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**"The productivity paradox: exploring Italy's slowdown"**

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*“Italy is often regarded as the sleeping beauty of Europe, a country rich in talent and history, but suffering from a long lasting stagnation” (Hassan and Ottaviano, 2013)*

## **ABSTRACT**

*Una delle caratteristiche distintive dell'economia italiana negli ultimi 25 anni è certamente la sua insoddisfacente produttività; sebbene il gap competitivo rispetto agli altri Paesi sia stato acuitizzato dalla Grande Recessione, le vere cause di questo rallentamento sono da ricercarsi più indietro nel tempo. Alcuni fattori strutturali impediscono all'Italia di raggiungere livelli di innovazione e produzione pari a quelli di altri Paesi sviluppati: l'analisi proposta mira a investigare quali siano queste caratteristiche proprie del sistema produttivo italiano e come queste abbiano potuto interagire con una serie di shock vissuti nel corso degli anni '90, in un modo tale da giustificare l'inizio di una stagnazione proprio in un periodo di eccezionale stabilità macroeconomica. Risulta in particolar modo interessante osservare come questi abbiano potuto precludere al Paese la possibilità di beneficiare delle opportunità di crescita offerte dalla rivoluzione ICT, ma anche come abbiano impedito al mercato un'efficace redistribuzione delle risorse nell'economia sulla base della produttività relativa dei loro usi. Oltre ad uno studio della letteratura in merito alle possibili determinanti di questo unlearning, si assume successivamente un approccio empirico, andando a svolgere un'analisi della portata di questo declino: impiegando i dati forniti dalla banca Istat, Eurostat e OECD si quantifica la perdita che l'Italia ha sofferto dal 1995 a oggi. Osserviamo una marcata riduzione della produttività in coincidenza con il rallentamento della crescita del Pil.. In particolare, viene messa in prospettiva la stagnazione italiana con l'evoluzione della produttività in altri Paesi europei e OECD, evidenziando ancora una volta la debolezza dell'economia italiana. Risulta ben chiaro perciò come una tale mancanza di dinamicità sia un tallone d'Achille che non ci si può permettere di ignorare, in particolare in un'economia mondiale dalla sempre crescente competitività e che richiede di essere in grado di evolversi e migliorare costantemente: il rischio è quello di venire sorpassati da Paesi più dinamici e capaci di sfruttare meglio le opportunità che l'innovazione tecnologica e la globalizzazione offrono.*

## **SUMMARY**

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# 1. Introduction

*“Productivity lies at the heart of long-term growth” (Calligaris et al., 2018)*

## 2.1 *The productivity slowdown*

While it may not be the panacea for all societal diseases, it is a widely agreed fact that many problems can be solved through economic growth. This is true not only because growth brings improvements in the living standards of a country’s citizens, but it can also alleviate many issues related to governmental budget constraints and even high inflation (Jones, 2017). For this very reason, a growth slowdown is a phenomenon that should not be underestimated. Italy is the third biggest economy in the EU, as well as the second manufacturer (Eurostat 2019). Even though it is a relatively large and wealthy country, it is often not well perceived by foreign analysts and economists: crippling public debt, inefficient institutions and its inability to keep up with the technological frontier all play a role in this less-than-ideal image that Italy has been projecting for the past decades. But perhaps, the biggest concern has been the inability to maintain a trend of strong, or in some cases even positive, economic growth since the late 1990s.

Italy’s fast pace of productivity growth during the Golden Age – the three decades following the 1950s – was promptly followed by an equally rapid decline, that led to the long-lasting stagnation that still paralyzes the country: starting much poorer than most of Western Europe after WWII, it has been catching up fast until the Nineties, but since then the process of convergence has reversed, yielding a productivity growth that has been weak both by historical standards and compared with other main European countries (Bugamelli et al., 2018). This is particularly surprising considering that, during the 70s and 80s, the country has proven itself to be the best growth performer among major European partners, and yet in the 1990s and the 2000s it stood out as the worst one; if anything, the economy’s outlook kept deteriorating, to the point where, in the manufacturing industry, the growth rate even turned negative from 2000 to 2005 (Hall et al., 2009).

To some degree, this is not an isolated phenomenon: in recent years, productivity has slowed down in many economies around the world. Commenting on these developments, Chad Jones wrote: “Perhaps the most remarkable fact about economic growth in recent decades is the slowdown in productivity growth that occurred around the year 2000” (Jones, 2017). The decline has only accelerated in the aftermath of the Great Recession, affecting both developed and developing countries; productivity in advanced economies, those same ones that once were the spearhead of the global economy, “has continually surprised to the downside” (Cette et al., 2016). This has been seen

by some as evidence of a so-called “secular stagnation”: Gordon (2012) claims that growth worldwide may face a further slowdown in the future, due to a series of supply-side structural issues looming above many developed countries, such as demographic contraction, rising inequality, globalization, and the increase in both consumer and government debt. Unfortunately, an important challenge preventing us from undertaking meaningful studies is the still short time-span for which such data are available. Within this global trend, the Italian case is worth of study: while most Western countries started to stagnate after the financial crisis, Italy is unique in experiencing such a decline far before others, and arguably it has been the main determinant of the dismal GDP growth of the last 20 years (Giordano et al., 2017).

The declining growth performance of “mature” countries over time is indeed a standard prediction of the Solow growth model, and it is a pattern that Italy shares with a host of other OECD countries (Daveri and Jona-Lasinio, 2005). However, the concerning aspect is that not only Italy’s per-capita GDP has grown at a slower pace than before, but has done worse than the average Europe’s GDP (reaching 25% of EU19 average in 2019<sup>1</sup>). Because the rest of Europe is still growing at a positive rate, Italy only had a relative decline over the years yet; though the risk is that it may turn into an absolute decline in a not-so-distant future. Similarly, while most of Europe was negatively impacted by the double recession (the financial crisis of 2007 and the sovereign debt crises of 2011), the crisis was deeper and more persistent for Italy than for many of its peers. In fact, it seems that the country never fully recovered from it, as its GDP level still remains lower than what it was before<sup>2</sup>. Arguably, this has to do with the fact that the global downturn only reinforced a deceleration that was already in place: productivity is the true factor holding back long-term economic growth in Italy. Which factors are to be singled out as the main determinants of this economic impasse has been a topic of great discussion in recent years.

Lastly, when approaching the topic, it is worth pointing out that this is not an issue to Italy alone: the sustainability of its public debt (already above 130%, but destined to grow due to the recent pandemic and the inevitable recession) relies on the ability to maintain a long-term growth pattern; otherwise, the country’s prospects will become “a matter of concern for the entire Eurozone and beyond” (Tiffin, 2014), perhaps threatening the its ability to remain a part of the Euro Area at all.

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<sup>1</sup> Italy GDP growth rate in 2019 has been 0,3%, while the EU19 mean was 1,2%. Data from Eurostat (2020).

<sup>2</sup> In 2008, real GDP per capita was around 28.230, while it only reached a value of 26.860 in 2018 (Eurostat, 2020).

## ***2.2 Approach***

In this paper, the aim is to analyse and measure the productivity decline that Italy experienced in the recent past. Section 2 will be all dedicated to evaluating the various contributions that authors have given to the topic of productivity slowdowns, focusing in particular on the Italian case. The review will cover a number of different studies published during the years, from the early 2000s up until very recently; each one of these will shed light on a different factor that may have been a key driver determining this downward trend.

After a literature review and having isolated the main possible causes of the phenomenon, Section 3 will offer an empirical analysis, aggregating a series of measures to quantify the extent to which the slump the country finds itself in has impacted various macroeconomic factors, starting from the GDP level to many measures of productivity such as TFP and GDP per hour worked. To do this, data have been collected through the Istat, Eurostat and OECD databases.

The paper will then end with Section 4, summing up the results of the empirical analysis, as well as pointing out which one of the aforementioned factors were especially significant in their contribution to this decade-long stagnation.

## **2. Literature review**

### ***2.3 How does productivity fall?***

Daveri and Jona-Lasinio (2005) describe the evolution of GDP per-capita by looking at the combined trends of two economic variables, labor productivity (output-per-hour-worked), and the total number of hours offered by each worker, correcting for the demographic change of population in their working age<sup>3</sup>. While differences in labor input can account for the absolute difference in output between Italy and the US, as Alesina et al. (2005) have argued before, it does not explain the evolution of GDP growth rate in the former, as hours worked only increased from the Nineties onwards. Instead, most of the fall stems from the declining growth of productivity per man-hour, rather than a reduced amount of hours; the impact of demographic forces is only marginal. On top of that, their results highlight how the rather generalised within-industry decline is responsible for most of the slowdown (around 80%): manufacturing alone accounts for one half of the downfall, but no industries (with the

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<sup>3</sup> Age between 15-64 (Daveri and Jona-Lasinio, 2005)

exception of utilities) is immune to the disappointing performance. The diminished reallocation of resources from backwards-growing industries, such as agriculture, onto more dynamic ones, namely market services, contributed the remaining 20% (Daveri and Jona-Lasinio, 2005). This last factor is called “misallocation” and it is something that will be tackled later on.

As many have argued over the years, labor productivity growth can be pointed at as the main determinant for growth in many advanced countries<sup>4</sup>. Understanding what made Italy incapable of improving its performance in the use of labor as much as other fellow countries did is a matter of great importance. Before diving into the reasons for the productivity downfall, it is key to rule out every other possible explanation. The declining output-per-worker may signal either a diminished efficiency in the use of labor or a decline in accumulation of capital per-hour-worked. It may be that the downward trend is a consequence of the *capital deepening*<sup>5</sup> phase, which has been one of the main determinants supporting the growth in the ‘80s, coming to an end. In other words, the worsened productivity is either a result of a shift in the isoquant, or a movement along the same isoquant due to the fall in capital intensity, perhaps as a result of a change in relative factor prices, leaving the efficiency level untouched. If Italy experienced only a re-adjustment of an inefficient factor mix, a falling productivity level would be a mere market-driven reaction to an excess in capital intensity in the past. The observed surge in employment over the last decade would also be consistent with this conclusion. If the former was true instead, this would imply a decline in the economy-wide productivity, that would result, *ceteris paribus*, in a lower value-added per worker (Fachin and Gavosto, 2007).

Based on the data, a productivity downfall seems the most solid explanation. The authors show that “in almost half of the industries examined the average annual rates of growth of Capital endowments per Labour Unit have been higher in the second part of the sample, hence accelerating exactly when labour productivity growth slowed down” (Daveri and Jona-Lasinio, 2005). The reduced labor productivity cannot be due to higher levels of labor employed, as capital grew more than proportionally in the same period while the relative productivity of labor plummeted. Although there has been some mild reduction in capital deepening during this period, it has been compensated by an increase in the share of capital in the value-added at the economy level, counteracting this declining accumulation; hence, the factor substitution narrative is incompatible with the data. The conclusion

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<sup>4</sup> As the ex-Governor of the Federal Reserve B.S. Bernanke stated: “Almost certainly, the most important economic development in the United States in the past decade has been the sustained increase in the rate of growth of labor productivity, or output per hour of work” (Bernanke, 2005).

<sup>5</sup> Following the definition given by Daveri and Jona-Lasinio, capital deepening is “the product of the growth of the capital-labor ratio - the ratio between productive capital stocks and the number of full-time equivalent employed persons - and the value added share of capital at  $t$  and  $t-1$ ”.

seems to be that most of the decline in productivity since 1995 is due to the decline in productivity, while capital deepening was roughly unchanged.

## ***2.4 Total Factor Productivity (TFP)***

The conclusion to this preliminary analysis is that Italy's slowdown appears to be overwhelmingly driven by its lag in productivity growth. To properly study this collapse, a measure to quantify its extent is needed. International comparisons often rely on the output-per-unit-input, also called *Total Factor Productivity* (TFP), a concept introduced by Solow (1957) as a measure of how efficiently given amounts of inputs are employed<sup>6</sup>. Intuitively, "the level of TFP is simply a measure of how successful a given basket of aggregate inputs, including capital, labor, and human capital, are in production" (Jones, 2017). TFP is widely regarded as the main driver of long-run growth: while a growth process based on the accumulation of factors of production will suffer from decreasing returns to scale, one relying on increasing productivity is more sustainable. For this reason, differences in TFP has been proposed as "a main reason for the large and persistent differences in output per worker across countries" (Calligaris et al., 2016), and therefore, a TFP slowdown can largely explain the disappointing performance of the Italian economy in the past (Hassan and Ottaviano, 2013). As countries differ not only in factor endowments but also, and perhaps mainly, in technology, TFP can be interpreted as a measure of the "quality" of Italy's production technology.

Looking at how this variable evolved over time, TFP growth clearly shrank throughout the decades, even turning negative in the 2000s. Returning to the definition of TFP as efficiency in the use of inputs, "its negative growth signals an unprecedented reduction in the ability of Italy to turn its productive resources into value added" (Hassan and Ottaviano, 2013). The emergence of such a marked slowdown is difficult to explain for standard growth theory: on the one hand, a lack of investments can explain a decline in labor productivity (that is indeed observed), but not in TFP: firms would have to "unlearn" what they already know. Moreover, as discussed before, it was economy-wide productivity (i.e. TFP) that affected labor productivity, and not the other way around. On the other hand, an institutional crisis could explain such a decline, but the period ranging from the mid-1990s to before the Great Recession was actually the most stable macroeconomic and political environment since the early 1960s, due to the low levels of interest rates, low inflation and stable governments.

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<sup>6</sup> "The TFP index at time  $t$  is the ratio of produced output and total inputs employed" (Del Gatto et al., 2011)



## 2.5 *Structural obstacles to innovation*

Many analyses over the years solidify the idea that Italy's feeble growth is not a result of an unfavourable business cycle or a temporary fluctuation, but rather a result of its pre-dated weaknesses: "it's generally recognized that the growth deficit is a reflection of unsolved structural issues, that become more urgent as the world economy changes"<sup>7</sup> (Banca d'Italia, 2009). The Italian productive system have remained mostly unchanged in the last decades, and many of its features "have proved ill-suited to addressing the new competitive pressures and fully exploiting the opportunities offered by technological innovation and European and global economic integration" (Brandolini and Bugamelli, 2009). These genetic flaws, which would not weight down Italy significantly in a period of relative stability, have become a relevant disadvantage as the competitive context becomes more dynamic and demanding, requiring the ability to innovate and evolve accordingly.

It is a well-known fact that "innovation is one of the main drivers of productivity growth" (Daveri and Parisi, 2010). For this reason, the existing innovation and technology gap is argued to be one of the key determinants of the unsatisfactory growth. Italy's performance belongs to the group of "moderate innovators" within the EU: while, thanks to the restructuring process the national economy underwent in recent years, many elements have improved (such as human resources and the quality of the research system), it still exhibits a marked disadvantage to many of its peers, lagging behind especially in the share of firms hiring R&D workers and private sector's R&D expenditure, as well as lack of adequate digital infrastructures (European Commission, 2020)

Interestingly, there is no evidence of innovation "underperformance", but rather of "underinvestment" (Bugamelli et al., 2018): looking at R&D as an indicator of the amount of innovative effort, the private sector is characterized by less frequent engagement in R&D and lower spending on it. The result is that the proportion of GDP that private firms invest in innovation is remarkably low by international standards. Still, Italian enterprises do not differ significantly from the European ones in terms of lower fecundity of research effort, nor are they any less innovative.

Hall et al. (2009) argue that the relationship between R&D, innovation and the overall productivity of firms is similar to that of other countries, so the reason behind the underinvestment must be the lower net gains from engaging in innovation: direct and indirect costs in Italy end up being so high that they actively discourage firms from investing. A number of factors, both internal or external,

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<sup>7</sup> "È opinione diffusa che il deficit di crescita economica rifletta problemi strutturali irrisolti, resi più pressanti dai notevoli cambiamenti che hanno caratterizzato l'economia mondiale"

appear to limit the willingness of firms to bear the costs of R&D and work towards filling the innovative and productivity gap.

Bugamelli et al. (2012) observe that the number of innovative firms is similar to that of Southern European countries, even though still less than Northern Europe, but what really harms their potential is the prevalence of an innovation model based on low commitment, which results in an insufficient level of R&D. This conditions the number of firms willing to do formal R&D and translates into an extensive margin problem for Italy. Moving further in this direction, Bugamelli et al. (2018) conclude that, apart from a few highly innovative firms on the productivity frontier, the gap reflects underinvestment by a great majority of firms, especially of a micro and small size, which appear to be less able or less willing to face the risks and costs of undertaking innovative projects, and when they do, they choose an innovation path that minimizes financial and organizational commitment, such as incremental product innovation and embodied technology for process innovation.

While what argued before may indeed be true, the problem could also be linked to the tools employed to quantify innovation. Saying that SMEs exhibit lower R&D expenditure does not automatically mean they do not innovate: their activity is often characterized by certain peculiar features that traditional indicators do not capture, as most of their innovative effort is carried out through informal channels like knowledge management, scientific collaborations with other institutions or the ability to benefit from spillovers (Bugamelli et al., 2018). It is therefore possible that informal innovation (with no R&D expenses) is comparable in terms of intensity but also quality to formal, R&D-based innovation, even constituting the very engine of technological change in some industries: “small firms play a fundamental role in the process of job creation and growth, by fostering competition and bringing new products to the market” (Pagano and Schivardi, 2001). Given that Italy has a remarkable share of these small and medium enterprises, this increases the risk of underestimating innovation more than elsewhere. At the same time, Atella and Quintieri (2001) argue the relationship between R&D expenditure and TFP is far from being established, as it depends on a number of assumptions on how the production function is defined and how TFP is calculated, as well as the level of aggregation of the data. The panel estimation by Fachin and Gavosto (2007) find no correlation between the two variables, supporting the claim that R&D may not be the best measure in this instance.

Nevertheless, Bugamelli et al. (2018) highlight a number of peculiarities of the Italian production system that may directly correlate to the lower propensity to innovate, and in turn, to lower aggregate productivity. Surprisingly enough, sectoral specialization does not seem to be one of these factors. Although the propensity to innovate changes drastically across sectors, and Italy seems to be

especially oriented towards low-tech, traditional sectors, looking at R&D expense on value-added Italy's backwardness holds for both low- and high-tech industries (Bugamelli et al, 2012). Therefore, the lower investment and lower share of innovative firms has to be a result to something else than sectoral inclination.

- Italian enterprises are by far *smaller* on average than their EU counterparts: more than 99% of active firms have fewer than 250 employees, with 95% reporting less than 10 employees (Bugamelli et al., 2018). Such a large share of micro and small firms is bad news both for innovation, due to the financing problem that they face and their lower absorptive capacity, and productivity at large, as SMEs in Italy are less efficient than larger firms (Calligaris et al., 2016). A very fragmented productive system appears to be less capable of bearing the high fixed costs and risk of innovation. Many authors found pieces of evidence suggesting a positive relationship between innovative activity and size distribution: Lotti and Schivardi (2005) highlight a correlation between firm size and engagement in patent activity; similarly, the odds of cooperating with other firms, universities and the public sector benefit from a larger size. Pagano and Schivardi (2001) find that countries with smaller average size have a lower innovation rate, due to the high fixed costs of R&D. Their competitive potential is affected as well, as the constraints from limited resources make it harder to access foreign markets, exploit a global value chain or the scale economies that technology offers (Brandolini and Bugamelli, 2009). Finally, low spending on R&D limits the benefits from knowledge spillovers from other firms, as well as reducing their ability to adopt innovations developed on the market. These factors leads SMEs in Italy to be on average less productive and dynamic than their European counterparts, while this does not hold for medium and large enterprises (Bugamelli et al., 2018).

- *Family-owned* businesses are usually more risk averse than the average firm (Bugamelli et al., 2012). The coincidence between family and firm assets leads them to self-select into lower risk-lower returns projects; this in turn harms their growth, propensity to innovate and internationalize. Unfortunately, while the share of family-owned enterprises in Italy is comparable to that of other EU countries, Italian firms mostly adopt a *family-based management model*<sup>8</sup>: these have a lower tendency to rely on external managers than others (Bloom e Van Reenen, 2007), and this is associated with a worse government system and lower levels of human capital in managerial positions, as firms are not controlled by the most suitable people (Hall et al. 2009). Family-managed firms are also less likely to invest in R&D and introduce product or process innovation; likewise, adoption of meritocratic practices in managerial selection and promotion is less common

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<sup>8</sup> 85% of Italian firms are family-owned (80% in France), and 66% are family-managed (26% in France) (AIDAF, 2019)

(Calligaris et al., 2016), further limiting the potential for growth: 9 out of 10 family-owned and managed firms use a centralized management system, meaning they do not remunerate managers based on performance (Bugamelli et al., 2012). Other adverse consequences of “familism” may be: an underdeveloped stock market, due to the unwillingness of owners to give up control even when they become inadequate; family-owned firms having other goals other than profit-maximization; the inability for the overall economy to shift towards sectors offering higher returns (Michelacci and Schivardi, 2013).

- The Italian economy is also characterized by the ineffectiveness of *industrial policy measures*, both with regards to the scarce involvement of employees in designing the production process (reducing their ability to propose organizational and process innovations) and the excessive bargaining centralization, concerning the degree to which improvements can be implemented through changes in contracts. In these respects, contract decentralization would highly benefit growth, increasing organizational flexibility and encouraging greater participation of employees in defining the companies’ strategies and processes (Bugamelli et al., 2018). Moreover, the preference for managerial practices that leave little space to delegation and autonomous decision-making, and the generally reluctancy to innovation (Bugamelli et al., 2012), which appears to be correlated with managerial age for innovative firms (Daveri and Parisi, 2010), further hamper growth.

- Another culprit for the existence of an innovative gap is the low level of *human capital*. There is both a quantitative and qualitative shortage compared to other advanced economies: studies suggest that Italy stands out for the considerably lower share of university graduates in the workforce, while also having the highest levels of mismatch between the skills of workers and those requested by the labor market in the EU (Bugamelli et al., 2018). This is a reflection of either a shortage of highly-educated workers, or a demand that keeps favoring less skilled work. In these regards, there seems to be a negative feedback between demand and supply: the difficulty in finding adequately-skilled workers discourages firms from innovating, offering on-the-job training or employing skilled labor, which translates into lower returns to education and lower incentives to invest in human capital in general.

- Many aspects of Italy’s *institutional and regulatory environment* can discourage innovation and the allocation of resources towards more productive enterprises.

Restrictive *labour market regulations* reduce the willingness of firms to innovate both by worsening allocative efficiency, as they limit the redistribution of resources across alternative uses, and by discouraging increases in their labor pool for undertaking innovative projects with

uncertain results, as they may become unable to lay off workers later if it turns out to be unsuccessful. While these measures increase and protect employment, they do that at the cost of productivity and efficiency.

Excessive regulations of the *start-up process* of entrepreneurial projects, making entry subject to the authorization of the Public administration, has a similarly strongly negative impact on productivity; in particular, the length of the registration and start-up process, as well as sector regulations, seem to reduce the quality of entrepreneurial projects and firms' incentives to innovate and grow. The time needed for such procedures, which reflects the quality and efficacy of the bureaucracy, is the highest in Italy among comparable OECD countries, and the costs are more than twice the average (Bugamelli et al., 2018). Also *product market regulation*, that disciplines the entry into specific industries, is too restrictive and limits firm size and therefore efficiency; the degree of competition in the economy is affected by these legal and regulatory provisions as well. Lastly, an effective *insolvency regime* should allow for a fast and effective liquidation procedure, favoring the reallocation of assets away from unproductive uses; the low quality of these procedures also hurt productivity ex-ante, acting as barriers to entry and increasing the cost of failures, overall discouraging firm creation. Moreover, the likelihood that financially distressed firms are successfully restructured is concerned. In Italy, insolvency procedures are still lengthy and uncertain, due to the inefficiency of the civil justice system, while also having the highest time and cost of restructuring proceeding, as well as the lowest recovery rate.

- Important for the business environment as a whole is the *quality of institutions*. Two particularly important factors are the *enforcement of contracts* and protection of *property rights*. The efficacy of the former reduces the room for opportunistic behaviour and prevents distortions in firms' behavior, while property rights assure that they will not be deprived of the returns of their investments. An effective judicial system shows a positive relationship with firm size, suggesting that protection of contractual relationships allows entrepreneurs to operate closer to their optimal scales, while also affecting their internal organization: Ferguson and Formai (2012) find that firms may compensate for the lack of contract enforcement with organizational arrangements that minimize dependence on other firms, like vertically integrated structures and higher centralization. Once again, Italy's court proceedings are particularly slow, both in absolute terms and by international standards, and this might affect firms' choices.

Similarly, the weak *rule of law* and the widespread presence in the market of firms that evade taxes, pay bribes or operate in connection with politicians distorts market selection (Bugamelli et al., 2018): illegal conducts generate unfair advantages for dishonest firms, and this alters the

incentives for honest ones. Moreover, the diffusion of illegal activities reduces the amount of public resources available and affects the quality of government expenditure, as resources are channelled towards unproductive projects from which higher bribes can be extracted.

Also related to the business environment is the heavy *fiscal burden* on firms, combined with a corporate tax system unfavorable to growth.

- Most of the productivity-enhancing choices a firm makes involve *finance*. Innovative firms usually have a harder time finding the necessary resources: entrepreneurs regard it as the most important obstacles to innovation (Bugamelli et al., 2012). Share capital seems to be more suitable than bank credit for financing businesses with uncertain results, due to the existence of information asymmetries: the firm knows more than the bank about its own product, and has incentives to maintain secrecy; moreover, the inherent uncertainty about future gains reduce the willingness of banks to fund this kind of projects. While physical capital accumulation could insure the lender against potential losses, as embodied technology that can be offered as a warranty, the prevalence of human and immaterial capital in innovative enterprises lowers this possibility. An alternative channel would be relying on specialized intermediaries that invest on firms undertaking potentially more profitable, but riskier, projects, while also providing them with financial and managerial consulting. In the case of Italy, the bank-centric nature of the financial system is an obstacle, as market finance, private equity and venture capital funds are all seriously underdeveloped; this is especially a problem for innovative SMEs, that represent one of the main drivers of Italy's economy (Bugamelli et al., 2018). The limited development of alternative sources of finance constrains firms' ability to grow, as well as negatively affecting the start-up rates and the allocation of resources across firms. As a result, a "bank-centered" capital market system, such as the Italian one, is arguably less capable of valuing R&D projects (Hall et al., 2009).

## 2.6 *Shocks in the Nineties*

As already mentioned, it is no secret that Italy lags behind other developed countries across many dimensions. However, these deficiencies can only account for a difference in absolute level and not for the relative drop in TFP that occurred around the mid-1990s. The same structural problems were present in the phases of its economic history when it outperformed many other European partners. At some point in time, a significant deterioration of the institutional environment must have taken place, or some other factors which did not matter before suddenly became a major driver of competitiveness.

Pellegrino and Zingales (2017) identify a number of shocks that might have caused radical shifts in the context in which firms operate, due to their interaction with country-specific institutions, and that ultimately proved responsible in changing its distance to the technological frontier. These are: 1) Trade dynamics and the so-called China effect; 2) Structural rigidities, mainly regarding the labor market; 3) A country-specific shock, in particular related to the institutional environment; 4) Technical change, and in particular the ICT revolution; 5) The introduction of the Euro causing a decline in the real interest rates and over-abundant credit. Italian firms, smaller than the European average and specialized in sectors with low technological intensity, were likely not resilient to these shocks. With regards to the effect of declining interest rates, the next chapter will examine why Southern Europe at large were not able to take advantage of the capital inflows and how this may have harmed productivity.

The first of these possible determinants is the *demand shock* caused by the entry of many emerging economies into the global markets, and in particular the increased competitive pressure following the entry of China in the WTO in 2001. Globalization gave access to the national market to actors with lower production costs, which outperformed Italian manufacturers in the low-tech, standardised industries they specialized in. This shock was intensified by Italy becoming a part of the Eurozone, as this prevented it from exploiting the tool of competitive devaluation, as it often did in the 70s and 80s. The exposure to international players and the subsequent loss of market shares may indeed produce a strong causal effect on the Italian firms' productivity (Alcalá and Ciccone, 2004); however, it seems that, contrarily to this explanation, sectors which were more exposed to Chinese imports (manufacturing more than any other) did not experience a more pronounced productivity loss than others (Pellegrino and Zingales, 2017). The opposite seems true: Bugamelli et al. (2018) find that globalization forces had an overall positive impact on trade, and in particular on the manufacturing productivity, even though some sacrifices were made in terms of employment. The positive impact comes from both within-firm adjustments and improved allocative efficiency, as reallocation of resources was stronger in sectors that were more exposed to foreign competition (Linarello and Petrella, 2017).

A second and related shock is the increased need for *flexibility of the labor force*, as a result of a more dynamic global economy fostered by technology and globalization. A heavily regulated labor market might have adversely affected productivity, preventing the reallocation of labor across different uses. However, a big issue with this narrative is that, while still remaining relatively rigid, in the last decades the government moved in the "right direction": the series of reforms that invested Italy, ranging from 1997 to 2015's Jobs Act, made the labor regulations laxer and were also successful in

increasing occupation and participation, especially for women (Bugamelli et al., 2012). Therefore, this is unlikely to be one of the key drivers of TFP fall. More interestingly, Daveri and Parisi (2010) argue the opposite: the labor market reforms of 1997-98, liberalizing part-time and temporary employment contracts, reduced incentives for both firms and employees to build up match-specific human capital, as the improved flexibility prevented workers from engaging in formation to meet the firm's needs. These reforms likely discouraged entrepreneurs' willingness to innovate as well, who preferred to intensively rely on part-time workers instead of investing in riskier productivity-enhancing projects – i.e. innovation, ICT. The share of temporary workers is found to be negatively correlated with productivity growth, in particular for non-innovative firms. Lotti and Viviano (2010) support this view, estimating a sizable negative effect of the share of temporary workers on long-run efficiency, particularly strong for high-tech industries. However, Calligaris et al. (2016) investigate further in this direction and find no evidence of this: productivity in sectors where labor turnover has been larger (meaning they “demand” reallocation) in the United States did not grow less in countries with more rigid labor markets. Overall, reforms lowering employment protection have generally been found to have a positive impact on productivity through improved allocative efficiency (Scarpetta and Martin, 2012), as long as this protection is not zero.

The third potential explanation is a *country-specific shock*. Italy has always been characterized by weaker institutions compared to its peers; however, from the mid-90s the country experienced a sharp deterioration in the quality of its governmental apparatus, in particular with regards to the Rule of Law<sup>9</sup>, as reported by Pellegrino and Zingales (2017). Another unfavorable interaction with the country's characteristics relates to the already infamous dependency that the Italian economy exhibits towards the public sector becoming more relevant as the years passed, as a result of the increased complexity of the competitive environment. However, given that industries that depend more on government inputs and regulations did not register a stronger deterioration of performance compared to others, both these explanations do not seem to be meaningfully correlated with the slowdown.

Last but not least, the divergence of Italy and many other countries in Southern Europe happens to coincide with the rise of *information and communication technology (ICT)*<sup>10</sup> *revolution*, which was a major driver of productivity growth in other leading economies (most notably the U.S.). Arguably, this had to do with their inability of taking full advantage of the technological revolution (Pellegrino and

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<sup>9</sup> World Bank's Worldwide Governance Indicators defines the Rule of Law as the “perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.”

<sup>10</sup> “Diverse set of technological tools and resources used to transmit, store, create, share or exchange information. These technological tools and resources include computers, the Internet, live broadcasting technologies, recorded broadcasting technologies and telephony” (UNESCO Institute of Statistics, 2020).



Zingales, 2017). In these regards, it is interesting to observe that, while in the early 1980s many European economies had TFP levels comparable to the U.S., from 1995 the convergence process abruptly stopped: while the United States benefited greatly from the technological revolution, TFP growth in Italy, Spain and Japan fell behind the frontier (Cette et al., 2016). Apparently, ICT alone is not enough to affect productivity: in order to exploit its potential, the whole firm has to be reorganized around the new technology, which implies significant costs in term of time, money and required flexibility (Hall et al., 2013).

Divergence between Northern and Southern Europe seems to be driven by lower firm-level productivity gains from ICT adoption, as well as the lower adoption rates (Schivardi and Schmitz, 2019). The ICT Revolution amplifies pre-existing differences between leading and lagging countries, due to its management- and size-biased nature. The complementarity that exists between the technology and managerial practices certainly played a key role: as inefficient management practices are more widespread in the South (Schivardi and Schmitz, 2018), on average firms get lower productivity gains from it. All else equal, they will have less incentives to adopt ICT, meaning that the gap may be a result of a lower demand, rather than a low supply. Bloom et al. (2012) argue that a similar difference in the diffusion of efficient managerial practices explains the divergence in aggregate productivities between the EU and US around the same period. The so-called “US management hypothesis” interprets the relative weakness of European productivity enhancement compared to the substantial boost in the States, which is surprising considering the similar diffusion rate, as a reflection of Europe’s inability to take full advantage of the opportunities offered by the technology, rather than being a result of specific characteristics of the US market. Thus, the Italian disease could be a more extreme form of a European disease.

The most prominent institutional feature that can account for this delay is the *lack of meritocracy* in selecting managerial figures: Pellegrino and Zingales (2017) find that TFP seems to grow more in ICT-intensive sectors where firms are more likely to select, promote, and reward people based on merit. Similarly, Schivardi and Schmitz (2018) argue that the impact of the revolution on productivity shows a strong complementarity with meritocratic managerial practices. Unfortunately, Italy stands out for being severely deficient across this dimension too: diffusion of such practices in most firms is scarce, as they choose to reward people based on loyalty rather than merit; moreover, firms exhibit certain unfavourable cultural traits, such as: rewarding people equally, irrespective of their performance, while also having poor performers rarely removed from their positions; promoting workers primarily on seniority; not evaluating recruiters on the strength of the talent pool they build (Hassan and Ottaviano, 2013). On top of that, because of inefficient management these firms will be

on average smaller, thus less willing to carry out the required investments; only large firms have a sufficient scale to bear the fixed cost of ICT adoption. To further reinforce this size-biased nature of the technology, a composition effect comes into play, as the ICT Revolution increases the employment share of firms utilizing management (Schivardi and Schmitz, 2018). As a result, the aggregate importance of management increases; and while Southern firms are equally efficient for basic technology, they were unable to fully exploit management gains as their Northern counterparts did<sup>11</sup>. This in turn only accentuates the disadvantage.

Instead of using meritocratic practices, firms opt for a *loyalty-based management model*, hiring managers based on closeness, fidelity to the owners or other personal/family contacts rather than on the possession of a specific expertise with regard to the company's business sector or strategies (Bugamelli et al., 2018). In the case of Italy, it seems that the prevalence of a fidelity model is not just an example of the country being stuck to the past, but rather an optimal response to its peculiar institutional environment. Loyalty-based management seems to perform better than a meritocratic one in markets with credit frictions, inefficient legal enforcement and lack of product market competition. This model provides a relative advantage in overcoming financial and bureaucratic constraints, as they can exchange favors with banks (so-called relational banking) and bypass bureaucracy through political connections or bribes, even though they find it more difficult to overcome labor market constraints (Pellegrino and Zingales, 2017). These non-meritocratic systems seems to have greater benefits in Italy than in other developed countries; therefore, resorting to cronyism rather than talented managers can be individually efficient, while remaining socially suboptimal. The result is that, while Italian firms adapted in an optimal way to their institutional environment, this also rendered the country incapable of taking full advantage of the revolution that was in place.

Disentangling the contribution from ICT on divergence, the lower benefits from adopting ICT account for roughly three quarters of this phenomenon, while the increased importance of management can explain most of the remaining quarter. However, it must be noted that the model does not account for all of the TFP fallout, but only around 35% of Italy's gap between 1995 and 2008 (Schivardi and Schmitz, 2019). Thus, there must have been other drivers to consider.

Interestingly, Bloom et al. (2012) find that most of the existing gap is due to a worse utilization of ICT investments, rather than a slower ICT-capital accumulation. This may come as a result of firms' failure to adjust to the changing economy: the presence of labor market regulations, while not being

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<sup>11</sup> "Between 1995 and 2008, the IT revolution increased productivity by 11.1% in Germany, 5.9% in Italy, 2.5% in Spain, and 3.4% in Portugal." (Schivardi and Schmitz, 2019)

directly responsible for the downfall, prevented many favorable ICT-related reallocations from happening, while the reduced competitive pressure from product market regulations lowers the incentive to transition to the most efficient production techniques. Away from the frontier, flexibility and dynamism appear to become even more important, and Europe as a whole provides a clear case of structural rigidities impeding growth (Cette et al., 2016). This story ties in with the next chapter, that deals with the misallocation of resources within the Italian economy.

## *2.7 Misallocation*

One surprising fact when analysing Italy's dynamics is that, while productivity economy slowed down and eventually flatlined, the rate to which labor and capital grew remained stable (Hassan and Ottaviano, 2013). Idea-based models of TFP growth have a hard time explaining how the productive system “forgot” how to produce, as firms are now able to obtain less output for the same combinations of factors than they used to. However, there is another plausible explanation for this “unlearning” rather than just a loss of knowledge, linked to the existence of structural inefficiencies in the allocation of resources across alternative uses in the economy.

Assuming once again that productivity is a marker of efficiency in the use of the productive factors, its measure (TFP) will be an aggregate measure of each firm's productivity (Calligaris et al., 2016). This not only means that having more efficient firms (that adopt better technologies and management practices) will increase the country's productivity, as one would expect: aggregate TFP depends on both the TFP of the individual production units and how inputs are allocated across heterogeneous firms with different productivities. It may be that aggregate TFP declined, but not the firm-level TFP (Pellegrino and Zingales, 2017): as long as frictions in factor and output markets “distort” the allocation of product demand and factor supply away from high TFP firms and toward their low TFP rivals, this reduces the average efficiency of the economy, leading to a lower aggregate TFP than in an ideal, frictionless markets (Calligaris et al., 2018). This phenomenon is called **misallocation**: as long as market imperfections impedes the flow of factors from less productive firms (offering lower factor returns) to more productive firms (where returns are higher), the maximum output for the economy is not reached. With regards to Italy, many studies have observed increasing misallocation over time, alongside the TFP downfall, so it might be one important driver of the divergence.

One of the seminal models for misallocation is that by Hsieh and Klenow (2009). The idea behind is quite intuitive: without market frictions, the marginal revenue product of inputs should be equalized across firms, as factors move towards firms that warrant a higher marginal revenue. By measuring

the dispersion in the marginal value product of inputs, they quantify the existing misallocation. Any deviations from the ideal situation is inefficient, meaning that reallocating capital and labor could improve productivity.

Gopinath et al. (2017) test this theory for Spain and then generalize the model to other Southern Europe countries, including Italy. While having significant differences in terms of their sectoral composition and evolution over time, both countries share a similar fate in terms of low productivity. The paper argues that the large capital inflows, caused by the introduction of the Euro and the subsequent financial liberalization process, were a primary cause of the divergence in productivity in countries with underdeveloped financial markets. The negative repercussions of this can be related back to misallocation: in particular, “between 1999 and 2012, there is significant increase in the dispersion of the return to capital and a deterioration in the efficiency of resource allocation across Spanish manufacturing firms”; meanwhile, no labor dispersion across firms is found. The key element were the reductions of the nominal and real interest rates in peripheral economies<sup>12</sup> as a result of the entry in the monetary union. This came as a reflection of the expectations of the disappearance of the exchange rate risk with a common currency, declines in default risk (from an implicit assumption that Euro-countries would be bailed out of a crisis), and the removal of barriers to capital mobility within the Euro area.

It seems that the channelling of the resulting capital inflows towards less productive sectors (such as constructions and services) rather than towards tradables was not a primary driver of capital dispersion. Instead, as the interest rate fell, the abundant credit was captured by low-productivity firms, depressing aggregate productivity. The reduced cost of funding allowed them to obtain financial resources that banks would not have lend them otherwise; cheaper loans allowed firms to leverage, “lowering the bar” for less productive enterprises to remain in the market. Cetto et al. (2016) present evidence that firms with the highest productivity did not crowd out the least efficient ones, as it should happen in an efficient market. On top of that, they also find that easier financing conditions and “soft budget constraints” reduce the incentives to maintain good governmental institutions.

The reason why capital flows were not allocated efficiently is the existence of size-dependent borrowing constraints. Gopinath et al. argue that, due to differences in net worth, some financially-constrained firms were unable to access the capital markets and borrow as much as they needed. The result was that only non-constrained firms had the opportunity to respond to the positive shock of Euro adoption by increasing investments, but these high net-worth firms were not necessarily the

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<sup>12</sup> “In nominal terms, Italian and Spanish 10-year government rates fell from around 12 percent in 1995 to around 5 percent when the euro was introduced in 1999.” (Cetto et al., 2016)

most productive. Misallocation grew as a consequence of the distorted allocation mechanism, potentially explaining the decline in TFP relative to its efficient level.

The authors apply the same framework to Italy and Portugal and they document similar results, although they do it, as Jones notes, “with less complete data” (Jones, 2017). To some degree, these findings seem to hold for other Southern Europe countries, that are likely to operate in underdeveloped financial markets, while it does not apply to countries in the North, as expected. However, authors such as Bugamelli et al. (2018) and Pellegrino and Zingales (2017) argue that the explanatory power of this narrative differs considerably by country: while for Spain this approach predicts roughly three-quarters of the observed decline in TFP relative to its efficient level, for Italy there’s still a significant part of the competitive downfall not accounted for by the change in real interest rate<sup>13</sup>. So while misallocation can still be pointed at as a primary culprit, maybe it was not the accession to the Eurozone that caused the downfall.

During the Great Recession, the credit crunch harmed both investment and efficiency: looking at the distribution of firm productivity, Calligaris et al. (2016) observe a thickening of the left tail, signalling an increase in the share of low-productivity firms over the period. This was caused by tighter credit constraints, preventing firms from undertaking potentially profitable projects, and distorted banks’ incentive on allocative efficiency, causing “zombie lending”<sup>14</sup>. During the financial crisis, undercapitalized banks were less likely to cut credit to non-viable firms, so misallocation of credit increased the failure rate of healthy firms and reduced it for non-viable ones. Arguably, the same effect also misallocated the Euro capital inflows in Spain. However, while some evidence of zombie lending was observed during the crisis, it did not significantly weaken allocative efficiency, as it has been counterbalanced by the cleansing effect that tighter credit standards had on less efficient firms, making them more likely to exit the market. Following up, Calligaris et al. (2018) argue that the existence of credit constraints is associated with significantly lower productivity, but not with higher misallocation. Similarly, Euro accession is most likely not responsible for zombie lending, as they find no evidence that increased leverage of less efficient firms caused a deterioration in productivity or had any impact on misallocation. Lastly, Schivardi and Schmitz (2018) contribution finds no adverse effects on the growth rate of healthy firms and no evidence of zombie lending before the financial crisis, providing a further piece of evidence against the narrative of Gopinath et al. (2017) for Italy. Overall, the recession appears not to have caused a permanent loss in terms of productivity growth, as the contraction of economic activity and capital accumulation have been offset by

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<sup>13</sup> “[...] capital misallocation can explain at most a 6% decline in TFP vis-à-vis the first best of the 21% gap of Italy accumulated with respect to the average of the most advanced nations in 1996-2006.” (Pellegrino and Zingales, 2017)

<sup>14</sup> Non-viable firms that would not have survived without that more favourable credit concession.

improvements in allocative efficiency and growth in R&D intensity (Bugamelli et al., 2018). A similar argument is presented by Linarello and Petrella (2017), saying that the prolonged recession created a more selective environment for firms, through the exit firms in the low tail of the productivity distribution and the subsequent reallocation of resources towards the most productive incumbents. Interestingly, this cleansing effect seem to hold only until 2013, as Calligaris et al. (2016) observe the survival of firms with even lower productivities than there used to be in some industries.

If misallocation of capital inflows is not the preferred narrative, the phenomenon may have two alternative explanations: either the market has gotten worse at reallocating resources; or, and more likely, the several sectoral “frontier shocks” during the last decades exposed the shortcomings of the Italian system, as the change in the optimality of the production structure required the resource allocation mechanism to be flexible enough. Following this last theory, Calligaris et al. (2018) argue that misallocation is a result of the increased volatility caused by idiosyncratic shocks and the heterogeneous ability of firms to respond effectively..

Measuring cross-firm dispersion, misallocation forces seems to be stronger *within-sectors*, meaning between firms belonging to the same industry, than *between-sectors* (Bugamelli et al., 2018). This reinforces the idea that the Italian model of specialisation towards traditional sectors with low human-capital intensity and low technology is not the primary culprit for the stagnation. Moreover, the slowdown has invested all industries and, if anything, it hit stronger for sectors that are more technologically advanced and closer to the frontier – i.e. pharmaceutical, machinery (Calligaris et al., 2016). The explanation for this counterintuitive fact may lie in the rising complexity of reallocating resources between firms within sectors where technology moves faster, rather than between sectors with different speeds of technological change. Moreover, Calligaris et al. (2018) shows that the increased misallocation comes mainly from higher dispersion within different size classes and geographical areas groups, hitting categories that were traditionally the spearhead of the Italian economy, such as firms in the Northwest and big firms. Relative specialization of these firm categories in sectors where the frontier has expanded faster helps explaining this pattern. The effect of the incapability to effectively reallocate resources condemns the most efficient firms to remain smaller than their efficient size, while allowing their less productive counterparts to be inefficiently large and over-resourced.

There are a number of possible causes for the existence of such ineffective reallocation mechanisms, many of which also work as structural factors getting in the way of Italy’s innovative stance:

- The diffusion of family-managed firms, on top of interacting negatively with idiosyncratic shocks (namely, the ICT revolution), also promotes misallocation of talents, as the most

appropriate managerial skills are not necessarily found within the family owning the firm. In addition to that, family- and especially government-controlled firms seem to be less efficient than their private counterparts (Calligaris et al., 2016), so a different ownership would significantly improve the economy-wide productivity.

- Once again, flexibility in the labour market has a positive effect on productivity, as it leads to better allocation of labour, making less productive firms able to reduce and more productive firms to increase the amount of labour freely. Particularly harmful are the wage supplementation schemes such as Cassa Integrazione Guadagni (CIG), protecting not only the worker but also the specific job match between worker and firm, even when no longer productive. Given that less productive firms are more likely to take advantage of CIG, this fosters misallocation (Calligaris et al., 2016). Instead, looking at recent years, temporary work is mostly employed by high productivity firms, in order to reduce the labour cost through substitution of full-time workers with temporary ones; once again, the narrative of Daveri and Parisi (2010) seem to get refuted, as no effect of the liberalization of the labor market is found on misallocation.

- Skill mismatch is also a source of productivity losses: Italy is characterised both by a large share of under-skilled and of over-skilled workers with respect to the competences required by their job. This can be attributed to both to the education system, that does not provide the necessary skills and experience, and to the rigidities of the labour market, along with the widespread use of informal selection procedures among companies, particularly SMEs. Calligaris et al. (2016) suggest that a higher share of high skilled white collars (taken as a measure of skill-intensity) is linked to higher productivity, as well as an increase in misallocation; no significant effect is found for blue collars. This is likely the case because firms struggle to find the appropriate candidates to fill in positions requiring a high level of specific skill.

- Lastly, innovation may also further fuel the divergence through the channel of misallocation. A higher share of intangible assets is associated with higher productivity (however, this does not hold for small firms) and also connected to higher misallocation. This implies that firms that invest more in innovation tend to be under-resourced and smaller than their optimal size. Moreover, these enterprises tend to suffer from a larger distortion in the allocation of capital than of labor, suggesting that reallocation constraints may be particularly cumbersome: as already mentioned, access to bank credit is problematic for highly innovative, risky firms.

Interestingly, the authors argue that the share of white collars and reliance of CIG are to be interpreted as two sides of the same coin in fostering misallocation: high-skill employees drive technological and

organizational innovation, but the flow of labor is hindered by the supplementation schemes, keeping unproductive firms afloat regardless of their structural problems, impeding the natural process of creative destruction. Innovative and family-owned firms are the one suffering from the strongest distortion in terms of capital, while a high-share of white-collars results in a stronger labor distortion. The authors investigate a number of other factors (i.e. equity, relational banking, cronyism). Along with credit constraint, these seem to be only markers of lower firm-level TFP, but through a different channel than misallocation.

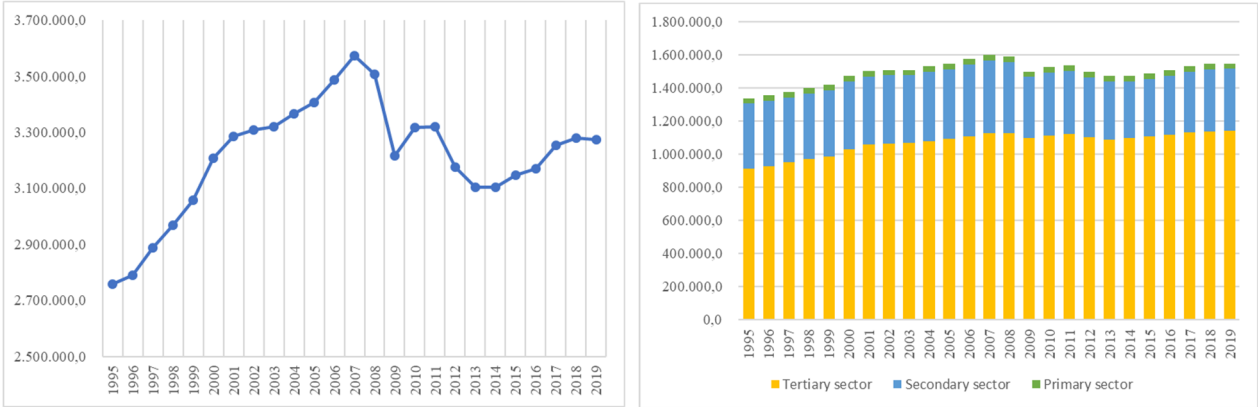


### 3. Empirical evidence of the productivity downfall

After a discussion of the main orientations of literature, the analysis will focus on the empirical study of the evolution of GDP and productivity indicators in Italy in last twenty-five years. Through this effort, the aim is to highlight some of the main trends driving the Italian productive machine, updating the previous results with more recent data.

First of all, we take a look at the dynamics of GDP from 1995 to 2019. Taking the estimates supplied by Istat, the general trend of growth is mostly respected over the two decades observed; the only periods that registered a decline are, not surprisingly, those corresponding to the financial crisis and the sovereign debt crises, from 2007 to 2009 and 2011 to 2014. The graph is compatible with the idea of a “lost decade”, that severely harmed the wealth of the country while it lasted but didn’t produce permanent effects on the growth trend in subsequent years (Bugamelli et al., 2018). Turning to the sectoral composition, services constitute almost three-quarters of total GDP, followed by the industry (24,1% in 2019) and only marginally impacted by agriculture (2,1%). This distribution is roughly unchanged during the time span considered; if anything, services slightly decreased in the last two years. The picture is consistent with what seen before: even if the trend is positive over most of the period, the yearly growth is still unremarkable (on average +0,64%, reaching over 2% only once in twenty years), less than half of the average growth of the EU<sup>15</sup>.

**Graph 3.1: Evolution of GDP in Italy, and value-added decomposed by sector**



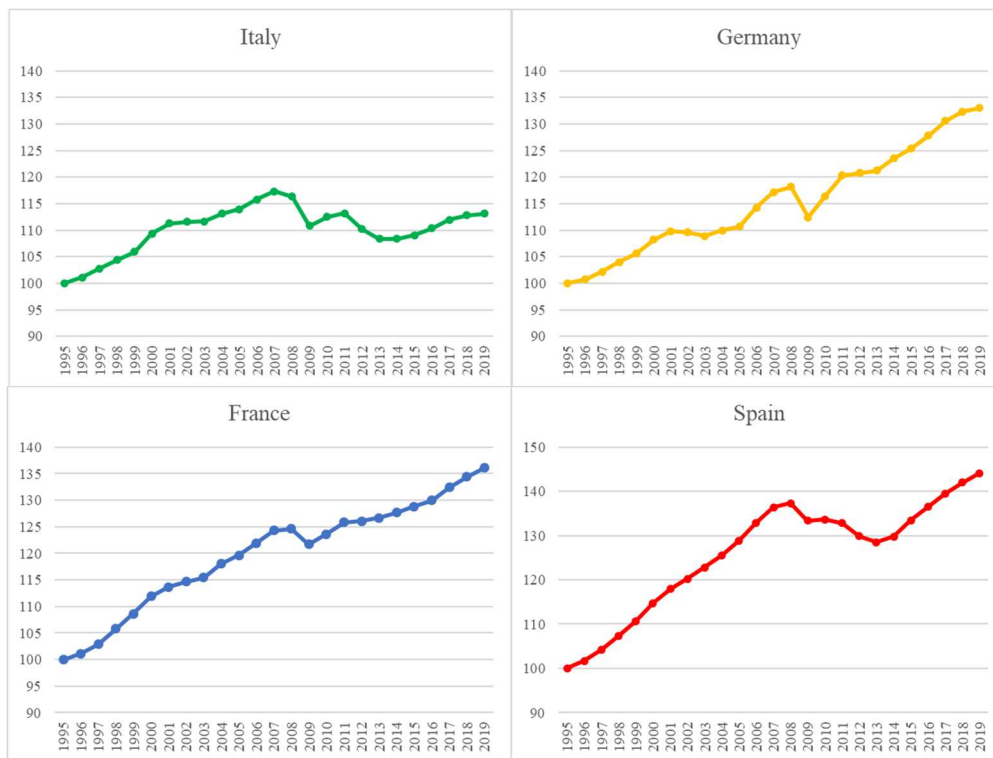
Source: author’s elaboration over ISTAT data

Looking at Eurostat data, it is evident how the country does not match most of its European peers. While in these 25 years Italy reached its peak in 2007, with a +17% compared to 1995, and only

<sup>15</sup> According to the World Development Indicators database, the EU countries registered on average a growth of 1,8 percentage points per year from 1995 to 2018, with a maximum of +3,9% in the year 2000 (World Bank, 2020).

scored a 13% increase over the whole period, other major countries experienced far more pronounced improvements: Germany saw a +33% maximum in 2019, France +36% and Spain reached +44%.

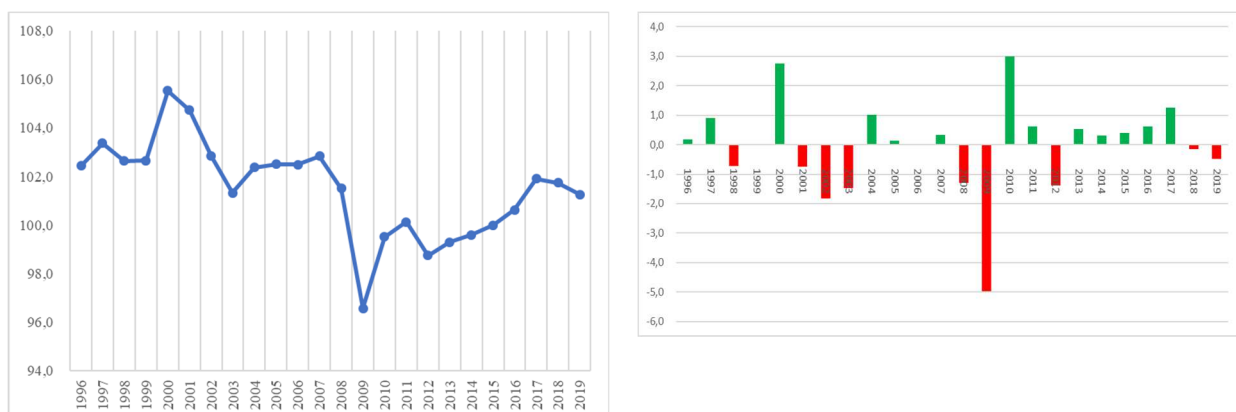
**Graph 3.2: Evolution of GDP in various European countries (base year=1995)**



Source: author's elaboration over Eurostat data

This lack of momentum is most likely due to the insufficient productivity growth. Graphs 3.3 shows the evolution of TFP, value-added based and with 2015 as the base, from 1996 to 2019. What is immediately noticeable is that, despite the strong volatility of the measure, reaching its peak in 2000 and its minimum in 2008, productivity did not improve but rather fell down: the recent maximum in 2017 is still more than 3% lower than what it was at the beginning of the century, and since then has only done worse. Moreover, in 10 years over the last 23 Italy experienced a negative productivity growth.

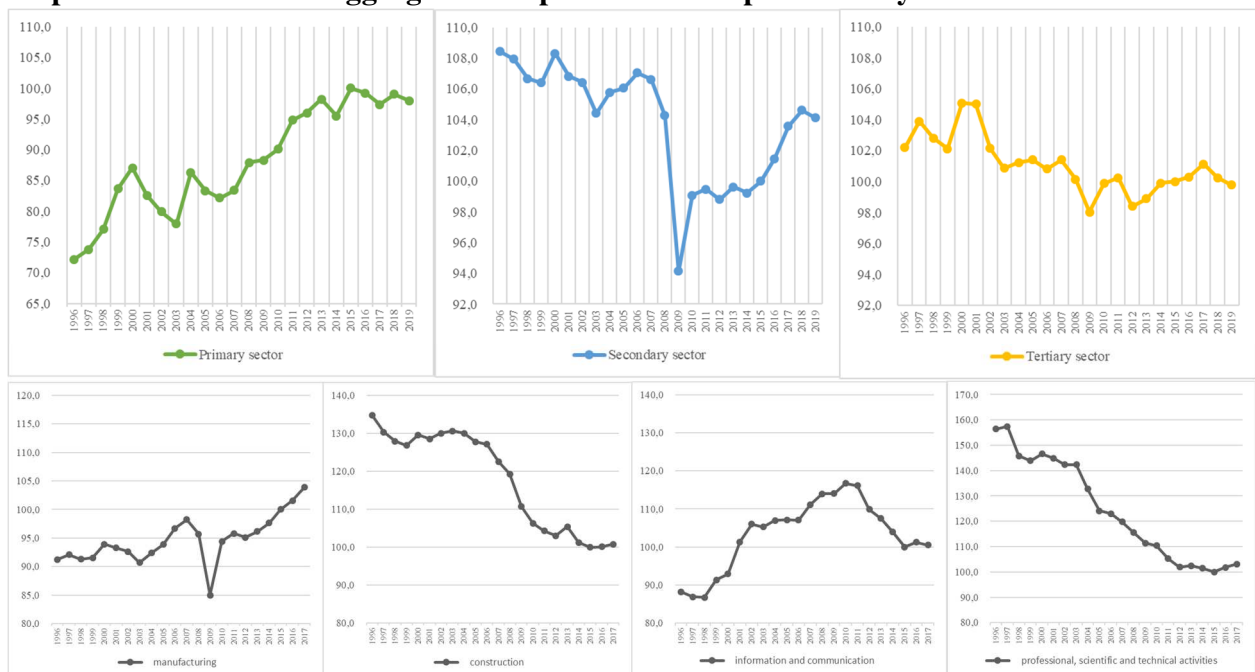
**Graph 3.3: Evolution of aggregate TFP and variation in TFP over value-added**



Source: author's elaboration over ISTAT data

Looking at a sector decomposition, most of the downfall seems to be due to the industrial productivity, that lost 9,2 percentage points from 1996 to 2014; however, since 2015 the trend is mostly positive. Instead, the data highlight a thoroughly negative evolution for services, even though the decline is limited (-2,4%). In contrast, productivity in agriculture has been growing almost non-stop: unfortunately, due to the relatively small impact on the overall economy, it cannot compensate the generalized decline. Interestingly, the picture portrayed by Daveri and Jona-Lasinio (2005) 15 years ago is still somewhat consistent with our data: their observation on the inability of services to compensate for the fall of productivity elsewhere is still accurate (contrarily to what happened in other countries, where ICT jumpstarted an unprecedented acceleration in those sectors); meanwhile, the downfall has less to with manufacturing, that besides during the financial crisis has maintained a positive growth over the whole period, and more with construction industries losing 32.3% since 1996. Other noteworthy productivity trends in the tertiary sector are that of ICT, plummeting after 2011, as well as the continuous decline of professional, scientific and technical activities<sup>16</sup>, only recently growing again. With regards to the ICT recent trend reversal, there are some evidence of labor market deregulations affecting employment, capital-per-worker and therefore productivity in the sector (Perugini et al, 2017). However, data is still too scarce to say anything definitive on the subject (also considering the contrasting results already discussed with regards to temporary labor liberalization in the Nineties).

**Graph 3.4: Evolution of aggregate TFP per sector and per industry**

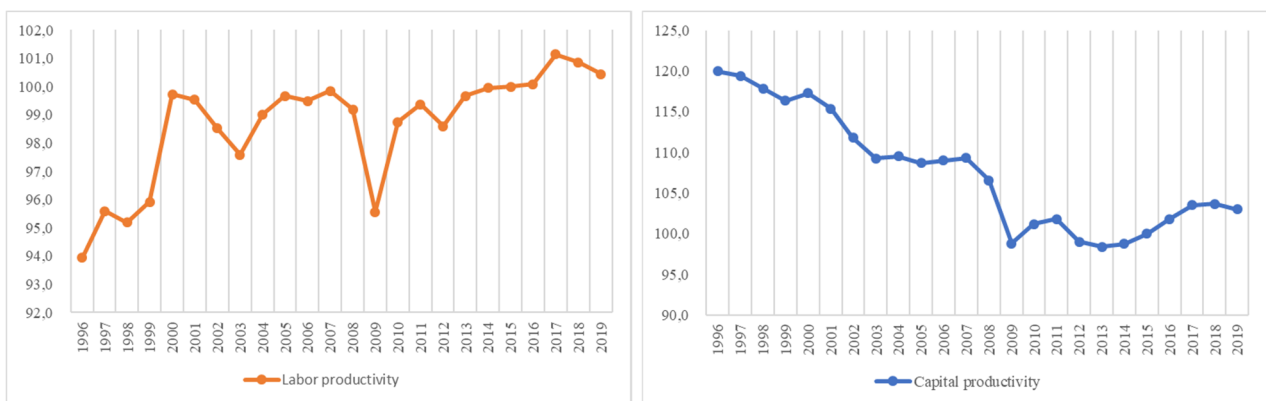


Source: author's elaboration over ISTAT data

<sup>16</sup> According to Eurostat nomenclature, these are activities that “require a high degree of training, and make specialised knowledge and skills available to users.” (NACE Rev. 2, 2006)

Taking a look at the production factors, capital seem to experience a worse evolution than labor. Productivity in the latter seem to be on the rise, despite some bumps within this trend (most notably, from 2000 to 2003 and during the Great recession); however, the measure benefits mostly from the strong increase experienced in the second half of the 1990s (perhaps as a result of the liberalization of the labor market), while since then the growth rate has considerably flattened. Meanwhile, for capital the financial crisis only temporarily accelerated an already well-established negative dynamic. Labor productivity seem to exhibit a great deal of correlation with the TFP evolution, reaffirming the hypothesis that labor is a main driver of the weak productivity performance. Interestingly, the data suggests a decline in TFP since 2017, driven equally by a lowered capital and labor productivity; the potential for this to signal a further downfall should be studied in the future.

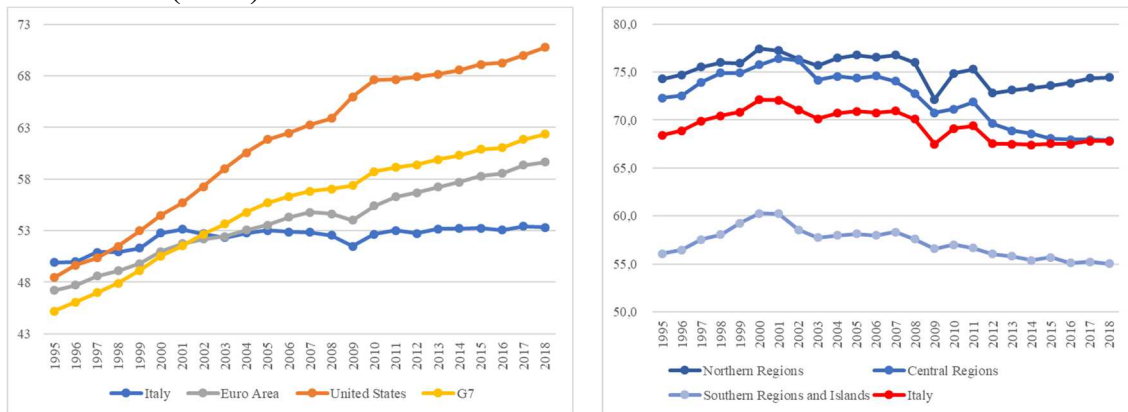
**Graph 3.5: Evolution of factor productivity**



Source: author's elaboration over ISTAT data

Another way to look at the problem is through GDP per hour-worked. Taking an international perspective, the results still hold. Since 1995, Italy's productivity remained mostly unchanged (a 6,7% increase vis-à-vis the 26,5% increase of the Eurozone), while the rest of the world was experiencing a sustained boost. This deterioration reached the point where the country fell behind the Euro average in 2003 and the divergence has only increased since then, while the United States reached a level of labor productivity almost 33% higher than Italy.

**Graph 3.6: GDP per hour-worked in OECD countries (USD) and GDP per person-employed per Italian area (Euro)**

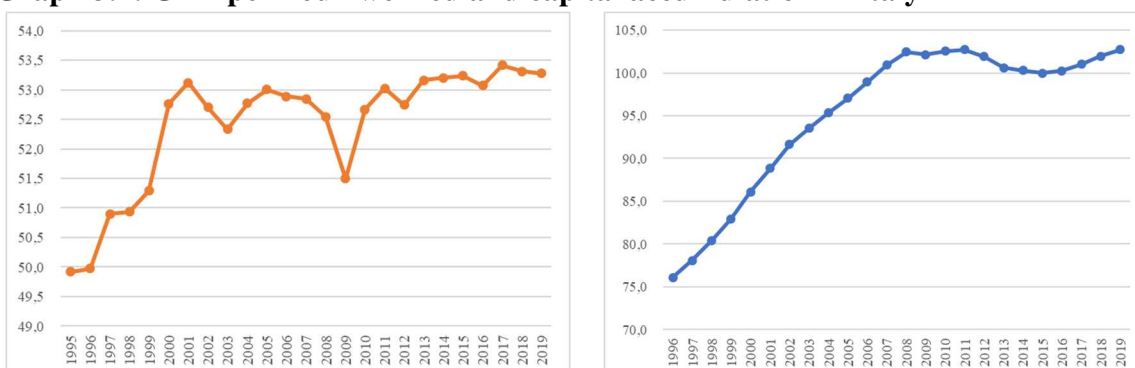


Source: author's elaboration over OECD and Istat data

Using a similar measure, there is also potential for disentangling the contribution of different Regions in causing the productivity downfall. Unsurprisingly, the Southern Italy has a markedly worse GDP per person-employed ratio than the rest of the country; this is further proof of the existence of a “Southern Question”, meaning a widening gap in economic performance and wealth between different geographical areas of Italy. Over the whole period, the North was the only area that reached a zero net change in output-per-worker, while the others had a firm decline from roughly 2001 onwards. Interestingly, the Central regions were the ones losing the most relative to 1995 (-11,2%), so not everything can be blamed on the historical lag afflicting the South.

Lastly, there is room for testing the capital-deepening hypothesis presented before. GDP per hour-worked is a measure of labor productivity, but differently from the Istat estimate, it does not control for changes in capital intensity. Even from this perspective, the picture remains unchanged: capital has been growing non-stop until the two major crises, while the productivity began slowing down more than a decade before, and still the decline in capital accumulation has been temporary and very limited in magnitude; therefore, it still appears unlikely that capital deepening is responsible for this phenomenon.

**Graph 3.7: GDP per hour-worked and capital accumulation in Italy**



Source: author's elaboration over OECD and Istat data

## 4. Conclusions

This excursus over the evolution of the Italian economy in the last 25 years clearly shows how the productivity slowdown experienced by the country is not a mere coincidence. A number of factors can be pointed out as concurring to determine this unfortunate fate.

There are structural characteristics impeding innovation, actively discouraging firms from undertaking productivity-enhancing efforts and preventing entrepreneurs from bringing their ideas to the market, such as: the small average size of Italian firms; the excessive presence of family-owned and managed firms; the ineffective industrial policy system, as well as the lack of involvement of employees; the insufficient human capital; the rigidity of the institutional and regulatory environment; the low quality of institutions; the lack of specialized intermediaries, that are willing to finance risky projects.

On top of these genetic weaknesses, Italy has endured a series of shocks during the 1990s that partially explain the deterioration of productivity; in particular, the rise of ICT technologies had a significant impact on the country, as it resulted in a deterioration of its competitiveness. Its inability to take advantage of the revolution was due to the lack of meritocracy in managerial practices and the complementarity that these exhibit with the new technology.

Lastly, an important share of fall of TFP does not relate to an “unlearning”, but rather to the misallocation of resources away from the most efficient firms. The rigidities of the Italian economy prevented the market selection of the best enterprises, as should happen following the creative-destruction process envisioned by Schumpeter, but instead allowed unproductive firms to survive, despite there being better uses for those capital and labor resources.

Data gathered from various databases provide the basis for an analysis of the magnitude of the phenomenon. The results prove that a productivity downfall indeed occurred, and this coincided with the occurrence of a GDP slowdown, which appears significant in particular with respect to other advanced countries. The main culprits appear to be the sharp decline in the secondary sector and the slower but continuous deterioration in the tertiary sector. Analysing the geographical patterns, the Southern and Central regions are mainly to be blamed, while the North suffered less from it. The lesson learned from each one of these productivity graphs is that the Great recession was without a doubt a decisive factor in worsening the performance of the country from 2007 onwards. While the financial turmoil and the debt crisis that followed did weaken the economic activity of the country while they lasted, no evidence of “long shadows” has been found (Cette et al., 2016). Still, the outlook

for the country is not positive. Unless these factors preventing Italy from expressing its true potential are removed, the potential for another recession hitting the country as hard as it did in the past, while the productive system still lacks the dynamism to proactively face it, is around the corner. In a global economy more competitive and demanding than ever, standing still is a luxury Italy cannot afford: for this reason and many others, a series of policy interventions to correct the descending trajectory should be promptly issued, to allow the country to return to the path of sustained growth it was once renowned for, and solve this productivity puzzle that weight down Italy's future and that of its citizens.

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