effect of the intervention and not the underlying trends independent of it.
- **Value for money evaluation:** analyses whether the effect of the policy was large enough to justify the efforts (monetary or of another sort) involved. This is a key consideration because many interventions might achieve change but at a disproportionately high cost. While these evaluations have gained prominence in the form of narrow cost-benefit analysis (CBA) and cost-effectiveness analysis (CEA), policymakers must think carefully about both their full objectives and the total investment that went into the intervention. Otherwise, such evaluations run the risks of reflecting only what can be easily calculated and thus providing estimates that are overly optimistic (if they ignore the full input costs and negative externalities) or overly pessimistic (if they do not capture positive externalities, public value, and long-term effects).

Besides these standard approaches, there are additional and alternative ones that can be utilised to overcome some of the possible shortcomings of these methods. They include social fabric matrices, living labs, and public value mapping (IIPP 2020). Note that all these methodologies can be relevant and can be combined with each other to provide a full and more informative account.

6.2 EVIDENCE TYPES

Within each methodology, policymakers should be aware of the robustness of the evidence they are gathering. This will tell them how sure they can be of the effects of the policy. Building on Nesta's Standards of Evidence (Puttick & Ludlow, 2013) and the Maryland Scientific Methods Scale, we propose the following 4 levels of evidence quality:

1. **Sound rationale:** there is a precise description of the policy and its objectives as well as an explanation of the mechanisms through which it should work, based on best practices or other secondary sources;
2. **Positive correlation:** there is evidence that after the policy was implemented the intended targets experienced the effects the policy had aimed to generate;
3. **Causal evidence:** the correlation evidence (2) is complemented by an indication that it is truly the intervention that caused the observable change. This ideally would be based on identifying a reasonable "counterfactual" scenario (e.g., a control group) that shows what the outcomes at the time of observation would have been, had the policy not been in place.
4. **Repeated and systematised causal evidence:** the type-3 evidence is available in various contexts and across time, thus ensuring that the effects were not a context-specific coincidence.

It should be noted that within each type both qualitative and quantitative evidence can, and ideally should, be used. Qualitative evidence, such as interviews, is particularly useful for understanding "how" something works, while quantitative evidence helps estimate the size of the effect. Both are important as policymakers try to understand whether an intervention should be aborted, continued, or scaled up - and if it would work in a different context.

6.3 GOVERNANCE OF EVALUATION

Who performs the evaluation is often key to ensuring its quality and reliability. There are multiple actors who might be well placed to conduct these analyses, but the main decision policymakers are faced with is whether to conduct the evaluation in house or rely on an external provider. Although a third-party analysis is typically an advisable choice, policymakers should consider:

- **Complexity:** how sophisticated can the analysis be at the stage when it is to be conducted?
- **Skills:** what expertise is present in house vs. externally?
- **Knowledge and data access:** who can have access to the relevant data and how informed are third parties on the functioning of the programme?
- **Accountability and conflicts of interest:** how can the governance of the evaluation process ensure that key stakeholders are involved but do not influence the

output, as well as limit the conflict of interests (even by the external evaluator) that would compromise the reliability of the exercise?

Broadly speaking, as complexity increases it is advisable to involve external partners to conduct the analysis. But involving externals is not enough if they are not given access to all the necessary data and processes are not in place to avoid conflicts ointerests.

6.4 TIMING

Finally, evaluations can be conducted at various points during a policy's life. The literature (OECD 2023b) identifies three main moments:

Ex ante: before the intervention kicks off. To shape its design and how it will be implemented. This can involve reviewing the evidence from other similar interventions, conducting simulations, piloting, and early testing of policy ideas. These exercises can be useful in setting expectations right in terms of the impact of the policy, as well as the likely obstacles.

In itinere: during implementation. To influence decisions, fine-tune, and help ensure that the policy can realise its intended benefits. These evaluations will typically collect evidence about the efficacy of the policy's design, its implementation, and emerging outcomes. They can cover both early estimations of the impact but also identify unintended consequences.

Ex post: after an appropriate time lag to allow for the policy effects. Policymakers should consider both the frequency of the evaluation and the appropriate temporal lag before the effects of a policy can realistically emerge and thus an ex-post evaluation be useful. Recent literature has highlighted how studies of industrial policy effects too often ignore the intergenerational or long-term effects of industrial policy and thus policymakers should be aware upfront of the likely timeline for effects to appear (Juhász, Lane, Rodrik 2023). On the other hand, the right timing for the evaluation is also key to ensuring that policies are discontinued when they either have proven ineffective or have proven so effective that they are no longer needed. The latter is a particularly relevant consideration for industrial policies, which are often interventions that aim to change an existing economic equilibrium to create a new one that should eventually become self-sustainable. In this context, effective policies should envision a "sunset provision" that pre-empts that the programme will be shut down once the original objective is achieved (see for instance Israel's successful Yozma programme for supporting the venture capital industry). In these cases, the timing of the evaluation is fundamental to properly inform the decision to continue or discontinue the policy.

7. CONCLUSIONS

This chapter offers policymakers a practical framework for designing effective industrial policy instruments. It walks through six questions that help turn broad ambitions to promote a sector into clear, actionable policies.

The first question clarifies the goal of industrial policy. It highlights that industrial policy can be utilised to: 1) increase productivity, equitable growth and (quality) employment, 2) resolve societal challenges, 3) achieve autonomy / resilience, or 4) protect / preserve (quality) employment and standards of living. Policymakers must identify their priorities and accept trade-offs before deciding on interventions.

The second question highlights the complexity of global value chains, urging policymakers to assess where their country or region can best compete—be it product invention, design, improvement, or production—and tailor policies to build the specific capabilities needed at that stage. We invite policymakers to analyse whether the country or regions are better positioned to excel at product invention (Stage 1), product design and creation (2), product improvement (3), or production and assembly (4).

Questions three and four focus on implementation. They address who funds and manages industrial policy. We explained that policymakers should consider aspects of capacity, flexibility, and timing to choose whether to manage it directly via public institutions or via intermediaries. We then provided a comprehensive menu of the policy instruments available for industrial policy, explaining for which objectives they are most effective and appropriate and what implementation approach is typically the most effective.

The fifth question covers the critical legal dimension of State aid within the European Union. It provides basic guidelines to understand what interventions constitute State aid and how to ensure compliance with EU rules. Finally, the chapter underscores the need for monitoring and evaluation. Given industrial policy's redistributive effects, continued support must rest on solid evidence. We provide guidance on how to structure these evaluations to inform policy adjustments and accountability.

While these insights are relevant worldwide, they are especially important for Italy. Italy has a highly heterogeneous economic structure, evident in its regional economic disparities and sectoral specialisations (see Gentile et al. in this volume). This underpins its global leadership in select industries despite its longstanding productivity stagnation. Yet Italian industrial policy has rarely reflected these deep differences. As Gronchi and Ughi illustrated in this volume, over the past eighteen years Italy has primarily relied on horizontal, national-level industrial policies—an approach that does not suit the country's pronounced regional diversity and sectoral variation. Reorienting these policies based on a deeper understanding of the industrial system and of Italy's competitive advantage across the different stages of production would help deploy resources in a more tailored way.

Finally, Italy's industrial policy has been characterised by significant fragmentation and a proliferation of interventions, often implemented directly by various public administrations with little coherence or coordination. The menu of policy tools and implementation methods presented in this chapter offers a practical way to rationali-

se and strengthen existing measures, while also guiding the design of new, more coherent and effective policies.

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Annex: Table A.1 Examples of industrial policy policy instruments

INSTRUMENT	EXAMPLES	ITALIAN EXAMPLES
TRADE FINANCE		
Trade Finance	Bpifrance Export Credit Insurance: covers risks of contract interruption or non-payment for French firms abroad. -KUKE (Poland's Export Credit Agency) covers bank loans from credit risk and political risk for Polish firms abroad.	SACE Contract-tied facility: eases access to international financing in hard currencies at competitive rates to purchase capital goods from Italy. -Cassa Depositi e Prestiti - finanziamenti agevolati SIMEST: offers favourable conditions for domestic firms to finance their international expansion.
FISCAL INCENTIVES		
R&D Tax Credits	The OECD portal INNOTAX has a whole database of R&D tax credits and tax deductions. -Ireland's R&D Tax Credit for SMEs: up to 25 % of SMEs' R&D expenditure. -Denmark R&D tax deduction: up to 110% deduction of any firms' R&D capital expenditure. -France's Credit d'Impôt de Recherche: to up 30% of R&D expenses. The credit can be used in any of the three following years following the firm's R&D investment.	-Credito d'imposta ricerca e sviluppo, innovazione tecnologica, design e ideazione estetica under Transizione 4.0: up to a 10% tax credit on R&D investments.
Capex Tax Credits	-French art.35 of Law 1322/2022: 20% tax credit of investment in capital goods for firms in the following sectors: batteries, wind power, solar panels and heat pumps.	
GRANTS AND SUBSIDIES		
Grants for R&D	-VINNOVA (Sweden): covers half of the cost of a 'purpose-driven innovation' projects. -Germany's Zentrales Innovationsprogramm Mittelstand: comprehensive financial support for SMEs innovative projects. -Germany's Cyberganetur (based within the Federal Ministry of Defence): it internalises the innovation of new technologies within the military. -Germany's Agentur für Sprunginnovationen (SPRIND): promotes early-stage disruptive innovation. -Austria Wirtschaftsservice Gesellschaf (Austria's federal promotion bank): offers R&D grants. -Spain's CDTI Agency NEOTEC grant: up to €325.000 grant per company to finance R&D activities.	Accordi per l'innovazione: covers up to half of the cost an industrial research project.
Subsidies for Regional Development	-CPER Grand-Est in France 2021-2027: a 5 billion, subsidies-based programme for regional development in France's Grand Est region. -Germany's Gemeinschaftsaufgabe „Verbesserung der regionalen Wirtschaftsstruktur" (GRW) : provides grants and subsidies covering up to 45% of an investment in a structurally weak region.	-Resto al Sud managed by Invitalia: up to €200.000 (50% of which is provided as a grant, 50% as a loan) to support individuals set up new companies in Italy's Southern regions. -Law 488/92: regional investment subsidies to develop industrial activity in the Mezzogiorno.

INSTRUMENT	EXAMPLES	ITALIAN EXAMPLES
Sectoral Subsidies	Germany's CfD Funding Program ("Förderprogramm Klimaschutzverträge") finances the decabornization of heavy industries in Germany. -Health-Holland is a PPP entity that provides financing in the pharmaceutical sector.	-PNRR Missione 1, Componente 2 - Economia spaziale: The second component of the Italian PNRR offers subsidies targeted at the space economy.
Consumer Subsidies	-Germany's Umweltbonus subsidizes the purchase of electric vehicles. -Estonia offers €5000 vouchers for consumers that buy electric vehicles that cost under €60.000. -Spain's bono cultural gives a 400€ voucher to citizens that turn 18 years old to be spent on cultural products.	-Ecobonus finances the purchase of non-polluting vehicles.
FISCAL INCENTIVES		
Debt	Germany's KfW Energy Efficient Refurbishment and Construction Programs: -gives preferential interest rate loans for companies in the buildings sector that meet green requirements. -part of the debt is condoned if further requirements are met. -France's Le Plan Climat issues loans (from €50k to €5 million) with advantageous conditions for 'green' investments.	-Fondo Rotativo Imprese (FRI) (Cassa di Depositi e Prestiti) - loans at low interest rates to support R&D investments.
Credit Guarantees	-Spanish ICO €40 billion debt guarantee programme protected SMEs struggling during COVID-19. -BPI France's France-Active: covers up to 80% of a bank loan for SMEs and self-employed. -Polish Development Fund Group offers several guarantee products, including the Biznesmax Plus warranty which covers 80% of commercial bank loans.	-Fondo di Garanzia: debt guarantees for SMEs and self-employed. -Controgaranzia CDP-FEI-EGF: covers up to 80% of loans to SMEs (the max loan being circa €3 million), helping them cover working capital expenses.
ACCESS TO EQUITY		
Direct Equity Investments	-INVEST NL: buys equity directly from companies in strategic sectors, providing up to 50% of financing of a firm, between €5-50 million. -The Polish Development Fund Group: equity financing for firms for up to 7 years and €1.2 million, as well as networking and business support.	-Fondo Italiano d'Investimento: invests equity in Italian industrial companies with high growth potential and strategic importance.
Indirect Equity Investments	-INVEST NL: invest in third funds. Participating interests between € 5-25 million per fund. -Croatian Venture Capital Initiative 2 (CVCi 2): €80 million fund-of-funds to fuel the growth of innovative SMEs. -Portugal Venture Capital Initiative (PVCi): fund-of-funds managed by the European Investment Bank. -Germany's KfW Capital: indirectly invests in VC funds of green and tech startups.	-Fondo Italiano d'Investimento: participates in Private Equity and Venture Capital funds various fund of funds vehicles.

INSTRUMENT	EXAMPLES	ITALIAN EXAMPLES
COORDINATION TOOLS		
FDI Attraction Offices	-Spain's ICEX -Germany's GTAI -Business France -The Netherlands Foreign Investment Agency (NFIA)	ICE/ITA: Foreign Direct Investment Desk
Technology Transfer Policies and Research-Industry Links	-VTT Technical Research Centre of Finland: state-owned research and tech company conducting applied research. It provides R&D services and information for private companies. -Estonian Research Council (ETAG) and Estonian Research Information System (ETIS): promote cooperaiton between government, research institutions and companies. -VINNOVA ENVIRONMAN project: transfers research knowledge to firms in the green transition. -Fraunhofer-Gesellschaft: Germany's largest applied-research organization.	-CDP Venture Capital - Fondo Technology Transfer invests in poles of technology transfer in collaboration with universities and research centers.
FDI Screening	-Spanish FDI screening mechanism RD 571/2023: foresees mandatory filings for foreign investors in strategic sectors. -Ireland's Screening of Third Country Transactions Act 2023: enables the Minister for Enterprise, Trade and Employment to respond to threats to security and public order posed by particular types of foreign investment.	- The Golden power law (Law-Decree No. 21/2012) allows the President of the Council of Minister to stop FDI in 'strategic' Italian assets and companies. -Law-Decree No. 21/2022 incorporates some extraordinary FDI screening measures adopted during the COVID-19 crisis into the ordinary Italian regulation.
PUBLIC PROCUREMENT		
Innovative Public Procurement	-Spain CDTI offers both PCP and PPI solutions through its program Compra Pública de Innovación. -In Austria, the PPI Service Centre of the Federal Procurement Agency is in charge of PCP and PPI procurement since 2013.	- Consip announced in 2021 that it would launch its own Innovative Public Procurement tools soon.
PRICE ASSURANCE		
Price Assurance Mechanisms	-Germany's Renewable Energy Sources Act: provides guaranteed prices for electricity generated from renewable sources.	- Agenzia per le erogazioni in agricoltura: provides price guarantees for certain agricultural products to stabilize farmers' incomes and ensure a stable supply of essential goods.
LOCAL CONTENT		
Local Content Incentives	-Greece Feed-In Tariff bonus for solar electricity: 10% bonus on top of the Feed-In Tariff if at least 70% of the equipment cost of solar panels come from EU countries. -France eco-bonus (consumer subsidy for electric vehicles) does not apply to cars manufactured in China. Both policies are currently the object of dispute at the WTO.	- Conto Energia IV and V: 10% bonus on top of the Feed-In Tariff if at least 60% of the equipment cost of solar panels come from EU countries.

INSTRUMENT	EXAMPLES	ITALIAN EXAMPLES
HUMAN CAPITAL		
Upskill and Reskill Policies	Upskill and Reskill Policies -Denmark's Industriens Kompetenceudviklingsfond – IKUF: grants to employees in the manufacturing sector to participate in self-selected training activities. -Finland's Aikuiskoulutustuki: subsidies for adults to participate in upskilling and reskilling trainings.	-Fondi paritetici interprofessionali nazionali per la formazione continua, managed by Agenzia Nazionale Politche Attive del Lavoro: gives money to firms to finance workers' training. -Fondo Repubblica Digitale: public-private partnership offering upskilling and reskilling training, focusing on digital skills.
Talent Attraction Policies	Spain's Plan to attract and retain innovation and research talent: grants for recognized academic researchers to be integrated into the Spanish system covering both capex and opex research expenses. France's Passeport Talent and the UKìs High Potential Individual Visa.	Rientro cervelli 2024 (art. 44 DL n. 78/2010): tax break for researchers and scholars who come settle in Italy after having lived abroad for at least three years.

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