

# Credit expansion, leverage, and banking distress: the puzzle of interwar Italy

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This study analyses the relationship between lending growth, leverage, and distress at the individual bank level for interwar Italy, which experienced remarkable credit expansion in the 1920s. Novel data from archival research based on banking supervision classified documents reveals a large, albeit forgotten, crisis. A puzzle emerges: regression analysis on individual bank balance sheets indicates that leverage and lending growth are not predictors of distress. Complementary indicators show that the features highlighted in the literature on leveraged credit booms do not apply to Italy. Italy's credit expansion was not a leverage-fuelled credit boom but a process of financial development.

## 1. Introduction <sup>1</sup>

Historical data show that credit growth is an effective predictor of banking crises: leverage is the main culprit (Schularick and Taylor 2012). At the macro-level, there is indeed a rich body of evidence on the credit-crisis nexus.<sup>2</sup> By contrast, scantier evidence is available on the relationship between lending growth and distress at the micro-level—especially in historical settings.<sup>3</sup> This lack might come as a surprise since post-Global Financial Crisis papers using individual bank balance sheets to predict distress abound.<sup>4</sup> The (few) papers available had to rely on indirect proxies of distress and are limited to contemporary banking crises.<sup>5</sup>

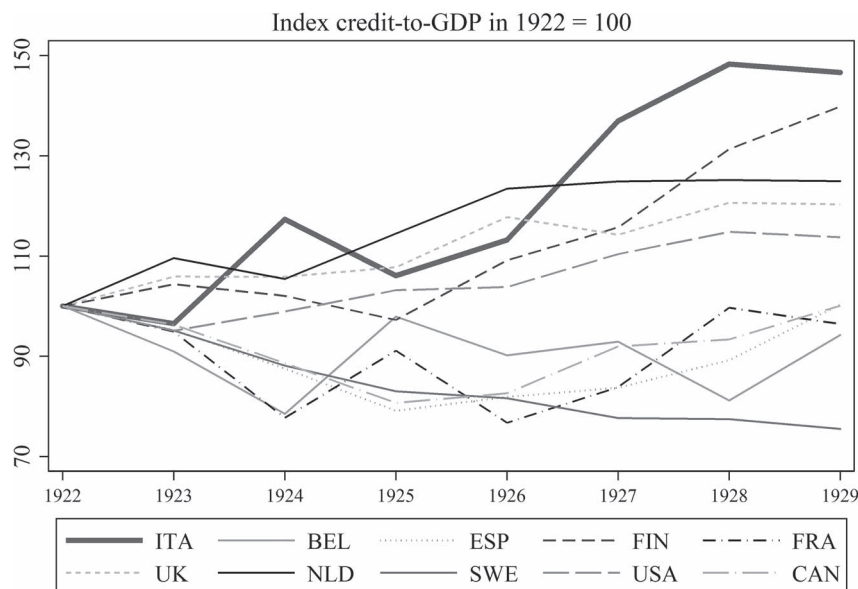
<sup>1</sup> The balance sheet data underlying this article were provided by the Bank of Italy by permission. Data will be shared on request to the corresponding author with permission of the Bank of Italy.

<sup>2</sup> Jordà *et al.* (2011); Gourinchas and Obstfeld (2012); Mendoza and Terrones (2012); Schularick and Taylor (2012); Borio (2014); Aikman *et al.* (2015); Boissay *et al.* (2016); Baron and Xiong (2017).

<sup>3</sup> Two papers do econometric estimates similar to this paper, but without focusing on credit and leverage. They employ fewer specifications of credit and leverage variables and consider more limited time spans. Colvin *et al.* (2015) focus on total assets and measure only 1-year growth. Grodecka-Messi *et al.* (2021) focus on leverage and measure only 3-year growth.

<sup>4</sup> Inter alia: Männasoo and Mayes (2009); Poghosyan and Čihák (2011); Fahlenbrach *et al.* (2012); Betz *et al.* (2014); Colvin *et al.* (2015); Cleary and Hebb (2016); Postel-Vinay (2016); Papanikolaou (2018); Baubeau *et al.* (2021); Grodecka-Messi *et al.* (2021).

<sup>5</sup> Igan and Pinheiro (2011) do not observe distress directly: the dependent variable is “distance to distress” proxied by bank z-scores. Fahlenbrach *et al.* (2012) find that banks with higher leverage and whose total assets grew more in the previous period had poor stock market performance in the 1998 and 2008 crisis. Jin *et al.* (2011) find that in the USA, credit growth in 2006/2007 was negatively associated with probability of distress in the 2008/2009 crisis, while growth in real estate loans was positively associated.



Sources: Author's own elaborations on Baubeau et al. 2021, Jordà et al. 2017, and Thomas and Dimsdale 2017

Figure 1. *Relative expansion of Italian credit-to-GDP ratio (1922–1929).*

Interwar Italy presents an excellent case study to study this matter, as it seems to fit the boom and bust macro-pattern perfectly. Italy had a robust expansion of bank credit relative to gross domestic product (GDP) in the 1920s (De Bonis et al. 2012; De Bonis and Silvestrini 2014) and experienced a banking crisis in the 1930s. In relative terms, this expansion was the strongest among Western countries: figure 1 shows that the Italian credit-to-GDP ratio in 1929 was almost 50% higher than in 1922, the year following the 1921 crisis. Furthermore, the wide availability of detailed macro- and micro-data makes it possible to understand the mechanisms underlying the credit-crisis macro-cycle<sup>6</sup>; these mechanisms are not yet fully understood. Italy can be used to test whether the well-established credit-crisis nexus holds at the individual bank level too. To do so, I rely on classified information from banking supervision sources to identify the distress of individual banks. Then, I employ historical micro-data to test econometrically whether leverage and credit growth are associated with bank distress. To the best of my knowledge, this is the first research that tests the credit-crisis hypothesis at the micro-level for a historical banking crisis. Surprisingly, data for interwar Italy show that while aggregate credit expansion is a good predictor of financial distress, this is not necessarily true at the individual bank level: distressed banks did not increase lending or leverage prior to the crisis.

<sup>6</sup> Detailed data are made available by the Bank of Italy, whose credit aggregates are directly underpinned by micro-data (Cotula et al. 1996; De Bonis et al. 2012; Natoli et al. 2016). This guarantees that comparing macro- and micro-trends is consistent. Banking micro-data used in this paper (Natoli et al. 2016) are the data underpinning the macro-aggregates reconstructed in De Bonis et al. (2012). The difference in publication years is due to the fact that the bank balance sheet data for 1890–1936 were collected by Cotula et al. (1996), but harmonised with post-WWII data only by Natoli et al. (2016). In turn, Cotula et al. (1996) is the backbone of the data employed in De Bonis et al. (2012) and De Bonis and Silvestrini (2014) to reconstruct the credit aggregates for the interwar period. These data are the credit aggregates used for Italy in Jordà et al. (2017) database.

This episode presents a puzzle. At the macro-level, previous research finds that credit booms and leverage are good predictors of banking crises. By contrast, at the micro-level, regression analysis on individual balance sheets of Italian banks fails to find an association between distress and soaring leverage and lending. How can this be explained? Using a wide range of indicators, I show that the Italian credit expansion did not have the characteristics of the average credit boom followed by a crisis. Instead, it had the features of financial development. In fact, financial access indicators such as branches per capita, real deposits per capita, and number of banks increased considerably in the 1920s, and Italy experienced a marked catch-up vis-à-vis more advanced economies. The case of interwar Italy presents some caveats for the interpretation of aggregate credit series. First, to properly understand the causes of banking crises, we should study whether the credit expansion happens at the extensive (more banks lend) or intensive (banks lend more) margin. Second, banking crises can follow financial development dynamics even when the role played by leverage is limited.

This paper provides a significant contribution to the economic history literature on interwar banking crises. To identify distress at the individual bank level, I conducted extensive archival research on hundreds of individual bank files at the Bank of Italy's banking supervision archives.<sup>7</sup> It revealed a hidden crisis of small and medium banks that previous research overlooked.<sup>8</sup> This crisis is comparable in magnitude to that experienced by commercial banks in the USA in 1929–1933. This new crisis is distinct from the well-known crisis of the big four large universal banks that Italy experienced when the international crisis hit in the 1930s.<sup>9</sup> The failure of the big four is the crisis considered in the literature looking at the recurrence of banking crises and their association with macro-series (Reinhart and Rogoff 2009; De Bonis and Silvestrini; Schularick and Taylor 2012). However, the big four played a marginal role in the credit expansion, while the other joint-stock banks played the lion's share.

The rest of this article is structured as follows. Section 2 reviews the relevant literature. Section 3 opens with a brief historical introduction and presents the evidence on Italian credit expansion in the 1920s. In this section, I argue that Italy in the 1920s lacked most of the features that literature usually finds associated with leveraged bad credit booms. By contrast, it shows that we can better understand the expansion in credit-to-GDP ratio as a process of financial development. Section 4 presents the data and documents the reconstruction of a new variable of bank distress for Italian joint-stock banks using classified archival documents from the Bank of Italy's banking supervision. Section 5 uses the newly constructed variable to test the hypothesis that lending growth and leverage are associated with distress at the individual bank level. Section 6 concludes by summarising the results and stressing the importance of considering whether a credit expansion happens at the extensive or at the intensive margin. It also paves the way for future research.

<sup>7</sup> *Archivio Storico della Banca d'Italia*, see Section 4.

<sup>8</sup> Italian scholarship acknowledges that some minor banks failed (e.g., Toniolo 1995) but does not appreciate the severity of the crisis. Non-Italian scholarship completely ignores the distress of smaller banks.

<sup>9</sup> The big four are Banca Commerciale Italiana, Credito Italiano, Banco di Roma, and Banca Nazionale di Credito (until 1921 Banca Italiana di Sconto). These banks were joint-stock banks, but to distinguish them from the rest of the joint-stock banks, I henceforth will refer to them as the big four. All remaining joint-stock banks are the other joint-stock banks. On the crisis of the big four, see Barbiellini-Amidei and Giordano (2015), Battilossi (2009), and Toniolo (1978, 1995).

## 2. Literature review

This paper fills a gap in the literature on interwar banking crises in Europe, which has considerably grown since the Global Financial Crisis (Accominotti, 2012; Accominotti and Eichengreen 2016; Adalet 2009a, 2009b; Baubeau *et al.* 2021; Bonhoure *et al.* 2021; Colvin *et al.* 2015; Colvin 2017; Jorge-Sotelo 2020; Lönnborg *et al.* 2011; Macher 2019, Monnet *et al.* 2021). A classic wave of research had focused on large universal banks and their inherent maturity mismatch due to financing industries, as well as on international capital flows and monetary instability.<sup>10</sup> A new wave of economic history research led to reinterpreting the experience of several countries that we previously thought did not have serious banking problems—in particular, the works of Accominotti (2012) on the UK, Macher (2019) on Hungary, Baubeau *et al.* (2021) on France, and Jorge-Sotelo (2020) on Spain. Schnabel (2004) had already advanced a reappraisal of banking problems in Germany's crisis following the literature on twin crises (Kaminsky and Reinhart 1999). The new wave missed Italy, which is unfortunate since it is a major European country with a financial system that heavily relied on banks.

Second, it contributes to the literature on credit booms and banking crises by reconciling the macro-picture (aggregate credit growth and banking crises) with the micro-picture (lending expansion and distress at individual bank level). Research on the relationship between credit expansions and banking crises at the macro-level abounds. Another legacy of the Global Financial Crisis is the lesson that credit and leverage matter, and (unsurprisingly) this idea has entered the policy debate. Using the new macro-history database, Jordà *et al.* (2011) and Schularick and Taylor (2012) show that rapid bank credit growth is the best predictor of banking crises and subsequent GDP contractions.<sup>11</sup> It does not mean that all credit booms turn into crises, but we should distinguish between “good” and “bad” booms (Dell’Ariccia *et al.* 2016). Credit booms leading to banking crises are often associated with external imbalances (Kaminsky and Reinhart 1999; Mendoza and Terrones 2008; Catão and Milesi-Ferretti 2014). Gorton and Ordóñez (2020) argue that, on average, prolonged productivity growth is not a feature of credit booms leading to crises. Jordà *et al.* (2015a) find that credit expansions become detrimental when they fuel leveraged asset price bubbles, particularly housing bubbles fostered by mortgage credit (Jordà *et al.* 2015b; Jordà *et al.* 2016; Dell’Ariccia *et al.* 2020). The credit boom interpretation of banking crises has flourished, and initial findings have been widely confirmed (Gourinchas and Obstfeld 2012; Mendoza and Terrones 2012; Borio, 2014; Aikman *et al.* 2015; Boissay *et al.* 2016; Baron and Xiong 2017).<sup>12</sup> One critical perspective is that of Bordo (2018). He does not deny the link between credit-driven assets price booms and banking crises altogether. However, he uses a narrative approach to argue that banking crises are heterogeneous: applying a one-size-fits-all model can mislead policy decisions. Furthermore, a recent paper by Jordà *et al.* (2021) has found

<sup>10</sup> See the contributions by James *et al.* (1991), Cottrell *et al.* (1992), and Feinstein (1995), and in the special issue “Banks and industry in the interwar period” of the *Journal of European Economic History*, 1984, 3/2 (AA.VV. 1984). For more recent contributions on the problems of universal banks in Italy, see Battilossi (2009) and Brambilla (2012).

<sup>11</sup> The micro-history database was made available to the public in Jordà *et al.* (2017).

<sup>12</sup> These studies are conducted at the macro-level using cross-countries comparisons and time series. Financial crises are defined as binary [0; 1] variables that take place in year “x” based on qualitative narrative and/or crashes in the price of financial assets. “Credit” is defined as total credit in the system and enters the regression as ratio to GDP, credit per capita, or real credit.

that the aggregate capitalisation (the inverse of leverage) of banking system is a poor predictor of banking crises.

Economic history of interwar banking crises and economics literature on credit booms have found common ground in the study of the 1920s. The interpretation of the Great Depression as a credit boom gone wrong was already implicit in [Kindleberger \(1973, 1978\)](#), was formally advanced by [Eichengreen and Mitchener \(2004\)](#), and was recently restated for the USA by [Postel-Vinay \(2022\)](#). Recent research shows that the strategies of Chicago banks in the 1920s explain well their distress in the 1930s and reappraise the role of mortgage credit in the building up of the crisis ([Postel-Vinay 2016, 2017](#)). Remarkably, [Postel-Vinay \(2016\)](#) shows that liquidity, rather than leverage, was the main problem of Chicago banks. Understanding the 1920s is thus crucial to correctly interpret banking dynamics in the 1930s. So far, works proposing the interpretation of the Great Depression as a credit boom gone wrong focused on the USA or cross-country comparisons: we miss studies on other individual countries to validate this hypothesis further. [De Bonis and Silvestrini \(2014\)](#) find that the credit-crisis nexus holds well in 150 years of Italian history. In two seminal papers on credit booms, [Eichengreen and Mitchener \(2004\)](#) and [Schularick and Taylor \(2012\)](#) suggest that credit dynamics in interwar Italy could be a credit boom. Thus, Italy seems tailored for the purpose.

To understand whether Italy experienced a credit boom leading to a banking crisis, however, we also need to consider a distinct strand of literature, that on financial development and the finance-growth nexus.<sup>13</sup> In this literature, developed in parallel to that on the credit-crisis nexus ([Wachtel, 2018](#)), the ratio of credit to GDP is used as a proxy for financial deepening, one of the dimensions of financial development. [Loayza et al. \(2018\)](#) suggest that financial deepening entails a trade-off between growth and crises: financial deepening fosters growth, but it also increases the probability of crises. At the same time, this trade-off may be non-linear. According to [Sahay et al. \(2015, p. 5\)](#), “the pace of financial development matters. When it proceeds too fast, deepening financial institutions can lead to economic and financial instability”, and they suggest that a “plausible reason is that faster growth of institutions is accompanied by greater risk-taking and high leverage, particularly when the financial system is poorly regulated and supervised” ([Sahay et al. 2015, p. 23](#)).

Recent literature on finance-growth nexus has stressed the importance of extending the scope of financial development beyond just financial deepening. International policy institutions such as the World Banks ([Čihák et al. 2013](#)) and the International Monetary Fund ([Sahay et al. 2015](#)) have urged to include diverse measures of financial development that include (a) financial access and (b) financial efficiency.<sup>14</sup> Financial access is found to be generally positive for both growth ([World Bank 2008](#)) and stability ([Han and Melecký 2013](#)). However, there are exceptions: according to the World Bank’s World Development Report 2014 (2013, p. 212), “Prudent financial inclusion can enhance financial stability but, if excessive, can weaken it”; for example, predatory lending to weak economic agents in the

<sup>13</sup> For an overview on this vast literature, see [Levine \(2005\)](#) and [Paşalı \(2013\)](#).

<sup>14</sup> In fact, it suggests financial stability as an additional measure of financial development, but this is tautological in the context of this paper. Suggested measures of financial access are as follows: current accounts per thousand adults, bank branches per 100,000 people, percentage of people with a bank account, percentage of firms with line of credit, and percentage of small firms with line of credit. Suggested measures of financial efficiency are as follows: net interest margin, lending-deposits spread, non-interest income to total income, overhead costs (percentage of total assets), profitability (return on assets, return on equity), and Boone indicator (or Herfindahl or H-statistics). These variables measure development of financial intermediaries; there is a different set of variables for financial markets. While financial efficiency is difficult to measure in historical perspective due to unavailable data on interest rates at the micro-level, historical data on banking facilities are more accessible.

US mortgage market played an important role in the 2007/2009 crisis. Furthermore, there is evidence that access to people lacking the required financial literacy has repercussions on financial stability (Klapper *et al.* 2013).

The issue of financial development deserves attention because the structure of the Italian banking system went through considerable changes in the 1920s and the structure of a banking system can have important repercussions in terms of financial stability. If new banks enter the market and/or existing banks expand their network of branches, the degree of concentration of the system changes, and new banks may be initially too small to properly diversify their lending portfolio. There is a vast empirical and theoretical literature on how the concentration of the system<sup>15</sup> and the size of banks, when it reflects the degree of diversification<sup>16</sup> (Winton 1997; Goetz *et al.* 2016), can both contribute to financial stability, and vice versa. It is therefore imperative to understand the changes of the Italian banking system in the 1920s and whether these made the system more or less prone to distress.

### 3. Historical context: credit boom or financial development?

The history of the Italian banking system during the Great Depression is mostly renown for the failure and secret rescue of its four largest universal banks in 1930–1934 (Toniolo 1978, 1995; Battilossi 2009; Feinstein *et al.* 2010).<sup>17</sup> When liquidity problems emerged in the early 1930s, the government could not let these banks fail, as these had become systemic for the whole industrial system. Italian public authorities took advantage of the nature of fascist dictatorship; the rescues were carried out secretly and arranged ad hoc for each bank, even though they followed similar lines.

Until recently, the rest of the banking system received little attention, though available evidence already suggested a substantial expansion in the 1920s.<sup>18</sup> Figure 2 shows that between World War I (WWI) and the Great Depression, Italy experienced a sustained growth of its credit-to-GDP ratio. Its pace was comparable to that of the USA (figure 3), which previous studies consider having experienced a credit boom in the 1920s (Eichengreen and Mitchener 2004; Gorton and Ordonez 2020; Postel-Vinay, 2022). However, figure 2 also shows that not all categories of banks contributed equally to this expansion.<sup>19</sup> After the post-WWI crisis, the big four gave way to the other joint-stock banks, which contributed the most to this credit expansion. Cooperative joint-stock banks and saving banks also grew considerably, but unlike other joint-stock banks, their weight in 1928 was still behind the pre-WWI level. Even though previous research has focused exclusively on the big four, we should not overlook the rest of the banking system. The other joint-stock banks played the lion's share in the credit

<sup>15</sup> For a review of this vast literature, see Carletti and Hartmann (2003) and Berger *et al.* (2017).

<sup>16</sup> For a review of this vast literature, see Winton (1997) and Goetz *et al.* (2016).

<sup>17</sup> Universal banks already experienced problems in the early 1920s following the post-WWI crisis. In 1921, Banca di Sconto became insolvent and was reorganised as Banca Nazionale di Credito under the supervision of the Bank of Italy. Banco di Roma was bailed-out by the government in 1923.

<sup>18</sup> Molteni (2020, 2021a) give a more comprehensive view of banking distress in Italy, especially with respect to small and medium banks. These works also provide a detailed overview of the institutional setting of Italian banking system in the interwar period, which therefore is omitted here.

<sup>19</sup> The contribution of the big four to this expansion was not substantial. None of the four banks expanded their lending faster than GDP growth in the 1920s, and even Banca Commerciale Italiana did not contribute much to the credit-to-GDP ratio, although it expanded the most. Remarkably, even considering their total assets, the picture does not change. See online appendix Figure A2.



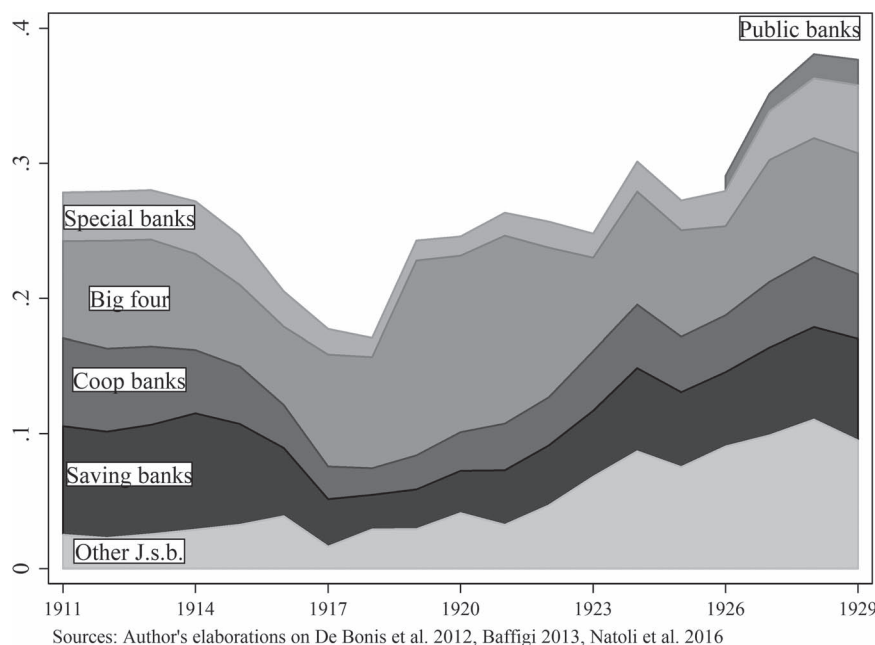


Figure 2. Credit-to-GDP ratio by bank category: 1911–1929.

expansion, and the crisis stroke them: as shown in Section 4—in parallel with the problems of the big four—Italy experienced another banking crisis in the late 1920s/early 1930s.<sup>20</sup>

Section 2 stressed that rising credit-to-GDP ratio can be interpreted as both a leveraged credit boom or a process of financial deepening, one of the dimensions of financial development. In the light of this consideration, we cannot rule out that the rising credit-to-GDP ratio we observe is not a classic bad boom followed by a crisis, but rather a process of financial development. Thus, it is worth looking at the macro-economic context of the 1920s in Italy, and considering whether the features that previous research usually find associated with classic bad credit booms are present or not. As discussed in Section 2, these features are (a) rising aggregate leverage, (b) bubbles in the real estate sector fuelled by credit, (c) bubbles in the stock market fuelled by credit, (d) fading productivity growth in the later stage of the boom, (e) currency crises, and (f) external imbalances due to short-term capital flights. Therefore, I assemble a set of annual indicators to check whether these features are present (table 1).

Historical real estate prices for Italy are not available before 1927, but the mortgage-to-GDP ratio hints that a leveraged housing bubble was not an issue. This indicator went from 1.24% in 1919 to 2.17% in 1929, and this increase cannot be due to joint-stock banks. In interwar Italy, mortgage lending was a prerogative of saving banks and special real estate banks (*Istituti di Credito Fondiario*), which were remarkably stable in this period. We do not observe a single case of distress in this group of banks in the 1930s. The stock market index peaked in 1924 but then entered a declining trend in the late 1920s: there was no bubble

<sup>20</sup> Ex post, one could say that, perhaps, it was historically inaccurate to regress the systemic crisis of the big four on past credit expansion. But since these two crises were parallel, all these econometrics exercises are fully valid.

Table 1. *Credit booms indicators 1911–1936*

	Credit- to-GDP ratio	Mortgage- to-GDP ratio	Stock market index (1928 = 100)	Total factor productivity growth	Labour productivity growth	Correspondent accounts (liabilities) of main banks, million Lire (annual averages)	Banks' contribution to the balance of payment, million Lire (KA account)	Capital ratio of joint- stock banks	Capital ratio non-financial joint-stock companies
1911	27.4%	3.80%	90.3	1.52%	1.12%			15.5%	53.7%
1912	27.5%	3.72%	92.6	1.53%	0.11%			18.1%	53.8%
1913	27.6%	3.53%	87.2	2.53%	2.51%			17.9%	52.4%
1914	26.8%	3.79%	82.9	–5.92%	–6.19%			16.2%	51.8%
1915	24.2%	3.41%	61.2					15.7%	49.2%
1916	20.2%	2.31%	70.5					16.9%	44.7%
1917	17.5%	1.63%	100.4					15.3%	40.6%
1918	16.8%	1.20%	96.9					13.3%	43.4%
1919	24.2%	1.24%	87.6	–3.38%	–7.97%			9.9%	45.8%
1920	25.0%	0.95%	70.2	4.57%	0.90%	2088.56	1625	10.6%	41.4%
1921	26.8%	1.06%	56.2	–1.79%	–1.63%	3614.70	1394	10.2%	43.3%
1922	26.1%	1.14%	64.0	6.83%	5.67%	3194.39	1006	11.3%	42.6%
1923	25.2%	1.23%	76.0	9.19%	9.18%	2999.26	–783	11.9%	45.3%
1924	30.6%	1.36%	115.9	2.11%	0.12%	2889.15	–332	9.0%	46.1%
1925	27.7%	1.44%	108.9	7.67%	5.52%	3094.79	356	9.7%	45.2%
1926	29.6%	1.53%	74.0	–1.79%	–0.57%	2195.34	–724		45.3%
1927	35.8%	1.87%	87.2	–4.52%	–3.34%	1841.71	–230	10.8%	46.3%
1928	38.7%	1.99%	100.0	5.72%	6.33%	1417.71	–592	10.3%	46.8%
1929	38.3%	2.17%	87.2	3.83%	4.38%	1249.03	–206	12.0%	45.5%
1930	43.2%	2.58%	68.6	–6.54%	–4.42%		73	12.5%	46.6%
1931	45.2%	2.95%	45.7	–3.69%	0.16%			14.3%	46.1%
1932	48.1%	3.18%	42.6	–0.33%	4.59%			15.0%	46.0%
1933	54.8%	3.18%	54.3	–1.35%	–0.96%			15.0%	46.8%
1934	53.4%	3.11%	59.3	–0.58%	–0.72%			14.8%	46.6%
1935	46.0%	2.77%	63.2	2.90%	3.67%			14.8%	44.6%
1936	47.5%	2.77%	79.5	–6.11%	–4.31%			14.2%	44.6%
Sources:	Jordà <i>et al.</i> (2017)	Jordà <i>et al.</i> (2017)	Jordà <i>et al.</i> (2017)	Giordano and Zollino (2020)	Giordano and Zollino (2020)	Falco (1996)	Falco (1996)	Natoli <i>et al.</i> (2016)	Imita.db, <a href="http://imitadb.unisi.it">http://imitadb.unisi.it</a>



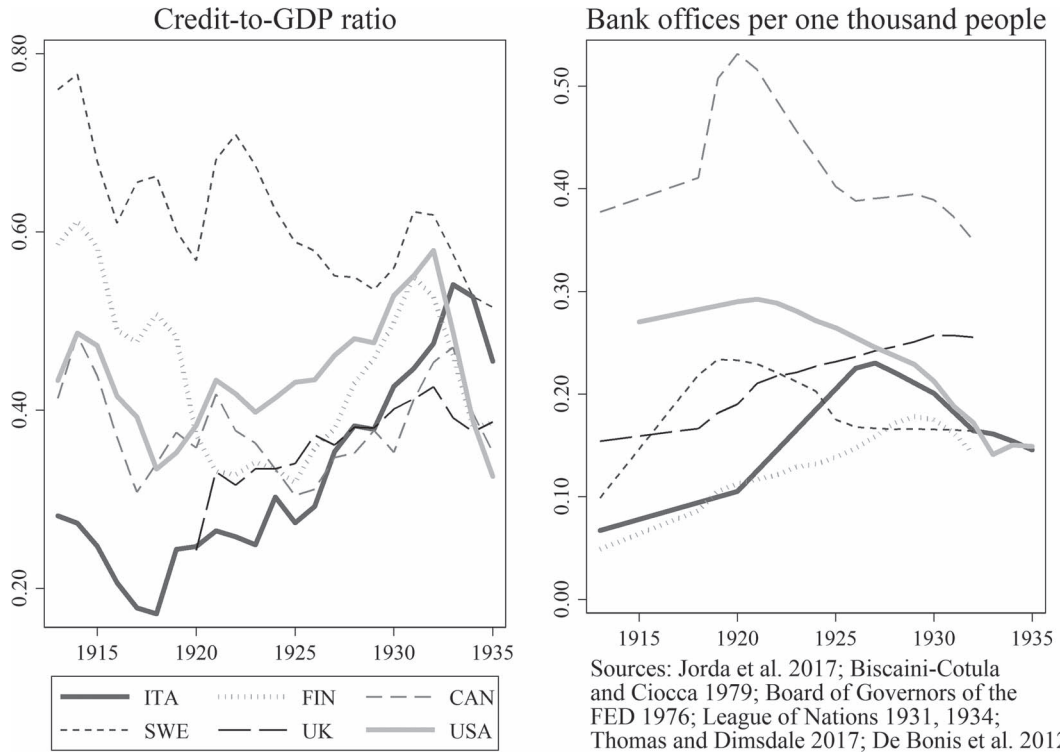


Figure 3. *Financial development in international comparison: deepening versus access.*

before the 1930s. Productivity growth (measured as Total Factor Productivity and Labour Productivity) was strong in the early 1920s, and after a hiccup in 1926–1927, it was still solid in 1928–1929.<sup>21</sup> There were no currency crises in the early 1930s: it is well-known that the fascist regime’s stubborn adherence to the gold standard made sure that Italy’s commitment to parity was never in question until the Ethiopian war of 1935. Unlike Germany, Italy did not experience a bonanza of short-term capital in the second half of the 1920s. Since summer 1925, the regime passed a series of measures to discourage short-term capital movements, considered destabilising for the “Battle of the Lira” and the return to the gold standard (Falco 1996). Even though it is difficult to measure them, available evidence suggests that foreign short-term capital to the banking sector decreased in the second half of the 1920s. Correspondent accounts balance of the big four was in decline since the mid-1920s, and available estimates of the Italian capital account show that, overall, banks exported more capital than they imported (Falco 1996). Finally, using data from *Archivio Storico del Credito in Italia* (ASCI) and IMITA.db (Vasta 2006), it is possible to calculate the aggregate leverage of Italian banks and joint-stock companies in the 1920s.<sup>22</sup> Neither of the two indicators shows

<sup>21</sup> The slowdown in 1926/1927 should be imputed to an abrupt policy change that favoured protectionism and heavy industries by the fascist regime, and not to endogenous factors (Giordano and Giugliano 2015).

<sup>22</sup> It is important to consider “the other side of the lending contract”: aggregate leverage can also be determined by firms accumulating too much debt.

Table 2. *Financial interrelation ratio 1913–1939*

Country	1913	1929	1939
Italy	0.47	0.68	0.73
India	0.34	0.3	0.38
France	0.98	0.81	
Belgium	0.9	0.82	0.98
Japan	0.64	1.23	1.42
Norway	0.72	1.03	0.74
USA	0.83	1.29	1.32
Germany	0.76	0.39	0.56
Denmark	1.41	1.55	1.26
Switzerland	1.5	1.65	1.59
Great Britain	1.96	2.45	2.7
Russia/USSR	0.4	0.09	0.28
South Africa	0.52	0.69	0.92

Source: [Goldsmith \(1985\)](#)

an increase over this period. If anything, the leverage decreases. Therefore, the features of a classic bad credit boom are not present in 1920s Italy.

A comparative perspective supports the hypothesis that the fast increase in credit-to-GDP ratio could be interpreted as catching up in financial development rather than a leveraged boom. In the 1920s, manufacturing marked a robust catch-up vis-à-vis more advanced European economies such as Germany, UK, and France ([Carreras and Felice 2012](#)). The picture looks similar considering another measure of financial deepening, Goldsmith's Financial Interrelation Ratio,<sup>23</sup> which “measures the relative size of an economy's financial superstructure” ([Goldsmith 1985](#), p. 43). Italy, being close to India before WWI, almost caught up with France and Belgium by the end of the 1920s ([table 2](#)).

A similar trend emerges by looking at the credit-to-GDP ratio in international comparison ([figure 3](#)).<sup>24</sup> The ratio of credit to GDP shows Italy lagging behind other Western countries at least until the 1930s, but it strongly accelerated in the 1920s, before contracting due to the international crisis and WWII. Bank offices per thousand people, which measure financial access and inclusion rather than financial deepening, are an additional indicator of financial development to be considered in a comparative perspective.<sup>25</sup> In [figure 3](#), starting from a level similar to Finland after WWI, Italy almost managed to catch up with the two most advanced economies, the USA and the UK, by 1926. Afterwards, during the crisis years, the number of banking facilities contracted steadily similarly to the USA. Mutatis mutandis, it is interesting to compare Italy to the USA, as the credit-to-GDP ratio grows markedly in both countries.

<sup>23</sup> The FIR is the ratio of all financial assets to tangible assets. Comparing the figures for FIR and credit-to-GDP for Great Britain shows the importance of looking at multiple indicators of financial deepening in assessing a country's financial development stage.

<sup>24</sup> Credit-to-GDP data displayed only for countries for which bank offices per capita is available.

<sup>25</sup> Bank office data are unfortunately available only for a limited sample of countries and come with some important limitations: Data for Sweden, Finland, Canada, and UK refer only to commercial banks. Data for USA and Italy are instead directly comparable because they include all kind of bank offices but rural mutual cooperatives. This creates a bias in the levels, but not in the trend—which is the important point for the convergence argument. For example, based on the data, one can conclude that Italy converged with respect to Sweden, but cannot conclude that it overtook it.

The USA experienced a credit expansion, but the level of banking facilities per capita, already high, did not rise further. The credit expansion in Italy, instead, was also accompanied by the sustained growth of banking facilities, signalling that a process of financial development through financial inclusions was underway. Therefore, looking at the credit-to-GDP ratio of Italy and the USA, the story looks similar, although the two underlying processes were possibly different.

For Italy, the 1920s was a period of high growth and modernisation, with the industry overtaking agriculture in terms of value added for the first time in 1929 (Baffigi 2013). It should not surprise that the strong economic expansion Italy had in the 1920s was matched by an analogous movement of its financial system.

The rapid growth of manufacturing created a demand for financial services, given the high capital intensity of the industries that characterised this expansion. In fact, according to Carreras and Felice (2012), the share of traditional manufacturing in the value added declined from 55% to 45% and was matched by the rise of advanced manufactures, engineering, chemicals, and rubber industries. In a country where the role played by the securities market was secondary (Baia Curioni, 1995), industrial development indeed required additional credit from banks. Total assets of both banks and firms increased dramatically. However, a high level of fresh capital investments in old and new companies characterised the 1920s—which explains why the capital-to-assets ratio did not decrease. Overall, according to Confalonieri (1994), the paid-up capital of Italian joint-stock companies (excluding banks and financial corporations) went from 14.495 million Lire in 1920 to 48.760 in 1928.<sup>26</sup>

The Italian banking system, quite backward at the turn of the century, started a process of development in the two decades that preceded WWI (Polsi 2000; La Francesca 2004; Carnevali 2005). But WWI and its aftermath represented a clear discontinuity and acceleration of this process. The 1920s was the period in which many Italian people, especially the small and middle class, were reached by banking services for the very first time (De Cecco 1986). Available measures of financial access are widely consistent with this hypothesis. Real deposits per capita and the number of accounts at saving banks were on the rise (table 3). According to the reconstruction made by Biscaini Cotula and Ciocca (1979), the expansion that took place between the end of WWI and 1926 is truly impressive. The number of bank offices increased from 4,227 in 1912 to 6,012 in 1920 and to 11,444 in 1926. In the same intervals, the number of bank employees went from 47,095 to 64,139 and then to 92,919. According to Segre (1926) and Mazzantini (1946), in 1918, there were only 1,865 Italian municipalities served by banks.<sup>27</sup> According to Biscaini-Cotula and Ciocca's calculations, in 1926, this number had skyrocketed to 5,000. However, this expansion was short lived: by 1936, all these figures had contracted sharply. Remarkably, we need to wait until the 1970s to see a number of bank offices and cities with banking facilities comparable to the 1926 peak.

While the decrease in active banks may be explained with a healthy process of banking concentration, the contraction in branches and cities with banking services casts a shadow over the rationality and sustainability of the process Italy went through the post-WWI years. Studying which municipalities had been banked and which were not, Mazzantini (1928) noted that the expansion was not carried out in an ordered and rational manner, as some large municipalities remained unbanked, whereas tiny ones had even multiple banks. This was

<sup>26</sup> This includes both listed and non-listed firms. Therefore, the increase is real and is not an artificial effect of existing companies going public.

<sup>27</sup> These figures do not consider municipalities annexed after WWI, but their number is not large enough to significantly affect the impressive rise.

Table 3. *Financial development indicators 1911–1936*

	Total assets of non-financial joint-stock companies, billion Lire	Number of ordinary joint-stock banks	Bank offices per thousand capita	Bank accounts at saving banks	Real deposits per capita (deflated with 1913 CPI), Lire	Deposits per capita (nominal) Lire	Concentration of joint-stock bank total assets (Herfindahl–Hirschman index)
1911	6.69	178		2,307,408	184.3	182.3	0.162
1912	6.85	193		2,363,832	186.9	186.5	0.172
1913	7.48	188	0.067	2,438,108	195.5	195.5	0.175
1914	7.57	192		2,473,216	194.0	194.0	0.155
1915	8.75	195			199.5	213.5	0.157
1916	10.30	201			196.7	263.3	0.175
1917	13.70	203			186.9	354.1	0.200
1918	17.30	219			190.4	502.9	0.196
1919	21.20	238		2,932,477	283.2	759.3	0.185
1920	30.30	249	0.105	3,205,602	269.8	950.7	0.169
1921	35.00	269		3,227,765	264.5	1,102.3	0.150
1922	36.20	306		3,372,480	264.3	1,095.1	0.126
1923	34.30	343		3,503,372	287.6	1,184.7	0.144
1924	41.00	390		3,680,370	309.6	1,320.0	0.109
1925	53.80	414		4,169,365	291.7	1,397.2	0.101
1926	66.00	416	0.225	4,324,244	289.3	1,495.0	
1927	72.70	427	0.230	4,429,506	343.4	1,622.1	0.106
1928	75.10	358	0.221	4,658,152	382.6	1,675.2	0.096
1929	86.90	339		4,841,224	372.5	1,656.8	0.103
1930	85.40	307	0.201	5,037,858	385.4	1,659.8	0.135
1931	86.40	297		5,190,772	401.6	1,562.5	0.144
1932	82.10	274	0.164	5,336,327	409.0	1,549.8	0.155
1933	80.00	259	0.161	5,447,004	420.1	1,497.5	0.157
1934	74.60	253	0.154		426.2	1,400.9	0.150
1935	78.30	246	0.146		373.8	1,281.8	0.156
1936	85.20	246			403.7	1,488.7	0.153
Sources:	Imita.db, <a href="http://imitadb.unisi.it">http://imitadb.unisi.it</a>	Cotula <i>et al.</i> (1996)	Biscaini Cotula and Ciocca (1979)	Rapporto al 3° Congresso Internazionale del Risparmio (1935)	JST (2017) and Jordà <i>et al.</i> (2021)	JST (2017) and Jordà <i>et al.</i> (2021)	Natoli <i>et al.</i> (2016)

particularly true for branched banks: most of the small municipalities banked were serviced by bank branches rather than by local independent banks. In 1928, according to the head of banking supervision, Niccolò Introna, licences to open new branches in smaller centres had to be limited, and if possible, avoided.<sup>28</sup>

<sup>28</sup> Handwritten note (July 1928?) in Archivio Storico Banca d'Italia, Banca d'Italia, Vigilanza, prat.1285, fasc.1

In this period, the number of banks increased sharply. Between 1920 and 1926, the total number of banks went from 3601 to 4657 (Biscaini Cotula and Ciocca 1979).<sup>29</sup> Considering only ordinary joint-stock banks, these were 192 before WWI, 219 in 1918, 343 in 1923, and reached a peak of 427 in 1927 (table 3). With all these new banks entering the market in the early 1920s, it is not difficult to make sense of the findings of De Bonis *et al.* (2018) that banking competition reached a historical peak in the 1920s. Polsi (2000) highlights that whereas a process of concentration had started before WWI, this was reversed after WWI and the collapse of the Banca di Sconto in 1921, this dynamic being evident looking at the concentration of total assets measured with the Herfindahl index for joint-stock banks (table 3). This is remarkable because, according to the League of Nations (1931), the general trend in Western countries for the post WWI era was one of increasing concentration.

#### 4. Data and new distress variable

To study whether there is an association between credit expansion fuelled by leverage and distress at the micro-level, we need (1) balance sheet information on individual banks and (2) indicators of whether these banks experienced distress or not. While historical balance sheets for a large and representative sample of joint-stock banks are available, reconstructing the variable “distress” is one of this paper’s contributions.

Individual balance sheets come from ASCI (Natoli *et al.* 2016), a dataset of bank balance sheets made available by the Bank of Italy for 1890–1974. For joint-stock banks, only the December balance sheets are available in ASCI for the period in question. The sample of banks present in ASCI varies over time. Despite these being public available balance sheets, a comparison with secret supervision balance sheets support their use for econometrics analysis.<sup>30</sup> Furthermore, the unevenness in availability of balance sheets should not be interpreted as banks publicising balance sheets only when they were in good conditions.<sup>31</sup> The representativeness increases after the completion of the first official register of credit institutions in spring 1928.<sup>32</sup> From 1929 onwards, however, the format of balance sheets became more succinct, showing fewer and more aggregated items. Balance sheets in December 1928 are the best in terms of representativeness and information available and conveniently refer to the last year before the onset of the international crisis. The year 1928 is also the peak of the other joint-stock banks’ credit cycle in terms of the credit-to-GDP ratio (figure 2). Therefore, even though the ASCI dataset has a panel structure, the econometric model is

<sup>29</sup> These figures include all kinds of banks: saving banks, mutual cooperatives, private bankers, cooperative joint-stock banks, and ordinary joint-stock banks.

<sup>30</sup> For a thorough discussion on the reliability of ASCI balance sheets, see Molteni (2021b).

<sup>31</sup> By law, every month all banks had to submit their accounting reports to the local tribunal where their headquarters was registered. These reports were available to the public. The Ministry of the National Economy then asked banks to send them a copy of these reports for publication in June and December. The Ministry did not have any supervision function in these reports. Since the local depositants had already direct access to monthly reports, there would be no incentive for banks to not submit a balance sheet in December for the reason of hiding something.

<sup>32</sup> The coverage of ASCI on total joint-stock banks population is 89% in 1928, 72% in 1927, 5% in 1926, 80% in 1925, 76% in 1924, 60% in 1923, 72% in 1922, 60% in 1921, and 71% in 1920. The official register of credit institutions was introduced by the 1926 banking law. For a full discussion on the 1926 banking law, see Molteni and Pellegrino (2021, 2022). The drop in representativity in 1926 is due to a technical bureaucratic issue. The introduction of the law, which mandated the introduction of a new supervision accounting report, created confusion between the Ministry of Finance and the Ministry of National Economy, and the main source on which ASCI is based was not published in 1926.

estimated on a cross-section of bank balance sheets at December 1928. Since the balance sheets format changed from 1929 onwards, some control variables cannot be used in a panel estimation. Given the research question, endogeneity should not be a major concern, since I am not making causality claims. However, using a cross-section of balance sheets at December 1928 also mitigates endogeneity issues. Despite the problems that the Italian banking system already had, the Great Depression was a crisis “imported” from abroad and thus can be considered an exogenous shock.<sup>33</sup>

Surprisingly, we do not have a complete account of which (nor how many) banks experienced distress in Italy during the Great Depression. Therefore, I use the information from the banking supervision documents at the Bank of Italy’s historical archives to classify all joint-stock banks present in Natoli *et al.* (2016) as distressed or non-distressed.<sup>34</sup> The source used to classify banks becomes available from January 1927, after establishing banking supervision in December 1926: I classify all banks that experienced distress from this date until December 1936.<sup>35</sup> In ASBI, 381 joint-stock banks appear at least 1 year in 1927–1936. For four banks, the source does not allow me to establish whether the bank was distressed or not. Of the remaining 377, I classify 193 as non-distressed and 184 as distressed.<sup>36</sup> Distressed joint-stock banks represented ca. 47% of total deposits of the banking system. If we exclude the big four universal banks from the numerator, this number is still a remarkable 15% (columns D and C in table 4).

Since the documents used to identify distress were classified, the new variable not only considers outright failures but also hidden distress resolved behind the doors. From this archival work, it emerges that Italian public authorities had an active policy of resolving distressed banks so that these did not have to file for bankruptcy. Like in other similar studies (Colvin *et al.* 2015; Postel-Vinay 2016; Grodecka-Messi *et al.* 2021), distress is defined *ex post*: it is the outcome that allows us to identify whether a bank is distressed or not. I classify the following outcomes as distress: (a) bankruptcies (i.e., in the Italian legal context, companies put into receivership); (b) dissolved companies where most of paid-up capital is lost<sup>37</sup>; (c) mergers taking place to avoid (a) or (b); and (d) resolution actions requiring money injections from third parties.<sup>38</sup> Dissolved companies that reimburse most paid-up capital to shareholders and mergers reflecting healthy market consolidation are not considered distressed.

In the case of bankruptcies, the timing of distress is relatively straightforward. By contrast, it is challenging to find a consistent estimate for the timing of resolution interventions because rescues were organised *ad hoc* and through different legal devices. For the sake of consistency,

<sup>33</sup> Colvin *et al.* (2015) and Grodecka-Messi *et al.* (2021) adopt the same approach.

<sup>34</sup> This research is based on the reading of hundreds of individual bank files at *Archivio Storico della Banca d'Italia* (ASBI) in Rome. For a detailed description of the documents available in ASBI, see Molteni (2020). The three main archival series consulted for this work are ASBI, Banca d'Italia, *Vigilanza sulle Aziende di Credito*, various *pratiche*; ASBI, Banca d'Italia, *Sconti*, various *pratiche*; and ASBI, *Ispettorato del Credito*, *Ispettorato del Credito*, various *pratiche*. A thorough discussion on how the distress variable is reconstructed is available in Molteni (2021a).

<sup>35</sup> In 1936, a new banking law was enacted, and 1937 is the year Italy recovered its 1929 GDP level.

<sup>36</sup> Branches of foreign banks are not included. For an overview on how distressed banks differed from non-distressed banks, see Table A1 in the online appendix. Descriptive statistics refer to the representative sample of 204 banks used to estimate the econometric model.

<sup>37</sup> The cut-off is arbitrarily put at 50%, but the dataset has two additional variables using a threshold of 0% and 100%.

<sup>38</sup> I.e., by the government, another bank, or new investors.



Table 4. *A quantitative look at banking crises in Italy and the USA 1927–1936*

Year	Italy										USA			
	Total bank deposits. (all categories of banks)	Bankrupt joint-stock bank deposits in ASCI	Distressed joint-stock bank deposits in ASCI (excluding big four)		Distressed joint-stock bank deposits in ASCI (including big four)		Total bank deposits (national, state, and mutual savings banks)	Failed (suspended) commercial bank deposits (national banks and state banks)						
	[a] Million Lire	[b] Million Lire	[b] / [a]	[c] Million Lire	[c]/[a]	[d] Million Lire	[d]/[a]	[e] Million \$	[f] Million \$	[f]/[e]				
1927	60,073.5	303.5	0.51%	509.6	0.85%	509.6	0.85%	57,622	199.3	0.35%				
1928	63,565.7	495.7	0.78%	716.8	1.13%	716.8	1.13%	61,480	142.4	0.23%				
1929	63,263.4	488.2	0.77%	964.0	1.52%	964.0	1.52%	59,832	230.6	0.39%				
1930	63,270.1	606.7	0.96%	3267.9	5.16%	5583.8	8.83%	58,092	837.1	1.44%				
1931	59,779.8	59.7	0.10%	644.7	1.08%	15700.1	26.26%	49,509	1690.2	3.41%				
1932	59,001.4	1212.0	2.05%	2875.7	4.87%	2875.7	4.87%	45,886	706.2	1.54%				
1933	58,837.8	82.2	0.14%	106.2	0.18%	2036.7	3.46%	42,125	3596.7	8.54%				
1934	56,667.7	0.8	0.00%	132.2	0.23%	132.2	0.23%	49,708	37.3	0.08%				
1935	53,050.9	7.9	0.01%	76.0	0.14%	76.0	0.14%	55,239	13.9	0.03%				
1936	60,555.2	0.0	0.00%	30.6	0.05%	30.6	0.05%	60,619	28.1	0.05%				
Sum		3256.8		9323.7		28,625.5			7481.8					
1927-36														
Total sum of [b]/[a] and [f]/[e]		5.33%		15.22%		47.35%			16.04%					
Ratio of “sum 1927-36” and “total deposits 1927”		5.42%		15.52%		47.65%			12.98%					

Sources: author's own calculations based on Board of Governors of the FED (1959, 1976) for the USA; De Bonis *et al.* (2012), ASCI—Natoli *et al.* (2016), and *Archivio Storico della Banca d'Italia* (various folders) for Italy.

I record the timing of distress as the date the resolution became “official.”<sup>39</sup> In many cases, however, the final formal solution was reached after the bank became distressed. While this approach is not an econometric problem if distress is a 0–1 binary variable (e.g., in logit models), the nature of this distress variable calls for caution when the dependent variable is the timing of distress (e.g., in survival analyses).

To make sense of the magnitude of these, [table 4](#) presents the total deposits of distressed banks by year in 1927–1936 and distinguishes between banks that went through a bankruptcy procedure in column [b] and all distressed banks in column [c]—i.e., bankrupt banks and those that went through a resolution process, but excluding the big four. To put these figures in perspective, column [f] also compares the magnitude of the banking crisis in Italy with that of the USA—the most studied and possibly iconic episode of widespread banking distress in the interwar period. Could the Italian banking crisis be as severe as bank failures in the USA if Italian public authorities did not resolve distress behind doors?<sup>40</sup>

If we compare column [c] with column [f], we can give a tentative answer to this question. Even excluding the big four, total deposits of failed (i.e., suspended) US banks were roughly the same as the total deposits of the other Italian joint-stock banks in distress. However, only a third of the latter went through bankruptcy. It follows that the hidden banking crisis that Italian small and medium commercial banks experienced was (at least) as severe as that experienced by commercial banks in the USA in the early 1930s.<sup>41</sup>

## 5. Empirical analysis

Rapid growth of the credit-to-GDP ratio, considered a proxy of macro-leverage, is acknowledged as the best predictor of financial distress. Macro-prudential rules and tools consider it key policy indicator ([Ampudia et al. 2021](#)). But little evidence is available on the association of distress and lending growth at the micro-level. Italy had a sustained expansion of its credit-to-GDP ratio driven by the other joint-stock banks ([Section 2](#)), followed by a severe, albeit hidden, crisis ([Section 3](#)). Two questions naturally arise: did the banks that expanded the most experience distress later? Is distress associated with higher and/or increasing leverage?

The empirical analysis tests these hypotheses. To do so, I put together a sample of joint-stock banks (including the big four) for which balance sheets are available in ASCI.<sup>42</sup> I then use these balance sheets to construct various variables that capture growth in leverage and lending before the Great Depression hit Italy (i.e., in 1920–1928), and I test whether they are valuable predictors of subsequent distress (i.e., in 1929–1936). Therefore, I estimate the

<sup>39</sup> For distressed mergers, the day the merger was authorised by Ministerial decree; for capital injections, the day the capital raise was probated by a Tribunal; for Government grant subsidies, the day the agreement between the bank and Government was signed, or the day of issue of the secret decree authorising the money transfer taking place.

<sup>40</sup> Studying the drivers and the motivations behind these distress resolution policies goes beyond the scope of this article. It is indeed an interesting path that future research should explore, especially given the dictatorial nature of the Fascist regime.

<sup>41</sup> International comparisons are often difficult because there are different accounting standards and diverse institutional settings to deal with bank distress. The objective of this comparative exercise is not to present a comparison but to construct a benchmark. The crucial issue is to avoid inflating upwardly the distress of Italian banks: it is important to stress that if [Table 4](#) is biased, the bias goes against the claim made here. Other joint-stock banks not present in ASCI and the exclusion of cooperative and private banks ensure that it underestimates Italian banking distress.

<sup>42</sup> The inclusion or exclusion of the big four does not change the results.

following discrete choice (logit) model:

$$\text{Log}_e \frac{\pi_i (\text{Distress})}{1 - \pi_i (\text{Distress})} = \alpha + \beta_1 L_i + \beta_2 K_i + \beta_3 C_i + \varepsilon_i \quad (1)$$

where distress is defined as binary variable that takes value 1 if bank<sub>*i*</sub> experienced distress between 1929 and 1936, and 0 otherwise.  $L_i$  is the explanatory variable of interest that captures leverage and/or credit growth.  $K_i$  is the ratio of capital and reserves to total assets in December 1928, and  $C_i$  is a vector of bank characteristics in December 1928.  $\varepsilon_i$  is the error term. The three main explanatory variables of interest are  $\mu$  lend growth<sub>*i*</sub>,  $\mu$   $\Delta\text{lev}_i$ , and  $\mu$  lev growth<sub>*i*</sub> which are the averages of lend growth<sub>*i*</sub><sup>*t*</sup>,  $\Delta\text{lev}_i$ <sup>*t*</sup>, and lev growth<sub>*i*</sub><sup>*t*</sup> calculated for all banks with at least three balance sheets available in 1920–1928.<sup>43</sup> Lend growth<sub>*i*</sub><sup>*t*</sup>,  $\Delta\text{lev}_i$ <sup>*t*</sup>, and lev growth<sub>*i*</sub><sup>*t*</sup> are defined as follows:

$$\begin{aligned} \text{Lend growth}_i^t &= \frac{\text{total lending}_i^{1928} - \text{total lending}_i^t}{\text{total lending}_i^t} \\ \Delta\text{lev}_i^t &= \text{leverage}_i^{1928} - \text{leverage}_i^t \\ \text{Lev growth}_i^t &= \frac{\text{leverage}_i^{1928} - \text{leverage}_i^t}{\text{leverage}_i^t} \end{aligned}$$

where  $t$  is each year available in ASCI for bank<sub>*i*</sub> between 1920 and 1927. Total lending is a variable available in ASCI (*Voce9997*) and leverage is  $= \frac{\text{total assets}}{\text{capital} + \text{reserves}}$ . Model (1) is estimated also using lend growth<sub>*i*</sub><sup>*t*</sup>,  $\Delta\text{lev}_i$ <sup>*t*</sup>, and lev growth<sub>*i*</sub><sup>*t*</sup> for each value of  $t$ . Therefore, I estimate a total of 24 distinct regressions and focus on the interpretation of  $\beta_1 L$  coefficient. If credit growth and leverage affect distress at the micro-level, the coefficients of these variables should be significant, large, and positive. Furthermore, the capital-to-assets coefficient should be negative, large, and significant. Since I am interested in the magnitude of the coefficients, I report the average marginal effects (AMEs).

The vector of bank characteristics employed as controls refers to December 1928. These are standard variables frequently included in similar studies using bank balance sheets to predict distress.<sup>44</sup> Size is the Log<sub>*e*</sub> of total assets. Age is the Log<sub>*e*</sub> of the age of the bank. Liquid assets are the ratio of the sum of cash, sight assets, and bills with maturity shorter than 3 months to total assets. Roa is the ratio of total profits to total assets and is winsorized at 5% level. Private securities are the ratio of private securities to total assets.<sup>45</sup> Other securities are the ratio of all other securities to total assets.<sup>46</sup> Branches are the Log<sub>*e*</sub> of the sum of all branches and offices.<sup>47</sup> As shown in [table A2](#) in the online appendix, bank headquarters were not evenly distributed around Italy, with certain regions having many more banks than others. To make

<sup>43</sup> Using all banks with at least 2 years available does not change the results.

<sup>44</sup> Descriptive statistics and test for equality of means are displayed in [Table A1](#) in the online appendix.

<sup>45</sup> These securities were shares of private companies, both listed and not listed. The issuance of private bonds in interwar Italy was extremely limited.

<sup>46</sup> These securities were mostly bonds issued by the State or large municipalities, bonds of State-backed companies and special credit institutions, or mortgage bonds issued by saving and public banks.

<sup>47</sup> Branches and offices are collected from *Dizionario delle Banche e dei Banchieri d'Italia*, published in Spring 1929 and refers to the end of 1928. In the few cases where the relevant information in *Dizionario* is missing, branches and offices are obtained from supervision documents from the archival sources used in [Section 3](#).

sure that my results are driven by a single group of banks, the model includes a set of regional dummy variables equalling 1 if the bank's headquarters are in the region. For the same reason, standard errors are clustered by region of the headquarters.

Table 5 reports the results of the regression estimated using  $\mu$  lend growth,  $\mu \Delta\text{lev}$ , and  $\mu$  lev growth and compare the results with a model including only controls. Estimating the model excluding  $\mu$  lend growth,  $\mu \Delta\text{lev}$ , and  $\mu$  lev growth shows that their inclusion does not change the sign or the significance of other coefficients, nor increases the area under the receiving operator curve.<sup>48</sup> The magnitude of other coefficients is marginally affected—except for capital to assets, which further shrinks towards zero when I include  $\mu$  lend growth. It is worth noticing that the coefficient of capital-to-assets ratio is not significant, suggesting that leverage in 1928, i.e., on the eve of the crisis, was not an issue.<sup>49</sup> Figure 4 shows the AMEs of the coefficients of the variables of interest.<sup>50</sup> Panel (a) displays the coefficient of  $\mu$  lend growth as well as those of  $\text{lend growth}^t$  for each value of  $t$ . Panel (b) displays the coefficient of  $\mu \Delta\text{lev}$  as well as those of  $\Delta\text{lev}^t$  for each value of  $t$ . Panel (c) displays the coefficient of  $\mu$  lev growth as well as those of  $\text{lev growth}^t$  for each value of  $t$ . Remarkably, in most cases, lend growth,  $\Delta\text{lev}$ , and lev growth have the opposite sign of what we should expect if leverage and credit growth were positively associated with distress. In almost all cases, coefficients are not statistically different from zero, irrespective of their sign. But most importantly, the economic significance of all these variables is negligible since the magnitude of the coefficients is very small. The only significant coefficient with the expected sign is lend growth<sup>1927</sup>: one unit increase in lending from 1927 to 1928 increases the probability of distress by merely 1 percentage point. A quite weak effect, considering that a one unit increase in lending means that the bank increased its lending by a full percentage in just 1 year.

I perform several robustness checks to confirm these results, and the overall interpretation does not change: lending growth and leverage are not good predictors of distress.<sup>51</sup> Regression tables for main robustness checks are available in table A6 in the online appendix. I estimate the model using (a) a distress variable that considers all liquidations as distressed and (b) a distress variable that considers all liquidations and mergers as distressed. In addition, I use

<sup>48</sup> Testing for equality of the Area Under the Receiver Operating Characteristics Curve (AUC) between models (1) and (2), between models (1) and (3), and between models (1) and (4), I cannot reject the null hypothesis that the AUC between the model excluding  $\mu$  lend growth,  $\mu \Delta\text{lev}$ , and  $\mu$  lev growth and the models including them is equal to zero—the  $p$  value being 0.509 for  $\mu$  lend growth, 0.392 for  $\mu \Delta\text{lev}$ , and 0.505 for  $\mu$  lev growth.

<sup>49</sup> The coefficient of capital-to-assets ratio is not significant even when the model is estimated using all banks present in ASCI in 1928, not just those with pre-1928 balance sheet available. This finding is consistent with that of Jordà *et al.* (2021), who find that aggregate capitalisation is not a good predictor of financial crises, but is the opposite of what Calomiris and Mason (2003) find in their seminal paper on the causes of bank distress in the USA.

<sup>50</sup> Full regressions in Tables A3–A5 in the online appendix.

<sup>51</sup> One problem of the econometrics behind Figure 4 is that the sample varies because not all bank balance sheets are present each year in ASCI. This problem raises the concern that these non-results can be due to a selection into sample effect correlated with the probability of experiencing distress: for instance, healthier banks might appear more frequently in the sample. If so, the results would be biased. Therefore, it is essential to check whether, concerning distress, all samples are representative of the bank population. The best reconstruction of the Italian bank population is Cerrito (1996). Since the mean of distress (defined as in Section 3) for all joint-stock banks identified by Cerrito in 1928 is 46.1%, I can test whether the mean distress in each sample is statistically different from 46.1%. In fact, at the 10% level, I can always reject the hypothesis that the mean of my sample is statistically different from 46.1%. For example, the bottom of Table 5 shows the mean of distress in the sample is 0.439 and the  $p$  value of the test is 0.528. Therefore, one can exclude that sample selection determines the results. Table A7 reports the test for all the samples employed in the paper.

Table 5. *Influence of credit growth and leverage on the probability of bank distress*

Influence of credit growth and leverage on the probability of bank distress				
AMEs logit regression (cross-section December 1928)				
	(1)	(2)	(3)	(4)
$\mu$ lend growth		-0.011 (0.010)		
$\mu$ $\Delta$ lev			-0.003 (0.003)	
$\mu$ lev growth				0.005 (0.035)
Capital-to-assets	-0.014 (0.187)	-0.077 (0.181)	-0.063 (0.177)	-0.077 (0.181)
Size	-0.060** (0.024)	-0.064*** (0.024)	-0.069*** (0.025)	-0.064*** (0.024)
Age	-0.031 (0.049)	-0.035 (0.049)	-0.030 (0.047)	-0.035 (0.049)
Liquid assets	-0.085 (0.206)	-0.067 (0.206)	-0.065 (0.204)	-0.067 (0.206)
Roa	-9.584*** (2.481)	-9.796*** (2.514)	-9.652*** (2.454)	-9.796*** (2.514)
Private securities	0.879*** (0.219)	0.818*** (0.195)	0.826*** (0.192)	0.818*** (0.195)
Other securities	-0.615** (0.294)	-0.635** (0.281)	-0.606** (0.282)	-0.635** (0.281)
Branches	0.169*** (0.027)	0.173*** (0.022)	0.177*** (0.024)	0.173*** (0.022)
Observations	204	204	204	204
HQ region indicators	Yes	Yes	Yes	Yes
S.E. clustered by HQ region	Yes	Yes	Yes	Yes
AUC	0.862	0.862	0.862	0.860
PseudoR2	0.342	0.342	0.342	0.339
Chi	187.3	556.7	722.3	196.3
Log likelihood	-91.94	-92.02	-92.02	-92.39
$p$	0	0	0	0
Standard errors in parentheses	*** $p < 0.01$ , ** $p < 0.05$ , * $p < 0.1$			
Mean of distress in sample:	0.436			
$p$ value of test mean! = 46.1:	0.478			
where 46.1 is the mean of distress of all joint-stock banks alive in 1928				

the mean of annual lending growth ( $\mu$  annual credit growth), annual  $\Delta$ lev ( $\mu$  annual  $\Delta$ lev), and annual leverage growth ( $\mu$  annual lev growth). These variables are defined as follows:

$$\text{Annual lend growth}_i^t = \frac{\text{total lending}_i^t - \text{total lending}_i^{t-1}}{\text{total lending}_i^{t-1}}$$

$$\text{Annual } \Delta\text{lev}_i^t = \text{leverage}_i^t - \text{leverage}_i^{t-1}$$

$$\text{Annual lev growth}_i^t = \frac{\text{total leverage}_i^t - \text{total leverage}_i^{t-1}}{\text{total leverage}_i^{t-1}}$$

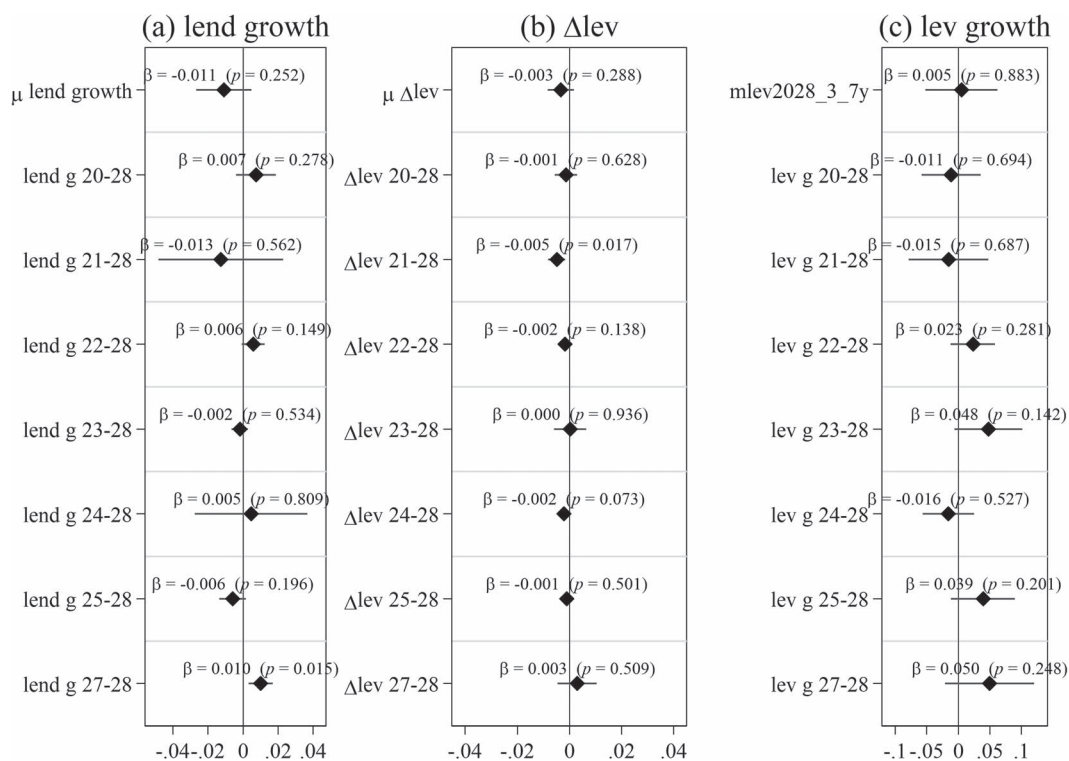


Figure 4. Logit AMEs coefficients of variables of interest.

where  $t$  is each year available in ASCI for bank $_i$  between 1920 and 1927. The mean is calculated for all banks with at least three balance sheets available in 1920–1928. In addition to this main set of robustness checks, my results are robust to the following: inclusion (jointly and separately) of the share of lending on total assets, share of foreign bills on total assets, share of loans collateralised with securities on total assets, share of mortgage loans on total assets; substitution of capital-to-assets ratio in 1928 with the same variable but calculated at time  $t$ <sup>52</sup>; and the exclusion of the big four from the sample. In addition, despite the issues of employing a panel estimation discussed in Section 4, I estimate a linear probability model, using bank fixed effects (online Appendix B). The results are confirmed: the econometric analysis does not support the interpretation of a crisis based on a leveraged credit boom.

The coefficients of the control variables employed in model (1) provide useful insights on the process of financial development that Italy went through in the 1920s. It is interesting to comment on them, although the goal of this paper is not to study the determinants of distress but just to test the credit/leverage hypotheses. Perhaps surprisingly, the coefficient of age is not significant, suggesting that newer banks established in the 1920s were not necessarily more prone to distress. The coefficient of size is large, significant, and with a negative sign, showing that smaller banks were more likely to experience distress. This is widely consistent with the economic literature discussed in Section 2, which suggests that larger banks have more

<sup>52</sup> In fact,  $\Delta$ lev $^t$  becomes significant for  $t = 1920, 1921$ , and  $1922$ , but with a negative sign.



diversified portfolios. The coefficient of Roa is large, significant, and negatively associated with distress, which is consistent with the interpretation of a period of dynamic financial development where least profitable banks are forced to exit the market, while only the most profitable ones survive. In the light of the literature on the problems of universal banking in the interwar period, the coefficient of private securities is hardly surprising. As a private bond market was not yet developed in interwar Italy (Baia Curioni, 1995), the securities in question were shares of companies, and thus can be interpreted as a proxy for universal banking activity. In a context of financial and economic development of a capital scarce country, it is not surprising that banks invested in industrial firms. However, when the international economic crisis hit, banks that were more exposed to industries were those that failed. By contrast, banks that had more conservative investment strategies and invested in other securities, i.e., in bonds issued by the government or public companies guaranteed by the State, were less likely to experience distress. Last but not least, the coefficient of branches is quite puzzling. Banks with more branches in 1928 were more likely to experience distress. Branched banks should be able to better diversify their lending portfolio, and previous literature stressed that branched banking systems were less likely to experience a banking crisis during the Great Depression (Bordo *et al.* 1994; Grossman 1994, 2010). One interpretation could be that this is the result of the disordered expansion of the early 1920s: banks that rushed to open many branches, and thus had more branches at the end of the period, were those that experienced distress in the 1930s. Testing this hypothesis, however, falls beyond the scope of this paper and is left to future research.

## 6. Conclusions and discussion

This paper presented a novel perspective on the distress experienced by Italian joint-stock banks in the interwar period. It documented a previously overlooked crisis that developed in parallel with the well-known failure of the big four. Previous research has not overlooked this crisis by chance or negligence: the public was unaware that most banks were distressed. I could identify distressed banks only thanks to the reading of hundreds of classified individual files produced by Italian banking supervision. The magnitude of this forgotten crisis is large, and without the intervention of public authorities, Italy could have had a severe crisis like the USA during the Great Depression. In the light of the evidence presented here, Italy emerges as one of the European countries mostly affected by banking problems in the interwar period. Former neutral countries in WWI, such as Scandinavian countries and the Netherlands, experienced a banking crisis in the early 1920s, but went through the 1930s relatively unscathed (Jonker and van Zanden, 1995). European countries such as Belgium, Germany, Austria, and Hungary were hit hard by the distress of their large universal banks in the 1930s (Feinstein *et al.* 2010). In France, by contrast, large banks were spared from distress, but small and medium banks experienced severe problems, which led to important deposit withdrawal in 1930–1931 (Beaubeau *et al.* 2022). Italy experienced all three cases: there was a severe banking crisis in the early 1920s, the big four universal banks had to be rescued in the 1930s, and the small and medium commercial banks ended up in distress after the strong expansion in the 1920s.

This episode is not just relevant for scholars interested in Italian economic history: it presents a puzzle that contributes to the literature on the credit/crisis nexus—a policy-relevant matter. While aggregate credit expansions and rising leverage are considered good predictors of banking crises, this association does not necessarily hold at the individual bank level. Italy experienced a prolonged credit expansion in the 1920s, followed by a crisis. However,

the very banks that contributed to this expansion were not those that experienced distress. Econometric analysis on bank balance sheets of Italian joint-stock banks shows that lending growth and increased leverage in the 1920s are poor predictors of subsequent distress. The key to understanding this puzzle lies in whether the credit expansion observed at the macro-level happened at the extensive or intensive margins.

While macro-financial literature interprets the credit-to-GDP ratio as a leverage measure, micro-financial economics defines leverage as the total assets-to-capital ratio. To the best of my knowledge, we still lack an established theory on how macro-leverage (credit-to-GDP ratio) and micro-leverage (capital-to-assets ratio) are related. Nevertheless, intuitively, the dynamics of micro- and macro-leverage should be related to whether the credit expansion happens at the extensive or intensive margins.<sup>53</sup> If credit-to-GDP ratio expands at the intensive margin, this can happen only if the leverage of firms and/or banks increases. Macro-leverage (credit-to-GDP ratio) will grow proportionally more than micro-leverage (capital to assets) only if fresh capital backs new credit. Additional capital can be obtained through capital injections to existing firms/banks or by newly established firms/banks with fresh capital (i.e., the economy expands and develops). Therefore, this suggests that if macro- and micro-leverage are positively correlated, credit expansion happens at the intensive margin. If macro-leverage increases but micro-leverage holds, credit expansion happens at the extensive margin, precisely what happened in Italy in the 1920s. While macro-leverage (credit-to-GDP ratio) increased throughout the 1920s, micro-leverage (capital-ratio) of joint-stock banks and firms remained flat, suggesting that the credit expansion happened at the extensive, rather than at the intensive, margin. This dynamic is consistent with the interpretation that Italy went through a financial development process: the credit expansion that Italy experienced in the 1920s happened more at the extensive margin, and went hand in hand with financial development.

However, although leverage was not the problem, there was nevertheless pervasive banking distress. Another puzzle emerges then. Financial development is widely considered beneficial (Levine 2005; World Bank 2008; Han and Melecky 2013), at least at the intermediate level of financial depth (Arcand *et al.*, 2015). So how could it be followed by severe banking distress in interwar Italy? The educated guess is that the process of financial development Italy experienced was too hasty, leading to a condition of “overbanking.” Such was the opinion of many coeval observers (Segre 1926; Mazzantini 1928, 1946; Tridente 1936). Even the Governor of the Bank of Italy, Bonaldo Stringher, in welcoming the new banking regulation on commercial banks in 1926 (and thus before the international crisis hit Italy), expressed his concerns:

“The complete lack of any banking regulation allowed the establishment of a multitude of banks with little or trifling capitals and their mushrooming in small and large cities through improvised networks of branches, with the specific aim of collecting deposits that often ended up in dreadful speculations.”<sup>54</sup>

Future research should address the mechanisms of this expansion, as this issue falls beyond the scope of this paper. To do so, we need a micro-analysis of the determinants of distress. Furthermore, future research should check the external validity of these findings. Was Italy in the 1920s an exception? If that is the case, in other countries, leverage and lending growth should be good predictors of individual distress. Otherwise, was Italy’s experience common?

<sup>53</sup> A theoretical approach to this issue is beyond the scope of this research.

<sup>54</sup> Cit. Banca d’Italia (1928), p. 56.

Then, an interesting “paradox of the aggregates” would emerge: leverage and lending growth are predictors of distress at the macro-level but not necessarily at the micro-level.

### Data availability

The balance sheet data underlying this article were provided by the Bank of Italy by permission. Data will be shared on request to the corresponding author with permission of the Bank of Italy.

### Acknowledgements

I am especially grateful to my DPhil supervisor Brian A’Hearn and to my DPhil examiners Paolo di Martino and Eric Monnet for invaluable feedback on this work. I also would like to thank the editor Joan Roses and three anonymous referees for their comments, and the participants of 2021 Economic History Conference at Warwick, Uppsala University Workshop in Business and Financial History, LSE Graduate Seminar in Economic History, UB-UC3M-UV: WEBINAR in Economic History, PSE Faculty Seminar in Financial History, Oxford Graduate Seminars in Economic and Social History, and Utrecht University Financial History Seminar for their suggestions. The author acknowledges generous funding from the Economic History Society Student Bursary, Pembroke College (Oxford), and the Einaudi Foundation in Turin. This publication is based on research that has received funding from the European Research Council under the European Union’s Horizon 2020 research and innovation programme (grant agreement No 883758). The usual disclaimer applies.

### Supplementary material

[Supplementary material](#) is available at *European Review of Economic History* online.

### References

- AA.VV (1984). Special issue on banks and industry in the interwar period. *Journal of European Economic History* **13**, Fall.
- ACCOMINOTTI, O. (2012). London merchant banks, the central European panic, and the sterling crisis of 1931. *The Journal of Economic History* **72**, pp. 1–43.
- ACCOMINOTTI, O. and EICHENGREEN, B. (2016). The mother of all sudden stops: capital flows and reversals in Europe, 1919–32. *The Economic History Review* **69**, pp. 469–92.
- ADALET, M. (2009a). Were universal banks more vulnerable to banking failures? Evidence from the 1931 banking crisis. TÜSİAD-KoçUniversity Economic Research Forum Working Paper, p. 911.
- ADALET, M. (2009b). The effect of financial structure on crises: universal banking in interwar Europe. TÜSİAD-KoçUniversity Economic Research Forum Working Paper, p. 910.
- AIKMAN, D., HALDANE, A.G. and NELSON, B.D. (2015). Curbing the credit cycle. *Economic Journal* **125**, pp. 1072–109.
- AMPUDIA, M., LO DUCA, M., FARKAS, M., PEREZ-QUIROS, G., PIROVANO, M., RÜNSTLER, G. and TEREANU, E. (2021). On the effectiveness of macroprudential policy. European Central Bank Working Paper Series. p. 2559.
- BAFFIGI, A. (2013). National Accounts, 1861–2011. In G. TONIOLO (ed), *The Oxford Handbook of the Italian Economy Since Unification*. Oxford: Oxford University Press, pp. 157–86.
- Banca d’Italia (1928). *Relazione del Governatore in Adunanza generale ordinario degli azionisti tenuta in Roma il ...* Roma.

- BARBIELLINI-AMIDEI, F. and GIORDANO, C. (2015). The redesign of the bank-industry- financial market ties in the US Glass-Steagall and the 1936 Italian banking acts. In P. CLEMENT, H. JAMES and H. van der WEE (eds), *Financial Innovation, Regulation and Crises in History*. London: Pickering & Chatto, pp. 65–83.
- BARON, M. and XIONG, W. (2017). Credit expansion and neglected crash risk\*. *The Quarterly Journal of Economics* **132**, pp. 713–64.
- BATTILOSSI, S. (2009). Did governance fail universal banks? Moral hazard, risk taking, and banking crises in interwar Italy. *The Economic History Review* **62**, pp. 101–34.
- BAUBEAU, P., MONNET, E., RIVA, A. and UNGARO, S. (2021). Flight-to-safety and the credit crunch: a new history of the banking crises in France during the Great Depression†. *The Economic History Review* **74**, pp. 223–50.
- BETZ, F., OPRICĂ, S., PELTONEN, T.A. and SARLIN, P. (2014). Predicting distress in European banks. *Journal of Banking & Finance* **45**, pp. 225–41.
- BISCAINI COTULA, A.M. and CIOCCA, P. (1979). Le strutture finanziarie: aspetti quantitativi di lungo periodo (1870–1970). In F. VICARELLI (ed), *Capitale industriale e capitale finanziario: il caso italiano*. Bologna: il Mulino, pp. 61–111.
- Board of Governors of the Federal Reserve System (1959). *All-bank Statistics, United States, 1896–1955*. Washington, DC: Board of Governors of the Federal Reserve System.
- Board of Governors of the Federal Reserve System. (1976). *Banking and monetary statistics 1914–1941*, 2nd ed. Washington, DC: Board of Governors of the Federal Reserve System.
- BOISSAY, F., COLLARD, F. and SMETS, F. (2016). Booms and banking crises. *Journal of Political Economy* **124**, pp. 489–538.
- BONHOUR, E., CLAUSSE, H., MONNET, E. and RIVA, A. (2021). The great expansion. The exceptional spread of Bank branches in interwar France. *CEPR Discussion Papers* n° 16698.
- BORDO, M.D. (2018). An historical perspective on the quest for financial stability and the monetary policy regime. *The Journal of Economic History* **78**, pp. 319–57.
- BORDO, M.D., ROCKOFF, H. and REDISH, A. (1994). The U.S. banking system from a northern exposure: stability versus efficiency. *The Journal of Economic History* **54**, pp. 325–41.
- BORIO, C. (2014). The financial cycle and macroeconomics: what have we learnt? *Journal of Banking and Finance* **45**, pp. 182–98.
- BRAMBILLA, C. (2012). Miscarried innovation? The rise and fall of investment banking in Italy, 1860s–1930s. *Entreprises et Histoire* **67**, pp. 97–117.
- CALOMIRIS, C.W. and MASON, J.R. (2003). Fundamentals, panics, and bank distress during the depression. *American Economic Review* **93**, pp. 1615–47.
- CARNEVALI, F. (2005). *Europe's advantage: banks and small firms in Europe and Britain, France, Germany, and Italy since 1918*. Oxford: Oxford University Press.
- CARRERAS, A. and FELICE, E. (2012). When did modernization begin? Italy's industrial growth reconsidered in light of new value-added series, 1911–1951. *Explorations in Economic History* **49**, pp. 443–60.
- CATÃO, L.A.V. and MILESI-FERRETTI, G.M. (2014). External liabilities and crises. *Journal of International Economics* **94**, pp. 18–32.
- CERRITO, E. (1996). La ricostruzione della popolazione bancaria. In F. COTULA, T. RAGANELLI, V. SANNUCCI, S. ALIERI and E. CERRITO (eds), *I bilanci delle aziende di credito 1890–1936*. Laterza: Roma-Bari.
- ČIHÁK, M., DEMIRGÜÇ-KUNT, A., FEYEN, E. and LEVINE, R. (2013). Financial development in 205 economies, 1960 to 2010. *Journal of Financial Perspectives* **1**, pp. 17–36.
- CLEARY, S. and HEBB, G. (2016). An efficient and functional model for predicting bank distress: in and out of sample evidence. *Journal of Banking & Finance* **64**, pp. 101–11.
- COLVIN, C.L. (2017). Banking on a religious divide: accounting for the success of the Netherlands' Raiffeisen cooperatives in the crisis of the 1920s. *The Journal of Economic History* **77**, pp. 866–919.
- COLVIN, C.L., de JONG, A. and FLIERS, P.T. (2015). Predicting the past: understanding the causes of bank distress in the Netherlands in the 1920s. *Explorations in Economic History* **55**, pp. 97–121.

- CONFALONIERI, A. (1994). *Banche miste e grande industria in Italia, 1914–1933, vol I*. Milano: Banca Commerciale Italiana.
- COTTRELL, P.L., LINDRGREN, H. and TEICHOVA, A. (eds) (1992). *European Industry and banking between the Wars*. Leicester: Leicester University Press.
- COTULA, F., RAGANELLI, T., SANNUCCI, V., ALIERI, S. and CERRITO, E. (1996). *I bilanci delle aziende di credito 1890–1936*. Roma: Laterza.
- DE BONIS, R. and SILVESTRINI, A. (2014). The Italian financial cycle: 1861–2011. *Clometrica* 8, pp. 301–34.
- DE BONIS, R., FARABULLINI, F., ROCCELLI, M., SALVIO, A., & SILVESTRINI, A. (2012). A quantitative look at the Italian banking system: evidence from a new dataset since 1861, *Quaderni di storia economica (Economic History Working Papers)*, 26.
- DE BONIS, R., MARINELLI, G. and VERCELLI, F. (2018). Playing yo-yo with bank competition: new evidence from 1890 to 2014. *Explorations in Economic History* 67, pp. 134–51.
- DE CECCO, M. (1986). La protezione del risparmio nelle forme finanziarie fasciste. *Rivista di Storia Economica* 3, pp. 237–41.
- DELL'ARICCIA, G., IGAN, D., LAEVEN, L. and TONG, H. (2016). Credit booms and macrofinancial stability. *Economic Policy* 31, pp. 299–355.
- DELL'ARICCIA, G., EBRAHIMY, E., IGAN, D., & PUY, D. (2020). 'Discerning good from bad credit booms: the role of construction', *IMF Staff Discussion Notes*, 20. International Monetary Fund.
- EICHENGREEN, B. and MITCHENER, K.J. (2004). The Great Depression as a credit boom gone wrong. *Research in Economic History* 22, pp. 183–237.
- FAHLENBRACH, R., PRILMEIER, R. and STULZ, R.M. (2012). This time is the same: using bank performance in 1998 to explain bank performance during the recent financial crisis. *The Journal of Finance* 67, pp. 2139–85.
- FALCO, G. (1996). La bilancia dei pagamenti italiana, 1914–1931'. AA.VV. In *Ricerche per la storia della Banca d'Italia vol. 6*. Laterza: Roma-Bari, pp. 3–265.
- FEINSTEIN, C.H. (ed) (1995). *Banking, currency, and finance in Europe between the wars*. Oxford: Oxford University Press.
- FEINSTEIN, C.H., TEMIN, P. and TONIOLO, G. (2010). *The world economy between the world wars*. Oxford: Oxford University Press.
- GIORDANO, C. and GIUGLIANO, F. (2015). A tale of two fascisms: labour productivity growth and competition policy in Italy, 1911–1951. *Explorations in Economic History* 55, pp. 25–38.
- GIORDANO, C. and ZOLLINO, F. (2020). Long-run factor accumulation and productivity trends in Italy. *Journal of Economic Surveys* 90, pp. 1–63.
- GOLDSMITH, R.W. (1985). *Comparative national balance sheets: a study of twenty countries, 1688–1978*. Chicago; London: University of Chicago Press.
- GORTON, G. and ORDONEZ, G. (2020). Good booms, bad booms. *Journal of the European Economic Association* 18, pp. 618–65.
- GOURINCHAS, P.-O. and OBSTFELD, M. (2012). Stories of the twentieth century for the twenty-first. *American Economic Journal: Macroeconomics* 4, pp. 226–65.
- GRODECKA-MESSI, A., KENNY, S. and ÖGREN, A. (2021). Predictors of bank distress: the 1907 crisis in Sweden. *Explorations in Economic History* 80, 101380.
- GROSSMAN, R.S. (1994). The shoe that didn't drop: explaining banking stability during the Great Depression. *The Journal of Economic History* 54, pp. 654–82.
- GROSSMAN, R.S. (2010). *Unsettled account: the evolution of banking in the industrialized world since 1800*. Princeton, NJ; Oxford: Princeton University Press.
- HAN, R. and MELECKY, M. (2013). Financial inclusion for financial stability access to bank deposits and the growth of deposits in the global financial crisis. *Policy Research Working Paper World Bank Washington* No. 6577.
- IGAN, D. and PINHEIRO, M. (2011). Credit growth and bank soundness: fast and furious? *IMF Working Papers* 11, p. 1.

- JAMES, H., LINDGREN, H. and TEICHOVA, A. (eds) (1991). *The Role of Banks in the Interwar Economy*. Cambridge: Cambridge University Press.
- JIN, J.Y., KANAGARETNAM, K. and LOBO, G.J. (2011). Ability of accounting and audit quality variables to predict bank failure during the financial crisis. *Journal of Banking & Finance* **35**, pp. 2811–9.
- JORDÀ, Ò., SCHULARICK, M. and TAYLOR, A.M. (2011). Financial crises, credit booms, and external imbalances: 140 years of lessons. *IMF Economic Review* **59**, pp. 340–78.
- JORDÀ, Ò., SCHULARICK, M. and TAYLOR, A.M. (2015a). Betting the house. *Journal of International Economics* **96**, pp. S2–18.
- JORDÀ, Ò., SCHULARICK, M. and TAYLOR, A.M. (2015b). Leveraged bubbles. *Journal of Monetary Economics* **76**, pp. S1–20.
- JORDÀ, Ò., SCHULARICK, M. and TAYLOR, A.M. (2016). The great mortgaging: housing finance, crises and business cycles. *Economic Policy* **31**, pp. 107–52.
- JORDÀ, Ò., SCHULARICK, M. and TAYLOR, A.M. (2017). Macrofinancial history and the new business cycle facts. *NBER Macroeconomics Annual* **31**, pp. 213–63.
- JORDÀ, Ò., RICHTER, B., SCHULARICK, M. and TAYLOR, A.M. (2021). Bank capital redux: solvency, liquidity, and crisis. *The Review of Economic Studies* **88**, pp. 260–86.
- JORGE-SOTELO, E. (2020). The limits to lender of last resort interventions in emerging economies: evidence from the gold standard and the Great Depression in Spain. *European Review of Economic History* **24**, pp. 98–133.
- KAMINSKY, G.L. and REINHART, C.M. (1999). The twin crises: the causes of banking and balance-of-payments problems. *American Economic Review* **89**, pp. 473–500.
- KINDLEBERGER, C.P. (1973). *The World in Depression 1929–1939*. Berkeley: University of California Press.
- KINDLEBERGER, C.P. (1978). *Manias, Panics, and Crashes: A History of Financial Crises*. New York: Basic Books.
- LA FRANCESCA, S. (2004). *Storia del sistema bancario italiano*. Bologna: il Mulino.
- League of Nations (1931). *Memorandum on commercial banks, 1913–1929*. Geneva: League of Nations.
- LEVINE, R. (2005). Chapter 12. Finance and growth: theory and evidence. In P. AGHION and S. DURLAUF (eds), *Handbook of Economic Growth* Vol. 1. Amsterdam: Elsevier, pp. 865–934.
- LÖNNBORG, M., ÖGREN, A. and RAFFERTY, M. (2011). Banks and Swedish financial crises in the 1920s and 1930s. *Business History* **53**, pp. 230–48.
- MACHER, F. (2019). The Hungarian twin crisis of 1931. *The Economic History Review* **72**, pp. 641–68.
- MÄNNASOO, K. and MAYES, D.G. (2009). Explaining bank distress in eastern European transition economies. *Journal of Banking & Finance* **33**, pp. 244–53.
- MAZZANTINI, M. (1928). Alcune indagini statistiche sull'organizzazione bancaria italiana. *Giornale Degli Economisti e Rivista di Statistica* **69**, pp. 772–92.
- MAZZANTINI, M. (1946). Alcune indagini statistiche sull'organizzazione bancaria italiana. In Ministero per la Costituente (ed), *Rapporto della Commissione Economica all'assemblea costituente: Credito e assicurazione, Vol. I & II*. Roma: Istituto poligrafico dello Stato, pp. 531–79.
- MENDOZA, E.G. and TERRONES, M. (2008). An anatomy of credit booms: evidence from macro aggregates and micro data. *IMF Working Papers* 08, p. 1.
- MENDOZA, E. G., & TERRONES, M. E. (2012). An anatomy of credit booms and their demise, *NBER Working Paper Series*, 18379. National Bureau of Economic Research.
- MOLTENI, M. (2020). Measuring Bank failures in interwar Italy: sources and methods for a comparative account. *Rivista di Storia Economica* **XXXVI**, pp. 345–98.
- MOLTENI, M. (2021a). The distress of Italian commercial banks in 1926–1936: a new dataset from banking supervision archives. *Oxford Economic and Social History Working Papers* n. 194.
- MOLTENI, M. (2021b). *Bank Failures: What Failure? Distress, Development, and Supervision in Italian Banking, 1926–1936*. DPhil thesis. History Faculty, Oxford: University of Oxford.
- MOLTENI, M. and PELLEGRINO, D. (2021). Lessons from the early establishment of banking supervision in Italy (1926–1936). In *Quaderni di Storia Economica della Banca d'Italia–Bank of Italy's Economic History Working Papers*, n. 48.



- MOLTENI, M. and PELLEGRINO, D. (2022). The establishment of banking supervision in Italy: an assessment (1926–1936). *Business History* pp. 1–29. <https://doi.org/10.1080/00076791.2022.2134347>.
- MONNET, E., RIVA, A. and UNGARO, S. (2021). The real effects of bank runs. Evidence from the French Great Depression (1930–1931). *CEPR Discussion Paper* n° 16054.
- NATOLI, S., PISELLI, P., TRIGLIA, I. and VERCELLI, F. (2016). 'L'archivio storico del credito in Italia. *Quaderni di Storia Economica-Banca d'Italia*. vol 36.
- PAPANIKOLAOU, N.I. (2018). A dual early warning model of bank distress. *Economics Letters* **162**, pp. 127–30.
- POGHOSYAN, T. and ČIHAK, M. (2011). Determinants of bank distress in Europe: evidence from a new data set. *Journal of Financial Services Research* **40**, pp. 163–84.
- POLSI, A. (2000). 'L'articolazione territoriale del sistema bancario italiano fra scelte di mercato e intervento delle autorità monetarie (1900–1936). In G. CONTI and S. La, FRANCESCA (eds), *Banche e reti di banche nell'Italia post-unitaria*. 61, Bologna: Il Mulino, p. 217.
- POSTEL-VINAY, N. (2016). What caused Chicago bank failures in the Great Depression? A look at the 1920s. *The Journal of Economic History* **76**, pp. 478–519.
- POSTEL-VINAY, N. (2017). Debt dilution in 1920s America: lighting the fuse of a mortgage crisis. *The Economic History Review* **70**, pp. 559–85.
- POSTEL-VINAY, N. (2022). Was the U.S. Great Depression a credit boom gone wrong? In M. SCHULARICK (ed), *Leveraged: The New Economics of Debt and Financial Fragility*. Chicago: Chicago University Press.
- Rapporto al 3° Congresso Internazionale del Risparmio (1935). *Le Casse di Risparmio e le Crisi*. Paris 20–25 August.
- REINHART, C.M. and ROGOFF, K.S. (2009). *This Time is Different: Eight Centuries of Financial Folly*. Princeton: Princeton University Press.
- SAHAY, R., ČIHAK, M., N'DIAYE, P. M., BARAJAS, A., AYALA PENA, D. B., BI, R., GAO, Y., et al. (2015). Rethinking Financial Deepening; Stability and Growth in Emerging Markets, *IMF Staff Discussion Notes*, 15. International Monetary Fund, 1.
- SCHNABEL, I. (2004). The German twin crisis of 1931. *The Journal of Economic History* **64**, pp. 822–71.
- SCHULARICK, M. and TAYLOR, A.M. (2012). Credit booms gone bust: monetary policy, leverage cycles, and financial crises, 1870–2008. *American Economic Review* **102**, pp. 1029–61.
- SEGRE, M. (1926). *Le banche nell'ultimo decennio*. Milano: La Stampa Commerciale.
- THOMAS, R and DIMSDALE, N (2017) "A Millennium of UK Data", Bank of England OBRA dataset, <http://www.bankofengland.co.uk/research/Pages/onebank/threecenturies.aspx>
- TONIOLO, G. (1978). Crisi economica e smobilizzo pubblico delle banche miste (1930–1934). In G. TONIOLO (ed), *Industria e banca nella grande crisi 1929–1934*. Milano: ETAS Libri, pp. 284–352.
- TONIOLO, G. (1995). Italian Banking, 1919–1936. In C. FEINSTEIN (ed), *Banking, Currency, and Finance in Europe Between the Wars*. Oxford: Oxford University Press, pp. 296–314.
- TRIDENTE, N. (1936). *La concentrazione bancaria dalla guerra europea ai giorni nostri*. Bari: Dott. Luigi Macri Editore.
- VASTA, M. (2006). Appendix: the source and the Imita.db dataset. In M. Vasta and R. Giannetti (eds), *Evolution of Italian Enterprises in the 20th Century*. Heidelberg-New York: Springer Verlag.
- World Bank (2008). Finance for all? Policies and pitfalls in expanding access. *World Bank Policy Research Report*, . Washington, DC: World Bank.