

## Marche's economy, which perspectives for the future?\*

di Alessandro Bellocchi<sup>†</sup> e Giuseppe Travaglini<sup>‡</sup>

### Abstract

Marche is one of the most industrialized regions in Italy. Entrepreneurial activity is mainly characterized by small family businesses. Due to a production model centered on districts and traditional manufacturing, the region has suffered more than other Italian regions from the successive crises of the last decades. The current Covid-19 crisis has ultimately exacerbated existing structural weaknesses. In the coming years, the Marche region must be able to enhance the distinctive features of its production system, overcoming the structural criticalities related to the size of the companies, the capacity for innovation and the ability to penetrate international markets. For this to be possible, the goals of its Smart Specialization Strategy (S3) must be achieved. This article examines changes in the local manufacturing system over the past three decades. The focus is on the manufacturing sector, given its weight on the regional economy in terms of employment and its strategic importance for S3. The objective is to analyze the impact of recent events on the most important sectors of the Marche economy and contribute to the formulation of proposals and suggestions useful to public decision-makers.

**JEL codes:** J21; L60; R11

**Keywords:** Regional economy; Labor market dynamics; Manufacturing

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## **Economia delle Marche: quali prospettive per il futuro?**

### **Sommario**

La regione Marche è una delle regioni più industrializzate d'Italia. L'attività imprenditoriale è caratterizzata principalmente da piccole imprese familiari. A causa di un modello produttivo incentrato sul modello del distretto e su produzioni manifatturiere tradizionali, la regione ha sofferto più di altre regioni italiane le crisi degli ultimi decenni. La crisi dovuta al Covid-19 ha ulteriormente peggiorato le debolezze strutturali. Nei prossimi anni, la regione Marche dovrà rafforzare le caratteristiche distintive del proprio sistema produttivo, superando le criticità strutturali in tema di dimensione d'impresa, capacità innovativa e penetrazione di mercati internazionali. A tal fine, gli obiettivi della Smart Specialization Strategy (S3) dovranno essere raggiunti. Questo articolo analizza i cambiamenti del sistema manifatturiero marchigiano negli ultimi tre decenni. L'attenzione è diretta al settore manifatturiero, dato il suo peso nell'economia regionale in termini di occupazione ed importanza strategica per la S3. L'obiettivo è quello di analizzare l'impatto dei cambiamenti recenti sui settori più importanti della regione e di contribuire alla formulazione di proposte e suggerimenti utili per i decisori politici.

**Parole chiave:** economia regionale, dinamica del mercato del lavoro, manifattura

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## 1. Introduction

Recent changes in the global economic system have increased economists' interest in regional aspects of development. In this context, it is interesting to study the case of the Marche region, traditionally characterized by a widespread model of development and industrialization, which took place through clusters of small companies, with a logic of cohesive growth between the economy, institutions and society (Fuà, 1983). This model of endogenous development, in a couple of decades, transformed the Marche region from an agricultural reality to a manufacturing one. The consequence was strong economic growth and widespread prosperity, with national and international sectors and companies of excellence (Calafati and Mazzoni, 2006; Ciuffetti, 2019).

As Blim (1987) noted, Marche's economic success stemmed from transforming pre-industrial regional specializations such as shoemaking, clothing and furniture into industrial export goods. The Marche region saw slow economic development in the 1950s, which then accelerated from the 1960s through the mid-1980s, only to slow down again in the following two decades (Canullo and Fabietti, 2001; Giannetti, 2014).

Macroeconomic indicators have long shown a healthy economy and a dynamic labor market. However, already in the early 2000s, a reversal of the positive trends of the previous decades began to be recorded, with some sectors in crisis, the closure of several companies and an increasing recourse to social shock absorbers. This dynamic lasted until the global economic-financial crisis of 2008, which hit Italy with significant effects on all economic sectors in the Marche region (OMLR Marche, 2008). However, here more than elsewhere, the economic crisis has challenged an economic system that was already severely weakened compared to years past. At the beginning of the new millennium, it was pointed out of the risk of a progressive loss of centrality of the Marche's economy, with the risk of "suffering passively from external integration" (Alessandrini, 2004). Similarly, Diamanti (2004) warned of the danger of a vicious circle that could have reversed the sign of the virtuous one, which had favored the previous development model. As noted by Favaretto and Zanfei (2005), this was attributable to the structural weakness of the *Marchigian model*, concerning the lack of institutionalized research and the ability to introduce new products and processes into the market. Public support for research and development (R&D), instead of aiming at long-term goals, was mainly geared

toward meeting short-term needs and problems of immediate business impact. All these fears proved to be well-founded a decade later.

Because of its marked productive specialization, the region suffered heavily from the numerous sectoral crises in the early 2000s, such as that of textiles (2002-2003) and footwear (2005-2006) (Goffi, 2013). These crises altered the ability of the regional system to create employment, economic growth and distribute income to the society (TrendMarche, 2012). Finally, after a forced paradigm shift in 2008, the economic fabric of the Marche region is now made up of some virtuous companies that have been able to remain competitive and undertake individual growth paths; but at the same time of large groups of companies that have not been able to keep up with the technological challenges and are now in great difficulty (Pompei and Venturini, 2011).

The last development in chronological order is represented by the Covid-19 crisis. In 2020, Italy's GDP fell by 8.9%, marking a larger contraction than the Euro Area (-6.6%). Data indicate that the regional economy was affected by the pandemic to a less marked extent than the rest of the country (8.8%), but the region registered a stronger contraction in investment. A greater sensitivity of the Marche's economy concerns exports, which fell by 11.2% against 9.3% in the country (Regione Marche, 2021). Among artisan manufacturing, the economic situation was favorable only for some mechanical activities (Carboni, 2020). The recovery was widespread among sectors, but with varying intensity. In the first nine months of 2021, within manufacturing, the recovery in economic activity was greatest for mechanical engineering and household goods. On the contrary, in the footwear sector, the most penalized by the pandemic, the recovery was modest (Banca d'Italia, 2021). Therefore, we believe that a joint study of the structural and cyclical dynamics of the regional economic system is essential to provide insights into future development prospects.

Special attention is paid to the technologies covered by the Smart Specialization Strategy (S3) of Marche. In fact, the regional innovation strategy is integrated within S3, one of the cornerstones of cohesion policy related to the 2014-2020 and 2021-2027 programming cycles and an "ex ante condition" for accessing European funds (Bertini, 2017). At this purpose, the Marche region has identified four areas of interest, namely home automation, sustainable manufacturing, mechatronics, health and well-being (Iacobucci and Guzzini, 2016; Biasio, 2020). The areas of specialization at the regional level represent the most promising trajectories for redeveloping and revitalizing the productive fabric of the Marche region and responding to the challenges the territory is

facing, among which demographic change and climate change represent by far the most relevant (D'Adda et al., 2022).

The contribution we intend to make is descriptive in nature. We will examine the structural factors holding back the development of the regional economy and focus on the dynamics of manufacturing. In addition to the strategic importance within S3, there are two additional reasons why we focus on this sector. First, the economic indices show the fundamental role of manufacturing for the Marche region, which ranks first in Italy in terms of business density, added value and employment. Second, the Covid crisis has affected manufacturing enterprises the most, with potentially lasting effects. As such, one of the objectives of the paper is also to evaluate the resilience of the regional system to the many changes that have occurred in recent years. Finally, we focus on labor market dynamics. In fact, the efficiency of a local economy is measured by its ability to channel productive activities and services in quantities that provide job opportunities for the resident population (Goffi and Dini, 2008). From this perspective, through a long-term analysis, the paper aims to determine the impact of the crises that took place in the local labor market.

The article is structured as follows. In Section 2, the critical elements of the regional productive system are examined. Section 3 studies the dynamics of the labor market in the Marche region from 1995 to the present. Section 4 analyzes a set of economic and financial indicators of firms in the manufacturing industry. Finally, conclusions and policy implications are contained in Section 5.

## **2. The productive system of the Marche region**

Today, the Marche region has a more diversified economy than in the early 1990s, when it was based primarily on traditional districts (Dini and Goffi, 2015). However, the erosion of its competitive advantage in the production of mass consumer goods (e.g., Made in Italy) and the limited presence in market niches with high added value have contributed to reduce the market shares of its companies in international markets (Favaretto, 2006). In the early 2000s, the crisis in the fashion industry, particularly exposed to low-cost competition from Asian countries, hit the southern part of the region (OMLR Marche, 2006). A large part of the Marche region, in fact, is characterized by the presence of micro and small enterprises, which operate in subcontracting chains and specialize in

the activities of traditional mature sectors. Then, the global economic crisis of 2008, which had significant effects for a few years, spread to all manufacturing sectors and throughout the region. However, in the Marche region, this crisis found a production system which was already showing signs of structural weakness.

The main criticalities of the Marche production system are highlighted by an OECD study on “Small business, entrepreneurship and local development in the Marche region” (Potter et al., 2010), which identifies seven main points of weakness in the regional production system: (i) A “locked-in” model of development focused on export-based manufacturing; (ii) Few hi-tech and innovative start-ups; (iii) Little regional marketing; (iv) Low foreign investment levels; (v) Dominance of basic skills in SMEs; (vi) Weak infrastructure; (vii) The lack of synergy in multi-level governance arrangements.

These problems had a significant impact on the productivity of regional industries (Bellocchi et al., 2020, 2021). In fact, only a residual part of the gap between the productivity of the manufacturing industry in the Marche and that of central and northern Italy can be attributed to the different sectoral composition. Even within industry, where the region is highly specialized, productivity has increased less rapidly than in other regions with a similar industrial composition (Banca d'Italia, 2008). This result confirms some of the critical issues that emerged from previous surveys such as the one conducted by Fondazione Merloni (2009) and Minetti et al. (2015) on different sample of manufacturing companies, highlighting a negative relationship between ownership concentration, firms' R&D effort, and innovation.<sup>1</sup> In many cases, the management of small and medium-sized enterprises (SMEs) in the Marche region is still largely tied to the direct involvement of the founder in organizational activities, with a total closure to different ownership structures. The risk (which has since materialized) is thus to anchor the company's current success to the competitive advantage on which its initial success was based. This rigid form of ownership structure may have protected the companies' presence in the market, but on the other hand, it may have hindered potential breakthroughs in exiting the crisis.

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<sup>1</sup> The first study analyzes 200 manufacturing firms in the Marche region, most of which are SMEs companies and account for 20% of employment and 30% of regional added value. The second study focus on 20.000 Italian manufacturers.

*Table 1. Innovation and employment indicators in the Marche and other Italian regions, 2019.*

| Region              | 1. R&D expenditure<br>(% total) | 2. R&D<br>employees | 3. R&D expenditure<br>(% GDP) | 4. R&D employees<br>(100.000) | 5. % Hi-tech<br>employment | 6. Export<br>(% GDP) |
|---------------------|---------------------------------|---------------------|-------------------------------|-------------------------------|----------------------------|----------------------|
| Abruzzo             | 1.22%                           | 1.42%               | 0.94%                         | 5.70                          | 3.00                       | 26.75%               |
| Basilicata          | 0.31%                           | 0.37%               | 0.61%                         | 3.41                          | 1.60                       | 31.77%               |
| Calabria            | 0.71%                           | 1.16%               | 0.54%                         | 3.11                          | 0.80                       | 1.67%                |
| Campania            | 5.56%                           | 6.29%               | 1.29%                         | 5.68                          | 2.20                       | 10.13%               |
| Emilia-Romagna      | 13.00%                          | 12.88%              | 2.03%                         | 15.24                         | 3.30                       | 39.47%               |
| Friuli (FVG)        | 2.52%                           | 2.45%               | 1.65%                         | 10.59                         | 3.00                       | 40.37%               |
| Lazio               | 13.69%                          | 11.04%              | 1.74%                         | 9.86                          | 6.60                       | 11.59%               |
| Liguria             | 2.67%                           | 2.18%               | 1.36%                         | 7.37                          | 3.70                       | 15.24%               |
| Lombardia           | 20.64%                          | 21.56%              | 1.32%                         | 11.32                         | 4.90                       | 32.19%               |
| Marche              | 1.82%                           | 2.60%               | 1.09%                         | 8.95                          | 2.70                       | 28.01%               |
| Molise              | 0.32%                           | 0.32%               | 1.28%                         | 5.44                          | 2.10                       | 10.62%               |
| Piemonte            | 11.84%                          | 8.95%               | 2.17%                         | 10.77                         | 3.60                       | 35.14%               |
| Puglia              | 2.36%                           | 3.02%               | 0.79%                         | 3.92                          | 1.40                       | 10.81%               |
| Sardegna            | 1.11%                           | 1.13%               | 0.82%                         | 3.62                          | 1.50                       | 16.66%               |
| Sicilia             | 2.91%                           | 3.10%               | 0.83%                         | 3.24                          | 1.90                       | 12.20%               |
| Tuscany             | 7.24%                           | 7.25%               | 1.55%                         | 10.21                         | 3.50                       | 31.40%               |
| Trentino Alto Adige | 2.10%                           | 1.96%               | 1.15%                         | 9.68                          | 2.85                       | 19.11%               |
| Umbria              | 0.92%                           | 1.37%               | 1.01%                         | 8.13                          | 2.70                       | 18.51%               |
| Valle d'Aosta       | 0.09%                           | 0.11%               | 0.49%                         | 4.67                          | NA                         | 15.35%               |
| Veneto              | 8.97%                           | 10.85%              | 1.39%                         | 11.65                         | 2.70                       | 38.95%               |
| Average             | 5.00%                           | 5.00%               | 1.20%                         | 7.63                          | 2.84                       | 22.30%               |
| St. Deviation       | 0.057                           | 0.056               | 0.005                         | 3.498                         | 1.331                      | 0.117                |

Note:

(1). Expenditure for intra-muros R&D by region, incidence on total Italy.<sup>2</sup>

(2). Employees for intra-muros R&D by region, incidence on total Italy.

(3). Incidence of R&D expenditures of public and private companies as a percentage of regional GDP.

(4). Research and Development employees per 1000 inhabitants.

(5). Percentage of employees in Hi-Tech sectors over total employment.

(6). Value of goods exports as % of GDP.

Source: Authors' elaboration on Istat and Eurostat data.

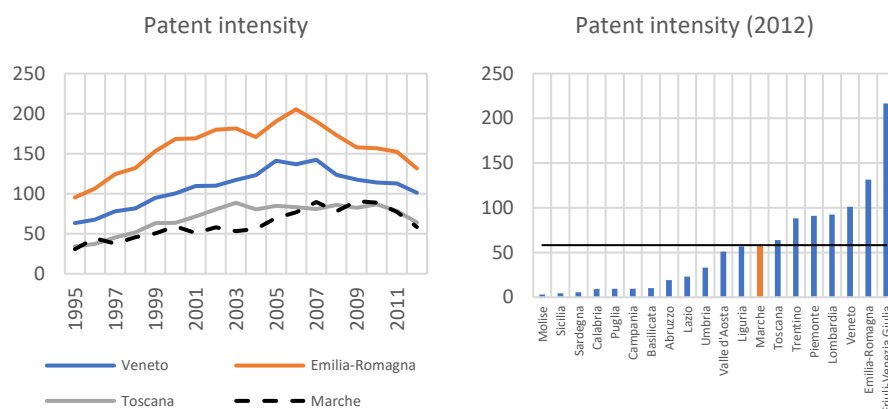
The innovative capacity of companies in the Marche has shown a systematic contraction over the years. Moreover, the periods of economic crisis, contrary to the predictions of theories of creative destruction, have acted as inhibitors rather than facilitators for the introduction of new products in the market (Goffi, 2013). The Community Innovation Survey (CIS) for the period 2004-2012 shows how companies have reduced the intensity of new product introductions, in favor of an optimization of their product portfolio (BES, 2013). Further, it emerges the role of passive strategies (cost containment and recovery of internal and external efficiency), compared to pro-active strategies (new products, R&D, new markets, brands, and patents) (Iammarino et al., 2006). This confirms an earlier

<sup>2</sup> R&D expenditure is for the total economy. It includes enterprises, universities, public and non-profit institutions.

study conducted by the Bank of Italy on a sample of 310 regional firms (Banca d'Italia, 2008) and complements a rather weak innovation system, characterized by a lower number of innovative units compared to other regions such as Emilia Romagna, Tuscany, and Veneto, with a prevalence of process innovations and a low number of patents (Cappelli, 2020)<sup>3</sup>.

Marche is one of the regions of Italy with the lowest number of public research institutions (Bossi and Scellato, 2005). All indicators on R&D expenditure and employment in research show that Marche lags the main reference regions of central and northern Italy (Table 1).<sup>4</sup>

Figure 1. Patent intensity (ratio of patents registered to the resident population).



Source: Istat elaborations on European Patent Office (EPO) data; Istat.

The trends traced by input-side measures of innovation are confirmed by output-side indicators. In fact, recent technological dynamics of Marche can also be analyzed using patent data for the period 1995-2012 (Figure 1). Although patents represent a partial indicator of the regions' innovative capacity, they are an important source of information on the characteristics of invention and allow

<sup>3</sup> ISTAT, statistical survey on innovation in enterprises. It takes into consideration various regionalized indicators derived from the survey on innovation in Italian companies harmonized at European level (CIS).

<sup>4</sup> The significant presence of micro and small businesses may lead to an underestimation of the true level of research and development, as it is more difficult for these types of companies to detect R&D activities (Favaretto and Zanfei, 2007).

tracking the technological evolution of a region (Kogler et al., 2017). The time frame considered allows for a comparative analysis of the region's technological structure before (1995-2008) and after (2009-2012) the global and local shocks. In general, the graph shows a steady increase in the number of patents (from 43.7 patents per person in 1995 to 58.2 patents in 2012). This increasing trend appears to be in line with patterns observed in European regions and is explained by a greater managerial orientation to the applied R&D and an increasing use of patents for strategic ends (Von Graevenitz et al., 2013; Cappelli, 2020). However, Marche's performance in terms of patenting remains below that of the main industrial regions of Italy (Figure 1 - panel b). Further, it should be noted that in the Marche registered patents concern mainly traditional sectors, the fashion sector and mechanics (POR Marche FESR, 2014).

For years, it was argued that the Marche Region had managed to maintain a high level of competitiveness with a low level of investment in research and development, according to a model of *innovation without research* (Goffi, 2018). This idea was supported by a survey of Censis-Confartigianato (2007), significantly titled "Making innovation without research". The idea is that smaller enterprises can be innovative even if they lack the necessary formal conditions for carrying out formal scientific activities. The study found that the drive for innovation in small and medium-sized businesses is linked to factors such as: market policies, customer demands, specific of customers, the needs related to the implementation of an order. On the other hand, the cases in which innovation in SMEs is stimulated by the availability of public funds or by collaboration with universities and research centers are rare. The model of innovation without research, long hailed as a success even beyond the region's borders, is now criticized by economists and public actors alike (Caroli et al., 2009). The literature on regional economic development has highlighted the need to move beyond the current paradigm without research, toward a model of structured research (Moncada-Paternò-Castello, 2006).

As far as the weight of employment in hi-tech sectors on the total number of employed people is concerned (Pavitt, 1984), Marche lies at the bottom of the ranking of Italian regions. If we look at the composition by technological level of manufacturing, there is a clear prevalence of low-technology companies, with a minimal presence of high-technology companies; moreover, from 1998 to 2008, high-tech companies decreased more than low-tech ones (Favaretto, 2011).

Among the problems of the Marche's productive system, there is also a delay in the development of updated skills and long-term strategic vision (Osservatorio Impresa 4.0). In the current globalized context, the value creation potential of a local economic system depends on its technological endowment rather than on "the existence of professional communities capable of enabling it in a strategic sense" (Carboni, 2005; Goffi, 2013). The traditional strength of industrial districts, which resided in the local community's relationship with labor, no longer works in the face of enormous changes in technology, digitization and competitive conditions. The risk, then, is that the development of core skills, which are crucial for the revitalization of innovative activities, will grind to a halt (Di Fernando et al., 2004; Calza Bini, 2010). The local fabric of small businesses lacks the organizational and technological knowledge necessary to induce changes in the economic behavior of small entrepreneurs. Therefore, companies with projects and ideas that could theoretically access cutting-edge technologies turn to second-best choices because of a bottleneck in the availability of advanced human capital relative to possible technology choices (Favaretto, 2011). From a global perspective, the second-best choices that the most dynamic companies are forced to make are then reflected on the entire production system with the effect of forcing it to compete at levels below its potential.

In the Marche, the manufacturing sector plays a major role. The Marche region is the Italian region where the manufacturing sector accounts for the largest share of total employment. Most manufacturing firms and employment are concentrated in four subsectors: mechanics, footwear and leather goods, wood furniture, textiles, and clothing. Mechanics is the sector with the highest incidence for all the indicators considered (number of companies and total employment), followed by footwear, woodworking, food preparation and textile clothing (Tables 2 and 3).

A comparison with Veneto, Friuli Venezia Giulia and Emilia Romagna, regions with a similar production structure to that of the Marche, shows that today manufacturing still plays a very important role in the regional economy. Over the 1995-2018 period, Marche experienced the second highest increase in value added in manufacturing, and by far the largest since 1995 to just before the crisis of 2008 (Figure 2).

Table 2. Number of Enterprises by industry, 2019.

| Industry                    | Number of firms |                 |        |          |               |        |
|-----------------------------|-----------------|-----------------|--------|----------|---------------|--------|
|                             | Marche          | Pesaro e Urbino | Ancona | Macerata | Ascoli Piceno | Fermo  |
| Metalmechanic               | 24.28%          | 28.86%          | 31.43% | 21.36%   | 28.42%        | 12.32% |
| Footwear and leather goods  | 18.59%          | 0.90%           | 1.84%  | 24.82%   | 5.55%         | 56.90% |
| Wood and furniture          | 12.49%          | 23.48%          | 10.62% | 12.35%   | 9.79%         | 3.82%  |
| Food and beverage           | 10.90%          | 9.72%           | 12.12% | 10.64%   | 18.87%        | 6.96%  |
| Textile and clothing        | 9.96%           | 11.80%          | 12.74% | 8.14%    | 12.24%        | 5.67%  |
| Plastic and non-methallic   | 6.96%           | 7.17%           | 6.44%  | 8.42%    | 5.79%         | 6.30%  |
| Paper                       | 3.91%           | 3.56%           | 4.89%  | 3.54%    | 4.90%         | 3.10%  |
| Electronics                 | 3.82%           | 4.17%           | 6.81%  | 2.86%    | 3.22%         | 1.50%  |
| Medical and dental supplies | 3.70%           | 3.92%           | 4.43%  | 3.00%    | 6.57%         | 1.91%  |
| Others                      | 3.17%           | 2.05%           | 5.82%  | 3.82%    | 2.69%         | 1.03%  |
| Transport equipment         | 1.35%           | 3.31%           | 1.75%  | 0.34%    | 0.78%         | 0.16%  |
| Petrochemical               | 0.82%           | 1.06%           | 1.10%  | 0.65%    | 1.13%         | 0.28%  |
| Pharmaceutical              | 0.03%           | NA              | 0.03%  | 0.06%    | 0.06%         | 0.03%  |

Note: Percentage weight of mechanics, wood furniture, footwear, leather goods, textiles and clothing, electronics, transport, chemical and pharmaceutical on the total manufacturing sector in the Marche region in terms of enterprises and employment. *Source:* Asia - statistical register of active enterprises (class of employees and economic sectors, Nace 2 digit).

Table 3. Number of Employees by industry, 2019.

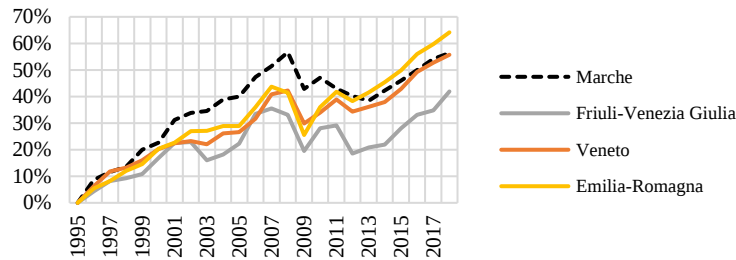
| Industry                    | Number of employees |                 |        |          |               |        |
|-----------------------------|---------------------|-----------------|--------|----------|---------------|--------|
|                             | Marche              | Pesaro e Urbino | Ancona | Macerata | Ascoli Piceno | Fermo  |
| Metalmechanic               | 26.73%              | 37.37%          | 33.35% | 17.98%   | 25.73%        | 10.13% |
| Footwear and leather goods  | 16.24%              | 0.54%           | 1.49%  | 22.52%   | 10.67%        | 60.66% |
| Wood and furniture          | 12.52%              | 27.27%          | 7.56%  | 10.47%   | 7.47%         | 1.86%  |
| Plastic and non-methallic   | 9.49%               | 8.67%           | 8.08%  | 14.88%   | 6.78%         | 7.65%  |
| Food and beverage           | 8.45%               | 5.62%           | 8.10%  | 12.19%   | 16.79%        | 4.91%  |
| Textile and clothing        | 8.33%               | 8.50%           | 10.97% | 6.55%    | 10.86%        | 4.71%  |
| Electronics                 | 7.86%               | 3.49%           | 15.66% | 5.58%    | 7.80%         | 4.97%  |
| Paper                       | 3.52%               | 2.14%           | 5.30%  | 2.89%    | 4.99%         | 2.91%  |
| Transport equipment         | 2.33%               | 3.99%           | 3.69%  | 0.32%    | 2.06%         | 0.07%  |
| Others                      | 2.04%               | 0.50%           | 2.60%  | 3.76%    | 2.67%         | 1.12%  |
| Petrochemical               | 1.64%               | 1.30%           | 2.21%  | 2.03%    | 2.32%         | 0.43%  |
| Medical and dental supplies | 0.81%               | 0.61%           | 0.98%  | 0.70%    | 1.69%         | 0.57%  |
| Pharmaceutical              | 0.05%               | NA              | 0.00%  | 0.14%    | 0.20%         | 0.00%  |

Note: Percentage weight of mechanics, wood furniture, footwear, leather goods, textiles and clothing, electronics, transport, chemical and pharmaceutical on the total manufacturing sector in the Marche region in terms of enterprises and employment. *Source:* Asia - statistical register of active enterprises (class of employees and economic sectors, Nace 2 digit).

In the years between 1995 and 2018, Marche's manufacturing connotation has remained virtually unchanged: the weight of value added in industry in the strict sense of the term (26.3% in 2018) and in services (64.9%) did not change much,

unlike the rest of the country and regions with a similar production structure, where a reduction in the weight of manufacturing has led to a substantial increase in service employment (Tables 4 and 5).<sup>5</sup>

Figure 2. Value added growth in manufacturing, index (1995=0).



Source: Authors' elaborations on ISTAT data.

Table 4. Composition by macro-sector in terms of value added in Marche and other similar regions.

|                | Value Added |      |   |          |       |   |              |      |   |          |       |   |
|----------------|-------------|------|---|----------|-------|---|--------------|------|---|----------|-------|---|
|                | Primary     |      |   | Industry |       |   | Construction |      |   | Services |       |   |
|                | 1995        | 2019 |   | 1995     | 2019  |   | 1995         | 2019 |   | 1995     | 2019  |   |
| Emilia-Romagna | 4.6%        | 2.6% | < | 28.9%    | 27.5% | < | 4.2%         | 3.9% | < | 62.3%    | 66.0% | > |
| Friuli (FVG)   | 3.5%        | 2.0% | < | 28.1%    | 24.5% | < | 5.5%         | 4.1% | < | 62.9%    | 69.4% | > |
| Marche         | 4.9%        | 1.9% | < | 27.8%    | 26.3% | < | 6.0%         | 3.9% | < | 61.3%    | 63.9% | > |
| Tuscany        | 3.3%        | 2.6% | < | 27.8%    | 20.9% | < | 4.0%         | 4.0% | > | 65.0%    | 72.6% | > |
| Veneto         | 3.6%        | 2.3% | < | 29.6%    | 27.2% | < | 5.5%         | 4.6% | < | 61.3%    | 65.9% | > |

Source: Authors' elaborations on ISTAT data.

This phenomenon may have discouraged a dynamic evolution in the technological composition of firms. In addition, it may have hindered the growth of an advanced service sector and innovative business services to support the production of high-end segments of manufacturing (Goffi, 2013). The weight of innovative services on the total turnover of the manufacturing industry in the Marche region is among the lowest in Italy (Moriconi, 2008). In other words, the regional manufacturing industry cannot benefit from the presence of an advanced service sector that can make it competitive in international markets.

<sup>5</sup> Within manufacturing (Nace level 1: C), between 1980 and 2008, there was a drop in employment in the so-called traditional sectors (foodstuffs, footwear, textiles-clothing, and wood-furniture), in favor of mechanics (C24 and C25).

Table 5. Composition by macro-sector in terms of employed persons in Marche and other similar regions.

|                | Employment |      |   |          |       |   |              |      |   |          |       |   |
|----------------|------------|------|---|----------|-------|---|--------------|------|---|----------|-------|---|
|                | Primary    |      |   | Industry |       |   | Construction |      |   | Services |       |   |
|                | 1995       | 2019 |   | 1995     | 2019  |   | 1995         | 2019 |   | 1995     | 2019  |   |
| Emilia-Romagna | 4.8%       | 3.1% | < | 27.0%    | 22.4% | < | 6.9%         | 5.6% | < | 61.3%    | 68.9% | > |
| Friuli (FVG)   | 3.8%       | 2.9% | < | 26.2%    | 21.6% | < | 6.3%         | 5.3% | < | 63.8%    | 70.3% | > |
| Marche         | 4.6%       | 3.0% | < | 31.8%    | 25.5% | < | 5.9%         | 5.7% | < | 57.6%    | 62.8% | > |
| Tuscany        | 3.3%       | 3.1% | < | 27.1%    | 19.5% | < | 5.6%         | 5.9% | > | 64.0%    | 71.4% | > |
| Veneto         | 4.5%       | 3.0% | < | 31.0%    | 24.6% | < | 6.1%         | 6.1% | < | 58.3%    | 66.3% | > |

\* Industry = industry in the strict sense (excluding construction)

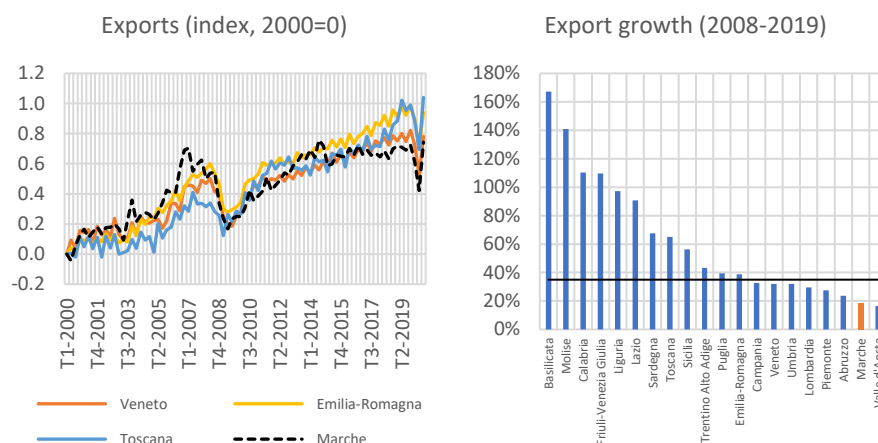
Source: Authors' elaborations on ISTAT data.

Another constraint that may have contributed to slowing the momentum of the Marche's economy is the lack of infrastructure. In the 1970s, the urban structure of the Marches was a slender network in terms of population size, but rather dense because of the succession of small and medium-sized towns that followed one another along the coastal strip to the foothills of the Apennines (Peroni and Minetti, 2007). This dense network of cities and businesses has not benefited from adequate infrastructure to support it. The infrastructure endowment index of Italian provinces calculated by Ecoter-Confindustria (2000), and the more up-to-date ones of ISTAT's statistical atlas of infrastructures, or the recent measures elaborated by the Bank of Italy all show that Marche lags the other regions of the Centre-North of the country in terms of physical, road, rail and air accessibility (Bank of Italy, 2011). Several studies have shown a positive relationship between competitiveness, infrastructure endowment and export capacity of Italian regions (Battisti et al., 2020). The main priority reported by companies regards transport and logistics networks, which represent a bottleneck for the regions with respect to the external projection of their production system (Di Giorgio et al., 2013). An efficient infrastructure network represents an advantage for exports, especially outside Europe where competition is more difficult.

Compared to Veneto, Tuscany and Emilia Romagna, Marche's export share of GDP is significantly lower. In addition, an analysis of the long-term dynamics of the ratio shows that until 2007 the Marche region was characterized by a growth in exports which was often higher than that of the other reference regions. However, the local production system has been affected by the crisis with a deterioration in international sales that, starting in 2008, has been more marked

than the rest of the country. To date, Marche's exports have not yet reached pre-crisis levels (Figure 3).

Figure 3. Exports of goods in Marche and in some Italian regions, years 2000-2020.



Source: ISTAT Quarterly exports of Italian regions (Ateco 2007).

While other Italian regions have returned to export levels slightly (Veneto and Emilia Romagna) or considerably higher (+75% Tuscany) than pre-crisis levels (2008), for Marche, total exports at the beginning of 2020 were still lower than in the fourth quarter of 2007 (-9.5%). Another aspect to note is the greater sensitivity shown by Marche's exports during 2020. While imports fell at the same rate as Italy (-7.9%), exports fell by 11.2% in the region against 9.3% in the rest of the country (Prometeia, 2021).

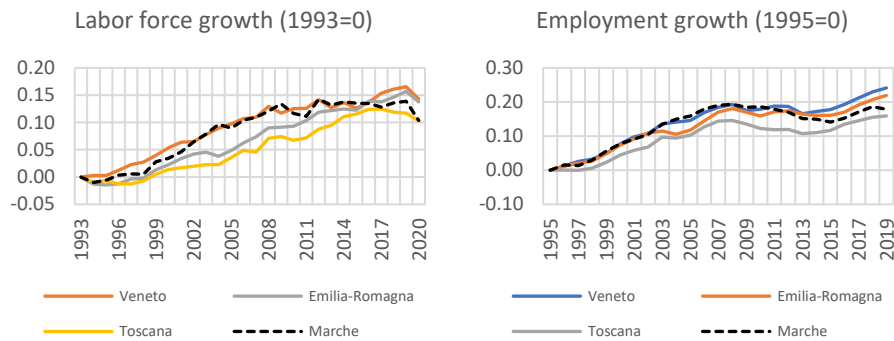
In short, even before the economic crises of the last few years, the difficult economic situation induced companies in the Marche region to review their long-run growth expectations, with lower profits that were reflected in lower investments. Favaretto (2011) was one of the first to notice that a process of decline in regional competitiveness “was already underway”. The risk of a progressive loss of momentum in the regional economy is rooted in the set of limitations of the current development model along with various weaknesses in the relationships between economic and institutional players (Goffi, 2013). Considering the current Covid crisis, these considerations take on even greater significance.

### 3. The regional labor market

ISTAT data from 1993 to 2020 were used to analyze the long-term dynamics of the Marche labor market. ISTAT reconstructed the quarterly time series and annual averages at the regional level from 1992 to 2020 relative to the Quarterly Survey on Labor Forces (RTFL) referring to: labor force; total employment, by position and by macro-sector; unemployment; inactive population; activity rates; employment rates; total unemployment rates (15-24). In order to have adequate comparative references, let us consider the usual three regions, namely Veneto, Emilia Romagna and Tuscany, which have a historical affinity with the Marche's production system and labor market.

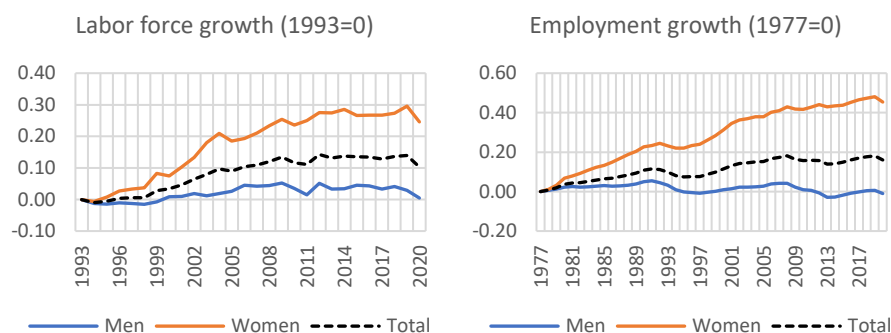
In the last 20 years the Marche Region has witnessed a consistent increase in the number of people participating in the labor market, in line with other regions (Figure 4). After a phase of stability, there was an acceleration in the growth rate of the labor force which continued until 2009. This increase was due to growth in the employment base until 2008, while in 2009 it was the surge in job seekers (+14,000 unit) that caused the growth in participation, a dynamic that also occurred in 2012-2013, when the unemployed increased by 17,000 unit. The activity rate between 1995 and 2015 increased from 62% to 69%.

Figure 4. Employment and labor force growth (by region), years 1993-2020.



Note: The labor force survey provides official estimates of employed persons, jobseekers, and information on the main aggregates of labor supply, occupation, branch of economic activity, hours worked, type and duration of contracts, training. The information is collected by interviewing every quarter a sample of 77 thousand households, equal to 175 thousand individuals residing in Italy, even if temporarily abroad. Source: Istat regional labor market data.

Figure 5. Employment and labor force growth in the Marche (by sex), years 1977-2020.

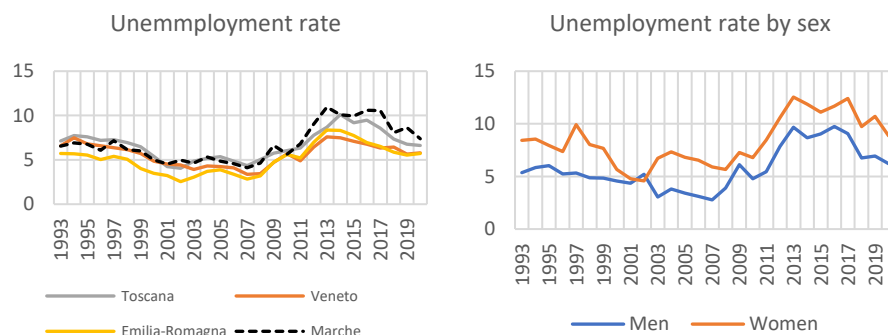


Note: The labor force survey provides official estimates of employed persons, jobseekers, and information on the main aggregates of labor supply, occupation, branch of economic activity, hours worked, type and duration of contracts, training. The information is collected by interviewing every quarter a sample of 77 thousand households, equal to 175 thousand individuals residing in Italy. Source: Istat regional labor market data.

Female participation in the labor market has also grown during the period considered (+32%), at a much faster rate than men (+3%), thus lowering the gap between male and female activity rates (from 27.6 percentage points in 1995 to 14.2 p.p. in 2015). Between 1995 and 2015 the average annual number of employed persons in the Marche region rose from 610 thousand to 720 thousand. The overall increase in employment has benefited decisively from the growth in female labor market participation (Figure 5).

The number of employed women increased from 218 thousand to 271 thousand (+24.3%, compared to only +2.6% for men), with the share on total employment increasing from 38% to 43%. Employment growth in the Marche and other benchmark regions came to a halt in 2008. However, in contrast to what happened in other regions, the Marche region began a downward trend that led to a net loss of 24,000 jobs in less than 5 years. In contrast, during the same period, other regions recovered from the employment levels reached in 2009-2010. The employment rate in the Marche Region has risen sharply between 1995 and 2003; in the following five years there have been slight fluctuations, up to the downward phase which began in 2008 and brought the Marche region to a rate of 62.6%, not dissimilar to the level recorded in the 2000, a value lower than that of the three regions considered (Figure 6).

Figure 6. Unemployment rates (regional - panel a and by sex - panel b).



Note: The labor force survey provides official estimates of employed persons, jobseekers, and information on the main aggregates of labor supply, occupation, branch of economic activity, hours worked, type and duration of contracts, training. The information is collected by interviewing every quarter a sample of 77 thousand households, equal to 175 thousand individuals residing in Italy, even if temporarily abroad. *Source:* Istat regional labor market data. Age group 15-64.

Over the last 25 years the female employment rate has increased by 10 percentage points to 54%, while the male employment rate has fallen slightly (70% and 1.8 p.p. less) (Figure 6). Distribution by profession has undergone significant changes, in particular the percentage of employees has risen from 71% to 73%; the changes almost entirely attributable to the female component, which grew by 6% (about ten times more than that of men). The opposite trend occurred in the case of self-employment, which in the twenty-five-year period registered a drop of 5%, totally attributable to the female component (-16.5%, compared with +4% for men); this decrease began in 2005 (Goffi, 2013).

At the sector level, ISTAT historical series have been reconstructed up to 2020. A particular transformation of the employment picture in the regions considered concerns the sectoral composition. The incidence of those employed in agriculture on the total has halved, from 4.5% in 1995 to 2.7% in 2015, in contrast, employment in the construction sector has grown (from 5% to 6.5%) (Bellocchi and Travaglini, 2021). Finally, while in the other regions considered there was a drop of 5-6 percentage points in the incidence of industry against a growth in services of 7-8 percentage points, in the Marche the picture remains unchanged after more than two decades (industry 1.5 p.p. less, services gain 2.5 p.p.).

The Marche system has been less affected by the process of tertiarization of the economy which characterized the most advanced economic systems. In historical perspective, from 1993 to 2008, there was the greatest increase in manufacturing employment (+19%), particularly in the period 2006-2008 when, after the darkest periods of the footwear and textile crises, the regional economy was heading toward a new path of development. Since 2008, the loss of manufacturing employment has been consistent, with a decrease of 18% in the number of people employed in industry in the Marche. In services, the Marche region registered a growth of 30%, lower than the other reference regions.

Marche is the region that shows the greatest increase in the number of unemployed from 1995 to 2015, with a +69%, compared to +59.5% in Emilia Romagna, +36.5%, in Tuscany, +18% in Veneto and +16% in Italy. From 1995 to 2000, Marche's trends did not differ much from those of Tuscany and Veneto, but subsequently Marche's dynamics were worse, especially in the last two years (1998-2000). A substantial increase occurred in 2004, due above all to the female component. This is primarily connected to the crisis in the fashion industry. From 2004 to 2008, the number of unemployed fell again, only to increase with the onset of the global economic crisis, with a peak in 2009. The latter dynamic is primarily attributable to the male component and is related to the downturn in the mechanical industry. In 2010, aggregate employment returned to decline, with the Marche region experiencing a situation not different from that of Veneto, but better than Tuscany. However, the strong increase in the number of unemployed in 2011 and the surge in 2012 bring the Marche region to its current levels, with an increase in the number of unemployed over 20 years, well above the three regions considered as reference. The unemployment rate, which in 1993 was 6.6%, reached 9.1% in 2012 and 9.3% in 2019, a level never reached in the last twenty-five years and higher than in Tuscany, Emilia Romagna, and Veneto.

According to the Labor Force Survey (ISTAT, 2021), in the first half of 2020 the number of employed persons in the Marche Region fell by 0.3 per cent with respect to the same period of the previous year, a less intense decline than in Italy (-1.7 per cent). The drop in employment was concentrated in the second quarter when the effects of the health emergency were most intense, albeit mitigated by measures to protect employment and social shock absorbers. The contraction in employment affected both services, those in the hotel, restaurant and commercial sectors, and industry; in the latter sector the drop was more accentuated than in Italy, reflecting the higher proportion of employees in

manufacturing sectors subject to suspension of activity. In construction, on the other hand, the trend was more favorable overall (OMLR Marche, 2021).

In summary, the data processed show how the Marche region, whose labor market was more similar to that of the Northeast than to that of Southern Italy twenty-five years ago, is progressively moving away from these reference models (Favaretto, 2004). The data corroborate what has already been noted in the preceding paragraph at the system level. In this sense, the recent crisis of Covid-19 is reinforcing already existing structural trends.

#### **4. An empirical analysis of the manufacturing sector**

In this section, we take an in-depth look at the manufacturing sector, given its significant weight in terms of employment and/or GDP on the economy of the Marche region (Regione Marche, 2021). The objective is to analyze the impact of the crisis linked to the spread of Coronavirus on the most important sectors of the Marche region and thus contribute to the formulation of proposals and suggestions useful to public decision makers. Specifically, the analysis aims, on the one hand, to highlight the criticalities encountered by economic activities during the health emergency and, on the other, the opportunities and prospects for recovery that are emerging in the renewed current context. The latter is in many ways different from the pre-Covid era, forcing businesses to reflect on the need to evolve in order to preserve their competitive positioning and continue to contribute to development and value creation for the regional economy.

We rely on aggregations of the manufacturing industry based on Eurostat NACE Rev. 2 (2-digit), according to level of technological intensity in each subsector (Table 6) (Eurostat, 2014). As a result, we focus our attention on the dynamics of high-tech, medium-high-tech, medium-low-tech, and low-tech manufacturing. The common denominator of the analysis is the comparison of economic and financial indicators in the period prior to the occurrence of the pandemic. The illustration of the pre-COVID economic and financial situation is intended to provide an overview of the health of the individual sector at the time of the epidemic crisis. To this end, the period 2012-2021 was considered (the latest available AIDA - Bureau van Dijk - data is as of December 31, 2021) and certain indicators of profitability, soundness-solvency and business

development are examined, which for convenience we summarize in Table 7, recalling their significance.

*Table 6. Aggregations of manufacturing based on NACE Rev. 2*

| Manufacturing Industries | NACE Rev. 2 codes (2-digit) level |                                                                                                                                                                                                                          |
|--------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | Code                              | Description                                                                                                                                                                                                              |
| High-technology          | 21                                | Manufacture of basic pharmaceutical products and pharmaceutical preparations;                                                                                                                                            |
|                          | 26                                | Manufacture of computer, electronic and optical products;                                                                                                                                                                |
| Medium-high-technology   | 20                                | Manufacture of chemicals and chemical products;                                                                                                                                                                          |
|                          | 27 to 30                          | Manufacture of electrical equipment; Manufacture of machinery and n.e.c. equipment; Manufacture of motor vehicles and trailers; Manufacture of other transport equipment;                                                |
| Medium-low-technology    | 19                                | Manufacture of coke and refined petroleum products;                                                                                                                                                                      |
|                          | 22 to 25                          | Manufacture of rubber and plastic products; Manufacture of other non-metallic mineral products; Manufacture of basic metals; Manufacture of fabricated metals products, excepts machinery and equipment;                 |
|                          | 33                                | Repair and installation of machinery and equipment;                                                                                                                                                                      |
| Low technology           | 10 to 18                          | Manufacture of food products, beverages, tobacco products, textile, wearing apparel, leather and related products, wood and of products of wood, paper and paper products, printing, and reproduction of recorded media; |
|                          | 31 to 32                          | Manufacture of furniture; Other manufacturing;                                                                                                                                                                           |

*Source:* Authors' classification based on Eurostat's industry aggregations.

The analyses reported, aggregating data from many companies, do not represent the situation of individual firms, but the average trend of the industry. The database used for the analysis includes a total of 7.151 firms, for which, as of today (May 25, 2022), balance sheet data as at 31 December 2020 were available.<sup>6</sup> It should be borne in mind, however, that the number of units on which the analyses have been carried out varies according to the economic-financial indicator considered from time to time, due to the availability or otherwise of the data required to calculate the individual indicator. Based on EU small and medium-sized enterprises (SMEs) classification criteria, 72.5% of our sample is made up of small-medium enterprises; of these, 18% are micro enterprises. Only 1.5% fall into the large category.<sup>7</sup>

<sup>6</sup> Some units may not be surveyed if they are companies exempt from financial statement requirements.

<sup>7</sup> See EU Recommendation 2003/361/EC. The SME category consists of enterprises which employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million

Table 7. Indicators for economic and financial analysis.

| Type of indicator           | Indicators                 | Description                                                                                                                                                                               |
|-----------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Economic variables</b>   | Revenues from sales        | Operating revenue, thousands of Euro.                                                                                                                                                     |
|                             | Number of employees        | Number of employees.                                                                                                                                                                      |
|                             | Added Value                | Added Value, thousands of Euro.                                                                                                                                                           |
|                             | Total assets               | Total assets, thousands of Euro.                                                                                                                                                          |
| <b>Profitability ratios</b> | Return on investment (ROI) | ROI is a performance measure used to evaluate the efficiency or profitability of an investment (rate of return on invested capital).                                                      |
|                             | Return on sales (ROS)      | ROS is a ratio used to evaluate a company's operational efficiency. This measure provides insight into how much profit is being produced per dollar of sales.                             |
|                             | EBITDA on sales            | The EBITDA is a measure of a company's operating profit as a percentage of its revenue.                                                                                                   |
|                             | Return on equity (ROE)     | ROE is a measure of financial performance calculated by dividing net income by shareholders' equity.                                                                                      |
| <b>Structure ratios</b>     | Liquidity ratio (x)        | The liquidity ratio is given by the ratio between current assets and current liabilities. It expresses the company's ability to meet its short-term commitments using current assets.     |
|                             | Solvency ratio (%)         | The solvency ratio measures the ability of the firm to meet its long-term debt obligations. It indicates whether the company's cash flow is sufficient to meet its long-term liabilities. |
|                             | Debt/EBITDA (%)            | The debt-to-EBITDA ratio makes it possible to assess whether the company in question can repay its debts and in how many years.                                                           |
|                             | Debt/Equity ratio (%)      | The debt-to-equity ratio can be used to evaluate how much leverage a company is using.                                                                                                    |

Source: Authors' own elaboration.

The four technology groups of firms considered, with reference to the companies of the AIDA dataset mentioned above, weighs in on the total number of companies present in the Marche region for about 25 billion in turnover out of a total of 53.3 and 116,504 workers employed out of a total of 248,370 (Table 8). Therefore, with reference to AIDA data, the sectors analyzed are extremely important in the regional economy in terms of either turnover, value added and

or an annual balance sheet total not exceeding EUR 43 million. Within the SME category, a microenterprise is defined as an enterprise which employs fewer than 10 persons and whose annual turnover does not exceed EUR 2 million.

number of employees. These sectors represent, in fact, roughly 14.2% of the total number of companies active in the region. As far as the employment size of firms is concerned, the firms with more employees are those operating in medium-low technology sectors (39 workers per firm on average), while those with the fewest employees all operate in more technology-intensive sectors (17 workers per firm). However, much of this differential is explained by the difference in average firm size in two subindustries (vehicle manufacturing and other manufacturing).

*Table 8. Firms by technological intensity, key characteristics.*

| Technological Intensity | Absolute values |                     |                     |              | Shares      |                     |                     |              |
|-------------------------|-----------------|---------------------|---------------------|--------------|-------------|---------------------|---------------------|--------------|
|                         | Value Added     | Revenues from Sales | Number of Employees | Total Assets | Value Added | Revenues from Sales | Number of Employees | Total Assets |
| HIGH                    | 248,494         | 791,947             | 3,851               | 881,151      | 3.77%       | 3.17%               | 3.31%               | 3.42%        |
| LOW                     | 2,733,586       | 11,434,462          | 54,649              | 11,632,041   | 41.50%      | 45.76%              | 46.91%              | 45.19%       |
| MED-HIGH                | 1,510,508       | 5,256,847           | 22,237              | 5,885,119    | 22.93%      | 21.04%              | 19.09%              | 22.86%       |
| MED-LOW                 | 2,094,924       | 7,506,261           | 35,767              | 7,340,502    | 31.80%      | 30.04%              | 30.70%              | 28.52%       |
| Total                   | 6,587,511       | 24,989,517          | 116,504             | 25,738,813   | 100.00%     | 100.00%             | 100.00%             | 100.00%      |

*Source:* Authors' own calculation on AIDA data.

The economic-financial analysis, conducted on the ten-year period 2011-2021, allows us to state that the regional manufacturing industry, before the epidemic crisis, overall was a sector with good results in terms of profitability, solidity-solveness and development. However, it is important to remember again that aggregate data does not represent individual companies. Compared to average data, there are production units with high quality strategies that systematically pursue better levels of profitability, soundness, and development and, conversely, production units that follow low quality strategies and systematically pursue worse results. It should also be noted that, within the manufacturing groups here identified, there are different supply chains and business models with highly heterogeneous characteristics and results. For instance, companies in the luxury leather goods sector have characteristics and results that are structurally different from those of units positioned in the mid-range; the companies in the leather goods supply chain have different characteristics from those in the footwear supply chain; companies with greater market power have different characteristics from small companies. In general, we can affirm, drawing on the results of the analysis, that before the crisis the situation appeared, on average, to be better for companies located in sectors with

high technological intensity and worse for companies entirely located in medium or low-tech sectors; a situation of fragility also characterized many small businesses (Camera di Commercio, 2021). For these reasons, the analysis carried out should be considered as a first approximation assessment which, by aggregating different companies, may overlook the nuances of the production realities under examination, but which allows to provide, in a timely manner, summary cognitive elements and useful suggestions also to the public decision-maker in the current phase of health emergency.

#### *4.1 Economic variables*

Analysis of the growth rate of turnover and added value confirms the cyclical trend of the sector, albeit of lesser magnitude than GDP in the same years (Figure 7). However, while the upper-middle segments of the manufacturing industry are trending steadily, it is primarily the lower end of the industry that is losing ground, thus redistributing market shares. In terms of employment, the data analyzed show a worrying downward trend for all the subsectors during the period under consideration. However, the negative trends are more pronounced in the low-tech sectors. The improvement in the economic outlook has favored capital accumulation in recent years. This confirms the survey of the Bank of Italy (2021) that approximately 70% of firms are meeting their 2021 investment plans. However, as the trend in the capital stock over time shows, this local trend is part of a general dynamic of disinvestment for low-tech firms that has persisted for several years, while, in contrast, investment by medium- and high-tech firms is growing structurally. This phenomenon is not purely Marche-related and concerns craftsmanship (Favaretto and Travaglini, 2014).

Figure 7. Selected economic indicators: (i) turnover, (ii) value added, (iii) employees and (iv) total assets.



Source: Autor's own calculation.

#### 4.2 Profitability indicators

The first indicator of *profitability* considered is ROI (i.e., the return on invested capital). The dynamics of ROI over the period is similar for all groups of companies (Figure 8). After an initial decline due to the crisis of 2010-2011, there was a three-year recovery (until 2018) and then a decline again in more recent years with the advent of the Covid crisis. Similarly, but more pronounced is the development of ROE (i.e., the return on equity) over time. The value of ROE in 2019 lies between 8.5 for low-tech firms and 10.5% for high-tech firms. Given the low level of interest rates during the period under review, a ROI value above 7% can be considered as positive. Operating profitability of sales is measured by ROS (i.e., the ratio of operating income to the value of sales). Its overall development is positive, although moderate and slightly declining in the last period (it varies between 3.8% and 3.5%) (Tartufoli et al., 2012). However, it should be noted that, other things being equal, a slight drop in sales prices or an increase in the price of raw materials is sufficient to significantly reduce the profitability of sales; this highlights a potential risk factor, given that the indicator could "easily" go from a positive sign to a negative one. ROS of low-tech manufacturing firms approached the zero threshold just before the arrival of Covid crisis. Finally, EBITDA (operating income before depreciation and amortization) in relation to the value of sales has risen slightly in the three years period before 2018 for all groups of firms except low-tech-intensive ones. In the long term, the dynamics of EBITDA are unfavorable for all sectoral groupings, particularly the latter. Trends in soundness-solvency are shown in Figure 9.

Figure 8. Selected profitability indicators: (i) Roi, (ii) Roe, (iii) Ros, (iv) Ebitda.

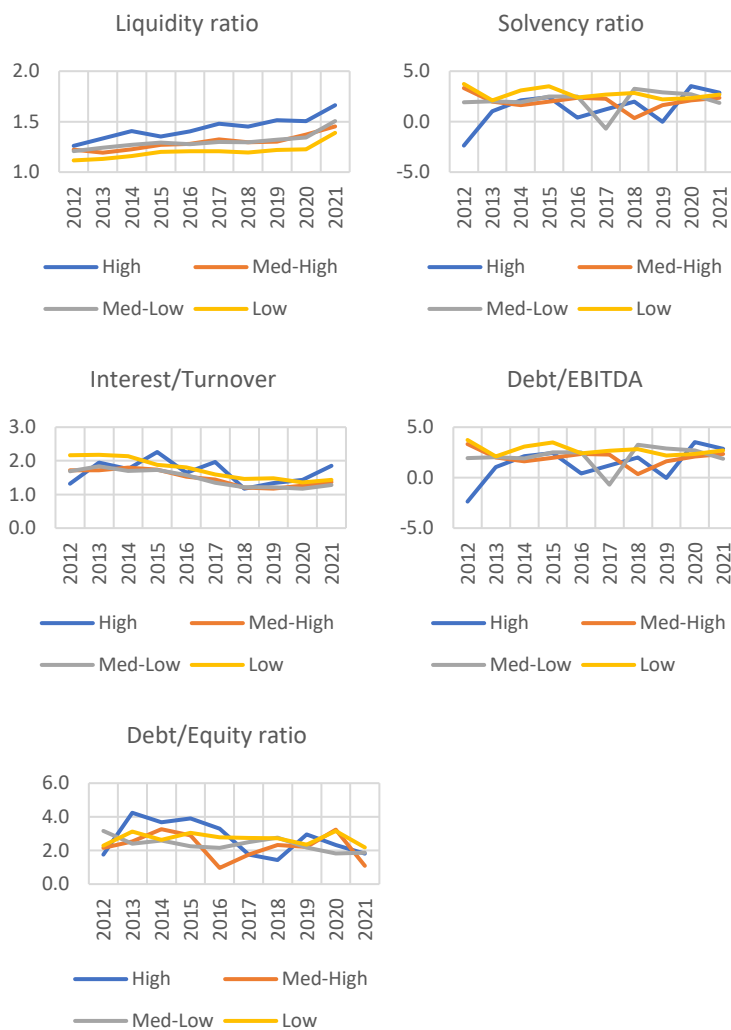


Source: Autor's own calculation.

#### 4.3 Indicators of solidity-solvency

The first indicator of *profitability* considered is ROI (i.e., the return on invested capital). The dynamics of ROI over the period is similar for all groups of companies (Figure 8). After an initial decline due to the crisis of 2010-2011, there was a three-year recovery (until 2018) and then a decline again in more recent years with the advent of the Covid crisis. Similarly, but more pronounced is the development of ROE (i.e., the return on equity) over time. The value of ROE in 2019 lies between 8.5 for low-tech firms and 10.5% for high-tech firms. Given the low level of interest rates during the period under review, a ROI value above 7% can be considered as positive.

Figure 9. Indicators of solidity-solvency.



Source: Autor's own calculation.

Operating profitability of sales is measured by ROS (i.e., the ratio of operating income to the value of sales). Its overall development is positive, although moderate and slightly declining in the last period (it varies between

3.8% and 3.5%) (Tartufoli et al., 2012). However, it should be noted that, other things being equal, a slight drop in sales prices or an increase in the price of raw materials is sufficient to significantly reduce the profitability of sales; this highlights a potential risk factor, given that the indicator could "easily" go from a positive sign to a negative one. ROS of low-tech manufacturing firms approached the zero threshold just before the arrival of Covid crisis. Finally, EBITDA (operating income before depreciation and amortization) in relation to the value of sales has risen slightly in the three years period before 2018 for all groups of firms except low-tech-intensive ones. In the long term, the dynamics of EBITDA are unfavorable for all sectoral groupings, particularly the latter. Trends in soundness-solvency are shown in Figure 9.

Finally, we turn to *corporate strength-solvency*. The joint evolution of the indicators is assessed, in aggregate terms, as quite positive. We notice a slight increase in the liquidity ratio of enterprises (expressed as the ratio of current assets, excluding inventories, to short-term debt). This index as of 2019 has values above unity for all groups of companies, meaning that current liabilities (short-term debt) are generally lower than current liquid or liquidable assets in the short term. Similarly, the structural improvement in the risk profile of SMEs about solvency which emerge from the analysis of the solvency ratio is a phenomenon that has affected all productive sectors (Cerved, 2020). The analysis by sector offers interesting food for thought. In fact, both the structure of companies and economic dynamics are linked to their respective macro-sectors. In general, companies operating in technology-intensive industries performed best in the evolution of liquidity-solvency ratios. This fact, together with the intensification of credit growth, thanks to the extraordinary measures to support public credit, has allowed companies in the Marche region to withstand the unexpected drop in revenues that occurred with the onset of the pandemic without many problems in terms of cash flow. Therefore, the deterioration of the financial situation during the 2020s is not expected to worsen to the point of returning to the critical levels of the previous sovereign debt crisis. In the period considered, debt ratios are also at acceptable levels. The measure of the ratio of payables to EBITDA is widely used by the banking system to grant credit. It should be noted that the numerator indicatively expresses the extent of indebtedness (net of certain items of liquidity) and the EBITDA an approximate indicator of the ability to produce financial resources from the "ordinary" operational management of the company. The figure of around 2 is hence to be viewed as moderately positively (the threshold value is typically set around 4).

The reduction in debt with respect to equity, which has continued uninterrupted since 2012, continued in 2019. Leverage, given by the ratio of financial debts to the sum of financial debts and shareholders' equity, fell further in all subgroups. The decrease observed over the years is partly attributable to the exit from the market of the most indebted players, especially microenterprises. Moreover, as pointed out by the Bank of Italy (2020), a gradual recomposition of debt in favor of long-term debt has contributed to the rebalancing of the financial structure of firms.

## 5. Concluding remarks

For some years now, many scholars have been pointing out the risk of a gradual loss of momentum in the Marche economy due to various structural weaknesses. At the beginning of the new millennium, the difficult economic situation highlighted these limitations, which then came to the forefront again due to the global economic crisis of 2008 and the Covid crisis of 2020. Labor market data over the past twenty-five years show how the Marche labor market has underperformed those in the Northeast of Italy over the long term.

For a long time, it was thought that the main explanation for the competitiveness problems of the regional economy was related to its industrial specialization in traditional and mature sectors. However, several crises have weakened this explanation by highlighting other factors that have contributed to the process of declining regional competitiveness. The model of *innovation without research* that supported the growth of the Marche's economy in past decades is no longer adequate to the new global economic context. The innovative capacity of small and medium-sized enterprises in the Marche region has been systematically reduced and the entrepreneurial system is dominated by process innovations and cost-containment strategies.

Alongside this fact, the role of local innovative units in the Marche is lower than that of similar regions in terms of productive structure. Moreover, all indicators on the intensity of research and development (R&D) processes place the region in a backward position. The rigidity of the ownership structure, the lack of generational turnover and the scarce presence of managers have further weakened the already weak innovative drive of the system.

The economy of the Marche has been less subject to the process of tertiarization which characterizes more advanced economies. The incidence of employment in manufacturing and services has remained about the same as it was twenty-five years ago. For this reason, the Marche region has a low presence of technology-intensive businesses, with an increase over time in the weight of businesses in intermediate sectors, especially those characterized by medium-low technology.

The lack of foreign investment compared to the main reference regions has penalized regional economic development in front of a stagnant domestic demand. The weakness of infrastructure compared to the north of the country has meant that opportunities linked to foreign markets have often not been adequately seized as a factor of development.

All indicators show that the weight of the manufacturing industry in the Marche region is substantial, and among the highest in Italy. The continued crisis of recent years has hit less technologically intensive companies the hardest. There was a loss of efficiency in the regional manufacturing sector (especially in the low-tech segment), which has been matched by a reduction in employment. However, employment dynamics are particularly interesting, since they have also affected companies in the high-end segment. This may be related to local labor market dynamics and warrants further investigation.

Among the factors behind the loss of efficiency in low-tech manufacturing firms there is a dramatic reduction in investment, which has been on the decline after a small recovery in 2011. The investment choices of micro-enterprises have been oriented towards greater efficiency of tangible assets, given the extent reached by unused production capacity.

However, AIDA data also show how the upper middle segment of manufacturing has responded positively to international challenges. This generalized growth indicates that some segments of the Marchigian industry still offer great opportunities and have an important economic potential. An additional positive aspect is that these technologies are also technologies covered by the S3. This signals that local government bodies have well identified the strengths of the regional economy and that supporting policies for these technologies are fully consistent with the European Union's S3 directives (Foray, 2015).

In conclusion, the potential of a widespread and heterogeneous entrepreneurial fabric such as that of the manufacturing sector in the Marche region remains vast, but is conditioned by the need for a coherent industrial

policy that can attract and guide investment. The latter are crucial for R&D activities and for supporting higher value-added segments in introducing innovations that go beyond simply containing production costs.

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