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The micro-foundations of Italy's existing and latent competitive advantages

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Abstract

This paper investigates the firm-level foundations of Italy's international competitiveness by analysing both export performance and emerging potential for industrial growth. It is divided in two parts. Part 1 uses detailed microdata from Istat and other sources to identify key structural characteristics of Italian exporters. The analysis reveals persistent regional and sectoral asymmetries in export performance, with Northern regions leading in both volume and competitiveness. Part 2 then introduces the concept of *latent competitive advantage*, showing that High-Growth Firms (HGFs)—key drivers of employment growth—are more evenly distributed across the country and sectors, including in low-tech domains. The paper argues for a place- and sector-sensitive industrial policy that leverages both existing export strengths and emergent regional specialisations, enabling a more inclusive and strategic approach to Italy's industrial transformation.

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Keywords: industrial policy, export, high-growth firms, regional heterogeneity, high-tech manufacturing, knowledge-intensive services

Summary

- This paper analyses the micro-foundations of Italy's export performance and industrial potential, offering insights for industrial policy aimed at both reinforcing existing comparative advantages and nurturing new ones. We look at Italy's current *comparative advantages*, by analysing the country's high-exporting firms. We then identify potential *latent competitive advantages* by mapping Italy's High-Growth Firms (HGFs).

- We first analyse Italy's export activity, finding that it remains highly concentrated in the North, particularly in traditional heavy industries and high-export value sectors. Exporting firms tend to be larger, more diversified, and more innovative than non-exporters.

- The most export-oriented sectors are Pharmaceuticals, Machinery, and Chemicals, although Food and Other Transport Equipment are experiencing the fastest growth in export performance (number of firms and export value). Except for Food, all of these activities are primarily concentrated in the North of the country.

- Sectors where Italy has historically had higher comparative advantages (Beverages, Textiles, Wearing apparel, Leather, Other non-metallic mineral products, Machinery and equipment)—mostly located in the Northeast—show some signs of weakening: a decrease in the number of exporting firms and export intensity, as well as lower growth of export value compared to the other sectors.

- We then turn to identifying Italy's High-Growth Firms (HGFs) to detect where each territory could build new specialisations. We find that these are more evenly distributed across regions and sectors compared to exporting firms. Although among the top performing provinces we find usual suspects such as Milan, Bolzano, and Reggio Emilia, we note that Campania is the third region for number of HGFs. Bari, Teramo, Pescara, and Catania all show relatively high shares of HGFs. This is a key finding, since these types of firms drive over 80% of Italy's employment growth.

- At the same time, clear areas of specialisations emerge. In the South, we observe relatively more Low-tech manufacturing (e.g., Siracusa) and non-knowledge-intensive companies (Naples). High-tech manufacturing is almost exclusively present in the North, in the triangle comprised between the north of Tuscany, Milan, and Trieste. Knowledge-intensive companies, finally, are disproportionately concentrated in Milan and Rome.

- Overall, manufacturing-oriented HGFs are more concentrated in sectors such as "Food", "Machinery" and "Metal products." Services-oriented HGFs are instead mostly present in "Trade," "Food and beverage service activities," "Computer programming, consultancy and related activities," and "Transportation."

- The data suggest that a strategic and inclusive industrial policy should comprise different support for, on the one hand, established exporters and, on the other hand, latent competitive advantage sectors. The analysis of HGFs suggests that policymakers should look at existing sub-sectors of specialisation to build new comparative advantages that can deliver growth across the country.

- Importantly, it implies that these comparative advantages will likely fall in different parts of global value chain, reflecting the different levels of technology and knowledge intensity present in each Italian regions.

1. Introduction

This paper examines Italy's position in global trade and the characteristics of its comparative advantages (Figure A1 in Appendix). 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.[1]

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 paper, 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 paper unfolds 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 (2025, forthcoming), 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 competitive advantages 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.

[1] Moreover, this dataset was enriched with data on patents held by companies sourced from Moody's Orbis Intellectual Property Database.

2. Characteristics and determinants of Italy's export performance

This first part of our paper 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, 2025, forthcoming) 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, overall 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[2] for cross-section analyses), and to 2017-2022 for metrics showing the evolution over time.[3]

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)

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 in the incidence of exporting firms, 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 percent to 41 percent. 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

[2] This analysis was carried out based on data available as of June 2025.
[3] 2017 is the first year of the harmonised statistical series of the frame "Export" from Asia-Istat.

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 the paper).

Figure 1: Profile of the average Italian manufacturing exporters (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 these to be 5.600 enterprises.[4] 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"

[4] 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

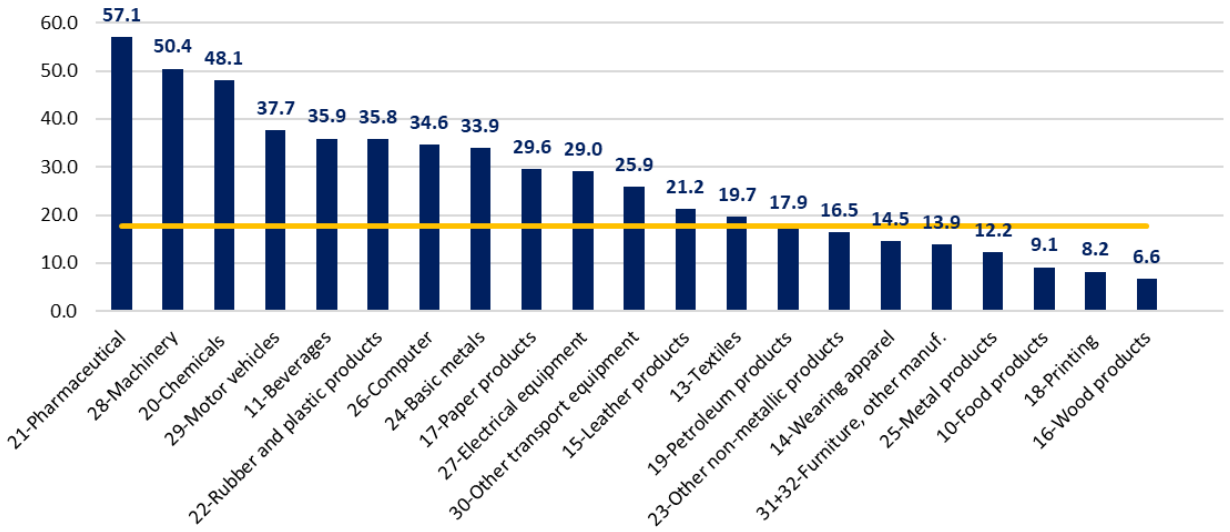
or “Many and Small”. For instance, policies can differ if the target is to increase the exporting firms, on the one hand, or increase the firm size, on the other.

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.[5] More recently, this was further strengthened by the “Export Action Plan” launched by the Italy’s Minister 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).[6]

[5] See Law 394/81.

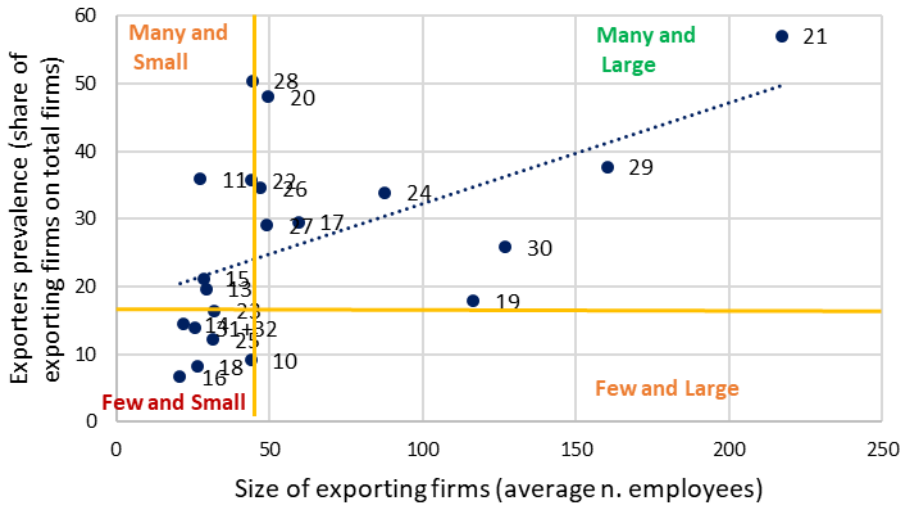
[6] Since 2021, the programme has assisted over 10,500 enterprises with the help of export promoters from local Chambers of Commerce, delivering more than 62,000 specialised services.

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



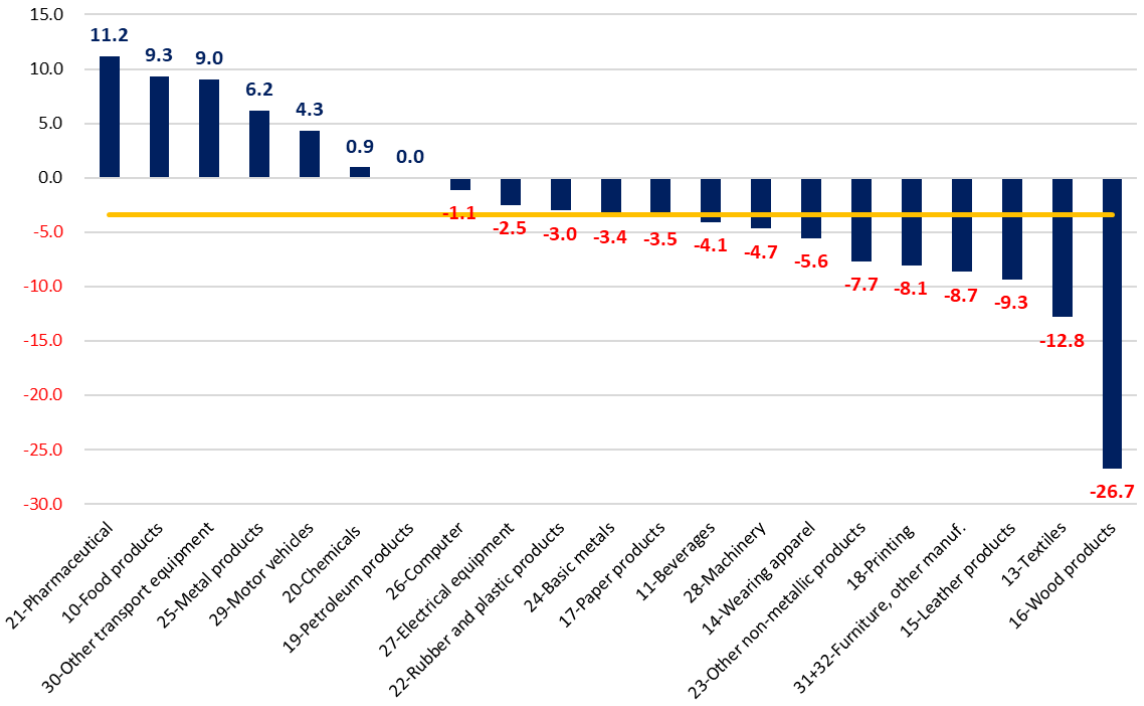
NB. The numbers indicates the sector corresponding to 2-digit Nace Rev.2 Classification.
Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

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 much 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 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.

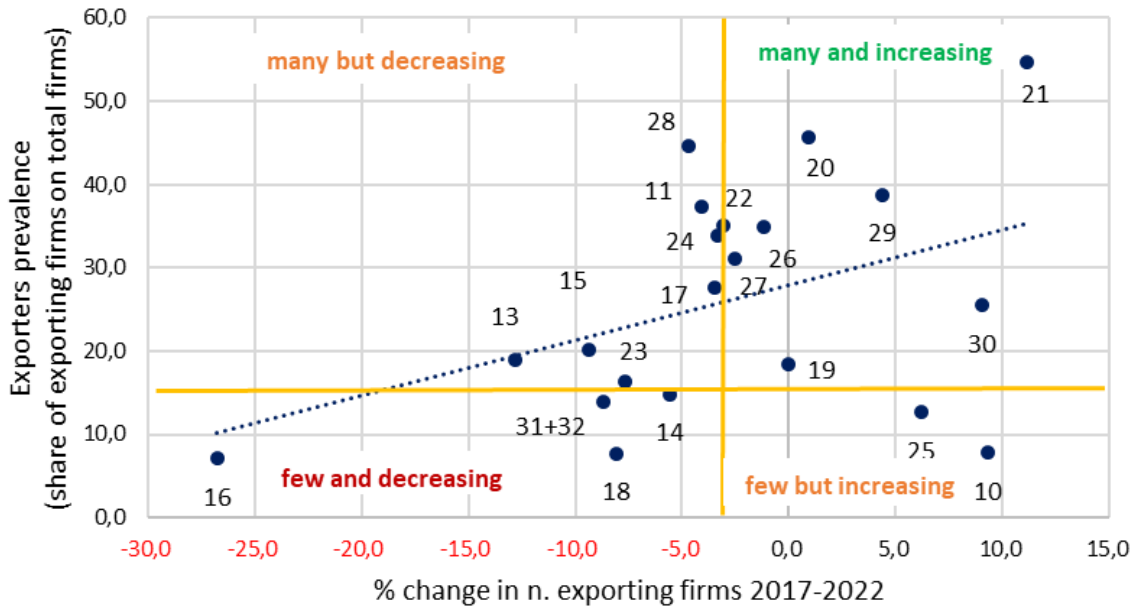
Table 2 summarises the key metrics discussed so far. The main insight for policymakers is that the landscape of Italy's export industry is varied, and industrial policy should take this into account. The weight of exports varies significantly across sectors and so do the competitive dynamics that result 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, 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

Figure 2: Summary metrics for all Italian exporters

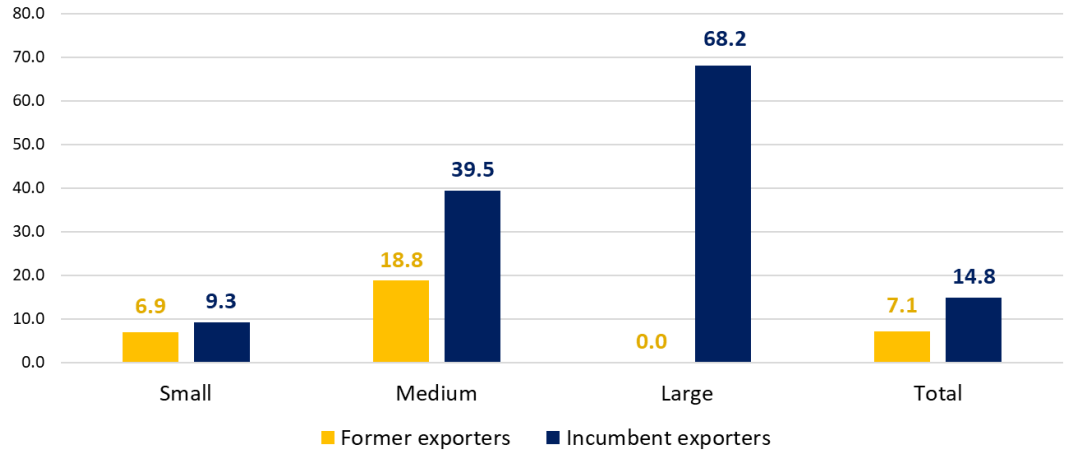
Industries	Exporting firms			Export value		Export diversification		Export concentration	
	Number	Share of total	% change 2017-22	Billion euro	% change 2017-22	Countries	Products	Share top-4 firms (C4)	C4 change p.p.
10-Food products	4,526	9.1	9.3	30,174	56.9	10	8	9.0	0.8
11-Beverages	1,240	35.9	-4.1	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[7]. 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).[8] In the Appendix 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

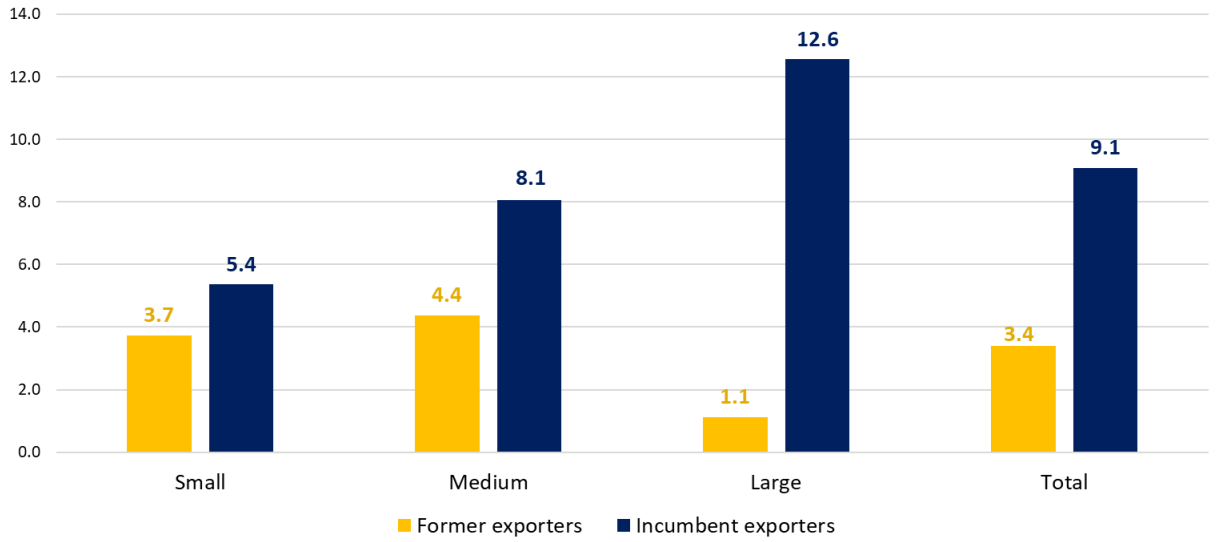


Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat and Moody's data

[7] 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.

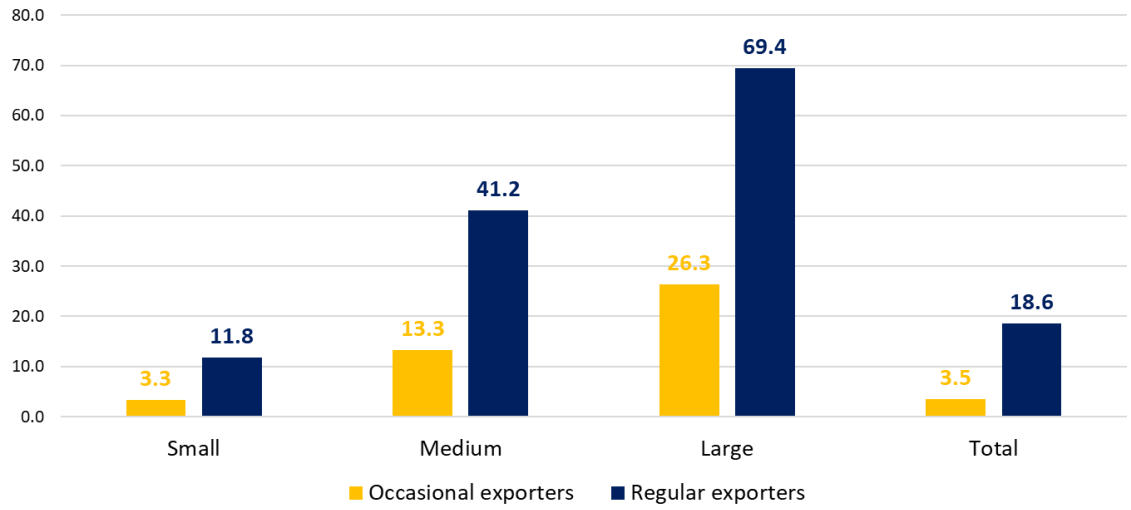
[8] We compared Occasional Exporters–firms that exported between one and four years in the 2017–2022 period–with regular exporters, who exported in five or all six years. Among regular exporters, 18.6% held patents, compared to just 3.5% of occasional exporters.

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



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat

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 and 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 Marczinek and Pacchiardi, 2025) 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 (2025, 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 percent of exporting firms and contribute 30 percent 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 (2025, 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 (2025, forthcoming)

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 their 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 the 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 (2025). This also means it is more exposed to the market fluctuations and trade disruptions in these industries. The Northwest appears instead 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 these are among Italy's Higher-CA sectors for Marczinek and Pacchiardi (2025, forthcoming). Finally, the analysis confirms that the South is currently almost entirely cut out 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 paper 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

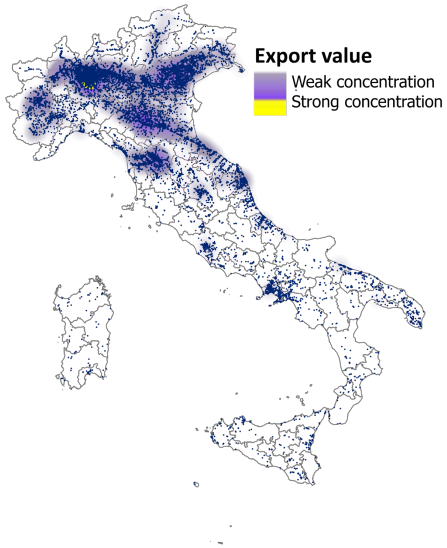
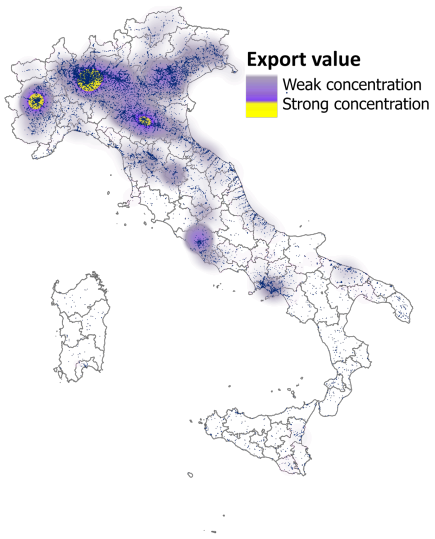


Figure 9.b Higher-EV industries



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 paper, 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 paper 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 High-Growth Firms (HGFs) by following the OECD definition. We consider HGFs the "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.[9]

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 the HGFs as those firms with average

[9] 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).

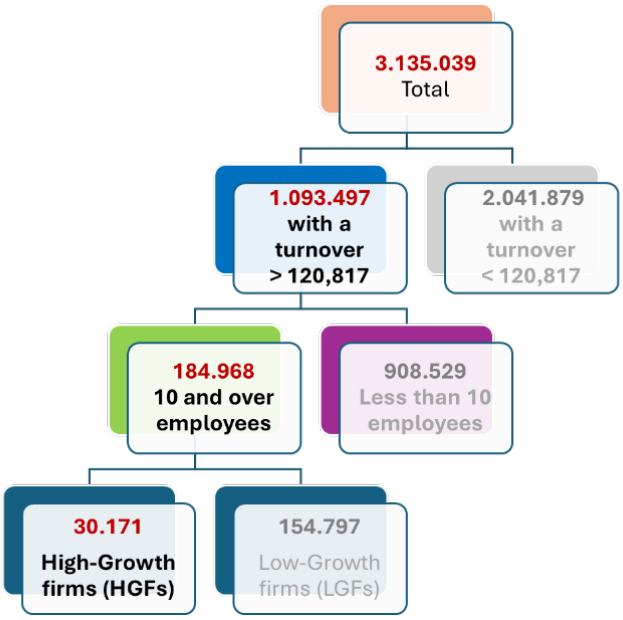
annualised growth in turnover greater than 20% a year, over a three-year period. All the figures and data in this section, therefore, refer to companies that qualify as HGFs as per the definition above by the year 2022.

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.

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 8% percent average in a 2009 OECD study on HGF (OECD 2009) in a comparable target firm population.[10]

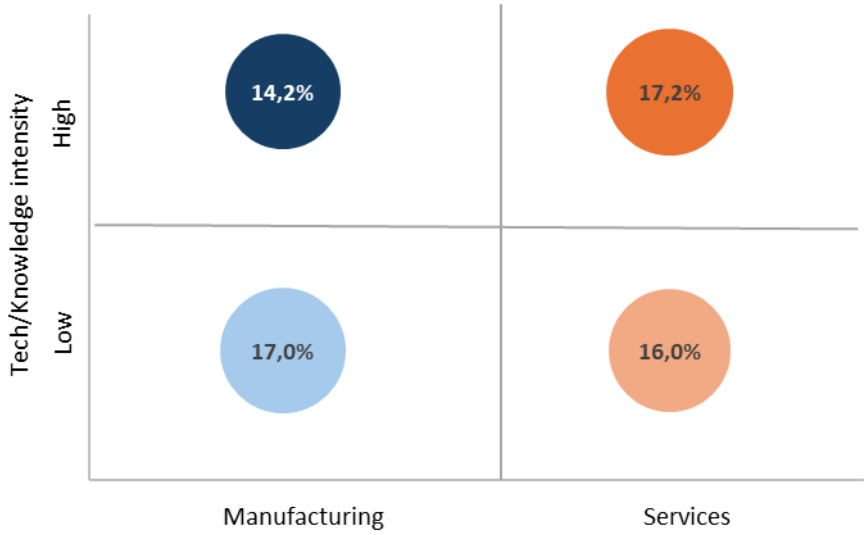
[10] In the 2009 OECD study, the definition of HGF does not take into account the threshold of the revenue set to fourfold of the GDP per capita.

Second, we find that these HGFs contribute disproportionately to employment growth. The 1 percent 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).[11]

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; 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'

[11] All sectors excluding primary sector corresponding to the section A of Nace Rev.2 classification.

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 percent 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.

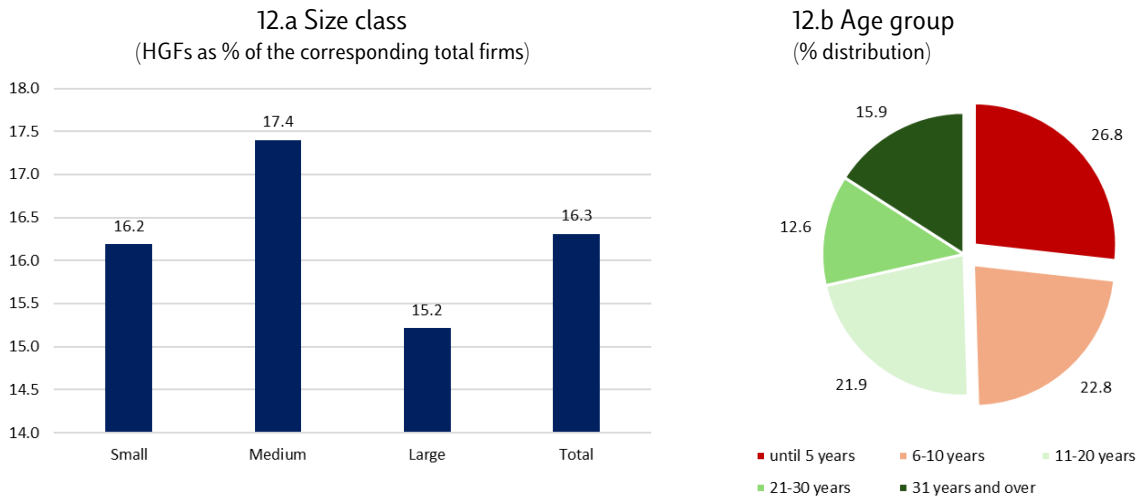
Table 10: Incidence of High Growth Firms (HGF) and Low-Growth Firms (LGF) by level of technology and knowledge intensity

	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 A2), in relative terms the likelihood of a company being high-growth is roughly the same (15-17 percent): specifically, the 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 percent 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



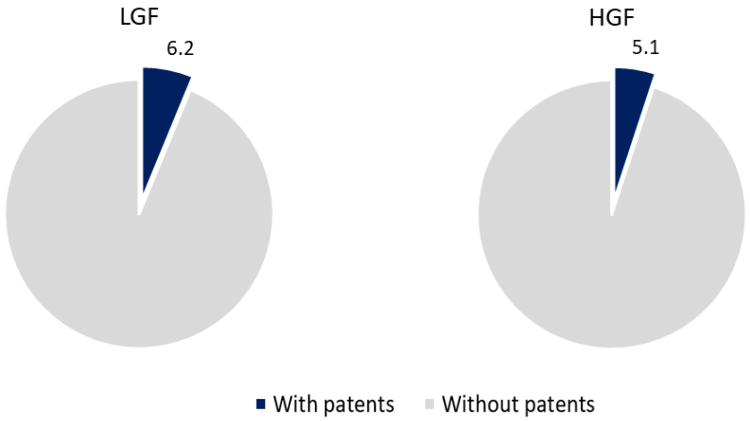
N.B. In Figure 12.a the shares are calculated, in each size class, on the total universe of manufacturing and services firms with 10 and more employees and a turnover more than 120,817 euro.

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%).[12] 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).

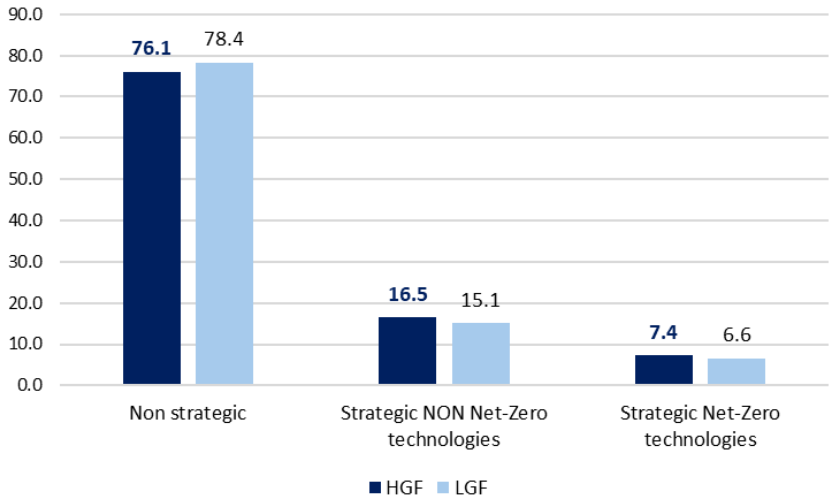
[12] Deep-tech including net-zero technologies, defined as those included in the EU STEP programme and net-Zero Industry Act. The list of the strategic technologies is available in Gentile et al. (2025).

Figure 13: Incidence of HGF by holding patents compared to LGF



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

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



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

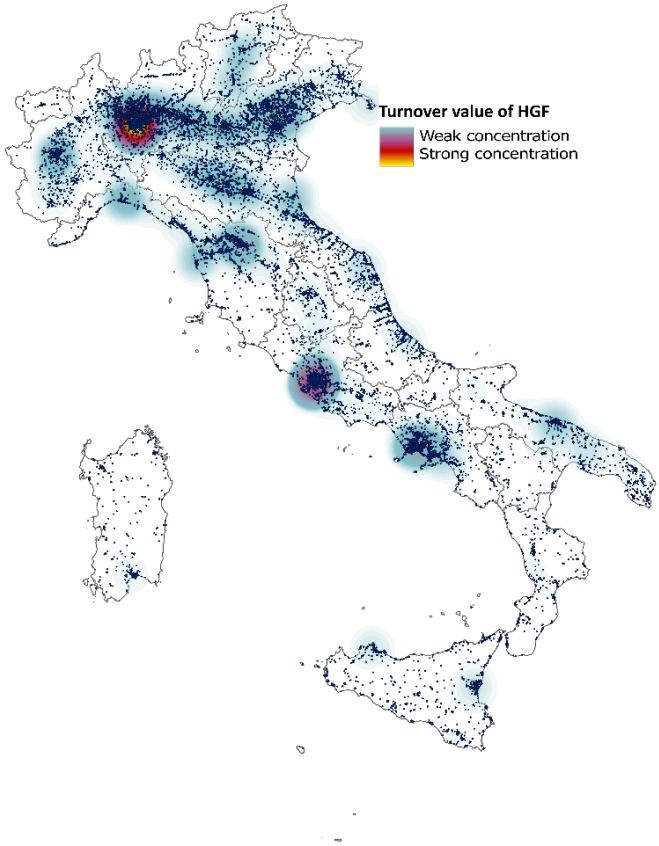
3.3. Findings by geography

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 paper (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 percent 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 A5 in appendix). Thus, these statistics should only be interpreted as evidence of industrial dynamism across the country, rather than as signal of better performance of the South.[13]

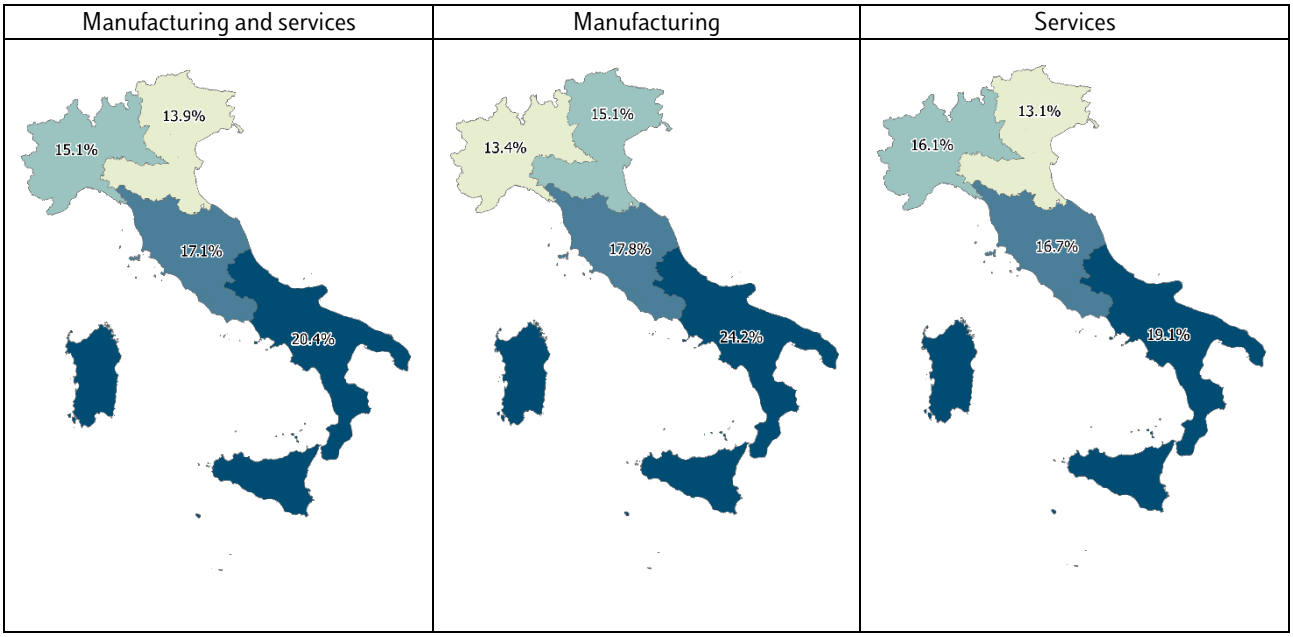
Figure 15: Geographical distributions of Italian HGFs, turnover value



Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

[13] 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 A5 for the same picture using the total population of relevant firms without the size cutoff.

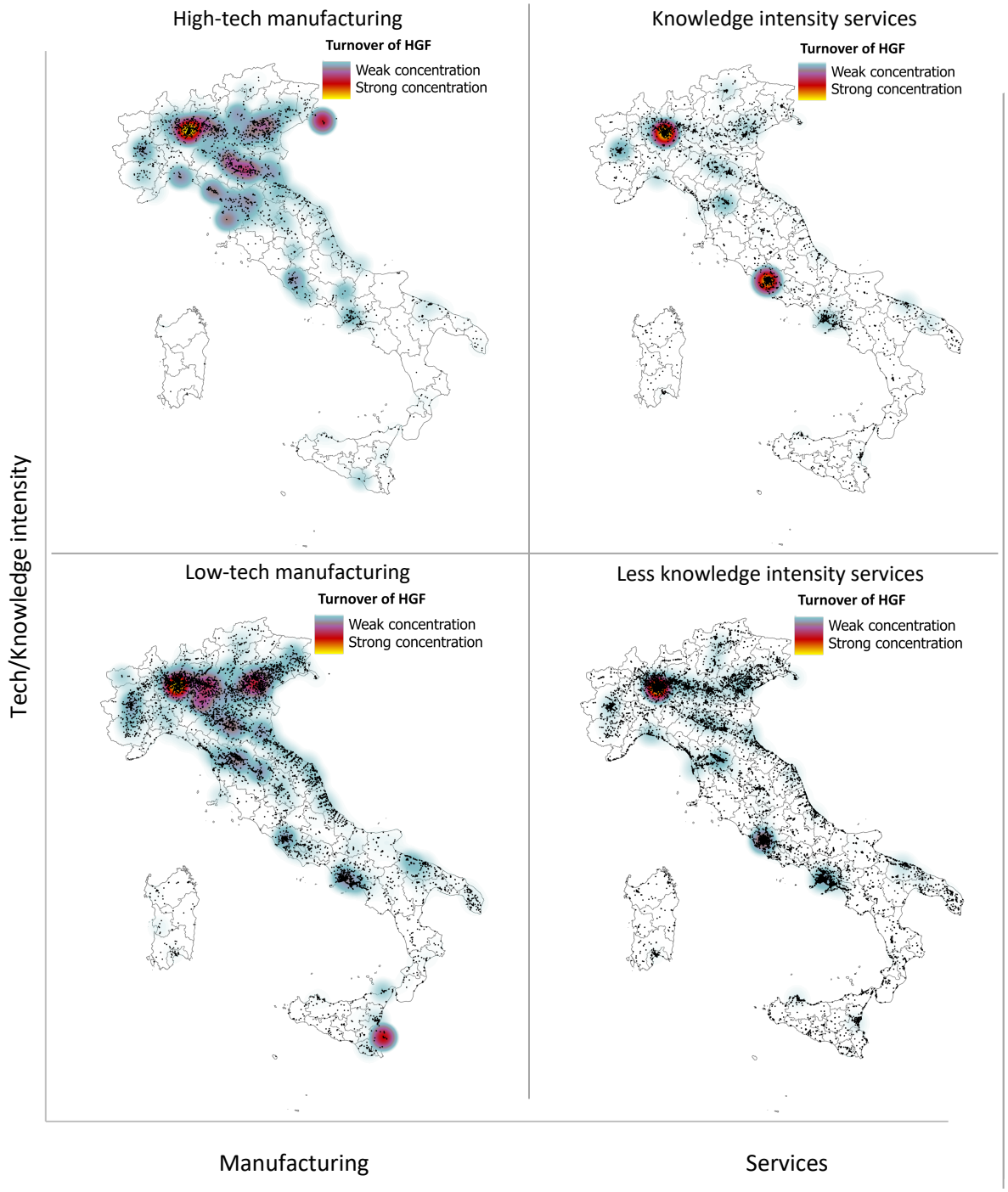
Figure 16: Italian HGFs by macro region: % share over total non-micro firms



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.

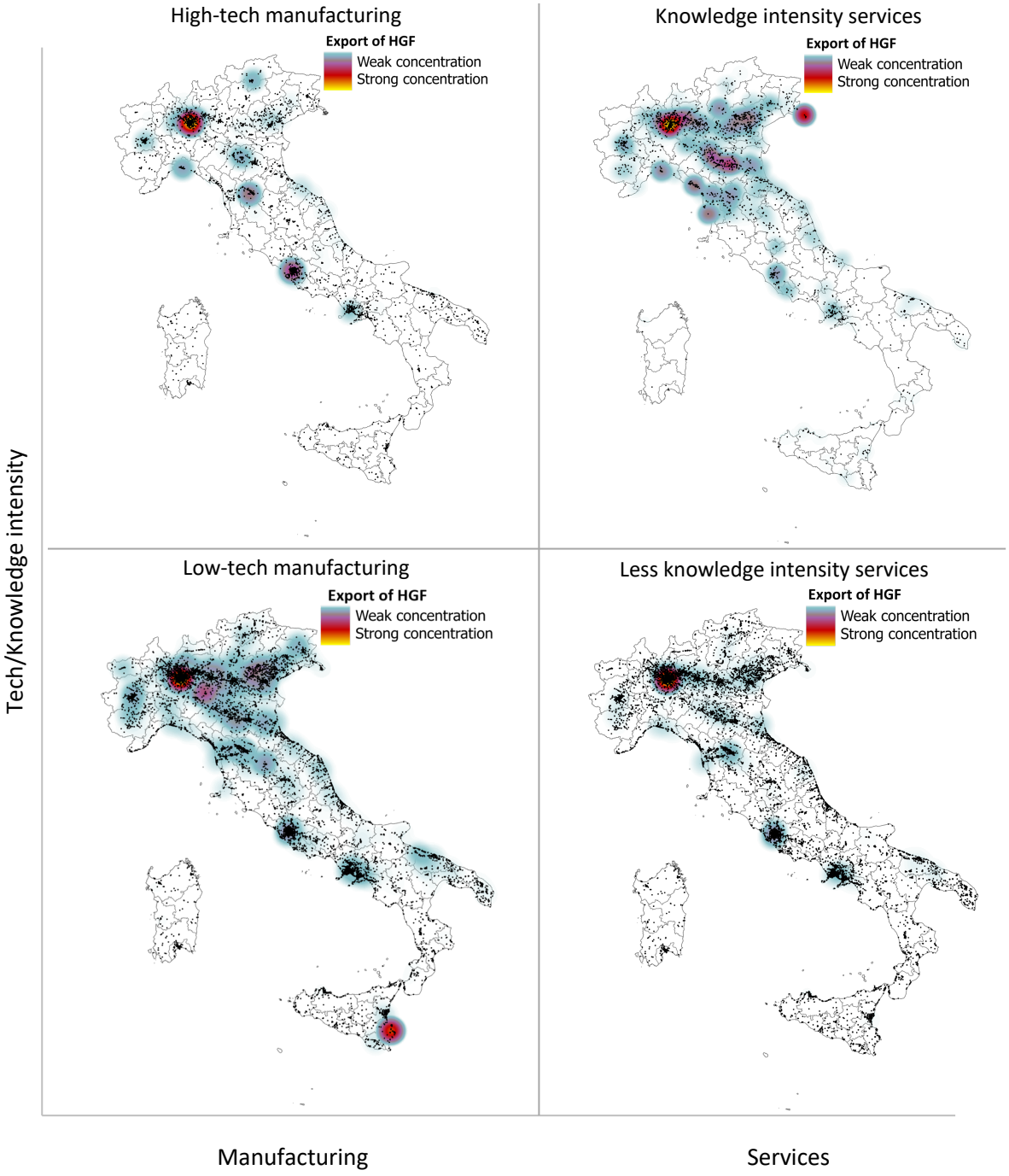
Figure 17: Geographical distribution of Italian manufacturing and services HGFs by level of technology and knowledge intensity, turnover value



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 also 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 specialisation. 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 service 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 percent lead on the next two provinces (Bolzano and Rome) and well above the trend line. On the manufacturing front, Arezzo, Prato, Vicenza, Fermo, Pesaro and Urbino clearly outperform. Note that one Southern province—Teramo—also appears among the manufacturing high-performers. Finally, the colour coding shows that many Southern provinces are among those with the lowest concentration of both HGF-M and HGF-S. Details are included in Appendix (Figure A6 and A7).

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, Figure A8 and A9). These results can be the first critical step to inform locally targeted industrial policies that build upon each territory latent competitive advantages. These tables tell policymakers the most vibrant sectors in each territory. Although subject to carefully 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 paper has examined the firm-level dynamics that underpin Italy's international competitiveness, offering a microeconomic complement to the macro-level analysis presented in Marczinek and Pacchiardi (2025, forthcoming). 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 paper focused on the characteristics and trends of Italy's exporting firms, a reflection of Italy's existing *comparative advantage*s. 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 about Italy's economic structure. 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, but that policymakers would need to design industrial policies accordingly. Tailoring policies to leverage these firms is critical as HGFs today contribute 80 percent 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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6. Appendix

Comparative advantages of Italian manufacturing firms

Figure A1: from Marczinek and Pacchiardi 2025 – Italian sectors by "revealed 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

Note: "revealed productivities" are calculated on the basis of the "higher-than-fair-share" of global trade in a given sector, controlling for a set of confounding variables. For details, see Marczinek and Pacchiardi (2025, forthcoming)

Further insights into High Growth Firms (HGFs)

Figure A2: Distribution of HGF by size class compared to LGF

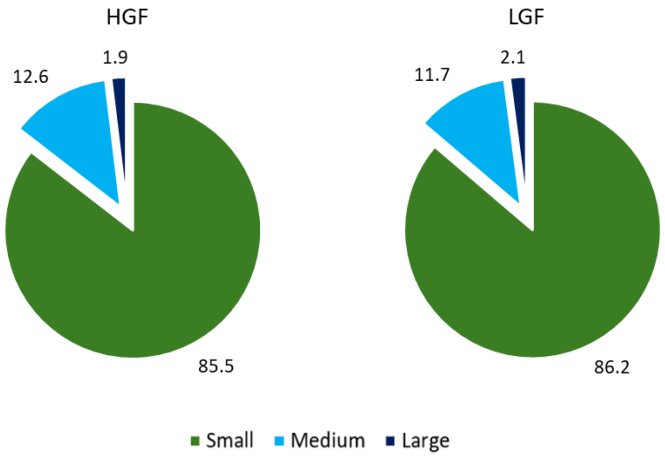
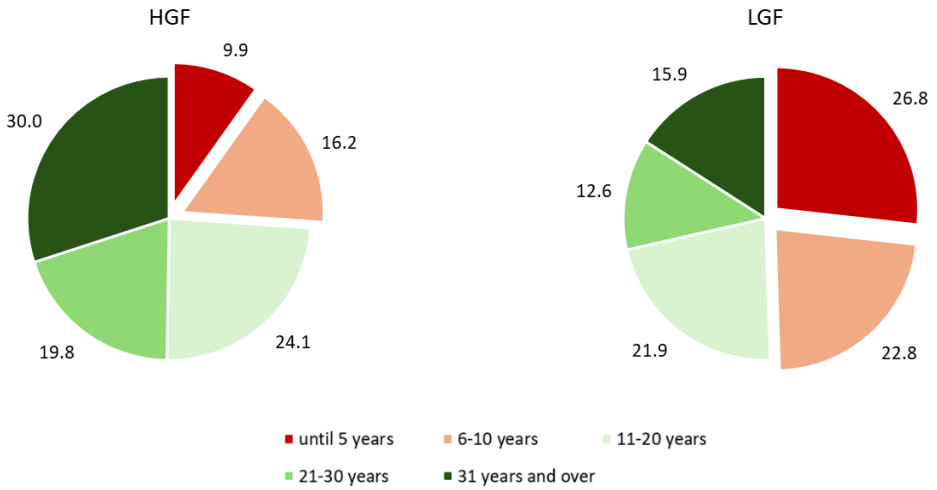
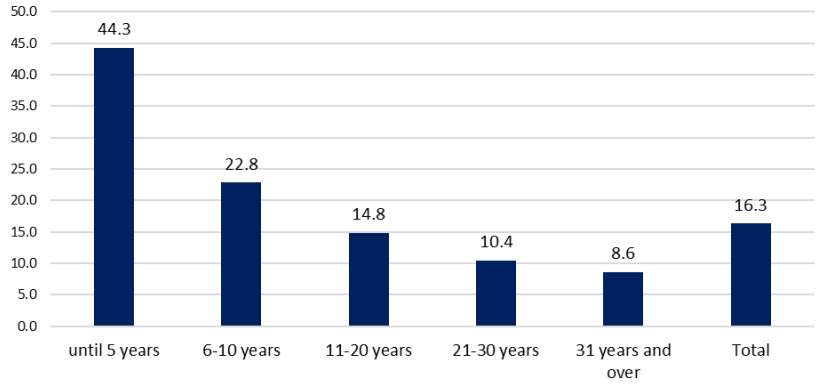


Figure A3: Distribution of HGF by company age group compared to LGF



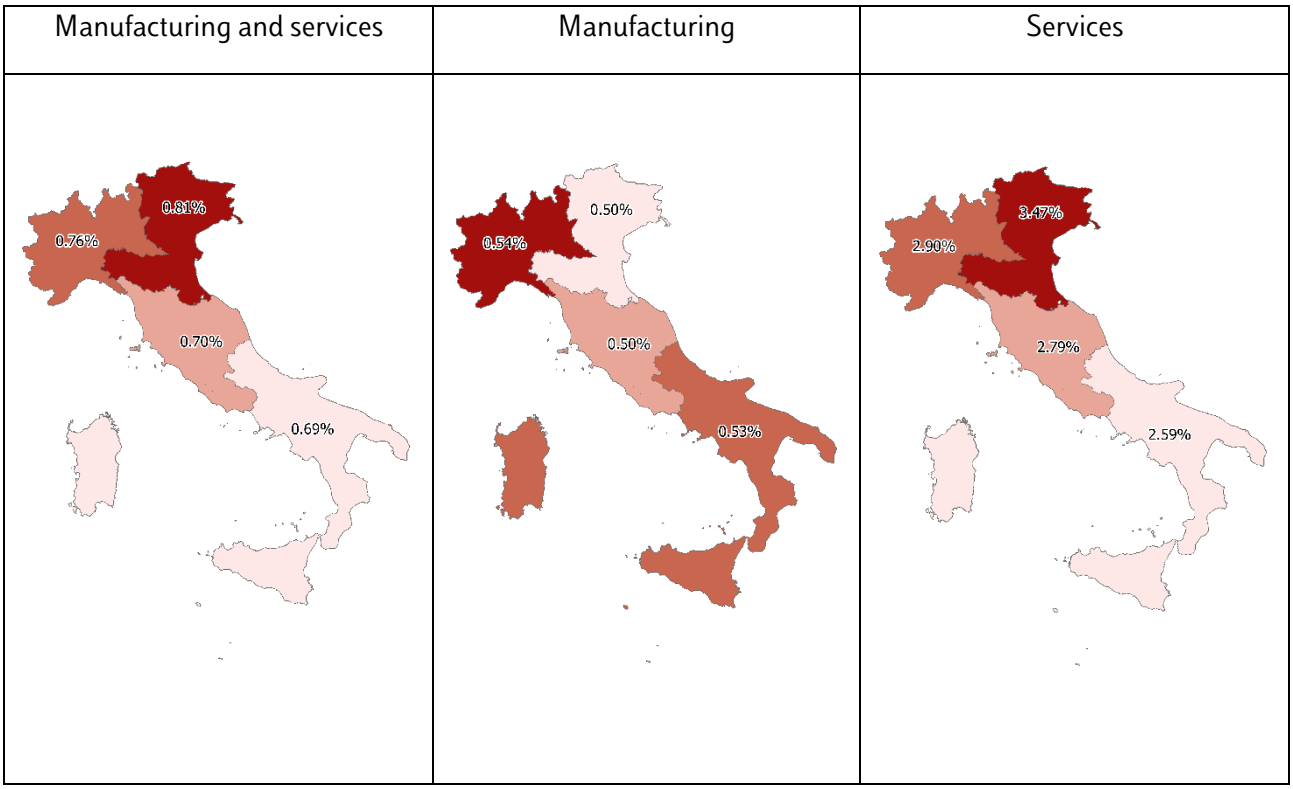
Source: Centro Studi Guglielmo Tagliacarne elaboration on Istat data

Figure A4: 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 A5: 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 A6: 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
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

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 A7: 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%
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%
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%
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:

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

Figure A8: 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
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
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
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
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
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	28-fabbricazione di macchinari ed apparecchiature n.c.a.

		apparecchiature per uso domestico non elettriche	
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
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 A9: 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

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
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
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
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)
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

7. Appendix A2

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:

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

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 $\mathrm{N}(0.\sigma^2)$ that captures any other unknown factors. To know the effects of any explanatory variable on the response probability $\mathrm{P}(Y = 1|\mathbf{x})$ 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_REG

	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).

8. Appendix A3

The productivity premium of exporting firms

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

$$lnLP_i = \beta_0 + \beta_1 EXP + \beta_2 C_i + \varepsilon_i$$

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 ε_i. 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. A2 – 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.	81.170	71.377

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%.