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"Mapping Economic Development: The Legacy of 19th Century Entrepreneurs and Politicians in Shaping the Italian Economic Landscape"

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Leonardo Mauro

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1. INTRODUCTION

The importance of entrepreneurship for achieving economic growth in contemporary economies is widely recognized, by both policy makers and economists. The relation between entrepreneurship and economic growth has been a central topic in several strands of the economic literature, each offering different insights into the mechanisms through which entrepreneurial activities stimulate economic progress. As its core, entrepreneurship is seen as a dynamic force that can stimulate economic progress, create jobs and drive innovation. Different economists have approached this relationship from distinct angles, providing a rich and multifaced understanding of how entrepreneurship impacts economic development.

The first strand of literature involves the general understanding of the role of entrepreneurship in the modern economy. Schumpeter (1934) and Kirzner (1973) stress different aspects of the role of the entrepreneur: while Schumpeter underlines the innovative aspects, Kirzner highlights the role of the entrepreneur in leading markets to equilibrium.
Acs (1992) discusses the contribution of small firms in modern economies, being them "agents of change" and a source of considerable innovative activities, as they stimulate industry evolution and contribute substantially to the share of the newly generated jobs. The role of small firms and entrepreneurship in stimulating growth is complex, because various intermediate variables are at play. Examples of such variables are entry and exit of firms, innovation and variety of supply. Economists have started to build theoretical frameworks which try to capture the role of the intermediate variables. An example of such a framework is provided by Thurik et al. (2002).

A second strand of literature involves the mathematical modelling of economic growth. Although entrepreneurship played no role in the neoclassical growth model, which assumes that technological progress is exogenous, it does play a role in some of the more recent endogenous growth models. For instance, Aghion and Howitt (1992) introduce a model where firms invest resources in research to achieve a new product that makes the previous product obsolete. Firms are motivated by the prospect of monopoly rents once the innovation is patented. Economic growth and technological progress at the macro level are then endogenously determined by competition among firms, and so entrepreneurs, that generate innovations.

A third strand involves the empirical modelling and measurement of the relation between entrepreneurship and economic growth. The consequences of entrepreneurship in terms of economic performance have generated an extensive empirical literature. However, this literature has generally been restricted into two units of observation – that of the establishment of firm and that of region. Between these two units of observation, studies at the regional level are in the minority.

This thesis seeks to make two key contributions. First, it fills a gap in the empirical literature by examining the relation between entrepreneurship and economic growth at the provincial level in a historical context, a relatively understudied area, following the third strand of literature. By focusing on Italy during the Liberal Age (1871–1911), the study provides a unique perspective on the role of entrepreneurship in a period of rapid economic change and industrialization. The 19th century marked a pivotal era of economic transformation across Europe, with Italy undergoing a profound shift from an agrarian to an industrial society. Central to this metamorphosis was the emergence and growth of an entrepreneurial class. Second, the research introduces an innovative approach by using the number of entrepreneurs as proxies for entrepreneurial culture, offering a new lens through which measuring the effects of entrepreneurship on economic development.

The central research question guiding this thesis is: what was the role of entrepreneurship in driving economic development at the provincial level in Italy during the Liberal Age? Specifically, the study aims to investigate whether regions with higher concentrations of notable entrepreneurs experienced greater economic growth. By addressing these questions, the thesis seeks to deepen the understanding of how entrepreneurship contributed to Italy's economic transformation during a pivotal historical era.

The analysis in this thesis utilizes provincial-level data on Italy during the Liberal Age to explore the relationship between entrepreneurship and economic growth. By employing both cross-sectional and panel data regression models, the study examines the effects of entrepreneurial rates on real wage across Italian provinces. Key control variables such as literacy rates, industrial value- added, share of agricultural labor force, patents, and urbanization rates are included to account for other factors that might have influenced economic development. The results of the analysis reveal a positive and significant relationship between entrepreneurial rates and real wages at provincial level. Provinces with higher rates of entrepreneurs consistently showed stronger economic performance.

The rest of the thesis is structured as follows. Section 2 provides a detailed discussion of the literature related to entrepreneurship and economic growth, exploring key theoretical and empirical frameworks that underpin this study. Section 3 presents the historical context of Italy during the Liberal Age, focusing on the country's economic transformation and the emergence of an entrepreneurial culture. Section 4 outlines the data sources and methodology used in the empirical analysis, including the variables and model specifications employed. Section 5 presents the empirical findings, discussing the results of the cross-sectional and panel data analyses. Finally, Section 6 concludes the thesis by summarizing the key findings and offering insights into the broader implications for understanding the role of entrepreneurship in historical economic development.

2. LITERATURE REVIEW

Entrepreneurship has increasingly been recognized as of significant importance for economic development, contributing to the prosperity of nations and regions. Entrepreneurship stands at the forefront of economic growth, innovation and social change. The concept of entrepreneurship has evolved significantly over time. Historically entrepreneurs have played a crucial role in the transition from agrarian societies to industrial powerhouses, and it continues to be vital in today's digital age. What stands out from the empirical studies is a trend indicating that economies with higher levels of entrepreneurial activity often experience more rapid growth. Yet, this observation is not universally supported, with certain studies failing to establish a significant link between entrepreneurship and economic expansion.

2.1. Classical and Neoclassical Economic Growth Model

The quest to understand the determinants of economic growth has been at the center of interest of economists for centuries. Theories of economic growth attempt to understand the factors that drive economic performance over time by unravelling the complex interactions between entrepreneurs, markets and institutions.

Adam Smith (1776) introduced the idea that self-interest actions of individuals, guided by an "invisible hand", could lead to societal benefits including economic growth. The pursuit of personal gain results in the efficient allocation of resources and the expansion of markets, with entrepreneurs acting as the catalysts in this process. Following Smith, other classical economists like David Ricardo and John Stuart Mill expanded these ideas, focusing on capital accumulation, labor productivity and gains from trade as key factors for economic growth (Edelberg, 1933).

Marshall (1890) began to analyze the factors of production in more depth, recognizing the entrepreneur's crucial role in coordinating and combining capital, labor and land. Marshall highlighted the importance of knowledge and technological advancement to economic expansion, linking in this way the entrepreneurs' role in fostering innovation and driving competitive markets.

The neoclassical model of economic growth, which emerged as an advancement of classical economic theories, brought technological changes to the forefront of explaining economic expansion. Solow's growth model is the central one of this approach: Solow (1956) states that land and labor could be rendered more productive through advancements in technology. However, this model with its focus only on inputs, sidesteps the intricacies of the economic process itself. This input-centric view has enabled to incorporate various factors into general equilibrium models. As noted by Holcombe (1998), better inputs yield better outputs. Subsequent models by economists like Arrow (1962) and Uzawa (1965) refined the model by including human capital and endogenizing technological change respectively. Krugman's (1985) work added learning-by-doing effects, highlighting how the specialization of specific industries can lead to divergent economic growth paths among nations.

In the equilibrium described by neoclassical economics, markets are inherently stable. Supply aligns with demand, leaving no room for profit margin to be exploited. Consequently, within this framework, growth is perceived as an increase in production of existing goods, rather than the creation of new ones. Entrepreneurship and innovation, essential for economic dynamism, are incorporated into the model via research and development activities. The neoclassical paradigm fails to adequately capture the essence of entrepreneurship. Entrepreneurs disrupt the status quo, identify unmet needs and introduce novel product or processes that redefine markets. Their role extends beyond the equilibrium model where they are absent.

2.2. Creative Destruction and Economic Growth

Despite the intuitive connection between entrepreneurship and economic growth, fine-grained theory on the effect of entrepreneurial culture on economic growth does not exist and, more broadly, the neoclassical economic theory has traditionally overlooked the role of the entrepreneur (Beugeksdijk, 2007).

According to Liebenstein (1968), the main reason behind not considering the entrepreneur in the neoclassical theories is caused by the conventional theory of the production function, in which the complete set of inputs is specified, known and has a fixed relation with output. Leibenstein argues that this is not realistic because the entrepreneur is someone who extends the production function by broadening the existing set of inputs.

The claim that differences in economic success may be related to the presence or lack of entrepreneurial activities in not new. Schumpeter (1934) presents the entrepreneur as the primary driver of economic progress through a process he called "creative destruction". He describes how the innovating entrepreneur challenges the incumbent firms by introducing new inventions that make current technologies and products obsolete. This dynamic process is the main characteristic of Schumpeter's Mark I regime. In the Mark II regime instead, Schumpeter emphasizes the role of large firms in sustaining innovation and how large firms outperform in the innovation and appropriation process the smaller firms. Baumol (1990) added nuance to this concept by suggesting that the type of entrepreneurial activities can have varying productivity levels and that the environment in which entrepreneurship occurs can shape its nature.

While Schumpeter (1934) argues that entrepreneurial action requires attitudes that are present in only a small fraction of the population and characterizes entrepreneurs by an autonomous drive to achieve and create for themself, it was McCelland (1961) to show that entrepreneurial behavior can be associated with personality characteristics. McCelland's argues that the "need for achievement", moderate risk-taking propensity, preference for energetic and or novel activity are key entrepreneurial traits that are not evenly distributed across populations, suggesting that the prevalence of entrepreneurial behavior may vary according to cultural and societal factors. Empirical tests of McClelland's theory, such as Freeman's (1976) study, support the notion that entrepreneurial values, as reflected in national cultures, significantly influence economic performance.

Jacobs (1969) outlines two engines of urban economic growth: import replacement, where cities produce what they once imported, and innovation through entrepreneurs creating new products. Jacobs (1969) highlights the role of city dynamics in shaping the entrepreneurial outcomes, suggesting that local conditions are pivotal in determining a city's economic trajectory.

Liebenstein (1968) argues that per capita income growth requires shifts from less productive to more productive techniques per worker, the creation or adoption of new commodities, new materials, new markets, new organizational forms, the creation of new skills and the accumulation of knowledge. The entrepreneur is the input controller and the prime mover of the capacity creation of these elements of the growth process and so entrepreneurial activation improves the efficiency of the process of production (Leibenstein, 1968).

An approach that attributes a central role to entrepreneurial discovery has been the Austrian school. The core of the Austrian approach is the conviction that standard neoclassical microeconomics, for

which the general equilibrium model is the analytical core, fails to offer a satisfying framework for understanding what happens in market economies. Building on works of Mises (1949) and Hayek (1948), scholars in this tradition theorize that the market is an entrepreneurially-driven process in which market participants acquire better knowledge concerning the plans made by fellow market participants. Entrepreneurs are crucial in this process for their willingness to take risk in pursuing market opportunities.

In Kirzner's (1973) concept of entrepreneurship, the entrepreneur is an exploiter of opportunities, reacting to misjudged and misplaced expectations of other market participants. Kirzner (1973) emphasizes the reactive nature of entrepreneurs in economic development, suggesting that entrepreneurs respond to existing opportunities rather than creating new ones, unlike the Schumpeterian entrepreneur who is seen as a disruptive force. In Kirzner's view, entrepreneurial activity is the catalyst for competitive dynamics that propel the market process forward.

This view corresponds with Leibenstein's (1968) view of the entrepreneur as an input controller. The main difference between Leibenstein (1968) and the Austrian school is that in Leibenstein's view the advancement of inputs may gradually converge towards some kind of equilibrium, this is not guaranteed according to the Austrians.

The logic developed above is interesting and relevant for this thesis on the relationship between entrepreneurs and economic growth. Leibenstein's (1968) view is that the set of individuals with gap filling and input completing capacities is exogenous and the personality characteristics of these entrepreneurs are important. The Austrians argue that it is this relatively scarce willingness to take risk that allows an economy to develop and grow.

Based on these two considerations, Beugelsdijk (2007) theorizes and empirically tests the relation between economic success of regions to non-economic elements such as the presence of an entrepreneurial culture, concluding the regions with higher economic growth and innovation possess a distinctly entrepreneurial culture.

Porter's (1990) emphasizes the importance of competitive advantage and regional clusters, underlining the crucial role of entrepreneurial activity. He conceptualizes the Diamond framework: central to this framework is the role of the entrepreneur, who serves as the catalyst for innovation and the engine of growth by disrupting the status quo, challenging existing market forces and stimulating intra-industry rivalry, thereby fostering an environment in which competitive advantage can be cultivated.

Aghion and Howitt (1992) present a model of endogenous growth driven by the process of creative destruction, where technological progress arises from vertical innovations that enhance product quality. This model builds on Schumpeter's concept of creative destruction, emphasizing that new innovations not only spur growth but also render previous technologies obsolete, thus constantly changing the economic structure.

Baumol (1993) further advances this perspective, giving emphasis to the essential role of entrepreneurs in explaining the difference between dynamic economies from stagnant ones. He states that: "If we seek to explain the success of those economies that have managed to grow significantly, compared with those that have remained relatively stagnant, we find it difficult to do so without taking into consideration differences in the availability of entrepreneurial talent and in the motivational mechanisms that drive them" (Baumol, 1993, p. 3). Baumol's argument suggests that variations in entrepreneurial activity can explain both economic slowdowns and rapid growth, placing the entrepreneur as a key actor in economic transformation. The stagnation, he argues, may

result from a decline in entrepreneurial activity, whereas the economic success can be traced to flourishing entrepreneurial environment.

Audretsch (1995) suggests a correlation between industries that heavily invest in new knowledge and an increase in the number of startups, suggesting that industries with intensive knowledge production experience more significant knowledge spillovers. This is the results of experienced professionals leaving established firms to start their own ventures, thereby disseminating their expertise.

Acs (2006) presents the notion that entrepreneurial endeavors significantly contribute to economic growth, acting as channels for knowledge spillovers that amplify productivity. Galindo and Mendez (2013) extended this line of research and identify several factors that foster innovation and entrepreneurship which in turn propel economic activity. Acs (2010) postulates a S-shaped relationship between entrepreneurship and economic growth, suggesting that the role of entrepreneurship evolves as economies transit from efficiency-driven to innovation-driven stages.

Valliere and Peterson (2009), leveraging Global Entrepreneurship Monitor (GEM) data, discover that, in developed economies, high performing entrepreneurs play a substantial role in fostering economic growth. Interestingly, this strong correlation was not found in emerging markets, suggesting that the conditions enabling entrepreneurial success might differ substantially between these regions. Stoica et al. (2020) observe a positive relation between entrepreneurship and economic growth in OECD and European economies, thought they employed different proxies for entrepreneurship.

Henderson and Weiler (2010) further emphasize the significant impact of entrepreneurship on driving job creation, particularly in densely populated nations where resources availability and market opportunities are more abundant. The finding suggests a mutually reinforcing relationship between population density and entrepreneurial success, as entrepreneurs in such environments benefit from both a larger customer base and a greater pool of resources.

Acemoglu and Johnson (2005) analyze the importance of strong institutions in shifting entrepreneurial efforts towards activities that bolster economic development, finding that strong legal frameworks, property rights and effective governance ensure that entrepreneurial activity is directed towards innovation and growth rather than rent-seeking activities.

In recent research, high-growth firms have been identified as significant contributors to job creation and economic output. De Nicola et al. (2019) present evidence that industries with a higher presence of high-growth firms exhibit stronger productivity growth. Parida et al. (2016) stress the importance of networking and cooperation among firms. They demonstrated that firms engaged with radical innovators or those with strong network capabilities tend to perform better in terms of innovation.

However, as economies mature and job opportunities proliferate, the role of the entrepreneurs may evolve. Koster and Rai (2008) argue that in highly developed economies, the necessity for entrepreneurial activity could decline as more stable employment options emerge. This suggests that the nature and necessity of entrepreneurship may shift over time.

The study of entrepreneurship reveals the complexity of the subject and how it can be viewed from different perspectives. As Audretsh (2003) points out, there is not one clear-cut definition of entrepreneurship because it is a multilayered idea. When we dive deeper into the role of entrepreneurs, it is clear that is not just about starting a business: it is about bringing something

new, that is a product, a service, or a way of doing things. Entrepreneurs can stimulate local economies by creating new jobs, but they also often introduce new technologies or processes that can make industries more efficient and competitive. This thesis aims to shed light on the connection between entrepreneurial activity and local economic development, underscoring the importance of a supportive environment that enables entrepreneurs to thrive and, consequently, local economies to prosper.

3. HISTORICAL CONTEXT

3.1. Pre-Unification Economic Conditions

Italy played an important role in the European and Mediterranean economy during ancient times, late Middle Ages, and Renaissance. During the 13th century, the Black Death caused a drop in population. In 1450, the population decreased by 40 % in comparison to the 13th century (Malanima, 2017). The number of cities with a population exceeding 5,000 inhabitants dropped from 96 to 59. As the population sharply decreased, the real wages rose quickly. However, as the Italian population started growing again around 1450, wages diminished and remained low until the 17th century (Chiarini, 2010). The population grew from 7.5 million people in 1450 to 13,3 million in 1600 (Figure 1). Only in the 17th century the population density would surpass the one of the 13th century (Bacci, 2000). The Black Death and later epidemics that took place in all Europe changed drastically the whole continent. As shown in Figure 2, the Italian economy was still more advanced than the other European and Mediterranean countries and lost its leadership only in the late Renaissance, surpassed by Holland, while England surpassed Italy much later in the 17th century (Malanima, 2017, 2020).
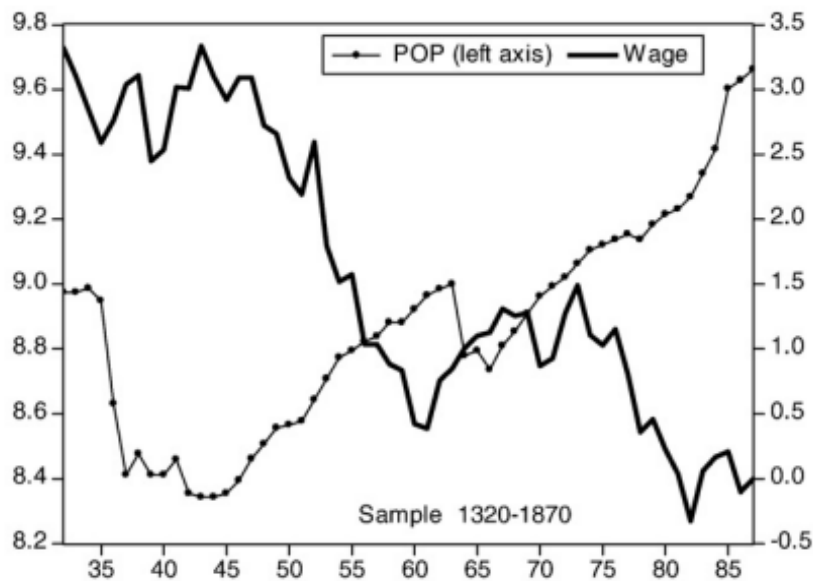

Figure 1, Population and real wages. Source: Chiarini (2010)

Urbanization rate before the Black death was around 21.4 %, with over 50 cities exceeding 10000 inhabitants, well above the average urbanization rate of 5.3 % in Europe (Malanima, 2017). Instead, in the 15th century, urbanization decreased to 17.6 %. Malanima (2017, p. 9) states that "From a comparative perspective, the center and north of Italy registered a fall in urbanization that was greater than that of other European states". The decline in population caused also a shift in the political institutions: during the 14th century there was a decrease in communal political liberties and new regional States formed around the wealthiest cities. Those new States, primarily revolving around the cities of Venezia, Milano, Genova and Firenze, had higher stability and coordination than before.

In premodern economies, Gross Domestic Product (GDP) increased whenever the population increased but the per capita GDP declined and the reverse occurred whenever the population declined. Chiarini (2010) finds that in the pre-industrial Italy a negative relationship between population and wages is not sufficient for economic growth, thus in contrast with the Malthusian

hypothesis. The levels of per capita income of the 15th century were reached only in the late 19th century in Italy.
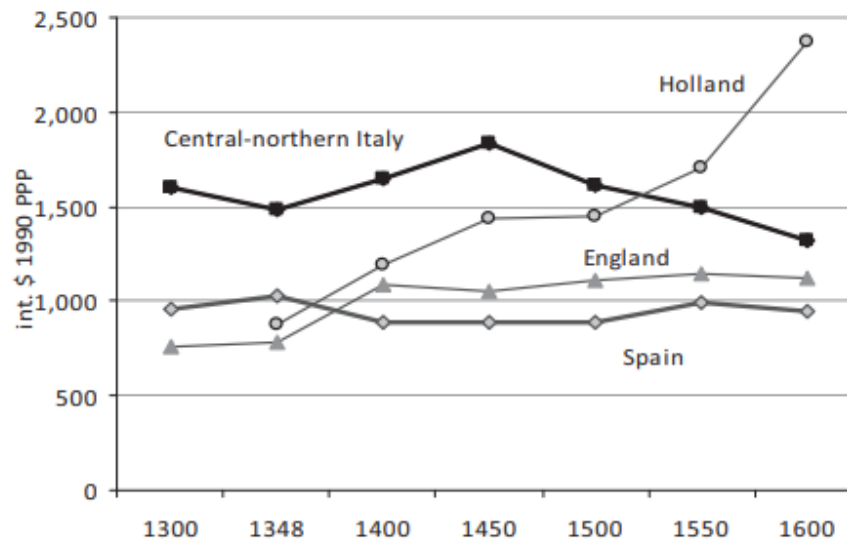

Figure 2, Per capita GDP. Source: Malanima (2017)

From the 17th to the 19th century, Italy became relatively underdeveloped compared to the more prosperous countries in northern Europe. France and Germany overtook Italy in around 1850 (Malamina, 2020). A significant drop in wages occurred in the 18th century, reaching its lowest point in the early 19th century (Chiarini, 2010). As shown in Figure 3, per capita output also had a drop of 25 % in the same period in northern Italy (A'Hearn, 2003). Interestingly, even though there was a reduction in severe mortality crises like epidemic or famine, the life expectancy did not have any improvement and infant mortality was higher considering other similar economies in the early 19th century (A'Hearn, 2003). This period has been explained by the loss of the central position in the world's trade of the Mediterranean.
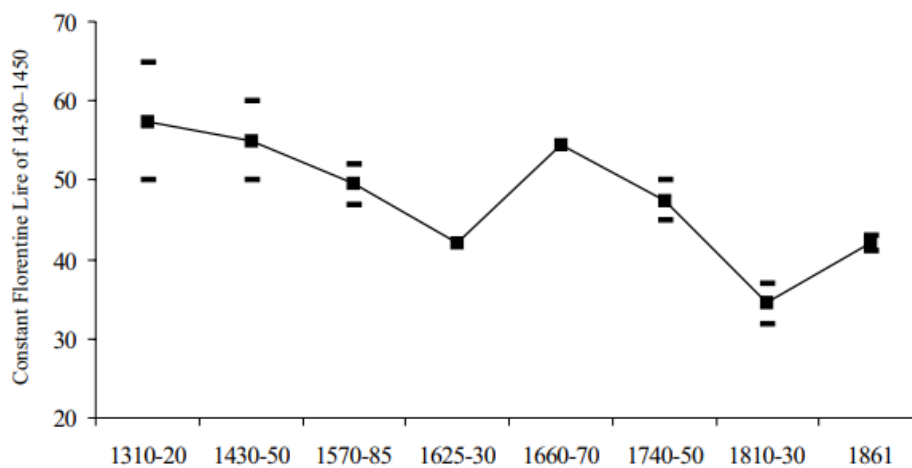
Figure 3, Per capita output in Northern Italy. Source: A'Hearn (2003)

The Italian economy during this period was traditional: almost half of the GDP came from the agricultural sector (Baffigi, 2015). The urbanization rate of cities with more than 10,000 inhabitants during the early 19th century was still lower than in the 13th century, at around 14 %. Compared to the rest of Europe, the urbanization was lower than in other economies, with England recording

rates of around 22.3 % at the beginning of the 19th century and 43 % in the late 19th century (Malanima 2009). Before 1861, the population in Italy was of around 26 million people. The human capital situation was quite dramatic, with over 75 % of the population being illiterate, among the highest values in Europe (Daniele, 2019). In the countryside the situation was even worse, where almost nobody was able to read and write (Malamina, 2020). Regarding land and labor productivity, Boserup (1965) describes land and labor intensification as a raise of productivity of available natural capital as a remedy to a population increase while natural resources remain stable. As population grew, there was an expansion of arable land through deforestation, allowing for greater cereal production, specifically of corn in the Po Valley (De Bernardi, 1984) which was more cultivated than wheat (Cazzola, 1996), a stable in the diet of lower-class workers, in particular for dishes as polenta. In the early 19th century, there was a shift in land ownership from noble families to new landowners such as former tenants or merchants, partially caused by the sale of church lands, the abolition of feudality, and the reduction of noble privileges during the Napoleonic periods, especially in southern Italy.

An important production was also the cultivation of mulberry trees for feeding silkworms, that led Italy to become the main producer of raw silk in Europe, with estimate of the value of silk produced being 4 % of GDP (Battistini, 2003) and one third of Italian exports by value (Federico, 2011). This laid the groundwork for the early industrialization in northern Italy on textile production. Regarding inter-regional trade, trade between regions was modest and concentrated mainly in the Po Valley (Federico and Tena-Junguito, 2014).

Before unification, Italy was composed of different jurisdictions: the Kingdom of Sardinia, the Kingdom of the Two Sicilies, the Papal State, the Grand Duchy of Tuscany, the Duchies of Modena and Parma and the Kingdom of Lombardy-Venetia.

The Kingdom of Sardinia was composed of the modern Italian region of Piemonte, Liguria and Sardegna and the French province of Nizza and Savoia that will be gifted to France after the Second War of Independence. Piemonte and Liguria were the most advanced economies in Italy, with established industries centered around the production of wool and cotton. The commitment to industrial and infrastructural development is evidence when considering that they possessed 40 % of the peninsula's railway network (Zamagni, 2007). The region of Sardegna instead exhibited a less developed economy, focused predominantly in the agricultural sector.

The Kingdom of Two Sicilies was composed of the modern regions of Campania, Abruzzo, Molise, Puglia, Basilicata, Calabria and Sicilia. It presented a picture of an economy deeply rooted in agriculture, with land ownership concentrated among the aristocracy. The land productivity was lower than that of the northern regions, disparity attributed to limited technological innovation in agriculture and inefficient labor utilization (Zamagni, 1993). The situation was further exacerbated by weaker infrastructure than the other states, with the Kingdom having only 99 kilometers of railway lines, predominantly financed by foreign capital (Massiaia, 2014). According to Zamagni (1993), such economic conditions hindered the development of a large internal market and most of the labor force lived in a close to subsistence level with little purchasing power to stimulate demand for goods beyond basic necessities.

The Papal States was composed of Lazio, Emilia Romagna, Umbria and Marche. In the northern parts, such as Emilia, the agriculture was more intensive, while the regions of Lazio and Umbria were dominated by large estate agriculture. The manufacturing was almost non-existent across the Papal States. Zamagni (1993) states a substantial portion of Rome's economy depended on the influx of pilgrims to the Vatican.

The Grand Duchy of Tuscany was located in the central region of Tuscany and under the rule of the Hasburg dynasty. It was characterized by a commercial policy embracing the principles of a free market that had a negative impact on the development of an industrial sector (Massaia, 2014). Tuscany was predominately engaged in the export of raw materials such as iron and marble. This export profile suggests that the region may have missed opportunities to add value to its natural resources through industrial processing.

The Kingdom of Lombardy-Venetia was composed of the northern regions of Lombardy and Venetia. Despite both being under Habsburg rule, the two regions exhibited a huge contrast in their economic development. Lombardy was characterized by highly intensive agricultural practices in the production of silk and one of the most advanced mechanical sectors within Italy, especially in steel production. The railway network was also quite extended, with almost 30 % of the total Italian railway network. The region of Venetia instead had a less advanced economy than Lombardy, with a decline that started at the end of the 18th century, with end of the Serenissima Republic of Venice. Both the commercial and agricultural sectors were less productive than Lombardy.

	Population 1861 (million)	Agriculture Output Per Hectare (lire)	Literacy Rate (1862)	Primary School Enrolment
Piemonte	2.8	169	6.1	45.80%
Liguria	0.8			10.30%
Sardegna	0.6	23		46.30%
Lombardia	3.3	238	5.3	25%
Veneto	2.3	128		33%
Parma-Modena	0.9	174	2.7	25-35%
Papal State	3.2	68		25%
Toscana	1.9	117	3.1	26%
Kingdom of the Two Sicilies	9.2	81	1.6	13%
Italy	25	104		25%

Table 1, Main economic indicators at the time of unification. Source: Zamagni (2007)

On the cusp of Italy's unification, the economic landscape of its regions presented a mosaic of diverse levels of development. The northern regions were marked by an agricultural system that was both intensive and specialized, focused on high-value crops such as cotton and silk. In contrast, the southern regions were primarily engaged in wheat production. The productivity in these regions was low, both in terms of output per hectare and output per worker. In 1857, Lombardy achieved an agricultural productivity of 238 lire while the Kingdom of the Two Sicilies lagged behind at a mere 81 lire per hectare (Massaia, 2014). The contrast was not limited to economic factors but also to literacy levels. As shown in Table 1, the literacy rate in the northern and center regions was much higher than in the Mezzogiorno.

Despite these regional differences, it is important to note that the overall pace of industrial growth was moderate when compared to other European nations. Nevertheless, the northwestern regions had laid the groundwork for a modern textile industry over the course of the 19th century. As noted by Cafagna (1989) the success of this industry in the north can be attributed to favorable conditions for silk production, the availability of hydroelectric power and protective tariffs.

The economic conditions of pre-unification Italy thus presented a complex scenario. The differences between regions were not merely economic statistics but they had profound social implications, influencing the wellbeing of the population, the low of internal migration and the political landscape.

3.2. Italian Unification

The Italian unification, or Risorgimento, was a complex and gradual process rather than a single event. It spanned several decades and involved multiple wars of independence, popular revolts and uprisings, political maneuvering, and diplomatic efforts. The unification was not just the result of military victories but also shifting political ideologies, the persistence of national movements and changing alliances both within and outside Italy.

Figure 4, Italian states in 1815. Source: Ministero dell'Istruzione

The momentum for the Risorgimento, can be traced back to the reforms introduced during the period of the French Revolutionary and Napoleonic wars (1796-1815) in which a number of Italian states were briefly consolidated, first as republics and then as satellite states of the French Empire. This period, thought short-lived, planted the seeds of a shared Italian identity by disrupting centuries of regionalism and foreign dominations. Many Italians, particularly those in the middle and educated classes, were exposed to new ideas of governance, liberty and national unity. When

Napoleon was defeated in 1815, the Congress of Vienna restored the old conservative order, reinstalling the former per-revolutionary rulers of the Italian states. This reversal triggered the opposition from secret societies who actively oppose the former conservative and foreigner leaders.

The decades following the Congress of Vienna saw a rise in revolutionary fervor. Groups like the Carbonari in 1820s and 1830s and later the republican group Giovane Italia (Young Italy), founded in 1831 by Giuseppe Mazzini, encouraged the masses to rise against the existing reactionary regimes. Mazzini's vision of a unified republican Italy resonated particularly with young educated Italians who were increasingly frustrated with foreign domination. The rise of movements reflects the broader cultural and intellectual shifts occurring in Europe during the 19th century, as liberalism, nationalism and republicanism gained momentum across the continent (Brooks, 2009).

The revolutions of 1848 marked a pivotal moment in the Italian unification process, as they were part of a broader wave of European revolutionary activity. Although the First Italian War of Independence (1848-1849) was ultimately a failure, it signaled a shift in leadership. The House of Savoia of the Kingdom of Sardinia began to take a more prominent role in unifying Italy. Under the leadership of King Carlo Alberto, and later his son Vittorio Emmanuele II, Sardinia-Piedmont positioned itself as the driving force behind the unification movement.

The Kingdom of Sardinia-Piedmont's pivotal role became clearer during the Second War of Italian Independence. The Kingdom of Sardinia successfully defeated the Austrian Empire, a major obstacle to unification, in 1859 with the help of the French Empire of Napoleon III and obtained the region of Lombardy. In April 1859, insurgents had overthrown Leopold II of Tuscany and later in June of the same year, Parma, Modena and the Papal Legations, the northern part of the Papal States rebelled, urging the unification with the Kingdom of Sardinia-Piedmont through plebiscites. Although Napoleon III initially opposed the unification of those states with the Kingdom of Sardinia, fearing the creation of a strong Italian state on France's border, the diplomatic intervention of Britain led to reconsiderations and subsequent plebiscites in the following year confirmed the popular sentiment in favor of a union with Piedmont.

In April 1860 an insurrection broke out in Palermo and, in May 1860, an expedition of a volunteer force known as Spedizione dei Mille (Expedition of the Thousands), led by Giuseppe Garibaldi, landed in Sicily. Francesco II, the King of the Two Siciles tried to calm down the situation by granting a constitution and promising amnesty to Sicilian rebels but on August 1860 Garibaldi crossed the Strait of Messina and conquered the rest of the Kingdom of the Two Sicilies. In the meantime, Piedmont seized the central Papal States, leaving only Rome and the surroundings under the papal control. In October and November 1860, plebiscites in the former papal and Bourbon provinces endorsed the annexation to Piedmont.

Figure 5, New Kingdom of Italy and other States in 1861. Source: Ministero dell'Istruzione

The culmination of these efforts came in March 1861, when the Kingdom of Italy was officially proclaimed with Vittorio Emmanuele II as its first king. However, unification was still incomplete. Rome and Venetia were still outside the new kingdom (Figure 5).

During the Third War of Italian Independence in 1866, the Italian Kingdom sided with Prussia against Austria in the Austro-Prussian War and managed to obtain Venetia. In 1870, the defeat of the French army by the Prussian during the Franco-Prussian War led to the loss of the French military protection of the Papal State, allowing, in September 1870, the Italian army to conquer Rome. The Pope was confined in the Vatican palace and would not recognize the new Italian country until 1929.

In conclusion, the Italian unification was a long and multifaced process that combined revolutionary ideals, military strategy and diplomatic negotiations. It was driven by a mix of popular uprisings, nationalist fervor and pragmatic leadership of figures like Vittorio Emmanuele II and Camillo Benso di Cavour. This political transformation had profound economic implications: it created a single market, standardized legal and monetary systems, and initiated a process of centralization of power. Although Italy was formally united, the process left unresolved tensions. These challenges would continue to shape Italian politics and society in the following decades.

3.3. Post Unification – The Liberal Age 1871 – 1911

The Italian Liberal Age, also known as the Liberal Period, spans from the unification of Italy to the beginning of World War I in 1914. This era was marked by significant political, social and economic transformations which laid the foundations for modern Italy.

From a political point of view, the Liberal Age saw a centralization of power and the establishment of a constitutional monarchy under the House of Savoia, firstly with the King Vittorio Emanuele II from 1861 to 1878, followed by King Umberto I from 1878 to 1900 and then King Vittorio Emanuele III from 1900 to 1946. The state's new borders, as shown in Figure 6, finalized after the conquest of the Papal States in 1870, persisted until the end of World War I, when Italy's territorial ambitions and involvement in the conflict led to new demands for further expansion (Palombelli, 2012).

Figure 6, Italian administrative regions in 1871. Source: Missiaia (2019)

The Liberal governments of the time attempted to foster national unity and economic modernization, but their policies often favored the already industrialized North, exacerbating Southern underdevelopment. State intervention, in the form of public works, education reforms and infrastructure projects, in particular in the railway network, aimed to integrate the South into the national economy, but was insufficient in closing the gap between North and South. In the period, southern regions experienced social unrest and mass emigration, particularly to the Americas.

From a cultural and social perspective, the Liberal Period was a time of significant intellectual and artistic ferment. Italy saw the rise of new political movements, including socialism and anarchism, which sought to address the inequalities within the country. Meanwhile, the expansion of literacy and the press contributed to the spread of nationalistic ideals, though regional identities remained

strong. The era was also marked by debates over the role of the Catholic Church, as the Pope, after losing the temporal power, retreated into a stance of opposition to the newly formed secular Italian state. Pope Pio IX refused to recognize the legitimacy of the Italian government and declared himself a "prisoner" within the Vatican. In response to the loss of the Papal States, the Pope issued the "Non Expedit" (It is not expedient) decree, reaffirmed after the occupation of Rome, which prohibited Catholics from participating in Italian political life (Marotta, 2019). The statement was later reaffirmed in 1886 by Pope Leone XIII with the *"Non expedit prohibitionem important"*, implying that the prohibition is absolute.

From an international perspective, Italy tried to establish itself as a European power, engaging in imperial ventures notably in East Africa. These ambitions, however, were often met with mixed results, as demonstrated by Italy's defeat at the Battle of Adwa in 1896 during the First Italo-Ethiopian War.

From an economic perspective, Italy's economic growth was relatively modest. At time of unification, agriculture account for almost half the Italian GDP (Federico, 1996). The period was characterized by an upward trend in economic indicators, with the average growth rate of GDP per capita and value-added sitting at around 0.9 % (Figure 7). Looking at the growth rate in the period 1881-1913, Italy experienced an annual growth in 1881-1888 of 4.6 %, a period of stagnation in 1888-1896 with an annual growth of 0.3 %, rapid growth in 1896-1908 with an annual growth of 6.7 % per year, and slow growth in 1908-1913 with an annual growth of 2.4% (Fenoaltea, 2006). According to Clementi et al. (2015), the GDP fluctuations that happened during this period were largely influenced by the variability in agricultural output.
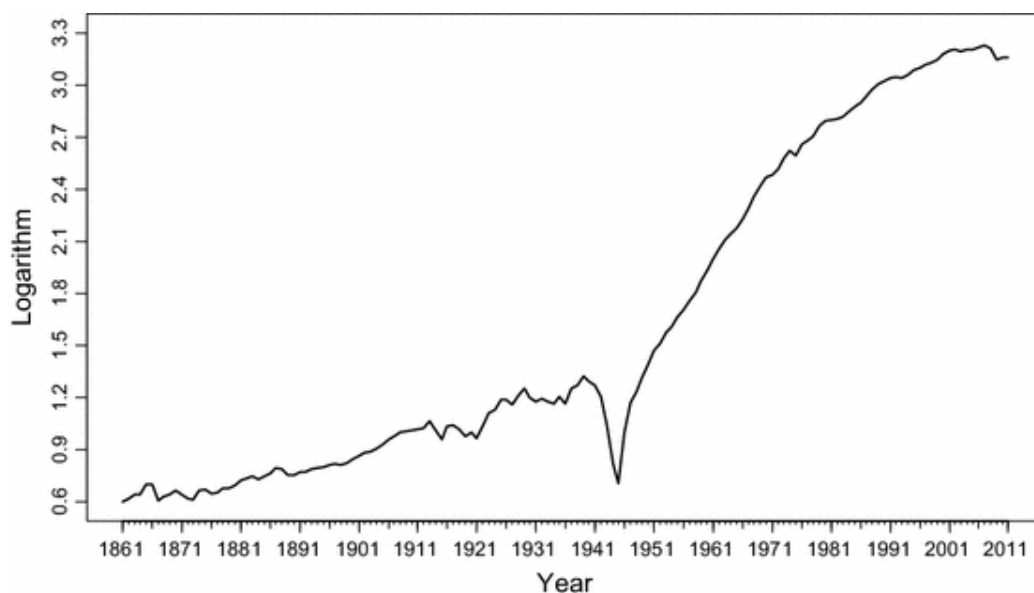
Figure 7, GDP per capita at constant prices 1861-2011. Source Clementi et al. (2015)

The population increased at an annual average of 0.7 % and the employment grew at a similar rate of 0.7 % on average. Real wages had an increase of 0.6 % per year, showing a gradual improvement in the standard of living, but as stated by Federico, Nuvolari and Vasta (2019, p.13) "Italian workers remained very poor throughout the entire period 1861-1913".

The annual productivity growth rate was instead much lower, averaging 0.2 %. Breaking down by sectors, both agriculture and industry experienced low growth rates, around 0.1 % while the service

sector experienced a productivity growth of nearly 0.5 % per year. Within the sector, private service had a bigger growth than government services, with the former at 0.5 % and the latter at slightly lower than 0.4 %. The growth rate of the service sector was one of the main growth contributors: overall the service sector contributed 56 % to the value-added growth, followed by the industry sector at 25% and agriculture at 19%. These figures paint a picture of an economy that was growing slowly. Moreover, the trajectory of real wage growth since the 1880s presents a similar image. Federico, Nuvolari and Vasta (2019, p.22) argue that "the modest growth of real wages since the 1880s was barely sufficient to converge with other peripheral countries".

3.4.   The Italian Economic Policies in the Liberal Age

The rapid railway network expansion (Figure 8) and the adoption of free trade policies served as the main pillars of the country's early economic strategy. According to Zamagni (1993), the economic policies taken by the government in the aftermath of unification were characterized by the ambition to emulate British industrial development and liberal economic policies.
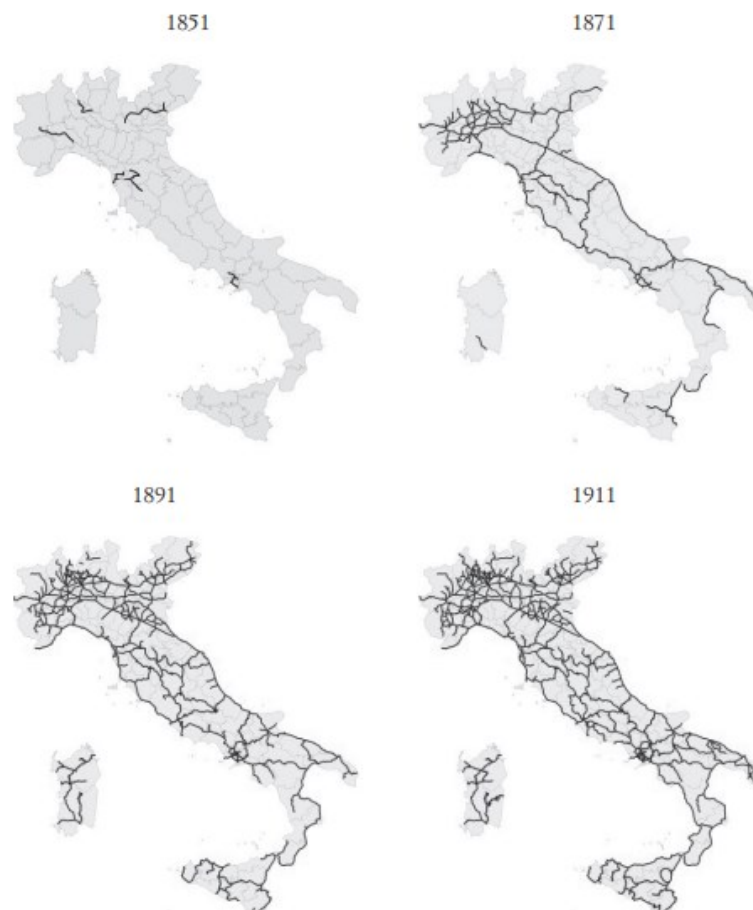
Figure 8, Rail network between 1851 and 1911. Source: Groote and Ciccarelli (2017)

The acceleration in railway construction was particularly noteworthy: the increase from 176 km to 376 km of new railway lines built per year (Figure 9) is evidence of this push towards modernization (Pontarollo and Ricciuti, 2020). This expansion aimed to unite the fragmented Italian states and stimulate industrial growth by enhancing connectivity. The shift in focus from the industrial triangle to the center south regions was a strategic move to integrate the entire nation into a cohesive (Romani, 1976).

Figure 9, Railways extension (thounsad kms). Source: Groote and Ciccarelli (2017)

A shift in policies promoting railways could be seen also in the locomotive industry. The Italian steam locomotive industry initially had relatively modest endowment in terms of engineering expertise and industrial infrastructure, particularly when compa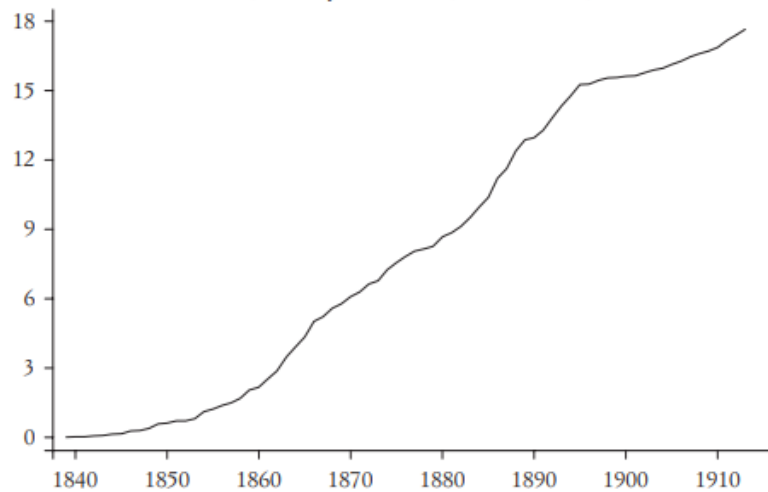red to nations like Germany and United Kingdoms. One of the primary obstacles the industry faced was the unpredictable nature of domestic demand, leaving producers unable to exploit economies of scale. Additionally, tariff protections on iron and other essential inputs imposed additional costs, putting Italian producers at a disadvantage (Ciccarelli and Nuvolari, 2015). However, beginning in 1885, the situation began to change with the introduction of discretionary procurement policies that effectively functioned as a "non-tariff barrier" (Cicarelli and Nuvolari, 2015). This shift, combined with the expansion of the Italian railway network, generated larger orders for locomotives, resulting in a virtuous cycle, where growing demand enabled to improve efficiency and leverage economies of scale.

However, the expected spillover effects of the railway construction were less pronounced than anticipated (Cafagna, 1989). Moreover, the dominant participation of foreign companies in railway project led to a significant outflow of capital, as materials and equipment were often sourced from abroad. The Italian engineering sector, still in its infancy, struggled to take advantage of the railway infrastructure due to its inability to compete with established foreign entities.

The embrace of free trade by the Italian government was another deliberate attempt to align with the British economic model. As Cavour, the first Italian Prime Minister, said, "our trade laws are the most liberal of the continent" (Letter to Massimo D'Azeglio, 1860). By extending the free trade policies of the Kingdom of Sardinia across Italy, the government aimed to integrate Italy into the global economic system. The reasoning behind these policies were multifaced, including the desire to gain international investment, the opening of foreign markets to Italian industrial goods, and a reciprocal commercial relationship with Britain and France, which had supported Italy politically and financially during unification (Zamagni, 1993). Overall Italian protections during the period were fairly low, with some notable exception. As shown in Figure 10, by looking at the Overall Trade Restrictiveness Index (OTRI), the pure change in tariffs, is it possible to spot some key moments in which tariffs were imposed (Federico and Vasta, 2015). Italy's largely agricultural economy favored free trade, benefiting landowners who exported agricultural goods. However, manufacturing firms, particularly in Campania, the most industrial southern region, suffered from the shift to free trade, prompting demands for protection. In response a commission was formed in

1870 and in 1878 new tariffs were introduced (James and O'Rourke, 2011). The tariff primarily benefitted the textile industry, though protection remained relatively limited, with tariffs reduced again after the 1881 trade agreement with France. Italy's trade policy in the late 19th century followed broader European trends, moving from a liberal stance towards protectionism. By 1887, a significantly higher tariff was imposed, particularly on iron, steel and textiles (James and O'Rourke, 2011). Tariff were also increased for yarn and wheat, both raising above 25% of the value (Toniolo, 1990). The 1887 tariff increase sparked a trade war with France, severely affecting Italy's silk and wine export, dropping by 57 % (Conybeare, 1985). Although the trade war ended in stages by 1898, wheat tariffs continued to rise, reaching 40 % ad valorem by 1913 (Toniolo, 1990).
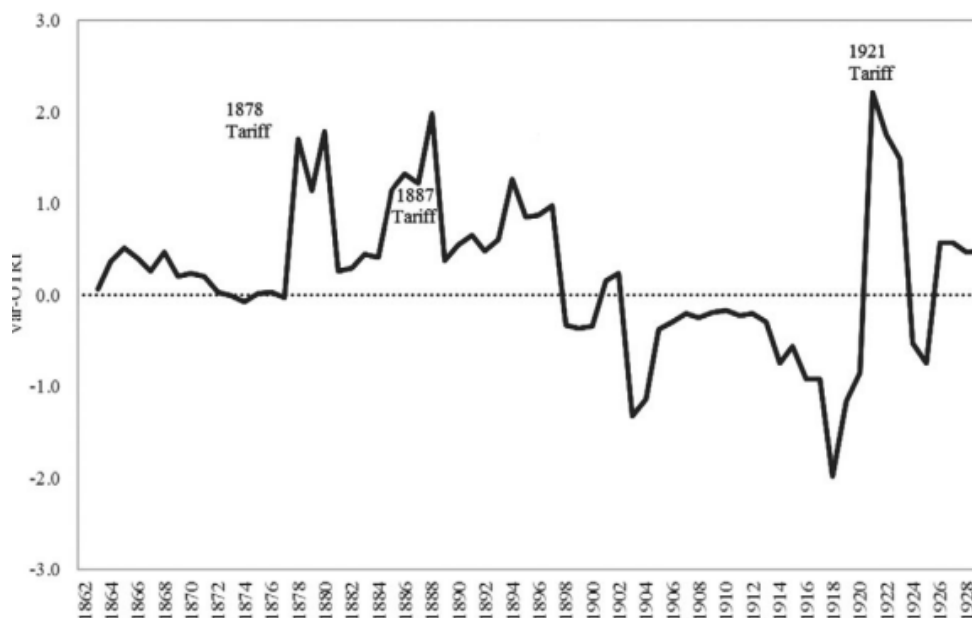

Figure 10, Variations in Italian Trade Policy. Source: Federico and Vasta (2015)

During the Liberal Age, Italian monetary and fiscal policies played a crucial role in linking the country to the global economy. As James and O'Rourke (2011, p. 12) states: "The exchange rate and its management constitute one of the most direct ways in which a national economy is connected to the world monetary system". In the late 19th century, many countries adopted the gold standard, and Italy initially followed this trend by issuing a bimetallic gold and silver standard in 1862. For Italy, a capital-scarce economy, the gold standard offered access to international capital markets, lowering borrowing costs and fueling growth (James and O'Rourke, 2011). However, during the Third War of Independence in 1866, Italy suspended convertibility, leading to a currency depreciation of 12 %. During the 1880s, commercial bank lending grew 15 % annually (Toniolo, 1990), but when the boom ended, banks faced difficulties, culminating in the 1893 financial crisis.

The subsequent bank reform led to the creation of the Banca d'Italia, financed by international capital. Italy's government debt, which doubled during the period, was also a significant challenge. In the 1870s fiscal consolidation efforts were attempted to stabilize finances, but the debt was largely. Despite the 1893 crisis, Italy's financial system became more resilient, as shown during the 1907 crisis, which had little impact on the exchange rate monetized (James and O'Rourke, 2011). By 1914, bond yield differences between Italy and France narrowed, reflecting Italy's improved financial stability (Bordo and James, 2007).

In the two decades that followed the unification, the industrial landscape experienced only modest growth, with the most notable progress occurring within the textile sector. Lombardy became the hob for silk production while Piedmont was known for its cotton production. Other sectors, such as iron, steel and engineering, lagged behind compared to other European countries. During the 1880s, Italy embarked on an ambitious policy of economic development, aiming to strengthen its industrial base. Central to this vision was the development of the steel and armaments industry. In 1884, a collaboration between the entrepreneur Vincenzo Stefano Breda and the Minister of the Navy, Admiral Benedetto Brin, led to the creation of a large-scale steel and armaments industry in Terni, becoming a powerful symbol of "state capitalism", where the state, through procurement contracts and protective tariffs, played a pivotal role in guiding industrial growth (Amatori and Colli, 1999). Moreover, engineering and iron and steel sectors benefitted from government contracts, such as the Beccarini Law of 1882, for railway construction and naval machinery. The change in tariff policies during the late 1880s also provided increased protection for domestic industries. Another significant factor was the reduction in freight rates, which decreased the cost of importing essential raw materials like coal (Bardini, 1997). This reduction of costs and the agricultural crisis caused by competition from North American grain during the early 1880s, resulted in as shift of investment from agriculture to industry. The crisis on agriculture also prompted the call for more protectionism culminated in the 1887 tariff regime discussed before. The textile industry, in particular, thrived under the new protectionist regime and a growing domestic market. Moreover, textile firms, often small and reliant on self-financing, were less affected by the 1893 financial crisis. From 1897 to 1913, Italy experienced unprecedented industrial growth.

The transformation of the industrial sector was fueled by several factors: the overhaul of the banking system laid the groundwork for more stable investment flows, the Giolitti administration prioritization of industrial development, the influx of foreign capital and the growth of exports. This era saw a significant push in production of intermediate and durable goods. Moreover, the growth of the electrical industry, thanks to the hydroelectric plants in the Alpine region, revolutionized both industry and market consumption. By 1914, Italy's electricity production reached 73 % of the British output (Toniolo, 1990). The engineering sector also matured to the extent that the Italian railway system became self-sufficient in terms of domestic production, with companies like Breda and Ansaldo. The birth of the Italian automotive industry, with companies like Fiat and Alfa Romeo and the growth of the chemical sector, with Pirelli emerging as an international powerhouse in rubber production, led to a pivotal shift in Italy's industrial landscape.

The early economic policies of Italy, therefore, reveal an intricate interplay between the ambition to mimic successful examples of industrialization, the practical challenges of domestic industry capabilities, and the influence of international economics. While the initial approach favored liberal economic principles, the realities of competition and industry development eventually necessitated a more protective stance.

3.5. The North-South Divide

One of the defining characteristics of the Liberal Period was the profound regional economic disparity between the North and the South, commonly referred as the "Questione Meridionale" (Southern Question). The North, particularly the industrial triangle of Milano, Torino and Genova, experienced rapid industrial growth, while, in contrast, the South remained mostly agricultural. The literature on these imbalances is extended and explore different aspects of the regional divide.

Felice (2018) reconstructs the regional GDP, productivity and employment in Italy on a NUTS2 level from 1871 to 2011 at ten-year intervals: at the time of the Italian unification there was significant regional variation within macro-areas. While the southern Italy was as a whole below the national average, Campania stood above it and Sicily was close to the average. Instead, some regions in the northern and central macro areas were ranked below the southern average, such as Marche, Valle d'Aosta and Trentino-Alto Adige. According to Felice (2015), this indicates that the North-South divide, in terms of GDP per capita, was not yet established. During the liberal age (1871-1911), despite the industrial growth in the North West's "industrial triangle", there was a slow process of convergence across Italy (Felice 2018).
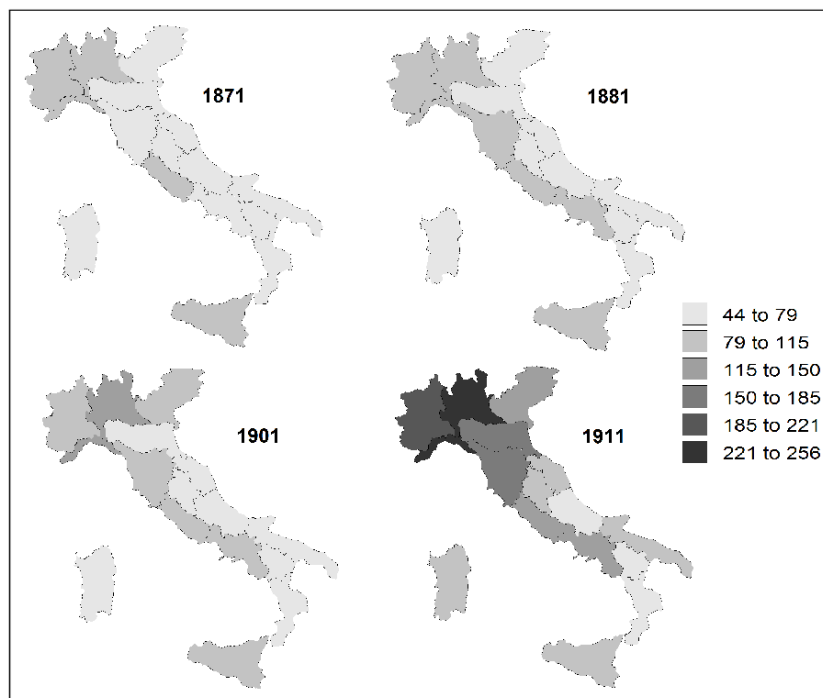
Figure 11, Industrial value added per capita 1871-1911 (constant 1911 prices). Source: Missiaia (2014)

This differentiation can be observed in Figure 11, which illustrates the regional disparities in industrial value added per capita over four benchmark years. In 1871, Italy was predominantly agricultural, with some industry primarily centered around silk production in Lombardy. However, by the eve of World War I, the Northwestern area, encompassing Lombardy, Liguria and Piedmont, had distinguished itself as the industrial center of Italy. Examining the two maps, it is evident that the primary change lies not in the magnitude of the divergence but in the nature of the regional gaps: in 1871 the industrial disparity was more pronounced on a West-East axis, with Eastern regions lagging behind in industrialization (Missiaia, 2014). According to Fenoaltea (2006), the regional divergence in industrial growth began after 1881.

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Considering productivity and workers per capita, regional differences are smaller than the per capita GDP. Southern Italy has consistently shown lower productivity and fewer workers per capita compared to the national average, which has contributed to its lower per capita GDP. During the period 1871-1911, both productivity and workers per capita inequalities increased.

The convergence of the income was partly due to outliers like Valle d'Aosta and Trentino-Alto Adige, but also because southern regions like Calabria and Basilicata did not perform as poorly as it would be expected: regions with high emigration rates, such as Calabria and Basilicata, but also Veneto in the North-East, saw their capita improve during the period. According to Felice (2018), these improvements were driven by rising workers per capita as many unemployed people emigrated and the increase was not a result of industrialization.

The gap in productivity grew particularly large mainly because the Centre-North started industrializing while the Mezzogiorno remained predominantly agricultural, with around 60% of the labor force occupied on it. Felice (2018) argues that since the agricultural productivity was lower than in industry and services, this further widened the per capita GDP gap. Even though Piedmont and Lombardy were showing signs of industrialization, they did not have, during the period, significant effects on the per capita GDP. Other regions in the Centre North grew quickly such as Liguria, which benefited from state aid, Lazio, which had an expansion of the tertiary sector, and Emilia Romagna. In contrast the region of Campania, the only region which had initially above average income in 1871, grew more slowly, contributing to the divergence (Felice 2018).

In 1871 the industrial structures of Italian regions were relatively similar, with each region hosting nearly all types of industries. This homogeneity can be attributed to political divisions prior to unification and the high transportation costs that hindered regional specialization (Missiaia, 2014). The regional industrial development of Italy during this time is a fascinating interplay of geography, resource availability and strategic infrastructure. One of the key factors underlying the geographical distribution of manufacturing activities was the access to domestic and foreign markets, with northern regions benefitting more from larger market potential thanks to the higher population density, proximity to large European markets and more developed infrastructure networks (Daniele et al., 2016). Considering resource availability, the mining sector was the most concentrated industry, with a substantial portion of mining activity localized in Sicily, abundant of sulfur mines, Sardinia, rich in mineral deposit, and Tuscany, with the mines of marble and other mineral resources. Sardinia saw an increase from 11 % in 1871 to 14 % in 1911, Tuscany increased from 14 % to 18% over the same period while Sicily, which held a significant share, it decreased from 44 % in 1871 to 32 % in 1911. The electrical industry instead offers an intriguing geographical shift, with Lazio accounting for 20 % of Italy's electrical production dropping to 9 %, largely due to the construction of hydroelectric plants in the North (Missiaia, 2014). Lombardy share, for instance, increased from 11 % to 24 % and Piedmont's contribution to the national electrical production grew from 14 % to 18 %. The textile industry was already concentrated in the Northwest by 1871, with over 60 % of Italy's textiles produced in Lombardy, Piedmont and Liguria, thanks to the production of cotton and silk in those regions as previously mentioned. The only region in the south with modest textile industry was Campania, but it struggled to modernize and grow as rapidly as northern Italy.
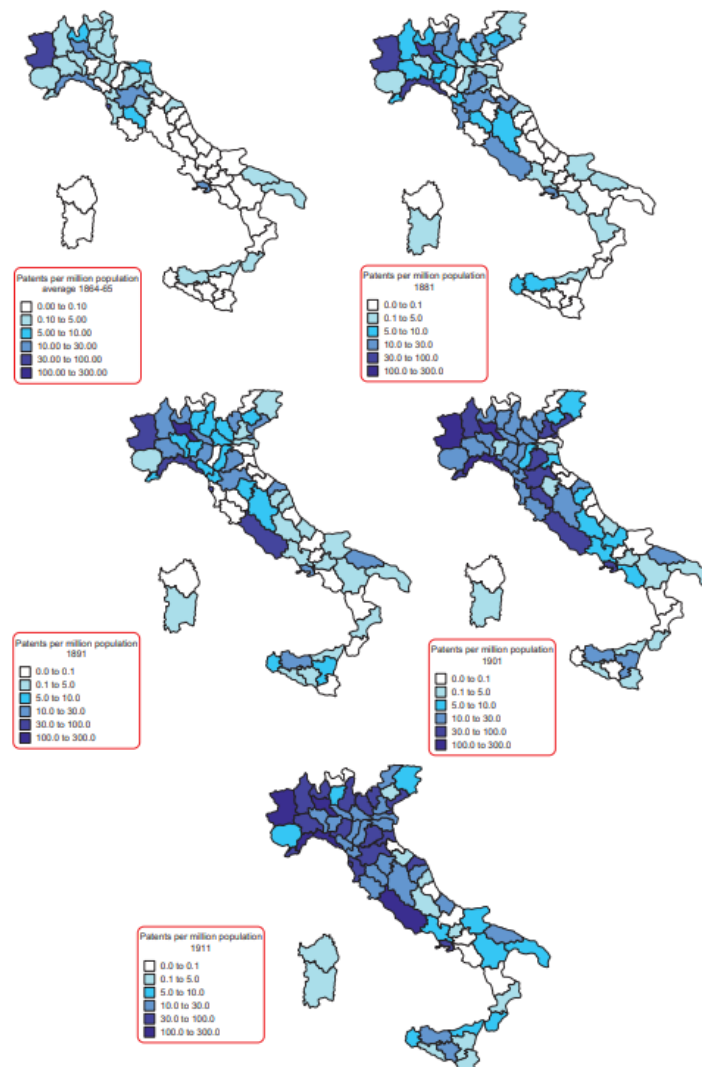
Figure 12, Geographical distribution of patents per million population. Source: Nuvolari and Vasta (2017)

Looking at the geography of innovation during the Liberal Age, the picture is similar (Figure 12). According to Nuvolari and Vasta (2017), patenting activities, often used as a proxy for innovation, were predominantly concentrated in the "Industrial triangle". They argue that the distribution of innovative activity was influenced by human capital formation, particularly secondary technical education, and, to a lesser extent, by engineering and science universities. The literacy rates, presented in Figure 13, describe a similar picture: the southern regions lagged behind the center-northern ones (A'Hearn and Venables, 2011).

Figure 13, Literacy rates, 1871-1911. Source: A'Hearn et al. (2011)

Federico, Nuvolari and Vasta (2017) explore the regional divide using estimates of Welfare Ratio. Their finding is that the gap between North and South was already present at the time of unification and that the real wages did not improve during the following twenty years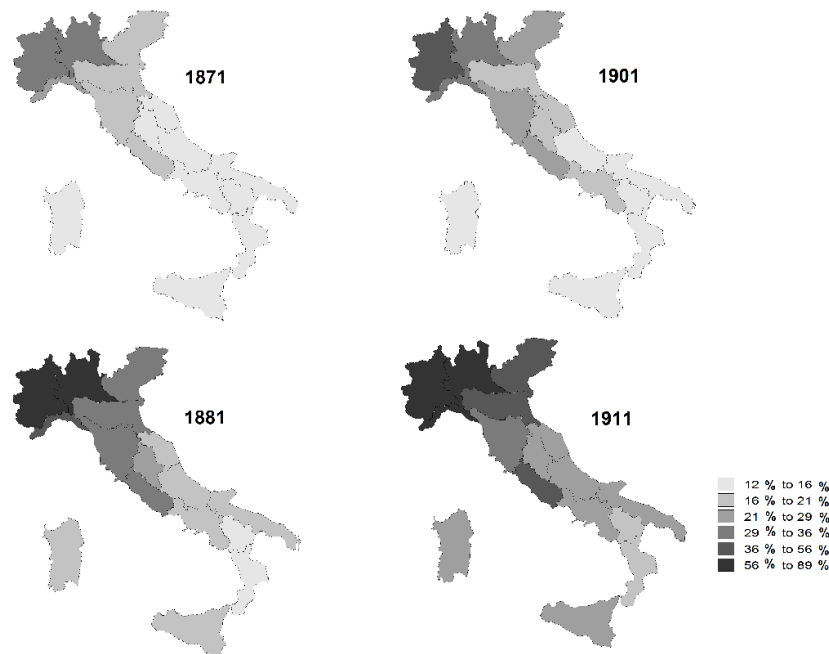. From the 1880s, real wages started to grow as a consequence of industrialization in the "industrial triangle". In other regions, real wages fluctuated until the end of the century without a clear trend (Federico, Nuvolari and Vasta, 2019). The Welfare Ratio improved during the whole period, with a small increase during the period 1862 and 1880 thanks to the increase of nominal wages, a modest increase during the 1880-1895 thanks to the decline in world prices of cereals and a more important increase during the 1895-1913 period.

Through the years, intellectuals, politicians and scholars have grappled with the reasons behind the disparity between center north regions and southern regions. Shortly after the unification, the "Questione Meridionale" was seen as a pressing issue. For instance, the first use of this term was in 1873 by the parliamentary Antonio Billia. In 1876, Franchetti and Sonnino published a report on the socio-economic condition in Sicily, highlighting the poor economic situation. Nitti (1901) argued that after the unification there was a wealth redistribution from South to North through taxations, stating that the South was used as a colony. This "colonial view" was revisited by Sereni (1948) and Romeo (1969), suggesting that the North's industrialization came at the South's expense particularly through the 1887 tariffs. Capecalatro and Carlo (1971) argues that the gap between north and south was the results of neo-colonial policies. However, Cafagna (1989) found no evidence of the South exploitation and Federico and Vasta (2015) downplayed the impact of protectionist policies. Moreover, Federico, Nuvolari and Vasta (2019) do not find support for the notion of a sudden and drastic impoverishment of the southern regions following the unification.

Cafagna (1989) instead provide an alternative viewpoint, focusing on the agricultural roots of the divide, arguing that the North's intensive farming, better infrastructure, credit availability and trade networks contrasted sharply with the South's extensive latifundia system.

Federico (2007) argues that the productivity gap between the northern and southern regions was not solely due to institutional arrangements but also to lower innovation investment and human capital levels.

Felice (2016) argues that the elites of the South have played a pivotal role in shaping the region's development, suggesting that the root causes of the South's problems lie within its governance. Felice and Vasta (2014) argue that the south's ruling class lead the south to passive modernization, a process marked by external imposition of development, often through state intervention, rather than active modernization, an organic society-wise effort, that was undertook by the northern regions.

Some scholars instead follow a different approach, positing that Italy's geography is a significant factor in the South's underdevelopment. Fenoaltea (2006) states that the natural advantages held by northern regions, particularly in terms of energy resources such as hydroelectric power, have influenced the pattern of industrialization. A'Hearn and Venables (2011) identify as a driver of economic activities the regional natural advantages. Daniele and Malanima (2007) suggest that the remoteness from the European markets hindered its industrial growth. Missiaia (2016) and Daniele, Malanima and Ostuni (2016) found evidence of positive effect of market access for the development of the northern regions.

Banfield (1958) identifies the distrust of public cooperation beyond the family unit in the south as an obstacle to economic development. Putman (1994) also explore this cultural perspective, arguing that the divergence between North and South could be traced back to North's communal spirit to city-state governance during the Medieval Ages, while the South's feudal monarchy fostered hierarchical relations and mistrust towards public authorities. Another perspective takes into consideration "genetic" explanations: Lynn (2010) states that IQ differences could explain various socioeconomic indicators, but Felice and Giugliano (2011) rebut this hypothesis arguing that there is a reverse causality in Linn's argument since the educational quality and income have an impact on IQ and literacy.

In conclusion, the North-South divide during the Liberal Period was shared by a complex interplay of historical, geographical and socio-economic factors. While initial regional disparities were not stark at the time of unification, industrialization in the North and the persistence of agriculture in the South led to growing inequalities. Scholars have explored various explanations for this divergence, ranging from resource availability, institutional arrangements, the role of elites, cultural and geographic factors. The "Questione Meridionale" remains a central theme in understanding Italy's regional economic divide, with scholars continuing to evaluate the causes of these enduring disparities.

4. DATA AND METHODOLOGY

This chapter outlines the methodological framework employed in this thesis to investigate the determinants of real wage growth in Italy at the provincial level from 1871 to 1911. The study employs Ordinary Least Squares (OLS) regression for the analysis of real wage growth, using entrepreneurial rate as the main explanatory variable. Additionally, the set of control variables includes real wages in 1871, literacy rate, patents, share of agricultural labor force, urbanization rate and industrial value-added growth. Additional models include geographical and historical control variables.

Furthermore, a Panel Data Regression analysis is conducted to deepen the understanding of the relationship between real wages and entrepreneurial rate during the period analyzed.

4.1. Data Sources

The empirical analysis utilizes historical data from various sources to compile a comprehensive dataset on Italian provinces. The data and their sources are discussed in details in the following sub-sections.

Entrepreneurial rate

As previously discussed, entrepreneurship, particularly when linked to innovation, draws significant attention from academics and policy makers. Quantifying entrepreneurship involves defining who entrepreneurs are and what they do.

Wennekers and Thurik (1999) identify three categories of entrepreneurs:
- Intrapreneurs, who are employed by others but take commercial initiatives in large organizations. As noted by Christensen (1997) and Baumol (2010), innovation, particularly incremental innovation, takes place in large firms rather than in startups.
- Managerial business owners, who are self-employed and represent the vast majority of small firms. They fulfill many economic functions, such as efficient organization of production and distribution.
- Schumpeterian entrepreneurs, that is, innovative ventures from new firms with transformative potential.

In the dynamic corporate landscape, distinguishing between the entrepreneurship of founders and the intrapreneurship within a corporation becomes challenging, as both can drive high performance. However, despite the interest of scholars, there is a shortfall in robust indicators for Schumpeterian entrepreneurship (Henreksin and Sanadaji, 2019).

No single metric perfectly encapsulates entrepreneurship. Nonetheless, certain metrics may be more apt for specific inquiries, as the study of entrepreneurship is ultimately about understanding its role in the broader economic narrative (Foreman-Peck, 2005). Different metrics have been used by scholars to study entrepreneurship. Gries and Naudé (2008) develop a general endogenous growth model using startups rates as a proxy for entrepreneurship. Bjuggren, Johansson and Stenkula (2010) use self-employment as proxy for entrepreneurship. Dvoulety (2018) examines different indicators of business activity, the self-employment rates, the GEM's Total Early-stage Entrepreneurial Activity rate and business ownership rate.

Utilizing quantity-based measures as proxies for entrepreneurship brings both advantages and challenges. As noted by Shane (2009), most businesses are not entrepreneurial. Moreover, as stated by Henreksin and Sanadaji (2019, p.4), "entrepreneurship still tends to be empirically quantified in terms of a single measure unable to capture any differences in entrepreneurship quality". Fazio et al.

(2016) highlight that quantitative metrics such as self-employment and startups activity overlook the variance in initial growth potential across companies. Moreover, the authors argue that unlike metrics that assess the quality of entrepreneurial efforts, the quantity-based measures fail to pinpoint high-value innovation hubs, such as Silicon Valley.

Another measure often used as a measure is innovation, however, broad indices of innovation such as Global Innovation Index are not able to estimate entrepreneurship since innovation take place also outside firms, such as in public sector, academia and nonprofit sector (Henreksin and Sanadaji, 2019); moreover, proxy for innovation, such as patent data, has been criticized by Griliches (1990) and Jaffe et al. (1993) for being a poor measure of innovativeness.

As pointed out by Henreksin and Sanadaji (2019), without accurate metrics, misinterpretations can easily arise. The authors, in order to capture the multidimensional phenomenon of business activity in a unidimensional metrics, rely on several measures, including: the self-made billionaire entrepreneurs from the Forbes list of the world richest individuals; the number of so-called unicorns, that is firms that received a valuation of at least one billion dollars after only a few years from foundation, per million inhabitants; the number of young top global firms founded by individuals included in the Forbes top 2,000 largest publicly listed firms; and the number of Venture Capital founded startups that attained the stage of an initial public offering. The idea is that measures which are characterized by a steep threshold, such as billion-dollars enterprises, are proxies for underlying latent factors of Schumpeterian entrepreneurship. After comparing with other six quantity-based measures of business activity (new firm registration per capita, business ownership rate, low expectation total early-stage entrepreneurial activity, high expectations total early-stage entrepreneurial activity, self-employment as a share of total employment, self-employed with employees as a share of total employment), they suggest that the measures of "rare success" are better measures to capture the rate of entrepreneurship than standard measures.

The measure for entrepreneurship used in this thesis is inspired by Henreksin and Sanadaji's (2019) work as it takes the entrepreneurs rate in Italian provinces during the Liberal Age. The choice of this measure is also due to several factors related to the historical context and the nature of available data. During the 19th century, comprehensive records of business activities have not been systematically maintained: the first official economic census made at a national level in Italy was in 1911 with the "Censimento degli opifici e delle imprese industriali" (Census of firms and industries). Moreover, standardized measures of innovation, such as patent filings or metrics as venture capital investment, may not have been consistently recorded. The rate of entrepreneurs could be one of the few quantifiable measures available to study this period.

The data used in this thesis cover Italy between the eighteenth and the twentieth centuries and matches information on entrepreneurs with population and economic variables at provincial level. The provinces used are defined according to 1911 borders, which were almost unchanged since 1871 (Palombelli, 2012), as presented in Figure 14.

Figure 14, Italian provinces between 1871-1919. Source: Palombelli (2012)

To build this database, raw data were systematically extracted from Wikipedia, focusing on the Italian version, as it was found to be the most complete and exhaustive in its coverage of relevant biographical information. A methodical scraping process was employed to gather data from categories that directly relate to entrepreneurs, using an approach similar to Laouenan et al. (2022).

The primary categories used for this purpose were:
- "Imprenditori italiani nel XVIII secolo" (Italian Entrepreneurs in the 18th century)
- "Imprenditori italiani nel XIX secolo" (Italian Entrepreneurs in the 19th century)
- "Imprenditori italiani nel XX secolo" (Italian Entrepreneurs in the 20th century)

A total of 1,936 Italian entrepreneurs were initially retrieved from Wikipedia during the data collection process (Figure 15). This number reflected a wide-ranging effort to systematically scrape biographical information from various Wikipedia categories as previously discussed. However, upon closer inspection, it became evident that many of the entries suffered from poor data quality, inconsistencies or incomplete information. This issue particularly affected crucial variables like birth and death dates, place of birth, and professional details, which are essential for building a reliable and comprehensive dataset.

As a result, a thorough cleaning and validation process was undertaken to ensure the integrity and usability of the data. This involved removing entries with significant missing or erroneous information, as well as standardizing data formats for geographical variables. Geographical variables extracted from Wikipedia were matched with the data provided by ISTAT (Istituto

Nazionale di Statistica), the Italian National Institute of Statistics on the population census of 1911 (ISTAT, 1960).

After this rigorous cleaning phase, the final database was refined to include 1,318 entrepreneurs. This subset represents only those individuals for whom sufficient and reliable information was available, ensuring that the final dataset is both accurate and robust enough for meaningful historical and statistical analysis.

The database is organized as in Laouenan et al. (2022) and Serafinelli and Tabellini (2022), with each row corresponding to one person. It captures a wide range of biographical and professional details, including:

- Personal information: Name, gender, date of birth, date of death
- Professional information: Main profession, secondary profession, and other professions (if applicable)
- Geographical data: place of birth and place of death at a municipal level and according geographical classification using NUTS (Nomenclature of Territorial Units for Statistics) system – levels NUTS1, NUTS2 and NUTS3.

The use of Wikipedia as a primary data source offers both advantages and limitations. On the one hand, it allows for the extraction of a broad range of biographical data with relative ease. The ability to scrape large amounts of information from a structured and categorized platform like Wikipedia ensures that the dataset is both extensive and diverse. However, this also raises potential concerns regarding the completeness and accuracy of entries, particularly for less known figures that may not have as robust documentation. The broadness is also the cause of some limitations: as noted by Serafinelli and Tabellini (2022), the selection of individuals in the dataset reflects the idiosyncrasies of crowd-funding, since it is possible that information is more readily available for individuals that were born in cities that at the time were renowned centers. Instead, the other limitations brought up by the authors, the English and Western Bias and the better quality of information for more recent individuals, are not a problem: the first because the analysis cover one nation, the second because as discussed by Laouenan et al. (2022), the error rate in the Wikipedia database regarding notable individuals is below 1 % for individuals born after 1751AD, and the error rate is higher with individuals that have shorter biographies.
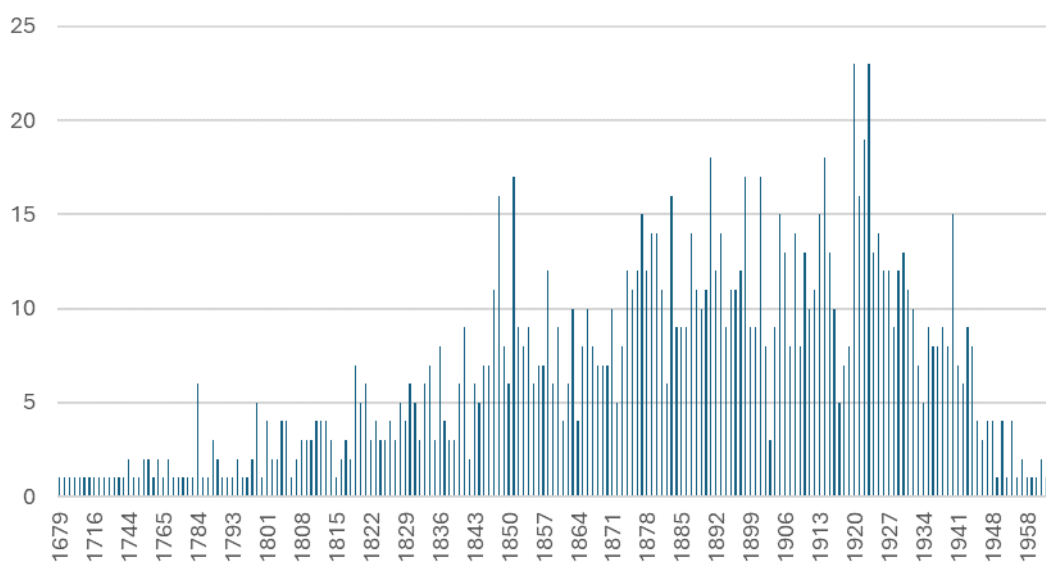

Figure 15, Entrepreneurs per year of birth. Source: own elaboration

Table 2 report some descriptive statistics concerning the dataset, which provides a rich overview of the entrepreneurial landscape across several dimensions. Most entrepreneurs in this dataset were born during the 19th century. The number of entrepreneurs that were active during the period 1871-1911 is 853.

The geographical distribution of entrepreneurs reveals a strong disparity, with most individuals concentrated in the northwestern are of the country, namely 586 individuals: indeed, three of the most frequent municipalities in the database are located in this macro-area (i.e., Milano, Torino and Genova). The northeastern are of the country follows with 315 entrepreneurs. In contrast, fewer entrepreneurs are from the South (138 individuals), insular regions (77 individuals) and Central Italy (202 individuals). In the southern macro-area, 22.4 % of individuals come from the municipality of Napoli.

The data on mobility, that is the difference from the region of birth and the region of death, provide some insights into internal migration patterns of entrepreneurs. Lombardy stands out as a key hub, with a notable outflow of 53 individuals and an inflow of 52 individuals. Lazio saw the highest inflow of 66 entrepreneurs, indicating that the political and administrative opportunities of the region likely attracted individuals from across the country.

One of the most striking aspects of the dataset is the severe gender imbalance among entrepreneurs. Only 41 women are listed compared to 1,277 men, which clearly reflects the broader social and cultural barriers that women faced in business.

When examining the main profession of the individuals in this dataset, entrepreneurs dominate, with 815 people. This is unsurprising given the dataset's focus. Politicians and engineers, while much smaller in number (62 and 54, respectively), represent other key figures in this entrepreneurial class. The presence of politicians suggests a close link between business and politics in this period, as many entrepreneurs likely engaged in public life or used their wealth and influence to shape economic policy. Considering also the secondary information, 225 individuals are listed also as politician. Engineers, meanwhile, represent the technical and industrial expertise that was crucial to Italy's modernization.

	No.	%
Gender		
Male	1277	3 %
Female	41	97 %
Total	1318	100 %
Area of birth		
North West	586	44 %
North East	315	24 %
Center	202	15 %
South	138	10 %
Insular	77	6 %
Total	1318	100 %
Municipality of birth – Top 5		
Milano	112	8 %
Torino	59	4 %
Roma	45	3 %
Genova	45	3 %
Firenze	35	2 %
Century of birth		
17th century	6	0.5 %
18th century	54	4.1 %
19th century	723	54.9 %
20th century	535	40.6 %
Total	1318	100 %
Alive during 1871-1911	853	65 %
Change of region death	435	33 %
Inflow – Top 3 regions		
Lazio	66	5 %
Lombardia	52	4 %
Liguria	27	2 %
Outflow – Top 3 regions		
Lombardia	53	4 %
Piemonte	45	4 %
Emilia-Romagna	37	3 %
Main profession		
Entrepreneur	815	62 %
Politician	62	5 %
Engineer	54	4 %

Table 2, Descriptive statistics. Source: own elaboration

Using the information of the database, the variable $Entrepreneur\ Rate_{pT}$ is defined as the number of entrepreneurs per million inhabitants alive in province p during the period T (1871-1911). Significant disparities are evident, with some provinces showing much higher rates of entrepreneurship compared to others (Figure 16). Como and Livorno lead with the highest entrepreneurial rates, 71 and 75 respectively. Northern provinces such as Milano (48), Genova (37) and Brescia (33) exhibit higher levels of entrepreneurship. On the other hand, Southern provinces like Catania (6), Foggia (2) and Caserta (1) show considerably lower entrepreneurial rates. The entrepreneurial landscape in Italy is marked by significant regional variations, with the industrial North leading the way while the South lags behind, with the only exception of Palermo (21), Napoli (15) and Benevento (15). These differences confirm the historical economic divide.
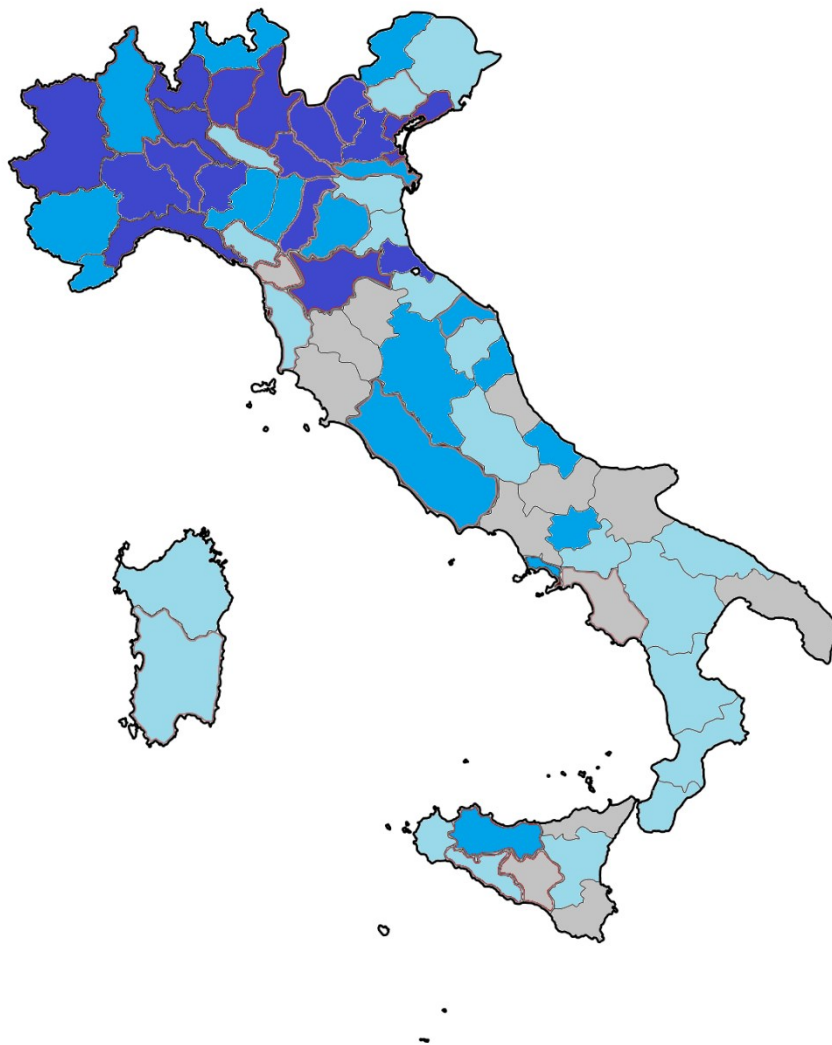

Figure 16, Entrepreneurial Rate in 1911. Source: own elaboration

Real Wages

The variable $Real\ Wages\ Growth_{pT}$ and $Real\ Wages_{pt}$, where t = 1871,…,1911, are the dependent variables used in the OLS and Panel Data analyses, respectively. Data on real wages are drawn from Federico, Nuvolari and Vasta (2019). The authors, using Allen's (2001) methodology, construct yearly real wages for the provinces between 1861 – 1913. Nominal wages data are taken from Ministero di Agricoltura, Industria e Commercio Direzione Generale di Statistica (Ministry of Agricolture, Industry and Trade Directorate General of Statistics) and Bollettino dell'Ufficio del Lavoro (Bulletin of the Labor Office). The prices are taken from Bollettino settimanale dei prezzi (Weekly bulletin of prices).

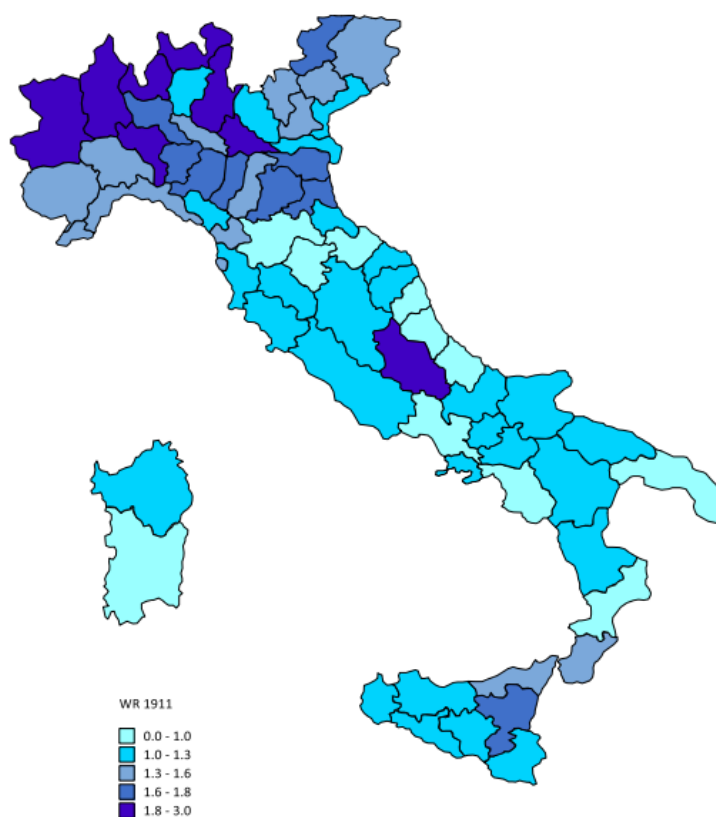The distribution of real wage levels is shown in Figure 17.

Figure 17, Real Wages in 1911. Source: Federico, Nuvolari and Vasta (2017)

Literacy rate

Literacy rates serve as a proxy for human capital levels across provinces. Human capital has been a crucial determinant of economic performance during the 19th century (Galor 2012, Goldin 2015) Higher literacy rates likely reflect better education, which can contribute to productivity improvements and potentially higher wages. This variable is sourced from Bozzano, Cappelli, and Vasta (2024). The data on literacy rate presents a clear north-south divide, where northern regions generally exhibit higher literacy rates compared to southern ones (Figure 18). The authors suggest that two distinct educational models were present during the 19th century: the North focused on economies of scale, using larger class sizes and lower spending per pupil to increase the quantity of

schooling, while the South and Center favored a more elitist model, with smaller classes and higher expenditure per student, resulting in lower enrollment rates.

The northern provinces of Como (98.7 %), Torino (98.4 %), Sondrio (97.5 %), Milano (96.7 %) and Bergamo (97 %) have literacy rates close to 100%, indicating a highly educated population in 1911. As we move towards central Italy, literacy rates start to decline. Bologna, Mantova and Parma have literacy rates around 90 %, while Firenze and Roma have around 76 %. Southern Italy suffers from significantly lower literacy rates. Napoli (63.5 %), Bari (52.0 %), Reggio Calabria (36.4 %) show stark contrast compared to their northern counterparts.
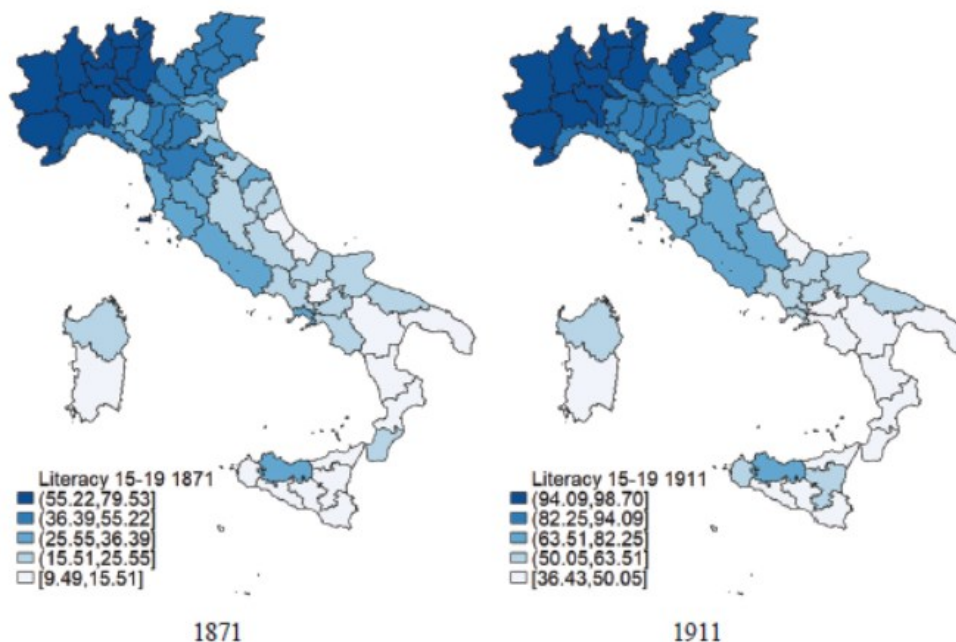

Figure 18, Literacy rate in 1871 and 1911. Source Bozzano, Cappelli and Vasta (2024)

Industrial Value Added

The variable *Industrial value added*, sourced from Ciccarelli and Fenoaltea (2013), measures the output of the industrial sector relative to the population. Higher industrial value added can indicate greater industrialization, which is typically associated with higher wages compared to less developed sectors, such as agricultural (Figure 19).

The variable for *industrial value added growth* in the period 1871-1911 in included in the set of controls used in the OLS regressions.

The provinces with the highest industrial value added per capita in 1911 are Milano (284), Livorno (271) and Genova (235) while the provinces with the lowest industrial value added per capita are Campobasso (45), l'Aquila (47) and Benevento (47).
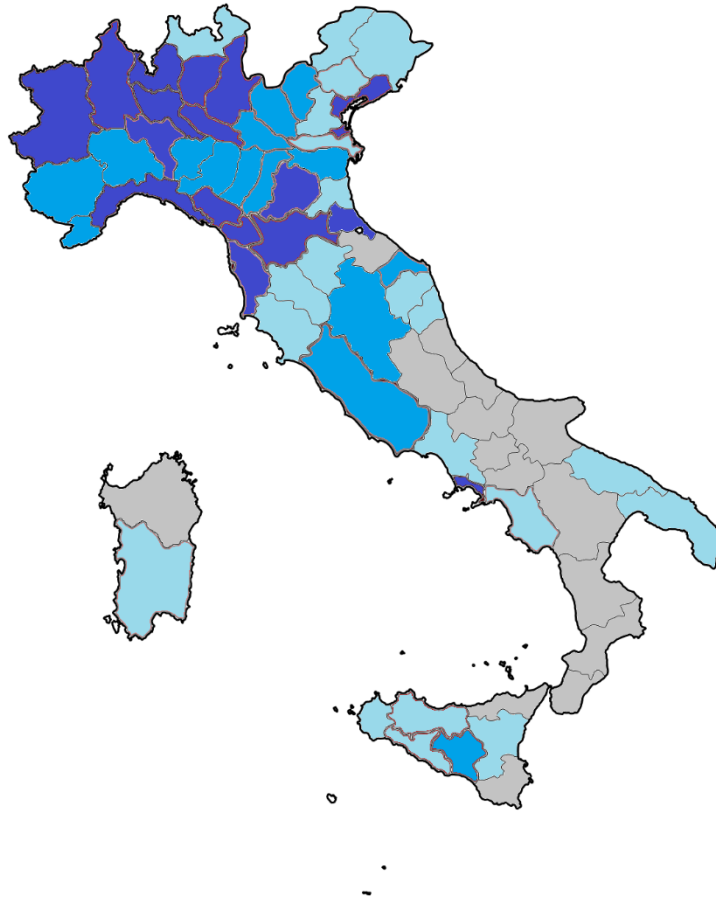
Figure 19, Industrial value added in 1911. Own elaboration, data from Ciccarelli and Fenoaltea (2013)

Share of Agricultural Labor Force

The share of agricultural labor force is drawn from Missiaia (2014), represents the proportion of the workforce employed in agriculture. A higher share of the labor force in agriculture may indicate a more rural and less industrialized economy, where wages are typically lower. In contrast, a lower share suggests a shift toward industrial or service sectors, which could contribute to higher wage levels (Figure 20). The provinces with the highest share of agricultural labor force in 1911 are Campobasso (80 %), Benevento (78 %) and Sondrio (78 %) while the provinces with the lowest share of agricultural labor force are Livorno (11 %), Napoli (20 %) and Milano (26 %).
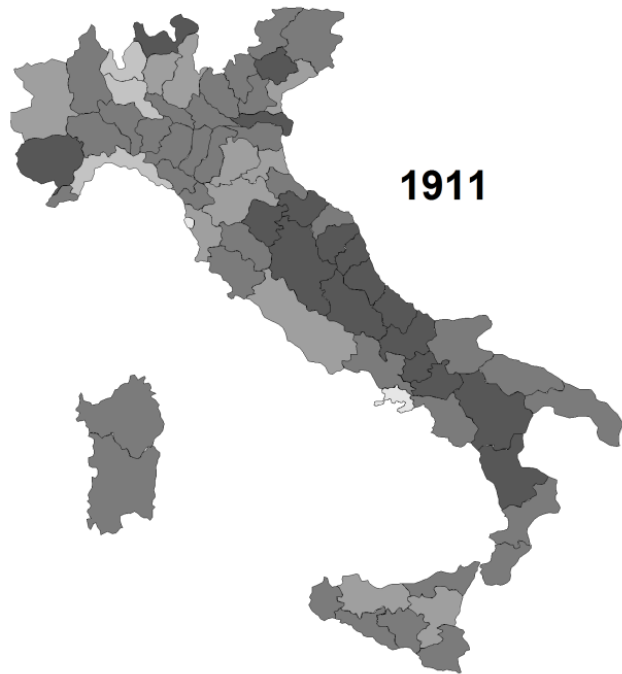
Figure 20, Share of agricultural labor force in 1911. Source: Missiaia (2014)

Urbanization Rate

The variable for urbanization rate, measuring the percentage of the population living in cities with more than 30,000 inhabitants, is drawn from data provided by Bozzano, Cappelli, and Vasta (2024). Urbanization is often linked with industrialization, better access to markets and higher wages due to the concentration of economic activities in cities. The urbanization rate reflects the extent of the transition from an agrarian to an industrial economy and its potential impact on real wages (Figure 21).

Figure 21, Urbanization rate in 1911. Source: own elaboration, data from Bozzano, Cappelli and Vasta (2024)

Patents

Innovation is proxied through the number of patents per million inhabitants, with data sourced from Nuvolari and Vasta (2017). This variable serves as a measure of innovation and technological progress. A higher number of patents suggests greater technological dynamism, which can boost productivity and lead to wage growth. The map showcases a more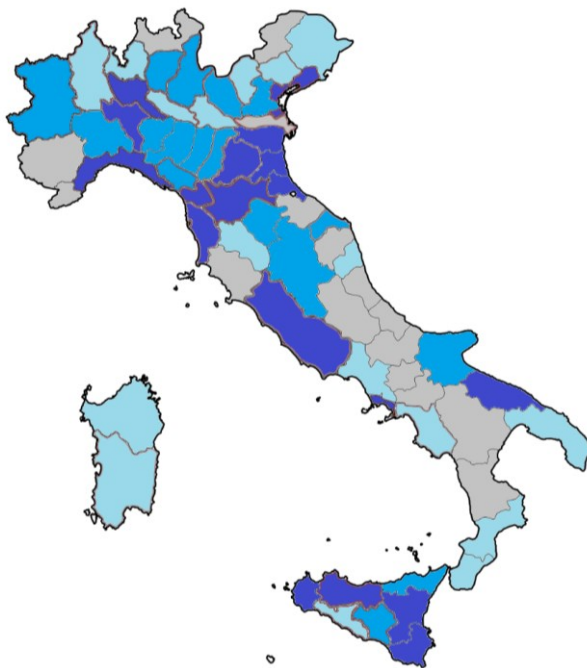 concentration of patents in the northeastern macro-area, while in the southern regions only Napoli is above the national average (Figure 22).

The provinces with the highest number of patents pre million inhabitants are Milano (292), Torino (235) and Genova (189) while the provinces of Campobasso, Potenza, Terano, Avellino, Sondrio have the lowest number of patents, 0.
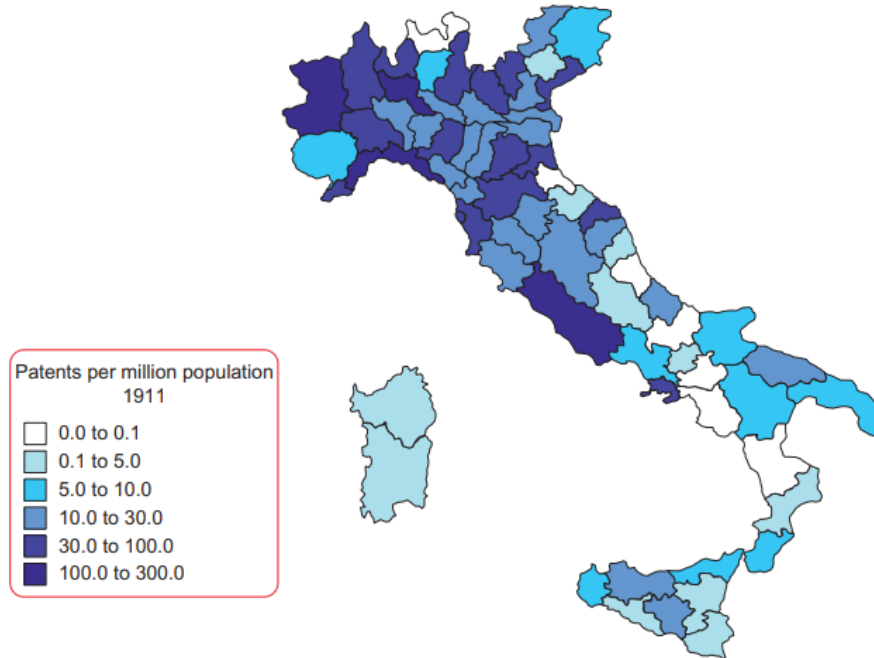
Figure 22, Patents per million inhabitants in 1911. Source: Nuvolari and Vasta (2017)

4.2. Model Specification

Real wages growth in the period 1871-1911 is analyzed in a cross-sectional setting via OLS according to the following regression equation:

$$Real\ Wages\ Growth_{pT} = \alpha + \beta Entrepreneur\ Rate_{pT} + \sum_{k=1}^{K} \gamma^k X_{pt}^k + \varepsilon_{pT} \qquad (1)$$

where the vector X_{pt}^k includes the following control variables referring to province p: real wages in 1871; literacy rate in 1871; patents per million inhabitants in 1871; share of agricultural labor force 1871; urbanization rate in 1871; industrial value added growth in the period 1871-1911. Finally, ε_{pT} denotes the error term.

The second part of the analysis relies on a Panel Data regression framework to account for both temporal and cross-sectional variations, allowing for more robust inference. This analysis utilizes fixed effects (FE) and random effects (RE) models to evaluate the impact of the independent variable on real wages. The FE model is defined as follows:

$$Real\ Wages_{pt} = \beta Entrepreneur\ Rate_{pt} + \sum_{k=1}^{K} \gamma^k X_{pt}^k + \mu_p + v_t + \varepsilon_{pt} \qquad (2)$$

Where the dependent variable is defined as real wages in province p in year t = 1871, … , 1911, the explanatory variable of interest captures provincial entrepreneurship in year t, and the set of controls is defined as for Equation (1), except for the variable capturing industrial value added growth, which is considered in levels in Equation (2). The terms μ_p and v_t denote province- and year-specific FEs, respectively, while ε_{pt} is the error term.

5. EMPIRICAL FINDINGS

This chapter presents the empirical findings from cross-sectional and Panel Data regression analyses conducted to investigate the relationship between real wage (growth), a key indicator of economic prosperity, and entrepreneurship, hypothesizing it to be a pivotal force in shaping wage dynamics.

5.1. Cross-Sectional Regression Analysis

The Table 3 reports the baseline results of the OLS regression analysis and suggest a positive relationship between entrepreneurial rate and real wage growth, with an estimated coefficient of 0.15 – see Column (3). This suggests that entrepreneurship indeed has the potential to propel wage increases, possibly due to the dual impact of job creation and the introduction of innovation into the economy. The increase of one notable entrepreneur per million inhabitants would lead to an increase of 1.5% of the real wage growth.

			Dependent variable:			
			Real Wages Growth			
	(1)	(2)	(3)	(4)	(5)	(6)
Enterpreneurial Rate	0.011***	0.015*	0.015**	0.015**	0.014**	0.009*
	(0.004)	(0.008)	(0.006)	(0.006)	(0.006)	(0.006)
Real Wage (1871)		-0.546***	-0.685***	-0.685***	-0.673***	-0.606***
		(0.189)	(0.165)	(0.165)	(0.166)	(0.163)
Literacy Rate			0.005	0.005	0.003	0.013**
			(0.006)	(0.006)	(0.006)	(0.006)
Share Agricultural Labor Force			0.012*	0.012*	0.010	0.004
			(0.006)	(0.006)	(0.007)	(0.006)
Patent			-0.006	-0.006	-0.005	-0.002
			(0.005)	(0.004)	(0.005)	(0.005)
Industrial Value Added Growth			-0.021	-0.021	-0.049	-0.023
			(0.188)	(0.136)	(0.191)	(0.206)
Urbanization Rate			0.005	0.005	0.003	-0.004
			(0.005)	(0.004)	(0.006)	(0.005)
Mezzogiorno					-0.167	
					(0.192)	
Kingdom of Two Sicilies						0.301
						(0.230)
Papal States						0.706***
						(0.226)
Duchies of Modena and Parma						1.007***
						(0.328)
Kingdom of Lombardy-Venetia						0.062
						(0.216)
Grand Duchy of Tuscany						0.036
						(0.248)
Constant	0.456***	1.040***	0.381	0.381	0.679	0.401
	(0.104)	(0.273)	(0.380)	(0.273)	(0.512)	(0.463)
Observations	69	69	69	69	69	69
R^2	0.105	0.256	0.353	0.353	0.361	0.521
Adjusted R^2	0.092	0.233	0.278	0.278	0.276	0.418
Residual Std. Error	0.531 (df = 67)	0.488 (df = 66)	0.473 (df = 61)	0.473 (df = 61)	0.474 (df = 60)	0.425 (df = 56)
F Statistic	7.883*** (df = 1; 67)	11.331*** (df = 2; 66)	4.748*** (df = 7; 61)	4.748*** (df = 7; 61)	4.233*** (df = 8; 60)	5.071*** (df = 12; 56)

Note: *p<0.1; **p<0.05; ***p<0.01

Table 3, OLS results. Source: own elaboration

The negative coefficient of the variable Real Wages (1871) supports the convergence theory, which posits that poorer or less developed economies tend to grow faster than richer ones because they can adopt existing technologies and best practices from more advanced economies, thus catching up over time. This finding also aligns with Vecchi (2011), who observed a significant decline in the incidence of absolute poverty in southern Italy. According to the author, the proportion of the population living in absolute poverty in the South decreased from 52% to 43 % over the period in question. This shift indicates a notable improvement in living conditions and could explain the convergence of poorer provinces. A similar line of reasoning could be applied to the variable Share of Agricultural Labor Force. In less industrialized economies in 1871, the shift toward industrialization likely had a positive impact. As industrialization advanced, it reduced the reliance on agricultural labor, opening up new employment opportunities in more productive and higher-wage sectors such as manufacturing and industry. This transition could have spurred economic growth. This interpretation is further supported when examining other indicators, such as Patents and Industrial Value Added Growth. While these variables may not show statistical significance, their overall trends suggest a potential negative relationship with real wage growth. One explanation is that in early stages of industrialization, despite a boost economic output, economies undergo structural adjustment, especially when capital investments are prioritized over wage increases.

Checking for the overall quality of the model, the results are robust when using heteroscedastic-robust standard errors – see Column (4).

Looking at Columns (5) and (6), with the inclusion of additional geographical and historical controls reveals an intriguing dynamic of regional convergence. The results suggest that economic convergence between provinces did not significantly occur in the South of Italy. This is reflected in the negative coefficient for the Mezzogiorno dummy variable, which, although not statistically significant, hints at the persistent economic disparities that have historically plagued the southern regions -see Column (5).

In contrast, the convergence process appears to have been more pronounced in the central part of the country, particularly in the Duchies of Modena and Parma and in provinces that were formerly under Papal rule – see Column (6). These regions seem to have experienced more robust economic integration and growth during the period under consideration. This could be attributed to various factors, such as development of the steel industry in the province of Perugia or the development of the food industry in Emilia-Romagna.

5.2.   Panel Data Regression Analysis

The empirical analysis investigates the determinants of real rages over the period 1871–1911, using both Random Effect (RE) and Fixed Effect (FE) regression models.

The results corroborate the positive relationship between entrepreneurship and real wages across provinces, underscoring the role of entrepreneurship in economic development during this period (Table 4). The consistency across models reinforces the premise that entrepreneurship is a cornerstone of wage growth. While the RE models suggest that the entrepreneurial and structural factors were important predictors of wages, the FE model underscores the importance of accounting for unobserved, time-invariant regional characteristics that influenced economic outcomes.

The empirical results indicate that regions with higher entrepreneurial rates also tend to have stronger growth in real wages, suggesting that entrepreneurial activities can lead to more significant benefits in the long term. The coefficient of $Entrepreneur\ Rate_{pT}$ is 0.013 – see Column (6): this mean that an additional notable entrepreneur per million inhabitants increase the real wage of 1.3 %.

This positive relationship aligns with the theory that regions with higher levels of entrepreneurship are better positioned to capitalize on innovation, attract investment and create jobs and it is consistent with Schumpeter's (1934) theory of creative destruction, where entrepreneurial innovation drives economic transformation by introducing new products and processes that displace older, less efficient industries. Moreover, this finding reinforces the argument made by Beugelsdijk (2004) and Porter (1990) that entrepreneurial activity fosters innovation and competitive advantage, which are essential drivers of economic growth. These insights highlight the complexity of economic development where both structural conditions and entrepreneurial dynamics play pivotal roles.

These results support the notion that entrepreneurial activity was not uniformly distributed across the country, with a marked concentration in the northern regions. This reflects the broader literature that emphasizes how market access and institutional quality play pivotal roles in shaping regional economic trajectories, as highlighted by Missiaia (2014) and Felice (2016).

Looking at the FE estimates – see Column (6), the variable for literacy rates becomes statistically significant, showing a positive coefficient of 0.007. This finding is in line with Federico, Nuvolari and Vasta (2019). The relevance of literacy rate as a variable can be seen as a reflection of how intellectual capital contributes to economic development. Higher literacy rates are indicative of a society's increased capacity for knowledge dissemination, skill acquisition and innovation. Over time, these improvements foster productivity gain, which in turn drive wage growth (Missiaia 2014). The relationship between literacy and wages can be interpreted as part of a broader process of modernization, where access to education enable the labor force to engage in more complex, and high value, economic activities. As worker become more educated, they are better able to adapt to new technologies and industrial processes, increasing the productivity. This, in turn, enhances the overall efficiency of the economy, and raises the demand for skilled labor, pushing up wages.

	Dependent variable:					
	Real Wages					
	Random Effect				Fixed Effect	
	(1)	(2)	(3)	(4)	(5)	(6)
Entrepreneurial Rate	0.013***	0.003	0.004**	0.004**	0.029***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Literacy Rate		0.007***	0.009***	0.008***		0.007***
		(0.001)	(0.001)	(0.001)		(0.001)
Share Agricultural Labor Foce		0.005***	0.004**	0.004**		0.003
		(0.002)	(0.002)	(0.002)		(0.002)
Patents		0.0001	0.0004	0.0003		0.001
		(0.001)	(0.001)	(0.001)		(0.001)
Industrial Value Added		0.003***	0.002***	0.002***		0.003***
		(0.001)	(0.001)	(0.001)		(0.001)
Urbanization Rate		-0.001	-0.001	-0.001		-0.002
		(0.002)	(0.001)	(0.002)		(0.004)
Mezzogiorno			0.256***			
			(0.054)			
Kingdom of Two Sicilies				0.269***		
				(0.078)		
Papal State				0.053		
				(0.086)		
Duchies of Modena and Parma				0.044		
				(0.126)		
Kingdom of Lombardy-Venetia				0.021		
				(0.077)		
Grand Duchy of Tuscany				-0.048		
				(0.101)		
Constant	0.854***	0.223*	0.097	0.111		
	(0.039)	(0.115)	(0.115)	(0.126)		
Observations	345	345	345	345	345	345
R^2	0.145	0.494	0.519	0.522	0.271	0.582
Adjusted R^2	0.142	0.485	0.509	0.506	0.088	0.468
F Statistic	58.085***	329.742***	364.111***	363.102***	102.332*** (df = 1; 275)	62.758*** (df = 6; 270)

Note:					*p<0.1; **p<0.05; ***p<0.01

Table 4, Panel Data regression results. Source: own elaboration

The variable for Industrial Value Added shows a statistically significant coefficient of 0.003. This finding may reflect the cumulative effects of sustained industrial activity over time. As industries expands, it leads to increased efficiencies through advancements in technology, optimized production processes and economies of scale. The positive effect of industrial value added can be understood as part of a broader structural transformation. As industries grow, they not only enhance productivity but also attract more skilled labor, which further pushes wages up as the demand for specialized skills increases. Interestingly, agriculture's significance diminishes in the panel data model, signaling that its influence may be more transient or overshadowed by individual-specific factors not captured in the OLS model.

The continued non-significance of patents and urbanization rates suggest that these factors alone do not have a direct relationship with wage levels. Urbanization, for instance, could have a complex dual effect: while it can lead to greater employment opportunities and wage potential, it might also result in increased living costs. Patents non-significance could be related, as pointed out by Nuvolari and Vasta (2014) to overall lower quality of Italian patents, as indicated by low renewal rates. Moreover, according to the authors, Italian firms, during this period, led technological advancements without relying on patents, using instead reputation and customer service to protect their innovations.

To conclude, the empirical evidence points to a multi-faceted landscape where entrepreneurship act as a catalyst for economic development. This could be attributed to entrepreneurs disrupting nature, introducing novel product and services and driving competition. The negligible impact of literacy rate in the OLS model, but its significance in the Panel Data model, suggest a potential incubation

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period for education investments to mature into economic gains. This delayed effect might be due to the time it takes for a young educated worker to integrate into and transform the economy. The contrasting significance of agricultural labor force across models could be interpreted as a reflection of the country's stage in the development cycle. As economies mature, they shift away from agriculture might initially increase wages but could later stabilize. The non-significance role of patents in both models challenges the conventional narrative that innovation directly translates into economic growth. This could imply that the quality and commercial viability of innovation are more critical than sheer quantity. Lastly, the mixed results for industrial value added and urbanization rates suggest a complex interplay of factors. The industrial sector's expansion may not uniformly raise wages if not matched with demand for labor, and urbanization could have countervailing effects on wages depending on the balance between job creation and cost of living increases.

6. CONCLUSION

This thesis has explored the role of entrepreneurship in fostering economic growth at a provincial level in Italy during the Liberal Age (1871–1911). The period of study marked Italy's transition from a fragmented and largely agrarian society to a more unified and industrialized economy, with significant regional disparities shaping its economic trajectory. Central to this transformation was the emergence and influence of entrepreneurs as "agents of change". By examining the relationship between entrepreneurship and real wages growth, this study provides insight into the significance of entrepreneurial activity as a driver of local economic development.

The empirical analysis conducted in this thesis reveals that provinces with higher levels of entrepreneurship exhibited greater real wages growth, indicating that entrepreneurship played a crucial role in the economic progress in post-unification Italy. Notably, the analysis highlighted pronounced regional disparities in entrepreneurial activity with the northern provinces, particularly those within the industrial triangle of Milano, Torino and Genova, showing significantly higher levels of entrepreneurship compared to the southern provinces. This divide is consistent with the broader economic patterns observed in Italy during this period, where the North experienced more rapid industrialization and economic growth, while the south remained predominantly agricultural.

This thesis contributes to the existing literature on entrepreneurship and economic growth by focusing on a historically significant but underexplored period in Italy's economic history. By employing historical data at provincial level and examining the relationship between entrepreneurship and real wages, this study adds a new dimension to the understanding of how entrepreneurial activity influenced regional economic disparities in post-unification Italy. Furthermore, it offers a novel approach to measuring entrepreneurship during this period, using a database of notable entrepreneurs drawn from biographical sources such as Wikipedia.

The findings of this study have important implications for understanding the historical roots of Italy's persistent North-South economic divide. The positive correlation between entrepreneurship and economic growth in the northern regions suggests that policies aimed at fostering entrepreneurial culture could have played a role in bridging the economic gap between the North and the South. However, the study also indicates that structural factors such as education, infrastructure, and industrial development are critical for economic growth.

While this thesis makes a valuable contribution to the literature, it is not without limitations. The use of historical data presents inherent challenges, particularly with respect to the accuracy and completeness of records from the 19th century. The reliance on biographical sources to measure entrepreneurship, while innovative, may not capture the full scope of entrepreneurial activity during this period. Moreover, the study primarily focuses on entrepreneurs who gained historical recognition, potentially overlooking smaller scale but equally important entrepreneurial efforts that contributed to local economies. Another limitation is the geographical focus on provinces as the unit of analysis, which may obscure more localized dynamics within provinces. Additionally, while the analysis controls for several key variables, there may be other unobserved factors –such as social networks, cultural influences and political connections – that also shaped the entrepreneurial landscape during this period.

Future research could build upon the findings of this thesis by exploring other dimensions of entrepreneurship in historical contexts. Comparative studies between Italy and other European countries during the same period could provide deeper insights into the role of national policies and cultural factors in shaping entrepreneurial ecosystems. Additionally, further research could investigate the role of women in entrepreneurship during this period, as the gender imbalance

observed in the dataset suggests that female entrepreneurship remains an underexplored area in historical economic research.

In conclusion, this thesis underscores the critical role of entrepreneurship in driving economic growth and shaping regional economic disparities in Italy during the Liberal Age. While entrepreneurship alone cannot explain the complex economic patterns of this period, entrepreneurial activity played a key role in advancing local economies. The lessons from this historical analysis remain relevant today, as modern economies continue to grapple with issues of regional inequality and the need for dynamic, innovative entrepreneurial cultures to drive growth and development.

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