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Distribution of bank offices in fascist Italy: a historical accident? New evidence from provincial data (1927–1936)

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Abstract
This paper examines the geographical distribution of bank offices in fascist Italy between 1927 and 1936, a period of critical banking consolidation, marked by the Great Depression and culminating in the 1936 banking law. We contribute to the ongoing debate between the Italian banking history literature—which emphasizes the complex interplay of economic, technical, and political factors—and the empirical economics literature, claiming the distribution of banks in 1936 as quasi-random: a "historical accident." We fit into this debate by constructing a novel, detailed dataset of provincial-level economic and banking indicators for late 1920s Italy. With OLS regression and Principal Component Analysis, we rigorously assess the relationship between pre-Depression economic fundamentals and banks' spatial organization. We document a strong and persistent correlation between the 1928 and the 1936 branch networks, and that local economic conditions are good predictors of both the 1928 and the 1936 spatial distributions. Our findings challenge the "historical accident" narrative by showing that market forces fundamentally shaped Italy's banking geography through the consolidation period. This research re-contextualizes the 1936 banking law not as an arbitrary political imposition, but as a codification of market-driven evolutions.

Keywords Banking history · Great depression · Italy · Financial development · Branch banking · Authoritarian regimes

JEL Classification N24 · G21 · R12

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1 Introduction

Through the institutions they shape, political dynamics affect the level of financial development and thus the availability of credit to people and firms (Rajan and Zingales 2003; Bordo and Rousseau 2006; Haber et al. 2008; Calomiris and Haber 2014). In many cases, this is tied to the presence of a local bank office that can properly screen and serve borrowers, provide access to payment infrastructure, and offer savings remuneration through investments. To what extent the local presence or absence of a bank depends on supply or demand-side factors is crucial to understanding the challenges of financial development. However, distinguishing between the two is often challenging due to endogeneity: are banks present because local firms need credit, or are firms present because credit is available locally? Social scientists frequently have relied on *historical accidents* as instruments to establish causal links. The researcher who wants to address this issue must confront a paramount question: to what extent the past transformations of the banking structure—such as the geographical distribution of bank offices—were the result of deliberate, top-down political design, versus the endogenous outcome of market forces, prior economic development, and selective pressures of economic crises?

Indeed, the interwar period is an excellent setting to study these issues. First, it marks the turning point of what (Rajan and Zingales 2003) called the "Great Reversal" of financial development. WWI and the 1920s saw a considerable expansion of bank offices, followed by severe contraction in the 1930s—a phenomenon that recently has received the attention of economic historians (Bonhoure et al. 2024; Molteni 2024). Second, it is the period when many European countries first adopted a more regulatory approach to financial matters and introduced forms of banking regulation. The roots of post-WWII financial repression and anti-competition regulation originated then. Third, even besides financial matters, it saw the rise of increasingly interventionist governments—often, with an authoritarian nature.

Fascist Italy before and after the Great Depression provides one of the most prominent examples of these dynamics, thus offering an ideal setting to study. First, the country experienced dramatic changes in banking structure, with bank offices expanding rapidly during the 1920s before contracting severely in the 1930s. Second, it introduced the first comprehensive commercial banking regulation in 1926—among the first systematic attempts at banking supervision in Europe—and a second, more pervasive and long-lasting banking law in 1936. Third, it featured an early authoritarian regime that came to power in 1922.[1] Finally, and most importantly, Italy's 1936 banking distribution has been extensively used in the economics literature as a source of exogenous variation in local financial development. Building on the influential work of Guiso et al. (2006, 2004), numerous studies have treated the 1936 bank office distribution as the result of arbitrary political decisions rather than market forces, a "historical accident", using it as an instrument to identify causal effects

[1] In line with Italian institutional historians, we refrain from defining the Fascist regime *totalitarian* While Gentile (2002) acknowledges that the Fascist regime had the propagandist *ambition* of being totalitarian, Cassese (2010) and Melis (2018) stress that totalitarianism was never implemented nor achieved in practice.

of finance on economic outcomes. However, the validity of the instrument has remained largely untested due to the absence of comprehensive pre-1936 data. Thus, our research question is: was the distribution of Italian bank offices that emerged from the interwar consolidation an arbitrary design, or to some extent was it fundamentally shaped by underlying market forces and pre-existing economic conditions? Moreover, answering this question contributes to the ongoing debate between a strand of Italian banking history and empirical economics literature, with historians emphasizing the complex interplay between economic, technical, and political factors shaping the banking network in the interwar period.

Our empirical strategy addresses this question through two complementary approaches using a novel dataset of economic indicators at the provincial level for late 1920s Italy. First, we directly test the persistence of banking structures by examining the correlation between bank office distributions in 1928 (during the market-driven expansion) and 1936 (after the consolidation). If the 1936 structure is truly random, we should observe limited correlation with pre-existing patterns and local economic context. Second, we employ Principal Component Analysis (PCA) to test whether local economic fundamentals in the late 1920s could predict the geographical distribution of bank offices in 1928 and in 1936. This approach overcomes the challenge of high dimensionality in our dataset, which contains 105 economic variables across 91 provinces. For both approaches, we implement extensive robustness checks through cross-validation procedures and alternative specifications that vary the sample composition, feature sets, and methodological parameters. Our dataset draws from multiple authoritative sources, including the 1929 Agricultural Census, 1927 Industrial and Commercial Census, 1931 Population Census, and Bank of Italy reports, providing comprehensive coverage of demographic, economic, and banking variables at the provincial level before the Great Depression.

Our OLS framework shows that the use of the 1936 banking structure as an instrument must be carefully qualified to ensure its validity. Confirming our descriptive findings, we detect a strong and significant persistence of the bank office distribution between 1928 and 1936, a relationship that remains robust and stable across all specifications. Thus, assuming a 1936 distribution independent from pre-existing banking structures may significantly bias the empirical estimation. To complement this insight, controls are progressively added to account for regional heterogeneity, local financial characteristics (total deposits and deposits per capita), demographic (population), and industrialization (proxied by installed HP). Those controls are significant determinants of the 1936 network, with adjusted R^2 ranging from 0.697 and 0.859.

The OLS results motivate further analysis on the relationship between the banking distribution of 1928 and the local socio-economic context. This is performed in a Principal Component Analysis (PCA) framework. We found that local economic fundamentals in the late 1920s explain 88.4% of the total variance in the 1928 bank office distribution—crucial when considering persistence—with our refined model achieving an adjusted R^2 of 0.809 using just six principal components. The first component, capturing overall economic intensity through firm density and sectoral composition, explains 63.6% of the total variance. The remaining components qualify the relationship: rural provinces with agricultural families correlate positively with branch numbers due to cooperative banks' capillary networks, while the presence of joint-stock and public banks correlates negatively with total branches, reflecting their tendency toward fewer but larger offices. When we apply the same methodology to predict the 1936 network using 1928 economic characteristics, we achieve an adjusted R^2 of 0.74, demonstrating that market forces continued to shape banking geography even through the consolidation period. Setting a lower-bound interpretation, we argue that, in the post-war period, political intervention played a role but on a strongly persistent and market-driven distribution. Our findings allow us to contribute to the following debates:

First, this paper contributes to the banking history of Italy. The interwar period marked a critical phase in the development of the Italian banking system, characterized by dramatic expansion in the 1920s followed by consolidation in the 1930s. According to Ciocca and Biscaini Cotula (1982) estimates, the banking sector experienced substantial growth between WWI and the Great Depression, followed by significant contraction. This transformation culminated in the 1936 banking law, which purportedly "froze" the banking structure for several decades. Scholars of Italian banking history interpret this transformation as a multifaceted relationship between economic, technical, and political forces. By contrast, a significant strand of the economics literature following Guiso et al. (2006, 2004) has treated the 1936 distribution of bank offices as exogenous, arguing it resulted from top-down political decisions rather than market forces.[2] This assumption has served as the foundation for Instrumental Variable approaches in numerous studies, examining the long-term effects of financial development on Italian local economies. However, the validity of the exogeneity assumption has mainly remained untested due to the absence of comprehensive pre-1936 provincial-level data. In this paper, we thoroughly test this assumption using newly collected data. To what extent does the pursuit of political goals make the structure of a financial system unrelated to actual economic and market conditions? We argue that, in the case of Fascist Italy, not enough to make it quasi-random.

A second contribution concerns the role of bank branching and, more broadly, of financial development on financial instability during the Great Depression. Several contributions highlight how banking systems with a more developed branch network were more resilient to the crisis (Bordo 1985). However, the picture emerging from micro studies is more nuanced: the timing and the pace of branch expansion mattered (Molteni 2024). In the 1920s California, where banks expanded their branch network by absorbing local banks, positive spillovers from competition dynamics made banks more resilient (Carlson and Mitchener 2009). By contrast, in 1920s Italy, where the branch expansion was abrupt and took mostly place primarily by opening new offices from scratch, banks that had a large branch network on the eve of the crisis were more likely to fail afterward (Molteni 2024). Recent research on

[2] The literature on banking under authoritarianism suggests that financial systems in such contexts are frequently not neutral economic entities but are often directed to serve political objectives, including regime maintenance, elite patronage, and the pursuit of ideological goals (Haber et al. 2003; Calomiris and Haber 2014; Musacchio and Lazzarini 2014; Altamura 2021; Torreggiani and Cardoso 2024; Jorge-Sotelo 2025).

Europe has stressed that the evolution of bank offices in the early 1920s was impressive and often not tailored to the economic needs of local economies. In France, the increase in branch network did not necessarily go hand in hand with a process of financial deepening (Bonhoure et al. 2024). In Italy, banks that expanded their branch network the most in the 1920s were more likely to experience distress in the 1930s. Understanding the determinant of the distribution of bank offices thus becomes paramount to assess the sustainability of the expansion that took place in the 1920s, which was a Europe-wide phenomenon (Molteni 2024). We find that provinces with lower deposits per branch before the crisis experienced a stronger consolidation afterward, suggesting, but not proving, that excess local financial development was present in some provinces.

In the remainder of this paper, we provide quantitative evidence that supports the argument that the 1936 banking network cannot be considered quasi-random but was, to a very large extent, the product of market-driven forces. Section 2 presents the historical context and critically reviews the argument that the 1936 banking office distribution was quasi-random. Section 3 presents the new data and descriptive analysis. Section 4 uses regression analysis and PCA to substantiate the argument that the 1936 banking office distribution was, to a large extent, endogenous. Section 5 concludes.

2 Historical context: the interwar Italian banking system and the exogeneity debate

The interwar period marked a critical phase in the development of Italy's banking system, characterized by dramatic expansion in the 1920s followed by significant consolidation in the 1930s. According to estimates by Ciocca and Biscaini Cotula (1982), the banking sector experienced substantial growth between World War I and the Great Depression, with the number of banking institutions growing from 3,601 in 1920 to 4657 in 1926 (a 29.3% increase). Bank branches nearly doubled from 6012 to 11,444 during the same period. This rapid expansion fundamentally altered the structure of Italian banking, shifting towards larger, more branched institutions (the ratio of branches per bank increased from 1.7 in 1920 to 2.5 in 1926) and widening the geographical reach of banking services. However, the Great Depression marked a turning point. By 1936, the number of banks had decreased by 56.2% from its 1926 peak, falling to 2,042 institutions, and branch numbers similarly contracted to 7,656, though notably, this remained above the 1920 level. This consolidation process led to a more concentrated banking system, with the average number of branches per bank rising to 3.8 by 1936. Table 1 summarizes the evolution of the Italian banking network during this period.

A significant strand of economic and finance research has prominently exploited the bank network structure established by the 1936 Italian Banking Law as a source of exogenous variation in local financial development. This literature, originating from the influential work of Guiso et al. (2006, 2004), posits that the 1936 regulation created persistent, quasi-random differences in local financial access by imposing lasting and differential constraints on various bank types' ability to open branches.

Table 1 The evolution of the Italian banking network in the interwar period

Category	1912	1920	1926	1936
Banks	3408	3601	4657	2042
Branches	4227	6012	11,444	7656
Towns and cities served	1510	1865	5000	3920
Staff	47,095	64,139	92,919	68,418
Branches per bank	1.2	1.7	2.5	3.8

Source: Molteni (2024) *elaborations on* Ciocca and Biscaini Cotula (1982); Segre (1926)

For example, national banks could only open branches in major cities, cooperative and local commercial banks were restricted to their 1936 provinces, while savings banks could expand within their 1936 regions. These studies, such as Minetti et al. (2015), Herrera and Minetti (2007), and D'Onofrio et al. (2019), commonly use the 1936 branch distribution as an instrument for local financial development, arguing for its plausible exogeneity.[3]

Guiso et al. (2006, 2004) argue that the 1936 banking structure was plausibly exogenous to the supply of credit at the regional level for two main reasons. First, they note that the regional distribution of different bank categories (e.g., savings banks, cooperative banks) by 1936 reflected "historical accidents"—specifically, the interaction between historical waves of bank creation (e.g., savings banks concentrated in the North-East and Center due to their Austrian Empire origins, expanding into areas like Lombardy, Tuscany, and the Papal States) and the complex process of Italian unification, rather than contemporaneous local economic fundamentals. Second, they emphasize that the 1936 structure was significantly shaped by government-directed consolidation during the 1930–33 banking crisis, which involved an asymmetric bailout policy favoring major national and savings banks while allowing many smaller commercial and cooperative banks to fail.

To empirically substantiate this claim of exogeneity, Guiso et al. (2004) test whether their 1936 banking structure variables correlate with contemporary proxies for local economic development. Specifically, they examine the correlation between the provincial distribution of total bank branches, savings bank branches, and cooperative bank branches in 1936 with cars per capita in 1936 and provincial GDP per capita in 1951 (which was the earliest comprehensive post-war data available at the time of writing). Their analysis indicates that while some raw correlations might be present, these tend to be "not very highly correlated" (Guiso et al., 2004, p. 944) and statistically insignificant or even negative once a broad North–South regional divide is controlled for using a "South dummy." For instance, they find that branches per

[3] Minetti et al. (2015) used the 1936 law to study how ownership concentration affects firm innovation, arguing that the regulation's constraints on local credit supply influenced firms' ability to attract new shareholders. Their instruments included the number and composition of bank branches in 1936, as well as post-deregulation branch creation patterns. Similarly, Herrera and Minetti (2007) employed the regulation to examine how relationship lending affects innovation, using the historical banking structure to instrument for relationship length. D'Onofrio et al. (2019) use a similar approach to show that banking conditions affect income inequality, by showing that local banking development alleviates income inequality.

capita in 1936 explain only 11% of the cross-province variation in cars per capita in 1936 and only 9.5% of the cross-province variation in added value per capita in 1951 (Guiso et al. 2004, p. 945). They also note that this positive correlation does not hold "within the Center-North of the country," where the estimated parameter becomes statistically insignificant when controlling for the North–South divide. This evidence led Guiso et al. (2004, p. 946) to conclude that, "if we exclude the South, the structure of the banking industry in 1936 was the result of historical accidents and forced consolidation, with no connection to the level of economic development at that time", thus validating its use as an instrument for exogenous variations in the supply of credit at the regional level.

However, a more nuanced historical perspective emerges from reading classic Italian banking historiography, offering a more complex interpretation of the bank office network at the time of the 1936 law. Rather than viewing it as a mere "historical accident", this literature emphasizes how the regulatory changes emerged from and responded to economic and financial dynamics. The existing history scholarship contextualizes the banking law of 1936 as part of a broader institutional transformation of Italian banking during the interwar period, challenging the prevailing economic narrative of it being assimilable to a purely exogenous shock. Indeed, this scholarship reveals a complex process of institutional evolution driven by market forces, technical considerations, and nuanced political interactions. It is also worth noting that the point regarding the asymmetric bailout policy for smaller banks has been disputed by recent research, which has shown an active banking resolution policy also directed towards small and medium banks (Molteni 2023, 2024).

The origins of this systemic change can be traced to the 1926 banking laws, which marked a pivotal moment in Italian banking history. Polsi (2000) shows how these laws represented the first comprehensive attempt to manage bank expansion through formal supervision and branch authorization mechanisms. Contrary to simplistic interpretations of political intervention, these regulations emerged as a sophisticated response to the market-driven proliferation of bank branches that had begun after 1907. The laws introduced mandatory authorization for new bank branches and established formal banking supervision, reflecting a nuanced approach to financial system management that balanced political oversight with technical considerations. More recently, Molteni and Pellegrino (2024) studied banking supervision practices and found evidence that in its operation, the Bank of Italy, in charge of banking supervision, managed to retain substantial autonomy from political powers, adopting a stance of "passive resistance." Toniolo (2022) comes to the same conclusions.

Complex market dynamics fundamentally drove the expansion of the banking network during the 1920s. Detailed studies by Polsi (2002, 2000), Conti and Polsi (2004); Balletta (1999), and Conti et al. (2003) reveal multiple interconnected economic forces shaping branch development. Banks engaged in intense competition for retail deposits, strategically expanding into rural markets to capitalize on emigrant remittance flows and emerging local economic opportunities. Preemptive branching became a critical strategy, with institutions seeking to lock in market positions before competitors could establish a foothold. This expansion was not just a politically mandated process, but a response to sophisticated economic incentives and local market conditions.

The Bank of Italy's regulatory approach during this period was characterized by a remarkably technical and nuanced assessment of bank viability.[4] Drawing on archival research, Polsi (2000, 2002); Robiony (2023); Molteni and Pellegrino (2024); Toniolo (2022) show that rigorous economic criteria guided supervisory interventions. Regulators conducted detailed evaluations of capital adequacy, management competence, and local market demand. Interventions such as forced mergers or branch authorizations were predominantly, albeit not exclusively, motivated by prudential considerations of systemic financial stability rather than just arbitrary political dictates. Furthermore, the detailed case study of Bank of Italy's supervisory interventions in the North-East by Robiony (2023) shows that regulatory inspections, whether conducted on-site or remotely, concentrated exclusively on evaluating banks' financial soundness rather than implementing politically motivated policies. This contradicts theories suggesting the Fascist government systematically favored or penalized specific banking sectors, such as cooperative institutions.[5]

Political interventions were present but far more nuanced than simplistic narratives of top-down control. Conti et al. (2003); Conti and Polsi (2004); Robiony (2018) document a complex interaction between political institutions and banking structures. While the state implemented occasional mandatory mergers and pursued selective public ownership interventions, mainly through institutions like the IRI, financially robust banks often maintained significant autonomy. The Marinelli banking group case, as analyzed by Conti (2004), illustrates how even apparently political banking interventions were fundamentally grounded in economic and technical considerations: the bank was unsound and fraudulent, and it was subject to insolvency procedures and closed down despite its political ties. Institutional continuity emerged as a defining characteristic of this period. Conti and Polsi (2004); Conti et al. (2003) research revealed that bank boards of saving and cooperative banks experienced limited turnout and remained largely consistent in this period, indicating substantial institutional persistence despite the political turbulence of the fascist era. Cooperative and popular banks, in particular, maintained remarkable autonomy. This continuity challenges the notion of a radical institutional break, suggesting instead a gradual adaptation and evolution.

By 1936, the Italian banking system had undergone a decade-long transformation characterized by market-driven expansions and contractions, evolving regulatory practices, and responsive policy interventions. The 1936 banking law effectively codified existing supervisory and ownership structures rather than imposing a radical new framework. While political interventions certainly played a role in shaping the final configuration, particularly through selective consolidation during the banking crisis, it is important to consider that simply because a system is "frozen" or subject to top-down policy, it does not automatically imply that its underlying structure is entirely independent of prior market forces or economic realities. The fixed costs associated with establishing and closing branches, as well as the selection process of

[4] This is in sharp contrast with the Bank of Italy's experience regarding monetary policy, where its independence from political authorities was minimal (Toniolo 2022).

[5] This also alleviates the survival bias that could arise from the Regime favoring connected banks in banking resolution processes.

stronger banks surviving the crisis, can naturally lead to a degree of persistence in the banking network over time, even in the presence of policy shifts.

For empirical economic research, these findings present significant methodological implications. Scholars utilizing the 1936 bank distribution as an identification strategy must carefully reconsider the rich historical context that fundamentally challenges the assumption of political arbitrariness. The historical evidence presented in this paper, complemented by our quantitative analysis in the following sections, provides a nuanced narrative of the banking system's evolution. According to the literature presented in this section, the 1936 banking law emerged not as an arbitrary political intervention but as a crystallization of market forces, technical regulatory approaches, and gradual institutional adaptations that had developed throughout the 1920s and early 1930s. This divergence between the "historical accident" assumption common in applied economics and the detailed historical accounts necessitates a direct empirical reassessment. In the remainder of this paper, we contribute to this debate by constructing and analyzing a novel dataset of provincial-level economic and banking variables for Italy in the late 1920s, before the Great Depression and the subsequent major consolidation. This allows us to investigate empirically whether the 1936 banking network was indeed independent of prior economic conditions, as the "historical accident" argument would imply, or if it was significantly shaped by the market-driven banking expansion of the 1920s and the underlying local economic fundamentals of that era.

3 Data presentation and descriptive insights

3.1 Sources and construction

This paper introduces a comprehensive new dataset of provincial-level variables that captures Italian local economic conditions before the onset of the Great Depression. The dataset offers a detailed portrayal of financial development and economic activity across Italian provinces in the late 1920s, drawing on multiple authoritative historical sources.

The primary data sources include official publications and historical records: the 1929 Agricultural Census (Catasto Agrario), the 1927 Industrial and Commercial Census (Censimento degli esercizi industriali e commerciali), the 1931 Population Census (Censimento della popolazione), the Bank of Italy's Governor Reports (Relazione del Governatore), and various other official statistical publications. The dataset also incorporates novel archival data on bank office distribution collected by Molteni (2024).

The dataset encompasses several key variable categories essential for our analysis. First, it includes detailed banking infrastructure data, recording the total number and type of bank offices per province in both 1927/28 and 1936. This allows us to track changes in the banking network during the critical consolidation period. The data distinguishes between different types of banks, including joint-stock banks (SOC), cooperative banks (BP), mutual cooperatives (BCC), savings banks (CRO), public banks (ICDP), and private bankers (DB). We also observe the number of municipalities served by banks and bank deposit data from 1929 to 1938, as well as postal deposit data for 1929.

Second, the dataset contains comprehensive economic indicators. These include measures of industrial and commercial activity derived from the 1927 Census, covering employment and firm counts across various sectors. The data captures both the scale of economic activity (through total employment figures) and its composition (through sectoral breakdowns). The dataset also includes income and taxation data from Orlandi (1935) and the Bollettino di Statistica e di Legislazione Comparata (1933).

Third, we have demographic and urbanization variables from the 1931 Census and the Catasto Agrario, providing information on population distribution, urbanization rates, and agricultural employment. These variables help control for structural differences across provinces that might influence banking development.

The dataset's comprehensive nature allows us to examine the relationship between local economic conditions and banking structure more thoroughly than previous studies. A detailed description of all variables and their precise definitions is provided in Appendix A.

3.2 Financial development before and after the great depression: socio-economic and banking structures

By 1928, Italy's socio-economic context was deeply fragmented, highlighting the nation's uneven path to development. As illustrated in Fig. 1, three distinct socio-economic clusters emerge.

1. Agriculture-focused provinces. As it can be seen from Fig. 1a, the majority of the families in Central and Southern Italy are involved in the agricultural sector. In these provinces, industrial intensity remained low, with both a low number of total HP installed (1b), and of active total firms (1c). This created a large, relatively homogeneous agrarian bloc that stood in sharp contrast to the industrializing North.

2. Mechanized provinces. Northern provinces stand out as industrialized clusters, with a compelling internal heterogeneity. This traces to different comparative advantages between the Alpine region and the Po valley: As it can be seen from Fig. 1b and 1d, the former developed clusters of energy-intensive, mechanized firms, thanks to the greater availability of hydroelectric power. Still, these industries often existed in relative isolation (1c), a clear distinction to the northwestern "industrial triangle" (e.g., Turin, Milan), characterized by a more mature and diversified industrial ecosystem with both mechanized and non-mechanized sectors thriving (1b, 1c). While the agrarian presence was strong, the Center and the South were not entirely excluded from the industrialization process, with notable clusters in Rome, Naples, and Catania, comparable in their diversified economic structure to those of their northern counterparts.

3. Non-mechanized industrial provinces. To fully understand the nuances of the Italian socio-economic context, it is essential to acknowledge the existence of a granular yet widespread network of small, non-mechanized firms. As panel 1c indicates, when non-mechanized firms are considered, distinct industrial clusters

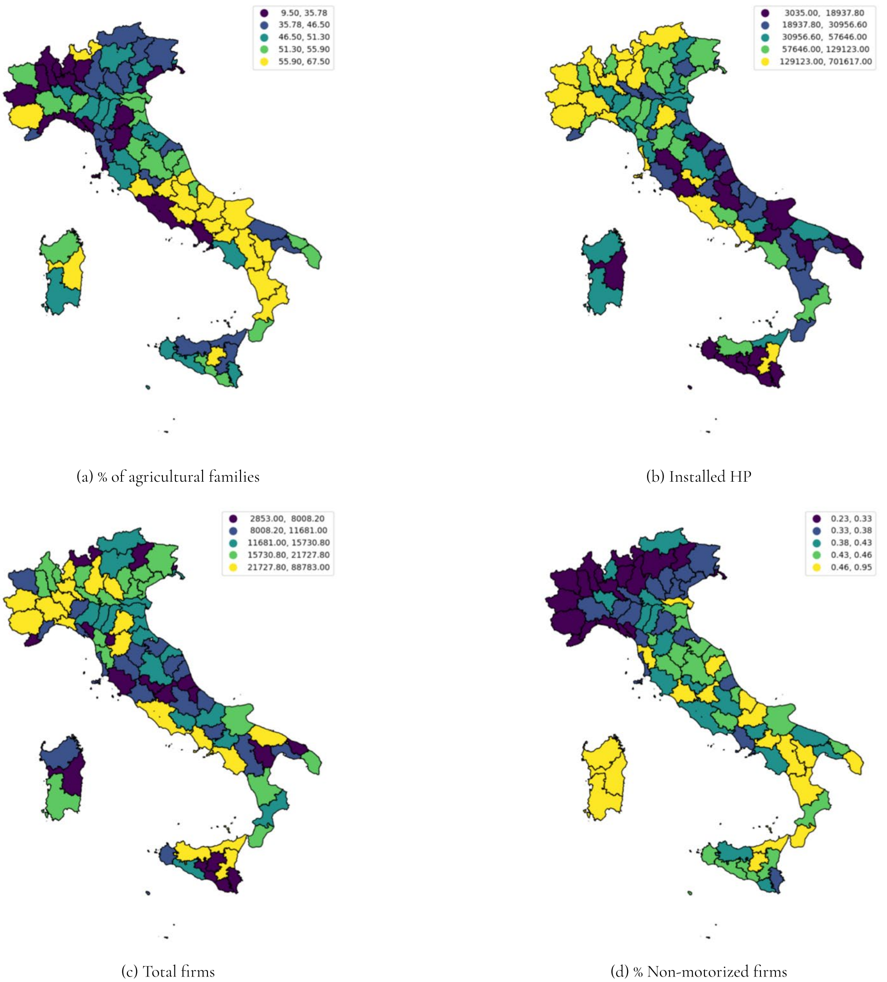
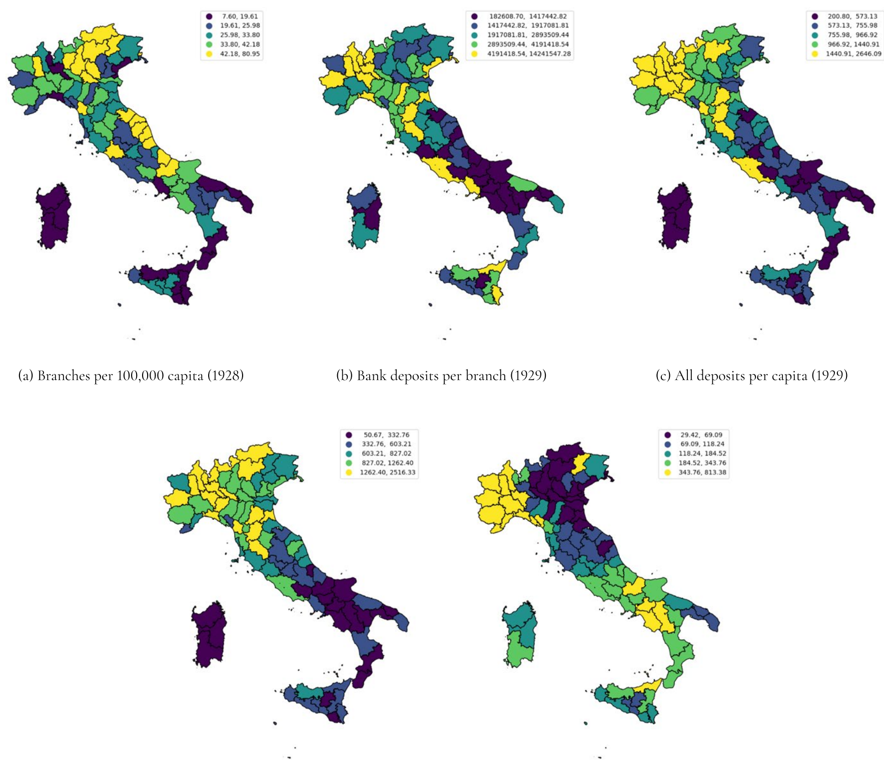


Fig. 1 Selected Socio-Economic Indicators (1928). The maps show selected socio-economic indicators that highlight the fragmentation of regional development. Colors are indicative of quintiles in the indicator's distribution

become visible in other parts of the South, particularly in Sicily, Calabria, and Apulia. As Fig. 1d shows, these pockets are predominantly non-mechanized industries, highlighting a different, less capital-intensive model of development.

What's crucial to our analysis is the two-way relationship between these different types of socio-economic context and financial development, as depicted in Fig. 2 and 3.

The visual analysis of provincial-level data reveals heterogeneity across Italian provinces that extends beyond the mere number of bank offices, encompassing the volume of deposits per capita and the composition between bank and postal savings. These patterns clearly reflect the different models of financial intermediation



(a) Branches per 100,000 capita (1928)

(b) Bank deposits per branch (1929)

(c) All deposits per capita (1929)

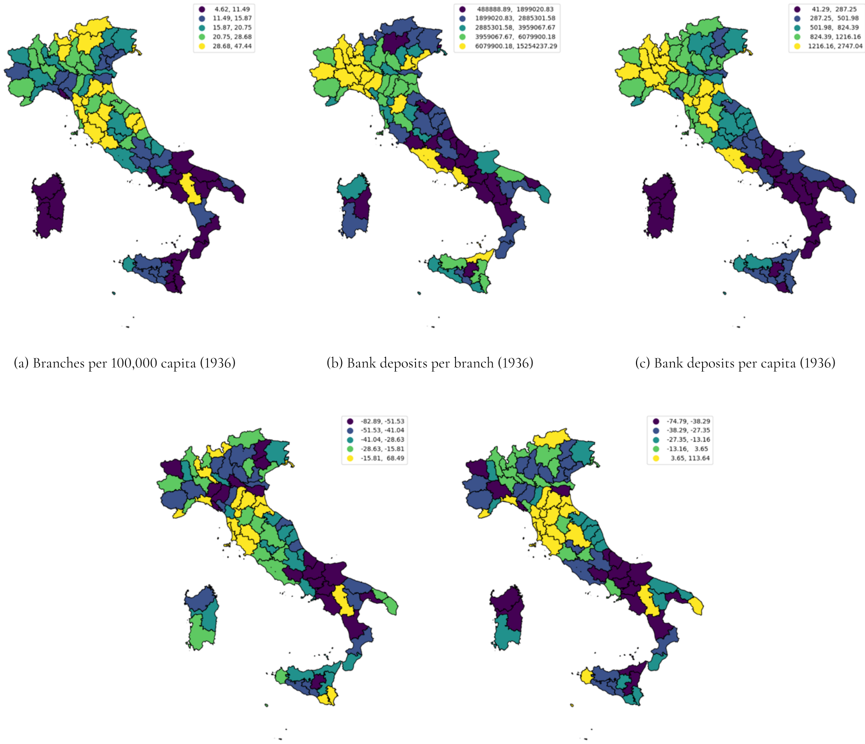
(d) Bank deposits per capita (1929)

(e) Post deposits per capita (1929)

Fig. 2 Banking geography by province 1928/1929. Note: Color gradients represent quintiles of the respective variable distribution

resulting from the socio-economic factors presented above, making their understanding crucial for two reasons. First, they shed light on the degree of financial development achieved by different areas of the country before the Great Depression and the subsequent banking reform. Second, they help us understand whether the distribution of bank offices that emerged after the 1936 banking law reflected pre-existing economic conditions rather than arbitrary political decisions.

The geographical distribution of banking activity across Italian provinces in the late 1920s reveals a complexity that extends well beyond a simple north–south gap, nonetheless present. Figure 2a shows the distribution of bank branches per capita in 1928, identifying distinct banking regions. The northeast, particularly Trentino-Alto Adige, Veneto, and Friuli, exhibited the highest density, reaching 80.95 branches per 100,000 inhabitants. The northwestern industrial triangle (Lombardy, Piedmont, Liguria) showed moderately high but more variable density, typically ranging



(a) Branches per 100,000 capita (1936) (b) Bank deposits per branch (1936) (c) Bank deposits per capita (1936)

(d) Change (%) in offices (1928 vs. 1936) (e) Change (%) in piazze (1928 vs. 1936)

Fig. 3 Banking geography by province 1936. Note: Color gradients represent quintiles of the respective variable distribution

between 33.80 and 42.18 branches per 100,000 inhabitants.[6]Central Italy presented an intermediate pattern, with Tuscany and Emilia-Romagna showing relatively high branch density (25–33 branches per 100,000) while Lazio and Umbria maintained lower values (19–25 branches per 100,000). The Adriatic coast (Marche, Abruzzo, Molise, and Northern Apulia) and provinces surrounding Naples show remarkably high levels of bank offices. The rest of the South and the islands appear to be less banked than the rest of the country, with some notable exceptions (Cosenza and South-West Sicily).

Figure 2b displays the distribution of average deposits per branch in 1929, highlighting noteworthy differences from the pattern of branch density. The northwestern industrial core (particularly Piedmont, Liguria, and Lombardy) now emerges with some of the highest deposits per branch (exceeding 4 million lire per branch in many cases), reflecting both higher local income levels and deeper banking relationships in these major commercial and industrial hubs. Parts of the northeast, despite

[6] This high figure is partly due to the presence of BCC, which were small unit banking offices operating mostly in rural areas. As Fig. 5 shows, BCC were present unevenly throughout the country both before and after the consolidation.

having a relatively dense branch network, register moderate to high deposits per branch. Central Italy, with the exception of Tuscany characterized by high values, also generally exhibits intermediate values, though provinces with important urban centers approach higher brackets. By contrast, large portions of the South and the islands remain in lower deposit brackets—often under 1.9 million lire per branch—consistent with weaker local economies and more limited saving capacity. Yet some southern port cities and provincial capitals (e.g., Napoli and Bari, and in parts of coastal Sicily) stand out for notably higher deposits per branch than the surrounding rural areas. One remarkable difference between the two maps is the Adriatic Coast and the provinces bordering Naples, which show very low levels of deposits, despite a high number of branches.

As Fig. 2c shows, total deposits per capita in 1929 reveal important regional nuances beyond the general north–south gradient. The northwestern industrial provinces form a clear cluster of very high deposits (2000–2646 lire per capita). However, the northeast shows more variation, with some provinces matching northwestern levels while others are closer to central Italian values (800–1200 lire per capita). Several clusters of high deposits appear in central and southern Italy, usually corresponding to major urban or commercial centers (Roma at 1840 lire, Napoli at 1620 lire). Notably, some agricultural provinces in the Po Valley exhibit deposit levels of 1400–1800 lire per capita, comparable to those in more industrialized areas.

A direct comparison of the two maps disaggregating bank and postal deposits (Fig. 2d and Fig. 2e) reveals distinct regional patterns that underscore the differing roles of these two forms of savings. In the industrial northwest (Piedmont, Western Lombardy, Liguria), bank deposits predominate, and postal savings, while still present, add modest increments to overall per-capita totals. Meanwhile, Veneto and Emilia-Romagna exhibit high bank deposits and do not noticeably rely on postal savings. Tuscany, Umbria, and Marche stand in between: postal deposits are moderately present, but are not as important as bank deposits. By contrast, southern provinces and the islands (Sicily and Sardinia) record markedly lower bank deposits per capita but substantially higher postal savings relative to their total deposit pool. Consequently, when postal deposits are added to the picture, provinces around Napoli, in parts of Apulia, and across much of Sicily reduce—but do not close—the gap with more developed northern counterparts.

The geographical pattern of banking sector consolidation between 1928 and 1936, along with its relationship to pre-existing financial structures, provides crucial evidence for understanding the endogenous nature of Italian banking development during this period. Figure 3d shows that the percentage change in bank offices between 1928 and 1936 varied dramatically across provinces, ranging from severe contraction (−82.89%) to modest expansion (68.49%). Figure 3e displays the percentage change in municipalities with at least one bank (Piazze bancabili) between 1928 and 1936, revealing a similar picture. This heterogeneous impact of the Great Depression reveals several important patterns that can be explained by pre-existing financial and economic structures. Nevertheless, comparing the 1936 distribution of bank offices per capita in Fig. 3a with that of 1928 in Fig. 2a suggests that there is a good degree of persistence between the local banking structure in 1928 and 1936.

Provinces that experienced the most severe contraction (shown in dark green in Fig. 3d, with reductions of 51.53% to 82.89%) were predominantly those that had shown signs of "over-branching" in 1928: comparing the figures reveals that these areas often had high branch density in 1928 (over 42 branches per 100,000 inhabitants) but relatively low deposits per branch (under 1.9 million lire, as shown in Fig. 2b). Not surprisingly, this visual correlation is highly statistically significant: the log of deposits per branch in 1929 explains 38% of the variance in the percentage change in bank offices between 1928 and 1936. This pattern is particularly evident in parts of the northeast and center-south, where many provinces experienced contractions exceeding 50% from initially high branch density and low deposit concentration. The provinces showing greatest resilience during the crisis (shown in yellow in Fig. 3d, with contractions under 15.81% or even expansion) generally had high deposits per branch in 1928 (visible in Fig. 2b, typically over 8 million lire per branch). Interestingly, provinces with relatively low initial branch density but high postal savings (visible in Fig. 2e, particularly in central Italy with postal deposits of 300–800 lire per capita) experienced milder contractions in Fig. 3d (typically in the −28.63% to −15.81% range).

The 1936 pattern of bank deposits per capita (Fig. 3c) reveals remarkable continuity with the 1929 distribution (Fig. 2d), despite the significant restructuring of the branch network. This persistence strongly suggests that banking development was fundamentally tied to underlying economic conditions rather than being shaped primarily by political decisions during the consolidation process. The northwestern industrial provinces maintained their leading position (1,216–2,747 lire per capita in 1936), while the south generally retained lower deposit levels (41-287 lire per capita), with some notable exceptions in urban centers.

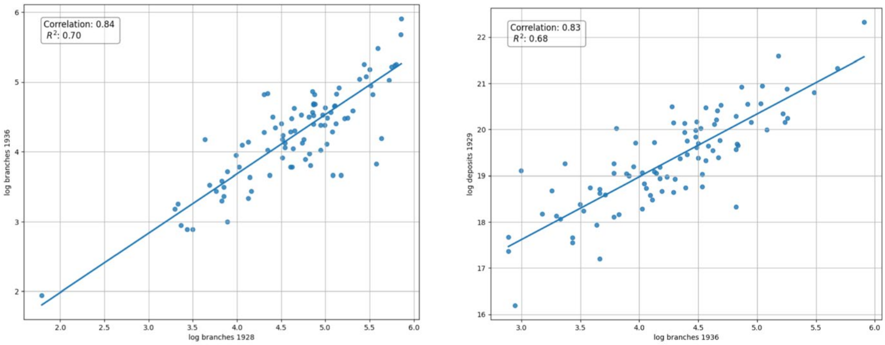
Therefore, comparing branch density vs deposits per capita in 1929 and 1936 strongly supports the paper's main argument that the 1936 banking structure was not an exogenous outcome of political decisions but rather reflected the interaction between pre-existing economic conditions and the selective pressure of the Great Depression. The crisis accelerated the consolidation, particularly in areas where banking expansion had outpaced economic fundamentals, while areas with more sustainable banking structures showed greater resilience. The persistence of regional patterns in deposits and institutional structures through the consolidation period suggests that market forces coexisted with institutional factors in shaping the post-Great Depression banking geography.

4 Empirical strategy

4.1 The 1936 network: persistence and determinants

The first objective of our empirical exercise is to study the persistence and the determinants of the 1936 branch network, to evaluate the claim that it was a "historical accident."[7] In this work, we test whether the earlier economic environment

[7] See Sect. 2 for a thorough discussion of this point.



(a) Bank offices 1928 vs 1936

(b) Bank offices 1936 vs Deposits 1929

Fig. 4 Bank offices per province 1936: selected correlations. The figures report the correlation of bank offices per province in 1936 with selected variables, namely the bank office distribution in 1928 and the amount of deposits. This allows for a preliminary investigation of key dynamics: the persistence of the branch network and the survival rate across the Great Depression are strongly linked with the depth of deposits

significantly shaped the distribution of bank branches in 1936. If this hypothesis is verified, using the 1936 branches distribution as an instrument for local credit conditions may introduce a bias in the empirical estimation, as the instrument would not be independent of unobserved fundamentals affecting later outcomes.

Following the descriptive analysis proposed in Sect. 2, Fig. 4 offers a visual investigation of the impact of *persistence* and *deposit intensity* in shaping the branch network pre and post the Great Depression, thus characterizing the interplay between operational frictions and selective pressures. The results suggest that a strong and positive relationship exists between the post-Depression branch network and pre-existing conditions, with persistence and deposit intensity channeling 70% and 68% of cross-sectional dependency across the Great Depression, respectively.

We delve deeper into this intuition and formally verify the visual correlations within an OLS framework. This allows, while controlling for endemic persistence, to test the significant determinants of the branches' distribution. The baseline specification takes the following form:

$$\log(\text{Branches}_{36i}) = \alpha + \beta \log(\text{Branches}_{28i}) + \gamma' X_i + \delta' R_i + \varepsilon_i \tag{1}$$

Where Branches_{36i} represents the number of bank branches in province i in 1936, Branches_{28i} captures the pre-Depression branch structure in 1928, X_i is a vector of pre-Depression economic controls—e.g. population in 1931 (log), deposits per capita in 1929 (log), and installed horse-powers (HP, log)—R_i represents regional fixed effects, and ε_i is the error term. We employ logarithmic transformations of the branch variables to address potential nonlinearities and facilitate elasticity interpretation. All variables are standardized for numerical stability ($X' = (X - \mu)/\sigma$).

In this model, the coefficient β accounts for the persistence of the branch network and is of particular interest. If the 1936 distribution were independent of pre-existing banking structures, we would expect β to be statistically insignificant or economically small. On the contrary, a large and significant β, while not being a full proof of the endogeneity of the instrument, would challenge its potential validity via the exclusion restriction channel, suggesting that it reflects unobserved fundamentals affecting later outcomes. That is why, to complement this insight, controls are progressively added to account for both local financial characteristics (total deposits and deposits per capita), demographic (population), and industrialization (installed HP). Results are presented in Table 2.

Confirming the previous visual insight, across all of the specifications β remains positive and significant, formalizing the strong and expected correlation with the branches network of 1928. Including regional fixed effects in Model 2 substantially increases the R^2 value, highlighting regional heterogeneity in branch persistence. Population and deposits—tested in Models 3 to 7—further improve the explanatory power, suggesting that demographic factors significantly shaped branch networks, channeling more deposits into the financial system. This is consistent with the historical narrative proposed in Sect. 3. Models 8 and 9 include HP to control for local economic conditions, and in particular to proxy for industrialization. Installed HP has a statistically significant and positive impact on the number of branches (Model 8), but this effect vanishes when controlling for the province's population (Model 9), suggesting a relationship driven by scale effects. The results are robust to different specifications, as presented in Appendix C.

These insights, while not a proof of the full endogeneity of the branch network, challenge the assumption of it being strictly unrelated to pre-existing conditions—an "historical accident"—and motivate further analysis. In particular, the coefficient β halves when controlling for deposits, population, and HP, suggesting a non-negligible role of local socio-economic heterogeneity. Moreover, the evidence from Model 9 aligns with the Italian context, which is notoriously characterized by a complex web of SMEs in low-value-added sectors (e.g., agriculture and textiles), particularly reliant on bank credit (Giannetti and Vasta 2006). This peculiarity underscores the need for an analysis that extends beyond traditional measures of development—such as GDP per capita—which, by definition, underweights low-value-added sectors. To develop deeper insights into this process, mindful of the nuances of the Italian context, the following section proposes a framework based on Principal Component Analysis. The dimensionality reduction algorithm, while allowing for comprehensive use of the dataset controlling for the threat of multicollinearity, explicitly targets the *depth* of the economic activity of a province—its extensive margin—complementing the standard measure of its *development*—its intensive margin.

4.2 The principal components analysis (PCA) framework

Our empirical strategy employs Principal Component Analysis (PCA), a dimensionality reduction algorithm that is ideal for solving two estimation challenges: multicollinearity and a relatively high number of independent variables (n = 105) compared to the number of observations (n = 90). Both of these issues are tackled by merging the independent variables into a smaller set of "synthetic" principal

Table 2 Persistence and determinants of the 1936 branch network

	Dependent variable: Branches 1936 (log)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	−0.000	−0.254***	−0.000	−0.080	−0.000	0.058	0.040	−0.073	−0.067	0.013
	(0.058)	(0.074)	(0.057)	(0.064)	(0.045)	(0.055)	(0.045)	(0.122)	(0.077)	(0.064)
Branches 1928 (log)	0.837***	0.904***	0.690***	0.462***	0.475***	0.537***	0.460***	0.800***	0.464***	0.452***
	(0.056)	(0.065)	(0.090)	(0.094)	(0.069)	(0.067)	(0.087)	(0.065)	(0.095)	(0.085)
Population 1931 (log)			0.197**	0.459***			0.191		0.446***	0.255
			(0.077)	(0.074)			(0.130)		(0.079)	(0.160)
Deposits 1929 (log)					0.502***	0.504***	0.358***			0.389***
					(0.064)	(0.059)	(0.122)			(0.140)
HP (log)								0.206***	0.020	−0.035
								(0.068)	(0.057)	(0.052)
Regional FE	NO	YES	NO	YES	NO	YES	YES	YES	YES	YES
Observations	91	91	91	91	91	91	91	91	91	91
Adjusted R^2	0.697	0.781	0.711	0.847	0.818	0.860	0.863	0.800	0.845	0.861
F Statistic	221.08***	68.81***	129.06***	163.53***	314.33***	194.74***	210.85***	1142.07***	177.60***	176.136***

The table presents the results of the OLS regression model that tests the persistence and the determinant of the 1936 branch network distribution. All variables are standardized. Robust standard errors in parentheses. $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$

components (PCs) that capture most of the variation in the data, reflecting dominant common patterns. Formally,

$$PC_k = \sum_a (a_{ak} X_a), \tag{2}$$

where PC_k represents the k-th principal component, X_a are the standardized economic variables, and a_{ak} are the factor loadings that maximize the explained variance.

Then, the PCs serve as independent variables in an OLS model predicting the logarithm of the total number of bank offices in 1928 for each province, controlling for its socio-economic characteristics (Eq. 3).

$$\log(\text{Branches}_a) = \alpha + \beta PC_a + \varepsilon_a, \tag{3}$$

where PC_a represents the vector of relevant principal components for province a.

The empirical exercise is composed of two stages. First, the estimation process, in which we assess how much of the variance in the 1928 branch network is explained by the PCs, as measured by the R^2. Second, the interpretation, in which we unravel the economic implications of the results, while confronting the black-box critique often moved to PCA.

The estimation includes the comprehensive set of variables representing demographic, economic, and banking characteristics at the provincial level—presented in Sect. 3, and thoroughly described in Appendix A—log-transformed and scaled to ensure a well-behaved distribution. Then, the optimal number of PCs is endogenously selected via cross-validation to maximize the out-of-sample predictive performance. Lastly, to foster interpretability and filtering out residual noise, we implement a backward stepwise elimination process to retain only the coefficients with a p-value exceeding 0.1. A more detailed explanation is presented in Appendix B.

To assess the stability of our results, we implement extensive robustness checks. We run the analysis considering selected subsamples of the inputs—demographic, industrial, and financial controls separately—and per capita specifications. Moreover, we performed a systematic and agnostic iterative robustness testing, estimating the PCA model through 99 quasi-random alternative specifications. Each specification varies multiple elements of the estimation procedure—provinces, controls, cross-validation procedure, scaling, p-value threshold, fixed effects—while maintaining the core PCA framework. Lastly, we tested whether our results are sensitive to the choice of a specific dimensionality reduction algorithm, comparing PCA results with regularized regressions—e.g., Lasso regression.

A thorough description of the robustness is presented in Appendix C. Those robustness checks confirm that our estimation framework is robust, stable, and not dependent on the parameters specified.

4.3 Results

The Principal Component Analysis approach yielded strong results in predicting the provincial distribution of bank offices in 1928 (Table 3). The initial model with

Table 3 Economic activity predicts the 1928 branch network development

Principal Component	Initial Model				Refined Model	
	Coef	Std. Err	z-value	p-value	Coef	Std. Err
PC1	0.0759	0.004	20.505	0.000	0.0759	0.004
PC2	0.0454	0.017	2.699	0.007	0.0454	0.017
PC3	−0.1798	0.019	−9.503	0.000	−0.1798	0.019
PC4	0.008	0.023	–	–	–	–
PC5	−0.0076	0.027	–	–	–	–
PC6	−0.0895	0.030	−2.986	0.003	−0.0895	0.030
PC7	−0.0201	0.030	–	–	–	–
PC8	−0.0132	0.050	–	–	–	–
PC9	0.0396	0.027	–	–	–	–
PC10	−0.0554	0.036	–	–	–	–
PC11	−0.073	0.033	−2.237	0.025	−0.073	0.033
PC12	0.1307	0.038	3.388	0.001	0.1307	0.039
Cumulative explained variance	0.884				0.776	
R-squared	0.832				0.822	
Adj R-squared	0.806				0.809	
Prob (F-stat)	0.000				0.000	
F-statistic	56.49				97.75	

The table reports the results of an OLS model trained on Principal Components. In the full model, the optimal number of components is determined to maximize the out-of-sample explanatory power. The restricted model is the result of a backward stepwise elimination process to retain only the coefficients with a p-value greater of 0.1

twelve components achieved an adjusted R^2 of 0.806 (R^2 of 0.832), indicating that local economic conditions strongly predicted the geographical distribution of bank offices. After removing statistically insignificant components through backward stepwise elimination, the model retained six components with an adjusted R^2 of 0.809 (R^2 of 0.822). Despite the substantial reduction in components, the significant explanatory power suggests that the refined model effectively captures the key determinants of bank office distribution while improving efficiency and reducing residual noise.[8]

[8] The model's statistical properties strongly support its robustness across multiple diagnostic dimensions. The Durbin-Watson statistic of 1.966, being close to the ideal value of 2, indicates that residuals are not serially correlated, suggesting that the model's predictions are independent across observations. The Jarque-Bera test examines whether model residuals follow a normal distribution by analyzing their skewness and kurtosis. The p-value of 0.383 indicates that we cannot reject the null hypothesis of normally distributed residuals at conventional significance levels, validating our statistical inference and confirming unbiased predictions across the distribution of bank offices. The condition number of 7.97, well below the conventional threshold of 30, indicates a well-conditioned model that is numerically stable. This low condition number is particularly noteworthy given our high-dimensional dataset of regional economic variables, suggesting that our PCA approach successfully addressed potential multicollinearity issues that often plague analyses of regional economic data.

The cumulative explained variance by the principal components is 88.4% for the full model and 77.6% for the refined one, providing a comprehensive representation of local economic conditions while avoiding overfitting.[9]

The strong predictive relationship between economic fundamentals and banking presence in 1928 highlights the risk that the 1936 branch distribution may not be entirely independent of underlying conditions. While mechanical persistence calls for interpretative caution, the high R^2 values suggest that market forces substantially influenced the geography of bank offices during the pre-Depression expansion. Since the branch network in 1928 is a strong predictor of the 1936 branch network, we could set a lower-bound interpretation, arguing that in the post-war period, political intervention played a role but on a strongly path-dependent distribution. Using the same methodology directly on 1936—i.e., using 1928 characteristics to predict the 1936 branch network—delivers an adjusted R^2 of 0.74 for the refined model. A result that is remarkably high, considering the non-negligible impact the economic crisis had on the local industrial and commercial network in the 1930 s.

4.3.1 PCA interpretation and explainability

While the analysis of the R^2 provides suggestive results, the defined framework allows for deeper insights. In particular, by examining the *factor loadings*—that quantify each variable's contribution to a given Principal Component (PC)—we can trace the relationship between the PCs and the input features. In turn, this process enables us to isolate the key variables defining each PC, thereby enhancing the interpretability of the coefficients and their economic significance.

Given the large number of input features, we restrict the interpretation to factor loadings that have a statistically significant impact on the respective PC, filtering out the least influential variables to reduce noise in the economic interpretation. The selection process follows a heuristic threshold approach, where only loadings exceeding 2.64 times the standard deviation of all loadings for each PC are considered. Under the assumption of factor loadings following a roughly normal distribution, the procedure is statistically comparable to a 1% significance level in a two-tailed t-test.

From the evidence above, it is known that the local economic conditions strongly determine the geographical distribution of bank branches, with the refined model for 1928 achieving an R^2 of 82.2%. Factor loadings disentangle the dynamics between the PCs, the banking network, and local economic conditions, allowing for a more granular analysis. Results are reported in Table 4.

Consistent with typical PCA results, the first principal component (PC1) explains the largest portion of variance, covering 63.6% of the total. It represents a *level factor*, capturing the scale effect, the broad economic activity of a province.[10] Among the most influential factor loadings is the total number of firms (tot_all_firm), indicating that a province's economic structure must be characterized by examining

[9] In particular, the first PC explains 63.6% of the total variance, the second 5.8%, the third 4.4%, the sixth 1.9% the eleventh 1% and the twelfth 0.9%

[10] The notion of *level* and *contrast* factors follows (Farnè and Vouldis 2017, 2021).

Table 4 Principal Component Refined Model - 1928 ~ 1928 (R^2: 0.822)

PC Factor	PC1	PC2	PC3	PC6	PC11	PC12
Coefficient	0.0759***	0.0454***	−0.1798***	−0.0895***	−0.0730**	0.1307***
	(0.004)	(0.017)	(0.019)	(0.030)	(0.033)	(0.039)
Explained Variance	0.636	0.058	0.044	0.019	0.010	0.009
Factor loadings						
	ret_chem_emp	*families_agric*	*off_ICDP_28_sh*	*off_SOC_28_sh*	*incomecatb29_count*	*ret_mixed_firm*
	(0.14)	(0.38)	(0.44)	(0.35)	(0.33)	(0.31)
	cloth_furn_firm		*families_agric*		*ret_wine_firm*	*ret_mixed_emp*
	(0.14)		(−0.33)		(−0.27)	(0.30)
	tot_all_firm					
	(0.14)					
	ret_lux_firm					
	(0.14)					
	indemp_nomot					
	(0.14)					
	ret_chem_firm					
	(0.14)					
	cloth_furn_emp					
	(0.13)					
	ret_furn_firm					
	(0.13)					
	ret_text_firm					
	(0.13)					
	tot_trade_emp					
	(0.13)					

The table summarizes the intuition behind the principal components of the Refined Model for 1928. It reports 1. the the Principal Components (PC), with standard errors in parentheses and *** and ** denoting significance at 1% and 5% respectively; 2. the share of the total variance explained by each PC; 3. the factor loadings for each PC. We report only the loadings higher than 2.64 times the standard deviations of the loadings for each PC (statistically similar to a p-value of 1%). Note: for the sake on conciseness, for PC1 only the top-10 of the 34 significant loadings are reported the extensive margin—the depth of its economic activity. Other loadings further enrich this narrative, complementing the OLS results. Specifically, aligning with established descriptions of the Italian economic landscape, advanced industries do not dominate (Giannetti and Vasta 2006); instead, traditional sectors such as textiles (cloth_furn_firm, ret_text_firm), furniture (ret_furn_firm), and luxury goods (ret_lux_firm) emerge prominently. The employment structure further supports these insights. Non-motorized industries (indemp_nomot) hold substantial importance, particularly through sectors such as retail chemicals (ret_chem_emp), textiles (cloth_furn_emp), and trade and services (tot_trade_emp). Thus, PC1 can be interpreted as capturing the socio-economic context of a province, explicitly emphasizing the *depth*—the extensive margin—of the economic activity, not necessarily its *development*—the intensive margin.

Unlike PC1, which describes the scale of economic activity, the following PCs—referred to as *contrast factors*—capture deviations from the general trend, focusing on specific provincial dynamics, and highlighting the relationship between sectoral specialization and the banking network.

PC2 and PC3, which explain a cumulative 10.2% of the total variance, offer an interesting perspective on the urban-rural divide. Rural areas, as proxied by the share of families involved in the agricultural sector (families_agric), ceteris paribus, are associated with a higher number of banks' branches. This pattern is consistent with historical evidence on the expansion of mutual cooperative banks (BCCs) in rural areas, which focused on providing credit to small-scale producers via a capillary unit branch network, often at the municipal level.

PC3 and PC6 capture the institutional heterogeneity of financial intermediaries, which shapes the banking network in a province. In particular, ceteris paribus, the share of joint-stock banks (SOC) and public law banks (ICDP) is negatively correlated with the total number of branches. This evidence is consistent with the structural peculiarity of these intermediaries, characterized by fewer but larger branches compared to BCC, BP, and CRO.

Although PC11 and PC12 account for only 1.9% of the total variance, they capture important nuances in the relationship between socioeconomic factors and the banking network. In particular, PC11 is positively correlated with the number of people declaring an income (*ricchezza mobile*) in *categoria B*, a measure of independent workers involved in industrial and commercial activities. These workers are more concentrated in urban areas, reinforcing the narrative of an urban-rural divide and suggesting that higher-income provinces exhibit distinct financial structures. On the contrary, the loadings for ret_wine_firm, ret_mixed_firm, and ret_mixed_emp, although more challenging to interpret, align with PC1's interpretation, reflecting the specific commercial characteristics of smaller and less developed municipalities. Indeed, mixed retail shops are less present in large cities, characterized by a more specialized set of retailers.[11] These results are robust and consistent when extending the analysis to 1936, reinforcing the validity of our conclusions over time.

Jointly considered, these findings complement traditional narratives of financial development, with a branch network closely resembling the local peculiarities of the

[11] The only exception is Milan, where department stores are included in the mixed retail category.

Italian economic landscape. In a context characterized by SME in low-value-added sectors, the depth of economic activity outweighs its intensity. The textile and the agricultural sector are key drivers of these dynamics, complemented by variables that reflect the breadth of local commercial and retail activity. As a byproduct of this analysis, we have found evidence of a banking system segmented along an urban-rural axis: rural areas are characterized by a capillary network of bank branches, largely due to cooperative banks (BCCs) supporting local and small-scale agricultural production, leading to a banking system with distinct geographical footprints. Moreover, the total number of branches is influenced by institutional heterogeneity of the financial intermediaries, with the presence of joint-stock (SOCs) and public law banks (ICDPs) negatively influencing the total number of branches, with these intermediaries favoring larger offices with fewer branches. These results, complementing the persistence detected by the OLS framework, not only demonstrate that the 1936 branch network is strongly dependent on pre-existing socio-economic structures, but also make a relevant contribution to the understanding of Italian financial development. We do not neglect the importance of political decisions in the aftermath of the Great Depression, but we show how it unfolded along a strong path-dependent branch distribution that was explicitly developed to meet the needs of a traditional economic sector, strongly segmented between urban and agricultural areas.

5 Conclusions

This study re-examines the Italian branch network at the time of the 1936 banking law. Using a novel and comprehensive provincial dataset, we show that framing the distribution as a mere exogenous "historical accident"—a common view in the economics literature—overlooks the ongoing multifaceted dynamics. Market forces, throughout the turbulent expansion of the 1920s, followed by a crisis-induced consolidation in the early 1930s, intertwined to shape the very structure of the banking system.

This general consideration unfolds in three key findings. First, we empirically verify the a-priori hypothesis of persistence in the branch network, catalyzed by operative frictions: in the baseline bi-variate specification, a one log-point increase in provincial branches in 1928 is associated with a 0.84 log-points increase in the 1936 network (Model 1 in Table 2); the coefficient halves when controlling for deposits, population, and industrialization suggesting a non-negligible role of local socio-economic heterogeneity. The R^2 remains above 0.70 in all the expanded models. Second, we demonstrate that the 1928 conditions were largely endogenous: a principal-components model built only on 1927–29 economic variables explains 81% of the cross-province variance (adjusted R^2) in the 1928 network and 76% in the 1936 network. This finding motivates a careful reassessment of the validity of the instrument that has underpinned numerous studies using the 1936 distribution as a source of exogenous variation. Third, we go beyond statistical testing, proposing a first insight into the mechanisms driving this relationship. The first principal component captures the overall depth of local activity (firm and employment density).

Subsequent components isolate (i) a dense cooperative-bank presence in rural provinces and (ii) a sparser joint-stock/public-bank network in industrial centers, framing a clear rural/urban segmentation. These economic patterns, more than top-down policy, organized the branching geography.

Our work adds to the growing literature documenting the "Great Expansion" of branch banking in the 1920 s across Europe and the United States (Bonhoure et al. 2024; Molteni 2024; Carlson and Mitchener 2009). We show that the mode of expansion matters and that selective contraction preserved ordering: Italian banks mainly opened new offices de novo, creating areas of "over-branched" (many branches, thin deposits). Then, provinces that were most over-branched in 1928 lost the highest share of offices, yet the spatial hierarchy persisted.

From a historical perspective, our study aligns with the view put forward by Italian banking historians, who have long emphasized the importance of economic and technical considerations in shaping the evolution of the Italian banking system in the analyzed period. Our quantitative evidence complements this qualitative narrative by demonstrating the strong empirical link between local economic conditions and banking structures. The persistence of regional patterns in financial development, even through periods of significant regulatory change, underscores the enduring influence of market forces on the spatial organization of banking.

Still, by showing that the 1936 branch distribution is correlated with 1920s fundamentals, our results do not invalidate its use as an instrument for local financial development. While violating the exclusion restriction assumption in its raw form, the regulatory shock of the 1936 law still contains useful variation—the key is to isolate the component that is orthogonal to pre-existing economic conditions. For these reasons, at the current stage of research, our findings do not necessarily invalidate Guiso et al. (2004, 2006) 's results on the effect of financial development on economic growth. Future research using the 1936 distribution should consider approaches that separate the market-driven component (which we show is substantial) from the political or administrative element of the law. This could involve controlling for pre-1936 economic fundamentals or employing residual-based strategies that preserve the exogenous variation while accounting for the endogenous component we document. Such refinements would maintain the valuable historical insight that the 1936 law mattered while respecting our evidence that the raw network distribution reflects earlier market forces.

Our findings also speak to the broader literature on how political institutions influence financial development (Rajan and Zingales 2003; Haber et al. 2008). The Italian case reveals that intervention occurred through codification, not blank-slate design. While the Fascist regime intervened—i.e., through forced mergers, bailouts, and restrictive licensing—our analysis suggests that it did so within clear economic constraints. The 1936 law crystallized existing supervisory and ownership structures rather than imposing a radically new framework. This complements the "fragile-by-design" argument by showing that political bargains may reinforce, rather than replace, inherited structures (Calomiris and Haber 2014). Market logic remained binding: even under authoritarianism, the spatial distribution of banking reflected underlying economic fundamentals. To be clear, our argument is not that

Table 5 Persistence and determinants of the 1936 branch network. Winsorized sample

	Dependent variable: Branches 1936 (log)									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Intercept	−0.000	−0.262***	−0.000	−0.074	−0.000	0.098	0.098	−0.078	−0.023	0.105
	(0.062)	(0.073)	(0.061)	(0.078)	(0.049)	(0.068)	(0.061)	(0.128)	(0.096)	(0.080)
Branches 1928 (log)	0.813***	0.863***	0.706***	0.502***	0.476***	0.510***	0.461***	0.775***	0.509***	0.463***
	(0.061)	(0.074)	(0.090)	(0.112)	(0.076)	(0.077)	(0.101)	(0.072)	(0.119)	(0.103)
Population 1931 (log)			0.154**	0.379***			0.104			0.099
			(0.074)	(0.086)			(0.118)			(0.119)
Deposits 1929 (log)					0.492***	0.500***	0.429***			0.424***
					(0.068)	(0.069)	(0.112)			(0.122)
HP (log)								0.204***	0.081	0.015
								(0.074)	(0.074)	(0.057)
Regional FE	NO	YES	NO	YES	NO	YES	YES	YES	YES	YES
Observations	91	91	91	91	91	91	91	91	91	91
Adjusted R^2	0.657	0.749	0.666	0.798	0.784	0.831	0.831	0.768	0.798	0.829
F Statistic	178.048***	116.920***	112.887***	138.248***	259.959***	231.494***	242.380***	866.267***	318.211***	269.013***

The table presents the results of the OLS regression model with the sample winsorized at 5%. All variables are standardized. Robust standard errors in parenthesis. Note: * p<0.1; **p<0.05; ***p<0.01

Table 6 Determinants of the 1936 branch network distribution. Alternative specifications

	Dependent variable: Branches 1936 (log)											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	−0.000	0.232	−0.000	0.181*	−0.000	−0.283	−0.000	0.113	−8.602***	−8.386***	−9.261***	−9.125***
	(0.083)	(0.319)	(0.070)	(0.108)	(0.105)	(0.282)	(0.076)	(0.148)	(0.757)	(0.863)	(0.812)	(0.828)
HP (log)	0.617***	0.622***										
	(0.095)	(0.134)										
Total firms (log)			0.750***	0.760***								
			(0.062)	(0.078)								
Agricultural employees (share)					−0.137	−0.090						
					(0.117)	(0.144)						
Non-motorized firms (log)							0.693***	0.747***				
							(0.077)	(0.078)				
Industrial employment (log)									0.840***	0.856***		
									(0.073)	(0.088)		
Trade employment (log)											0.979***	0.999***
											(0.084)	(0.094)
Regional FE	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES
Observations	91	91	91	91	91	91	91	91	91	91	91	91
Adjusted R^2	0.373	0.469	0.558	0.757	0.008	0.210	0.474	0.755	0.559	0.696	0.569	0.747
F Statistic	41.72***	21.99***	145.43***	52.34***	1.37	20.15***	81.15***	65.26***	134.14***	29.93***	135.00***	36.87***

The table presents alternative specifications of the OLS regression model that don't control for the persistence of the 1928 branch network. All variables are standardized. Robust standard errors in parenthesis. Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

the distribution of bank offices in Italy was solely the product of market dynamics, and fascist politics did not play any role. Recent research has shown that the political connections of Italian non-financial firms led to the misallocation of resources during the Fascist Era (Faccio and McConnell 2023): the fascist regime was far from being the technocratic agent that it claimed to be through its official propaganda. We argue, however, that dismissing the distribution of bank offices at the end of the *Ventennio* as quasi-random does not do justice to the complexity of Italian interwar banking history. We can interpret these findings in two ways. On one hand, it is possible that the fascist regime lacked the strength or willingness to bend the banking system to its will against market forces. On the other hand, it is possible that some elements within the Italian state managed to resist the totalitarian and purely political drive of policy, maintaining a technocratic approach where public officers acted according to market forces rather than just political will. Drawing the exact line between these two interpretations, however, is beyond the scope of this paper.

To conclude, is it fair to stylize the distribution of bank offices in fascist Italy as a "historical accident"? As it is often the case with complex problems, the virtue stands in the middle. From a data-driven and economically grounded perspective, we show that the relationship between the market and political intervention is one of interaction, not substitution. In other words, while the 1936 law undoubtedly mattered for Italy's subsequent financial development, it did so by codifying–not erasing–the branch network that emerged from the 1920s expansion and the consolidation of the Great Depression. For empirical economists, the 1936 distribution remains a potentially useful source of variation, but one that requires careful consideration of its endogenous components to satisfy modern identification standards. Together, the evidence presented in this work rules out the view that the interwar consolidation significantly altered the pre-existing structures. The 1936 law codified a map that the market had already drawn.

Data sources and description

This paper presents a new dataset at the provincial level, including a large number of variables that allow us to have an all-embracing picture of financial development and local economic activity in each province before the onset of the Great Depression. This dataset provides a comprehensive collection of variables describing Italian provinces' economic, demographic, and banking infrastructure during the late 1920s and early 1930s. The data originates from multiple reliable sources, including censuses, official publications, and historical records, which are listed below with their abbreviated names for reference: 1. *Catasto Agrario 1929 (Catasto Agrario):* Urbanization and agricultural employment data. 2. *Censimento degli esercizi industriali e commerciali 1927 (Industrial Census 1927):* Industrial, commercial, and occupational data. 3. *Censimento della popolazione 1931 (Population Census 1931):* Population measures. 4. *Banca d'Italia Relazione del Governatore (Bank of Italy Reports):* Banking infrastructure and deposit data. 5. Orlandi (1935): Income and taxation data. 6. Molteni (2024): Historical bank office breakdowns by type and period. 7. *Bollettino di statistica e di legislazione comparata (1933) (Bollettino*

1933): Taxation data for exchanged goods. 8. *Cassa Depositi e Prestiti 1930 (Postal Bank Report 1929):* Postal bank deposits.

Demographic and urbanization variables The dataset includes population measures from the Industrial Census of 1927 and the Population Census of 1931. Specifically, it contains the estimated total population in 1927 (‘Pop_calc27‘), the resident population in 1931 (‘Pop_res31‘), and the present population in 1931 (‘Pop_pres31‘). Urbanization is captured through the percentage of people living in urbanized areas (‘urban_share‘) and non-urbanized areas (‘rural_share‘), sourced from the Catasto Agrario. The dataset also includes the share of families and individuals employed in agriculture (‘families_agric‘ and ‘emp_agric‘), both derived from the Catasto Agrario.

Banking infrastructure variables The dataset records detailed information on bank offices and their distribution across provinces, sourced from the Bank of Italy Reports and Molteni (2024). For the years 1927/28 and 1936, it includes the total number of bank offices (‘off_tot_28‘, ‘off_tot_36‘) and the number of municipalities with at least one bank office (‘piazze_28‘, ‘piazze_36‘). Further breakdowns by bank type are provided: 1. Mutual Cooperative Banks: ‘off_BCC_28‘, ‘off_BCC_36‘. 2. Foreign Banks: ‘off_BE_28‘. 3. Joint Stock Banks: ‘off_SOC_28‘, ‘off_SOC_36‘. 4. Cooperative Joint-stock Banks: ‘off_BP_28‘, ‘off_BP_36‘. 5. Private Bankers: ‘off_DB_28‘, ‘off_DB_36‘. 6. Saving Banks: ‘off_CRO_28‘, ‘off_CRO_36‘. 7. Public Institute Banks: ‘off_ICDP_28‘, ‘off_ICDP_36‘. The dataset also reports the total number of branches (‘tot_branches‘) and headquarters (‘tot_hq‘) in 1927/28. Additional banking data includes discounts and advances by the Bank of Italy in 1928 (‘Discounts_bdi28‘) and deposits of the Postal Banks in 1929 (‘deposits_cdp29‘). Annual bank deposit data is available from 1929 to 1938 (‘dep_29‘ to ‘dep_38‘), providing insights into provincial financial activity.

Income and taxation variables The dataset includes measures of income declared for taxation purposes, based on Orlandi (1935). ‘incomecatb29_value‘ and ‘incomecatc29_value‘ report the total income derived from industrial/commercial and professional activities, respectively. Additionally, the dataset provides the number of individuals declaring such income (‘incomecatb29_count‘ and ‘incomecatc29_count‘). The variable ‘exchangetax2829‘, sourced from the Bollettino 1933, records tax revenues from exchanged goods in 1928/29.

Industrial and occupational structure variables The dataset offers a detailed breakdown of each province’s industrial and occupational structure, sourced from the Industrial Census 1927. General measures include the total number of industrial firms (‘indfirms_tot‘) and employees (‘indemp_tot‘). Industrial activity is further disaggregated into firms and employees using power engines (‘indfirms_mot‘, ‘indemp_mot‘) and those without power engines (‘indfirms_nomot‘, ‘indemp_nomot‘). Total installed industrial capacity is captured through horsepower (‘HP‘). Sector-specific data provide additional detail, reporting the number of firms (‘_firm‘) and employees (‘_emp‘) across various industries. These include agriculture (‘agri_firm‘, ‘agri_emp‘), fishing (‘fish_firm‘, ‘fish_emp‘), mining (‘mining_firm‘, ‘mining_emp‘), wood processing (‘wood_firm‘, ‘wood_

Table 7 Persistence and determinants of the 1936 network distribution: per-capita measures

	Dependent variable: Branches per capita 1936 (log)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	−0.000	−0.100	−0.000	0.037	−0.000	−0.057	0.063
	(0.079)	(0.096)	(0.069)	(0.084)	(0.078)	(0.102)	(0.107)
Branches per capita 1928	0.665***	0.453***	0.542***	0.480***	0.641***	0.460***	0.484***
	(0.081)	(0.076)	(0.075)	(0.077)	(0.081)	(0.076)	(0.077)
Deposits per capita 1929 (log)			0.398***	0.246**			0.236**
			(0.076)	(0.104)			(0.117)
HP per capita (log)					0.168**	0.082	0.061
					(0.065)	(0.050)	(0.055)
Regional FE	NO	YES	NO	YES	NO	YES	YES
Observations	91	91	91	91	91	91	91
Adjusted R^2	0.436	0.710	0.576	0.727	0.458	0.710	0.725
F Statistic	68.15***	66.71***	63.42***	35.26***	44.78***	161.52***	79.98***

The table presents alternative specifications of the OLS regression model that normalize selected controls for the total population of the province. All variables are standardized. Robust standard error in parenthesis. Note: *p<0.1; **p<0.05; ***p<0.01

Table 8 Persistence and determinants of the 1936 network distribution: per-km2 measures

	Dependent variable: Branches per km2 1936 (log)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	−0.000	−0.203***	−0.000	0.091	−0.000	−0.038	0.093
	(0.057)	(0.073)	(0.045)	(0.083)	(0.054)	(0.107)	(0.087)
Branches per km2 (log)	0.842***	0.814***	0.463***	0.502***	0.732***	0.734***	0.502***
	(0.056)	(0.066)	(0.069)	(0.063)	(0.065)	(0.064)	(0.064)
Deposits per km2 (log)			0.506***	0.471***			0.467***
			(0.067)	(0.060)			(0.069)
HP per km2 (log)					0.216***	0.194***	0.006
					(0.063)	(0.063)	(0.048)
Regional FE	NO	YES	NO	YES	NO	YES	YES
Observations	91	91	91	91	91	91	91
Adjusted R^2	0.706	0.801	0.817	0.866	0.738	0.818	0.864
F Statistic	224.40***	137.87***	179.49***	447.77***	128.39***	596.35***	443.990***

The tables presents alternative specifications of the OLS regression model that normalize selected controls for the surface (squared km) of the province. All variables are standardized. Robust standard error in parenthesis. Note: *p<0.1; **p<0.05; ***p<0.01

emp‘), food production (‘food_firm‘, ‘food_emp‘), leather processing (‘leather_firm‘, ‘leather_emp‘), metallurgy (‘metal_firm‘, ‘metal_emp‘), weaving (‘weaving_firm‘, ‘weaving_emp‘), textile (‘cloth_furn_firm‘, ‘cloth_furn_emp‘),

Table 9 Persistence and determinants of the 1936 network distribution: per-population density measures

	Dependent variable: Branches per density 1936 (log)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	0.000	−0.220**	0.000	0.018	0.000	−0.096	0.020
	(0.053)	(0.097)	(0.046)	(0.066)	(0.051)	(0.124)	(0.072)
Branches per density (log)	0.866***	0.866***	0.665***	0.670***	0.776***	0.808***	0.670***
	(0.056)	(0.068)	(0.070)	(0.051)	(0.069)	(0.064)	(0.071)
Deposits per density (log)			0.325***	0.321***			0.319***
			(0.058)	(0.050)			(0.058)
HP per density (log)					0.176***	0.137**	0.004
					(0.051)	(0.057)	(0.075)
Regional FE	NO	YES	NO	YES	NO	YES	YES
Observations	91	91	91	91	91	91	91
Adjusted R^2	0.747	0.831	0.811	0.871	0.767	0.838	0.869
F Statistic	235.61***	68.71***	216.69***	61.67***	191.90***	82.93***	44.671***

The table presents alternative specifications of the OLS regression model that normalize selected controls for the population density (resident population over squared-km) of the province. All variables are standardized. Robust standard error in parentheses. Note: *p<0.1; **p<0.05; ***p<0.01

chemicals (‘chem_firm‘, ‘chem_emp‘), utilities (‘utilities_firm‘, ‘utilities_emp‘), and construction (‘constr_firm‘, ‘constr_emp‘).

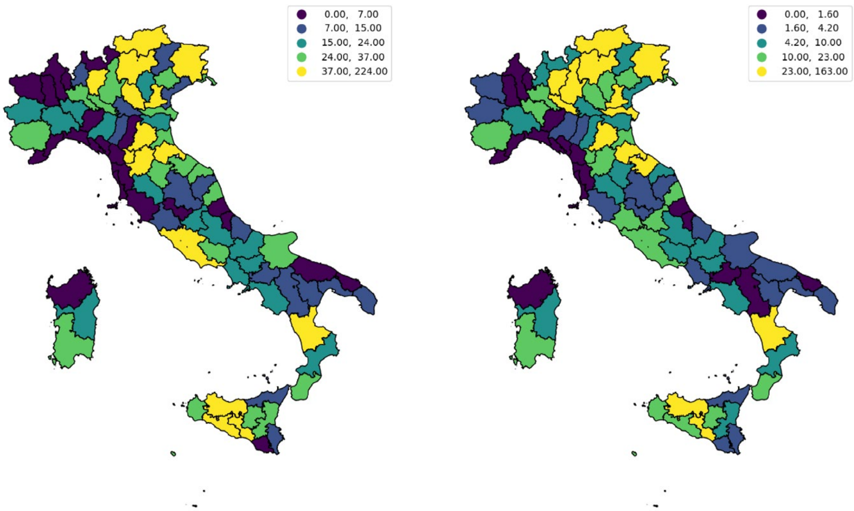
Commercial and retail trade variables The dataset captures both wholesale and retail trade activities. Wholesale trade is broken down into specific sectors, including firms and employees trading live animals and raw materials (‘whole_raw_firm‘, ‘whole_raw_emp‘), food products (‘whole_food_firm‘, ‘whole_food_emp‘), textiles and clothing (‘whole_text_firm‘, ‘whole_text_emp‘), and other goods (‘whole_other_firm‘, ‘whole_other_emp‘). Retail trade variables provide information on firms and employees in various sectors, including food (‘ret_food_firm‘, ‘ret_food_emp‘), textiles (‘ret_text_firm‘, ‘ret_text_emp‘), furniture and glassware (‘ret_furn_firm‘, ‘ret_furn_emp‘), luxury goods (‘ret_lux_firm‘, ‘ret_lux_emp‘), chemicals (‘ret_chem_firm‘, ‘ret_chem_emp‘), mixed retail activities (‘ret_mixed_firm‘, ‘ret_mixed_emp‘), wine and liquors (‘ret_wine_firm‘, ‘ret_liquor_firm‘). This data originates from the Industrial Census of 1927.

Services and hospitality variables The dataset includes measures of firms and employees in the service and hospitality sectors. This includes hotels and restaurants (‘hosp_firm‘, ‘hosp_emp‘), public entertainment (‘entert_firm‘, ‘entert_emp‘), publishing (‘pub_firm‘, ‘pub_emp‘), hygiene services (‘urb_serv_firm‘, ‘urb_serv_emp‘), auxiliary commercial services (‘aux_trade_firm‘, ‘aux_trade_emp‘), and management-related activities (‘other_mng_firm‘, ‘other_mng_emp‘). Finally, the dataset includes the occupational structure related to financial services, insurance, and exchanges (‘fin_serv_firm‘ and ‘fin_serv_emp‘). These variables provide insight into the scale and employment levels within the provincial service economy.

Table 10 PCA, alternative specifications

Dependent variable: Branches 1928 (log)		
Alternative specification	df Refined model	Adjusted R^2
Controlling for the share of BCC 1928	7	0.81
Demographic controls 1928	6	0.63
Industrial controls 1928	5	0.72
Financial controls 1928	9	0.84
Per capita controls 1928	25	0.68
Dependent variable: Per capita branches 1928 (log)		
Per capital controls 1928	29	0.69
Dependent variable: Branches 1936 (log)		
Full controls 1928	4	0.74

Industrial and commercial totals Finally, the dataset also includes the totals for all employees and firms considered in the census. (‘tot_all_emp ‘, ‘tot_all_firm‘). Plus, the totals for industry and commerce, separately. (‘tot_ind_emp‘, ‘tot_ind_firm‘, ‘tot_trade_emp‘, and ‘tot_trade_firm‘).



(a) BCC branches (1928)

(b) BCC branches (1936)

Fig. 5 BCC geography by province

Table 11 Italian bank office network by the province before the 1930s contraction

Province	Region	Banks	SOC (%)	BP (%)	BCC (%)	CRO (%)	ICDP (%)	DB (%)	Other (%)
Aquila degli Abruzzi	Abruzzo	93	53.8	18.3	18.3	2.2	3.2	4.3	0.0
Chieti	Abruzzo	160	68.1	12.5	9.4	6.9	2.5	0.6	0.0
Pescara	Abruzzo	62	74.2	6.5	8.1	8.1	1.6	1.6	0.0
Teramo	Abruzzo	102	69.6	5.9	6.9	13.7	2.0	2.0	0.0
Matera	Basilicata	32	18.8	25.0	28.1	3.1	15.6	9.4	0.0
Potenza	Basilicata	73	32.9	34.2	12.3	2.7	8.2	9.6	0.0
Catanzaro	Calabria	90	27.8	37.8	24.4	0.0	4.4	5.6	0.0
Cosenza	Calabria	190	35.8	5.8	43.7	10.0	2.1	2.6	0.0
Reggio di Calabria	Calabria	90	27.8	35.6	32.2	0.0	4.4	0.0	0.0
Avellino	Campania	161	72.7	13.7	6.8	0.6	1.9	3.7	0.6
Benevento	Campania	140	65.0	12.1	15.0	0.7	1.4	5.7	0.0
Napoli	Campania	217	51.2	15.7	7.8	0.0	6.0	17.1	2.3
Salerno	Campania	278	59.0	15.1	8.6	7.9	1.8	7.6	0.0
Bologna	Emilia-Romagna	267	38.6	4.5	34.1	20.6	1.1	0.4	0.7
Ferrara	Emilia-Romagna	101	75.2	3.0	15.8	5.0	1.0	0.0	0.0
Forlì	Emilia-Romagna	130	36.9	10.0	31.5	20.0	0.8	0.8	0.0
Modena	Emilia-Romagna	100	45.0	29.0	6.0	19.0	0.0	1.0	0.0
Parma	Emilia-Romagna	123	46.3	6.5	19.5	22.8	0.8	4.1	0.0
Piacenza	Emilia-Romagna	124	39.5	22.6	2.4	16.1	0.0	19.4	0.0
Ravenna	Emilia-Romagna	81	35.8	8.6	35.8	18.5	1.2	0.0	0.0
Reggio nell'Emilia	Emilia-Romagna	146	48.6	24.7	9.6	10.3	0.7	0.0	6.2
Gorizia	Friuli-Venezia Giulia	104	8.7	9.6	75.0	3.8	1.9	0.0	1.0
Pola	Friuli-Venezia Giulia	37	0.0	8.1	89.2	2.7	0.0	0.0	0.0
Provincia del Friuli	Friuli-Venezia Giulia	234	51.3	13.2	22.2	3.4	0.4	8.5	0.9
Trieste	Friuli-Venezia Giulia	76	26.3	18.4	42.1	3.9	3.9	1.3	3.9

Table 11 (continued)

Province	Region	Banks	SOC (%)	BP (%)	BCC (%)	CRO (%)	ICDP (%)	DB (%)	Other (%)
Zara	Friuli-Venezia Giulia	5	20.0	0.0	40.0	20.0	0.0	20.0	0.0
Frosinone	Lazio	150	62.0	8.0	18.0	6.7	1.3	4.0	0.0
Rieti	Lazio	55	30.9	20.0	36.4	12.7	0.0	0.0	0.0
Roma	Lazio	348	44.3	11.8	16.7	11.2	2.6	8.6	4.9
Viterbo	Lazio	112	45.5	16.1	13.4	22.3	2.7	0.0	0.0
Genova	Liguria	127	57.5	7.1	3.9	8.7	3.1	14.2	5.5
Imperia	Liguria	39	35.9	2.6	17.9	10.3	0.0	33.3	0.0
La Spezia	Liguria	48	54.2	8.3	4.2	8.3	2.1	22.9	0.0
Savona	Liguria	45	44.4	11.1	15.6	13.3	2.2	13.3	0.0
Bergamo	Lombardy	323	53.3	20.7	18.9	6.5	0.0	0.6	0.0
Brescia	Lombardy	313	63.6	19.8	11.5	4.5	0.0	0.6	0.0
Como	Lombardy	129	66.7	2.3	7.8	14.0	0.8	8.5	0.0
Cremona	Lombardy	129	56.6	10.9	24.8	4.7	0.8	2.3	0.0
Mantova	Lombardy	201	35.3	50.7	5.5	5.0	0.0	3.0	0.5
Milano	Lombardy	349	60.2	13.2	9.2	8.0	0.9	5.7	2.9
Pavia	Lombardy	172	50.0	20.9	11.6	14.5	0.6	2.3	0.0
Sondrio	Lombardy	53	28.3	49.1	9.4	9.4	0.0	3.8	0.0
Varese	Lombardy	73	64.4	16.4	1.4	15.1	0.0	2.7	0.0
Ancona	Marche	166	44.6	8.4	21.7	21.1	1.2	3.0	0.0
Ascoli Piceno	Marche	143	52.4	7.0	18.9	21.7	0.0	0.0	0.0
Macerata	Marche	157	47.8	9.6	9.6	31.2	0.0	1.3	0.0
Pesaro Urbino	Marche	129	20.9	24.8	28.7	18.6	0.0	7.0	0.0
Campobasso	Molise	263	85.2	4.6	8.4	0.4	0.8	0.8	0.0
Alessandria	Piedmont	304	53.6	13.8	7.9	16.8	0.7	7.2	0.0
Cuneo	Piedmont	247	36.8	6.9	13.0	21.9	1.6	19.8	0.0

Table 11 (continued)

Province	Region	Banks	SOC (%)	BP (%)	BCC (%)	CRO (%)	ICDP (%)	DB (%)	Other (%)
Novara	Piedmont	127	8.7	67.7	0.0	21.3	0.8	1.6	0.0
Torino	Piedmont	244	54.1	5.3	6.6	20.1	1.6	10.7	1.6
Vercelli	Piedmont	164	42.7	26.8	0.6	25.6	1.2	2.4	0.6
Bari delle Puglie	Apulia	140	54.3	8.6	4.3	5.7	9.3	17.9	0.0
Brindisi	Apulia	42	57.1	26.2	2.4	0.0	7.1	7.1	0.0
Foggia	Apulia	176	63.6	11.4	17.0	1.7	2.3	4.0	0.0
Ionio	Apulia	61	27.9	26.2	18.0	0.0	4.9	23.0	0.0
Lecce	Apulia	76	28.9	34.2	11.8	0.0	3.9	21.1	0.0
Cagliari	Sardinia	48	29.2	0.0	62.5	2.1	4.2	2.1	0.0
Nuoro	Sardinia	28	17.9	3.6	78.6	0.0	0.0	0.0	0.0
Sassari	Sardinia	30	23.3	30.0	23.3	0.0	13.3	6.7	3.3
Agrigento	Sicily	113	9.7	19.5	56.6	6.2	7.1	0.9	0.0
Caltanissetta	Sicily	78	9.0	11.5	69.2	5.1	3.8	1.3	0.0
Catania	Sicily	93	32.3	10.8	39.8	3.2	9.7	3.2	1.1
Enna	Sicily	63	6.3	25.4	58.7	1.6	7.9	0.0	0.0
Messina	Sicily	46	37.0	8.7	21.7	13.0	17.4	2.2	0.0
Palermo	Sicily	163	13.5	27.0	47.2	3.1	6.7	0.0	2.5
Ragusa	Sicily	26	19.2	34.6	19.2	11.5	11.5	3.8	0.0
Siracusa	Sicily	27	7.4	18.5	33.3	11.1	18.5	11.1	0.0
Trapani	Sicily	91	27.5	25.3	36.3	4.4	5.5	1.1	0.0
Arezzo	Tuscany	122	35.2	11.5	24.6	12.3	15.6	0.8	0.0
Firenze	Tuscany	229	34.1	8.3	21.0	19.2	12.2	4.4	0.9
Grosseto	Tuscany	57	43.9	7.0	7.0	3.5	38.6	0.0	0.0
Livorno	Tuscany	61	50.8	1.6	1.6	18.0	27.9	0.0	0.0
Lucca	Tuscany	147	59.2	8.8	1.4	17.0	12.9	0.7	0.0

Table 11 (continued)

Province	Region	Banks	SOC (%)	BP (%)	BCC (%)	CRO (%)	ICDP (%)	DB (%)	Other (%)
Massa e Carrara	Tuscany	45	48.9	8.9	4.4	17.8	6.7	13.3	0.0
Pisa	Tuscany	103	40.8	6.8	4.9	32.0	15.5	0.0	0.0
Pistoia	Tuscany	83	21.7	3.6	59.0	10.8	4.8	0.0	0.0
Siena	Tuscany	89	22.5	7.9	22.5	6.7	34.8	4.5	1.1
Bolzano-Bozen	Trentino-Alto Adige	167	4.2	11.4	74.9	7.8	0.6	0.6	0.6
Trento	Trentino-Alto Adige	329	10.6	17.0	68.1	2.7	0.3	0.3	0.9
Perugia	Umbria	129	29.5	20.9	10.1	27.9	10.9	0.8	0.0
Terni	Umbria	46	37.0	8.7	15.2	34.8	4.3	0.0	0.0
Aosta Valley	Aosta Valley	99	54.5	5.1	7.1	19.2	2.0	12.1	0.0
Belluno	Veneto	117	45.3	29.9	6.8	12.8	0.0	3.4	1.7
Padova	Veneto	151	26.5	26.5	29.1	14.6	0.0	2.0	1.3
Rovigo	Veneto	115	35.7	4.3	32.2	27.0	0.0	0.0	0.9
Treviso	Veneto	183	12.6	46.4	17.5	21.9	0.0	0.5	1.1
Venezia	Veneto	99	34.3	22.2	15.2	17.2	2.0	6.1	3.0
Verona	Veneto	253	22.9	19.8	35.6	20.2	0.4	0.0	1.2
Vicenza	Veneto	131	29.0	30.5	17.6	18.3	0.8	2.3	1.5

The network expansion refers to the peak after the introduction of the 1926 banking law and the moratorium on opening new branches in 1927/28. The bank categories commonly used in Italian banking statistics (e.g. Natoli et al. 2016) are employed for conciseness. SOC is joint-stock banks (Società Ordinarie di Credito); BP is cooperative joint-stock banks (Banche Popolari); BCC is mutual cooperatives (Banche di credito cooperativo); CRO is savings banks (Casse di Risparmio Ordinarie); ICDP is public banks (Istituti di Credito di Diritto Pubblico); DB is private bankers (Ditte Bancarie); Other offices are Foreign bank offices, joint-stock banks that do not collect retail deposits and other special credit institutions collecting deposits. Source: Author's elaborations based on Molteni (2024)

Table 12 Selected Economic and Financial Indicators by Italian Province (1927–1936)

Province	Region	Industry (1927)			Resident Pop. (1931)	Banking (1936)			Banking (1929)	
		Ind. Firms	Ind. Workers	HP		Offices	Deposits	Deposits pc	Deposits	Deposits pc
Aquila degli Abruzzi	Abruzzo	5.025	13.941	18.270	366.858	57	121	329	137	374
Chieti	Abruzzo	5.944	14.678	30.136	368.780	72	101	273	126	341
Pescara	Abruzzo	2.903	14.118	22.107	196.431	37	60	305	61	312
Teramo	Abruzzo	2.977	7.298	3.738	236.030	56	90	380	151	641
Matera	Basilicata	2.651	5.949	4.255	156.358	17	37	235	35	223
Potenza	Basilicata	6.387	14.310	19.223	357.354	123	69	194	91	254
Catanzaro	Calabria	7.032	19.508	70.411	589.835	49	98	166	178	301
Cosenza	Calabria	8.037	24.912	22.028	568.073	88	134	235	327	575
Reggio di Calabria	Calabria	11.265	40.272	20.076	565.518	64	127	224	168	297
Avellino	Campania	8.035	17.063	9.794	428.934	38	37	85	29	69
Benevento	Campania	4.318	10.961	33.306	335.642	55	50	148	87	260
Napoli	Campania	29.253	157.042	577.484	2.085.183	154	1.045	501	1.253	601
Salerno	Campania	9.816	36.598	74.383	661.717	65	91	137	128	193
Bologna	Emilia-Romagna	12.278	71.604	133.626	687.669	240	1.391	2.023	1.087	1.580
Ferrara	Emilia-Romagna	7.181	23.382	39.202	368.998	43	242	656	231	625
Forlì	Emilia-Romagna	6.318	25.125	31.559	430.939	123	348	807	312	725
Modena	Emilia-Romagna	7.687	29.384	33.837	457.202	87	525	1.148	478	1.046
Parma	Emilia-Romagna	7.609	26.713	68.884	383.683	52	325	847	361	941
Piacenza	Emilia-Romagna	5.363	24.184	31.575	295.992	44	298	1.007	497	1.680
Ravenna	Emilia-Romagna	6.739	21.142	24.169	272.898	89	377	1.380	356	1.305
Reggio nell'Emilia	Emilia-Romagna	7.786	27.440	79.472	370.109	79	345	931	456	1.233
Gorizia	Friuli-Venezia Giulia	3.086	15.869	27.035	210.441	73	119	565	166	790
Pola	Friuli-Venezia Giulia	3.849	18.964	24.913	302.980	64	66	218	89	292

Table 12 (continued)

Province	Region	Industry (1927)			Resident Pop. (1931)	Banking (1936)			Banking (1929)	
		Ind. Firms	Ind. Workers	HP		Offices	Deposits	Deposits pc	Deposits	Deposits pc
Provincia del Friuli	Friuli-Venezia Giulia	10.110	55.255	99.011	787.598	160	461	586	483	613
Trieste	Friuli-Venezia Giulia	5.002	65.364	92.972	350.220	125	438	1.251	342	977
Zara	Friuli-Venezia Giulia	348	1.512	1.479	19.599	6	8	418	8	408
Frosinone	Lazio	5.853	17.865	57.801	432.065	60	55	128	106	244
Rieti	Lazio	3.298	6.712	21.582	173.684	43	65	373	73	421
Roma	Lazio	26.959	140.040	255.890	1.504.487	292	2.534	1.684	1.830	1.216
Viterbo	Lazio	5.810	14.632	14.606	230.397	92	117	506	142	615
Genova	Liguria	14.707	155.048	337.683	813.978	129	1.251	1.537	1.214	1.491
Imperia	Liguria	2.924	11.753	30.206	158.174	33	105	663	84	529
La Spezia	Liguria	3.206	29.326	48.586	230.945	19	145	626	199	861
Savona	Liguria	4.015	29.579	111.697	219.557	35	188	855	139	632
Bergamo	Lombardy	8.984	105.995	321.319	612.891	187	651	1.063	565	922
Brescia	Lombardy	11.219	86.245	326.783	720.347	184	774	1.075	682	947
Como	Lombardy	12.334	114.740	112.069	494.760	108	886	1.791	826	1.669
Cremona	Lombardy	7.993	41.814	30.055	369.138	91	540	1.462	499	1.351
Mantova	Lombardy	10.178	32.101	24.975	403.422	97	306	759	341	844
Milano	Lombardy	42.453	478.821	701.617	1.975.220	367	5.426	2.747	4.970	2.516
Pavia	Lombardy	11.951	62.003	56.790	487.249	136	990	2.032	838	1.719
Sondrio	Lombardy	1.683	9.391	327.759	140.218	51	123	874	216	1.540
Varese	Lombardy	8.179	115.506	172.667	391.127	71	877	2.241	796	2.036
Ancona	Marche	6.928	32.906	30.343	359.720	81	227	630	282	783
Ascoli Piceno	Marche	5.080	14.398	29.224	293.436	92	195	666	184	626
Macerata	Marche	5.464	16.102	18.369	285.850	95	206	721	247	864
Pesaro Urbino	Marche	4.757	16.987	15.482	300.857	80	140	464	138	460

Table 12 (continued)

Province	Region	Industry (1927)			Resident Pop. (1931)	Banking (1936)			Banking (1929)	
		Ind. Firms	Ind. Workers	HP		Offices	Deposits	Deposits pc	Deposits	Deposits pc
Campobasso	Molise	7.179	16.399	30.806	387.605	45	29	76	77	199
Alessandria	Piedmont	14.041	72.016	162.035	762.292	152	935	1.226	848	1.112
Cuneo	Piedmont	11.671	48.699	297.384	642.251	140	556	865	569	887
Novara	Piedmont	8.337	72.756	401.789	395.537	95	675	1.707	778	1.966
Torino	Piedmont	21.815	247.127	531.774	1.142.748	177	2.700	2.363	2.375	2.079
Vercelli	Piedmont	7.760	75.371	126.121	366.308	105	813	2.218	730	1.994
Bari delle Puglie	Apulia	13.890	53.382	37.484	958.004	79	406	423	553	577
Brindisi	Apulia	3.393	9.821	6.024	244.115	30	44	179	42	172
Foggia	Apulia	8.376	22.478	16.182	502.469	38	149	297	134	267
Ionio	Apulia	4.373	18.636	28.999	309.578	27	69	223	70	225
Lecce	Apulia	7.712	27.991	8.702	489.202	55	192	393	189	386
Cagliari	Sardinia	9.781	37.355	53.510	479.105	40	114	237	118	246
Nuoro	Sardinia	3.269	6.667	3.653	213.126	18	9	41	11	51
Sassari	Sardinia	5.416	16.069	42.137	291.529	17	61	208	47	162
Agrigento	Sicily	6.690	21.980	13.833	402.648	61	176	437	193	480
Caltanissetta	Sicily	3.306	13.570	15.687	246.032	38	105	426	123	499
Catania	Sicily	14.550	42.347	147.157	683.458	61	333	488	368	538
Enna	Sicily	2.875	10.233	14.750	225.696	30	53	236	47	208
Messina	Sicily	14.321	40.531	37.531	605.456	28	217	358	230	380
Palermo	Sicily	15.700	52.946	73.083	837.419	104	621	741	600	717
Ragusa	Sicily	2.148	7.462	3.035	244.848	23	67	273	79	321
Siracusa	Sicily	3.047	8.717	10.542	283.779	25	111	393	129	454
Trapani	Sicily	5.693	17.168	18.510	376.631	68	208	553	173	460
Arezzo	Tuscany	5.559	23.309	61.947	309.978	89	267	860	259	836

Table 12 (continued)

Province	Region	Industry (1927)			Resident Pop. (1931)	Banking (1936)			Banking (1929)	
		Ind. Firms	Ind. Workers	HP		Offices	Deposits	Deposits pc	Deposits	Deposits pc
Firenze	Tuscany	19.695	105.395	103.839	834.150	190	1.289	1.546	1.174	1.407
Grosseto	Tuscany	3.048	13.763	22.714	176.514	59	146	827	117	661
Livorno	Tuscany	4.772	37.910	196.886	241.600	62	276	1.141	189	780
Lucca	Tuscany	8.546	46.470	125.192	346.479	102	542	1.565	544	1.570
Massa e Carrara	Tuscany	3.303	23.150	39.682	194.384	26	85	435	75	383
Pisa	Tuscany	9.251	40.980	46.264	335.049	101	347	1.034	308	918
Pistoia	Tuscany	3.948	15.977	24.117	209.590	76	285	1.359	259	1.234
Siena	Tuscany	5.652	21.307	14.613	262.666	81	405	1.541	379	1.444
Bolzano - Bozen	Trentino-Alto Adige	6.618	24.806	178.108	261.394	124	316	1.210	354	1.355
Trento	Trentino-Alto Adige	7.031	29.409	95.368	406.432	191	331	813	616	1.516
Perugia	Umbria	7.777	30.142	57.026	521.761	106	306	586	264	507
Terni	Umbria	2.514	18.443	247.355	177.222	32	117	662	96	543
Aosta Valley	Aosta Valley	3.487	33.077	322.551	237.231	43	204	859	188	790
Belluno	Veneto	2.964	11.974	40.204	236.823	48	100	424	186	783
Padova	Veneto	8.966	43.738	53.224	639.469	88	696	1.088	571	892
Rovigo	Veneto	7.030	20.294	46.580	317.773	64	150	473	214	672
Treviso	Veneto	7.965	40.787	24.504	581.674	87	270	465	413	710
Venezia	Veneto	7.723	54.057	94.811	591.642	72	533	901	562	950
Verona	Veneto	10.181	47.016	70.262	571.686	123	678	1.186	649	1.135
Vicenza	Veneto	8.294	58.088	69.261	548.042	107	369	674	383	698

This table presents selected economic and financial indicators for Italian provinces. Industry data for 1927 comes from the Industrial and Commercial Census and includes the number of industrial firms, industrial workers, and installed horsepower (HP). Banking data includes the number of bank offices from Molteni (2024) *and deposits for both 1936 and 1929 from the Bank of Italy annual reports. Population data comes from the 1931 Population Census. Deposits pc are expressed in Lire, while Deposits are expressed in mln Lire*

The principal components analysis algorithm implementation

Implementing the PCA requires three technical decisions that affect our estimation: the choice of the scaling procedure, the number of components to retain, and the validation of component selection. First, the scaling procedure is central for PCA, because it ensures that all variables contribute equally to the analysis, preventing those with larger variance from dominating the principal components. We implement two preprocessing steps for all variables. First, we add a constant of 1 to all variables and apply a log transformation to address left-skewness in a context with potential zero values. Second, we standardize the transformed variables to ensure a roughly normal distribution. Our baseline specification uses robust scaling based on the interquartile range—$X_i' = (X_i - \text{median}(X))/\text{IQR}(X)$—while alternative specifications employ traditional standard scaling—$X_i' = (X_i - \mu)/\sigma$.

Second, to determine the optimal number of principal components, we employed a cross-validation procedure that systematically evaluates different component configurations. Specifically, we used a three-fold cross-validation to assess the predictive performance of the PCA transformation. This approach involves partitioning the dataset into three subsets and iteratively estimating PCA models with varying numbers of components. We fit the PCA on two-thirds of the sample for each potential component configuration and project the remaining third onto the component space, computing the R^2 score for out-of-sample prediction. The number of components was selected based on maximizing the mean cross-validated R^2 score, ensuring that the dimensionality reduction captures the most predictive information while avoiding overfitting. We constrained the selection to retain principal components explaining at least 95% of the total variance in the dataset, balancing model complexity with comprehensive information preservation. Although the three-fold cross-validation may lead to higher variance due to the limited sample size, we claim that it provides a reasonable trade-off between bias and variance, ensuring that the number of selected components generalizes well without overfitting to specific training subsets.

Third, concerning validation, our primary refinement procedure implements a backward stepwise elimination process, that is, an iterative selection of principal components based on statistical significance. Starting with all components that meet our variance explanation threshold, we remove components with p-values exceeding 0.1 in the regression of bank branches on principal components. After each removal, we re-estimate the model. This process continues until all remaining components are statistically significant at the 0.1 level.

Robustness checks

To validate our results, we have developed extensive robustness checks, both for the OLS and the PCA model. Results are presented in this appendix.

OLS robustness checks

The robustness of the results presented in Table 2 has been tested against alternative specifications, varying the set of controls included, their normalization, and the preprocessing. Table 5 provides the same exercise but with the sample winsorized at the 5% level. Results are consistent with the main specification, confirming that the inference is not significantly biased by outliers in the original sample, but it correctly captures the underlying relationship.

Table 6 tests whether the determinants pinpointed in the main exercise are robust to the exclusion of the persistence component from the model's specification. Additional measures of the socio-economic structure of a province are also tested, namely the total number of firms, the share of employees in the agricultural sector, the count of non-motorized firms, and the number of employees in the industrial and trade sector[12] Main results are robust to the exclusion of 1928 branches distribution from the controls.

Table 7, 8, and 9 test whether main results are robust to a change in the normalization of the inputs, correcting for the population of the province (per-capita measures), for the area of the province (km^2), and for the population density (population-per-km^2). Results are consistent both with the main findings and with the robustness checks.

PCA robustness checks

To test the stability of our results, we perform both supervised and quasi-random robustness checks. First, we vary the control set, considering demographic, industrial, and financial variables separately.[13]

To further assess the robustness of the results, we implement an agnostic test, iterating through multiple quasi-random alternative specifications, changing the following parameters: 1. We modify the sample composition by excluding two random provinces; 2. We simultaneously vary the features set by randomly dropping 10% of our economic indicators; 3. We randomly avoid using cross-validation but set different thresholds for component retention, ranging from fixed numbers of components (5, 10) to varying explained variance thresholds (80%, 90%, 95%, 99%); 4. The p-value threshold for the iterative removal of insignificant components varies uniformly between 0.05 and 0.20; 5. We alternate between standard and robust scaling methods, and lastly; 6. We randomly include regional fixed effects.

We rerun our analysis 99 times, allowing these parameters to be set randomly within the set boundaries. We compute two correlation matrices to evaluate the

[12] The discrepancy between agricultural employment, and industrial and trade employment derives from limitations of the sources. The share of agricultural employees is reported on the *Agricultural Census* of 1929 while the number of employees in the industrial and trade sector is presented in the *Industrial and Commercial Census* of 1927.

[13] Following the nomenclature presented in the data appendix, demographic controls include urban_share, families_agric, emp_agric, pop_calc27, Pop_pres31, pop_res31. financial controls include deposits_cdp29, dep_29, fin_serv_firm, fin_serv_emp. Industrial controls include the sectoral breakdown presented in the data appendix (Table 10).

stability of our results across these specifications. First, we calculate the correlation between residuals across all specifications. Second, we compute Spearman rank correlations of the provincial rankings derived from each specification. These correlations allow us to assess whether the results are sensitive to specific methodological choices. The average correlation in the residual correlation matrix is 0.71, while the average correlation in the ranking is 0.71. The strong positive correlation in both matrices confirms that our estimation method to compute the PCA is robust, stable, and not dependent on the parameters specified.

Lastly, we test whether the results are sensitive to alternative choices of the algorithm. We run a horse race between PCA, regularized regressions—i.e., Lasso, Ridge, and Elastic Net, explicitly designed to control for overfitting in an OLS-like framework—and Partial Leaste Squares (PLS). Each model is optimized using grid-search with 5-fold cross-validation, and evaluated based on its R^2 following the same procedure described for PCA in Appendix B. Then, this procedure is iterated 100 times to ensure consistency. The PCA exercise described in the main body serves as a baseline, scoring an R^2 of 0.81. The scores of alternative algorithms, with standard deviation in parentheses, follow: Lasso 0.77 (0.072), Elastic Net 0.77 (0.075), Ridge regression 0.76 (0.089), PLS 0.73 (0.110). High values of the R^2 prove that the relationship between the branch network and the socio-economic conditions is robust to alternative methodological choices. We select PCA for its efficiency and theoretical simplicity. An alternative specification using OLS with post-Lasso selected controls returns consistent results with an adjusted R^2 of 0.524.

Additional tables and Figures

See Fig. 5; Tables 11 and 12.

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