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Related Lending: Manifest Looting or Good Governance? Lessons from the Economic History of Mexico

Noel Maurer and Stephen Haber

6.1 Introduction

Close ties between banks and their borrowers are common in many less-developed countries (LDCs). Indeed, in many LDCs these ties are so close that banks lend primarily to firms controlled by their own directors, or their directors' close friends and families. The standard view among policymakers is that these arrangements are pernicious: they allow insiders (bank directors) to expropriate outsiders (minority shareholders and depositors). The incentives to expropriate outsiders are likely to be particularly strong during a financial crisis, as the insiders seek to use the resources of the bank to rescue their other enterprises.¹ Related lending, according to this view, is therefore “a manifestation of looting” (La Porta, López-de-Silanes, and Zamarripa 2003, 231).

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1. See Akerlof and Romer 1993; La Porta, López-de-Silanes, Shleifer, and Vishny 1997, 1998; Rajan and Zingales 1998; Johnson, Boone, Breach, and Friedman 2000; Johnson, La Porta, López-de-Silanes, and Shleifer 2000; Laeven 2001; Bae, Kang, and Kim 2002; Mitton 2002; Habyarimana 2003; La Porta, López-de-Silanes, and Zamarripa 2003.

If related lending is so bad, then why did it characterize the banking systems of the United States, Germany, and Japan during their most rapid periods of growth?² Indeed, as Kroszner and Strahan have shown, related lending is *still* widespread in the United States, continental Europe, and Japan (Kroszner and Strahan 2001). These findings suggest, in turn, that there are conditions under which related lending is pernicious and conditions under which it is not.

What might those conditions be? One might posit either of two hypotheses. The first is that the impact of related lending varies with the quality of property rights. According to this view, related lending was (and is) positive in the United States, continental Europe, and Japan because the rule of law and efficiently specified property rights make looting difficult.³ In developing countries, on the other hand, the lack of well-specified property rights, coupled with the lack of rule of law, allows directors to loot their banks with impunity. The second hypothesis is that the impact of related lending varies with the quality of corporate governance. This view stresses that what determines the growth outcomes of related lending is the presence (or absence) of institutions that lower the cost of monitoring bank directors.⁴

We argue that the weight of the evidence supports the second view: the outcome of related lending depends on the incentives and monitoring costs faced by bank directors, minority shareholders, and depositors. Our view is motivated by several curious features of what is perhaps the most intensively studied case of looting through related lending: Mexico from 1995 to 1998. During this period, bank directors made loans to the firms in which they held an interest that had lower levels of collateralization, lower interest rates, and higher default rates than arm's-length loans (La Porta, López-de-Silanes, and Zamarripa 2003). The first curious feature of this episode is that it took place in the context of an ongoing taxpayer-financed bailout of depositors, bank debtors, and stockholders.⁵ The second odd feature of the 1995–1998 banking crisis is that the directors of Mexico's

2. See Aoki, Patrick, and Sheard 1994; Lamoreaux 1994; Calomiris 1995; Fohlin 1998.

3. For example, looting via default on existing debt will be more difficult in countries where bankruptcy law allows creditors to replace the management of bankrupt companies.

4. The term *corporate governance* is often used to capture two conceptually separate issues. It sometimes refers to the general enforcement of property rights. At other times, it refers to the institutions that allow shareholders and directors to monitor one another. We use the term in its second sense. Indeed, the institutions that allow shareholders and directors to monitor each other are important precisely because the agency problems between residual claimants (like depositors, shareholders, and directors) rise along with the cost of information and the difficulty of using the state to enforce property rights.

5. From 1991 to 1995, Mexico's banks were characterized by extremely high levels of loan default and negative real rates of return on assets. In early 1995 the Mexican government carried out a bailout designed to protect depositors. This bailout was originally intended as a one-time event, but it quickly became an open-ended mechanism that not only protected depositors but protected bank debtors and bank shareholders as well (Haber 2005).

banks had very little of their own capital at risk well before the crisis began. When Mexico privatized its banking system in 1991, the new owners borrowed much of the capital they used to purchase the banks *from the very same banks they were purchasing*. Many of the banks, therefore, effectively had capital-adequacy ratios close to zero well *before* they ran into trouble (Mackey 1999). In other words, neither depositors nor shareholders had any incentive to monitor the activities of the bank directors, and the directors had no incentives to monitor each other. In short, both property rights and corporate governance were poor in Mexico's 1995–1998 episode, which greatly limits its utility in adjudicating between the competing hypotheses.

We assess these two hypotheses by exploring the causes and consequences of related lending in a case in which there was widespread related lending, an externally generated financial shock that occasioned a government-organized rescue of the banks, weakly enforced property rights, and the unambiguous absence of the rule of law. This country did, however, have institutions that provided bank directors with incentives to monitor one another, and allowed depositors and minority shareholders to monitor bank directors. The country is Mexico during the thirty-five-year dictatorship of Porfirio Díaz (1876–1911). If the property rights view of related lending is correct, then one would expect that Mexican bankers should have looted their own banks or used them as mechanisms to transfer resources to firms under their control. At the very least, they should have allocated credit inefficiently, overinvesting in firms that they controlled. If the corporate governance view is correct, then one would expect that there would have been neither looting nor capital misallocation.

We find that bankers neither looted their own banks nor did they misallocate capital. Rather, we find that Mexican bankers primarily lent to their own firms because information was costly and contract rights were extremely difficult to enforce through the legal system.⁶ Related lending provided an informal means to assess *ex ante* risk and enforce contracts *ex post*. We also find that even when the economy was hit with a large external shock, Mexico's bankers did not use related loans as a mechanism to loot their own banks. In addition, the loans they made to their own enterprises were no worse an allocation of credit than that which they could have obtained by making arm's-length loans to comparable enterprises. These results are consistent with the literature on the financial history of the developed nations, the literature about business groups in India, and recent

6. For a discussion of the importance of the legal system for financial development and economic growth see Levine 1998, 1999 and La Porta, López-de-Silanes, Shleifer, and Vishny 1998. For a discussion of the advantages that accrue to creditors from long-term relationships in the credit market see Greenbaum, Kanatas, and Venezia 1989; Sharpe 1990; Rajan 1992; Petersen and Rajan 1994, 1995.

work on the Asian crisis of 1997–98 (Friedman, Johnson, and Mitton 2003). The implication is that there is no necessary connection between related lending and looting, even in countries with weak property rights.

Related lending did not produce looting in Porfirian Mexico because various institutions aligned the interests of bank directors, shareholders, and depositors. The first were the institutions that allowed bank directors to monitor each other and enabled shareholders to police the directors. The second were the institutions that governed the banking sector. These institutions mandated high capital requirements, placed strong restrictions on note issue, and created limited liability. The third was the design of the banking rescue of 1908, the year in which Mexico was hit by a severe economic downturn originating from the Panic of 1907 in the United States. The Mexican government intervened as a lender of last resort, buying illiquid loans from the banks, but it carefully structured the terms of its intervention to ensure that the banks could not pass off their bad loans to taxpayers. The end result was a remarkably stable and efficient banking system, despite the ubiquitous use of related lending.

We do find that related lending gave rise to a more concentrated industrial structure in downstream industries. That outcome, however, was a result of Mexico's concentrated banking system. That is, bankers allocated credit to entrepreneurs on the basis of relational ties, but few entrepreneurs enjoyed such ties, because there were few banks. Nevertheless, it is not clear that the degree of concentration in Mexico was sufficiently high to create a significant degree of market power.

Our findings have implications beyond related lending. In recent years, a large literature has emerged on the effects of institutions on economic growth.⁷ One of the findings of the literature is that there are numerous cases of dictatorial governments that are unable or unwilling to effectively specify or enforce property rights, but that nevertheless experience prolonged periods of rapid growth (Przeworski et al. 2000, 177). Our findings imply that economic actors may be able to compensate for weak legal institutions (at least for a time) by exploiting ties based on longstanding social and business relationships.

The rest of this paper is organized as follows. Section 6.2 provides a discussion of the data sets we develop. Section 6.3 provides a discussion of how related lending came to be the dominant business strategy of Mexico's bankers. Section 6.4 analyzes our data on the performance of the banking industry. Section 6.5 examines the impact of related lending on a downstream industry—cotton textiles. Section 6.6 concludes.

7. See North and Weingast 1989; Barro 1991, 1997; Engerman and Sokoloff 1997; Rajan and Zingales 1998; Przeworski et al. 2000; Bates 2001; Acemoglu, Johnson, and Robinson 2001, 2002; Keefer (forthcoming).

6.2 Sources and Methods

The analysis that we carry out on the causes and consequences of related lending in Mexico draw on three bodies of evidence that we have developed. The first body of evidence consists of bank financial reports. These reports were published in the Mexican financial press and allow us to estimate bank rates of return, share prices, dividend payments, and capital-asset ratios.

The second body of evidence focuses on bank lending strategies. For two of Mexico's largest banks, the Banco Nacional de México and the Banco Mercantil de Veracruz, we retrieved internal bank records that allowed us to estimate the extent of related lending over long time periods—1884–1911 and 1898–1906, respectively. These records were located in the Archivo Histórico Banamex and the Archivo de la Nación, both in Mexico City. For four other large banks, we were able to develop a data set for a cross-section of the loans they made in 1908. These records were also retrieved from the Archivo General de la Nación.⁸ The two banks for which we have collected time series information (Banamex and the Banco Mercantil de Veracruz) accounted on average for nearly half of total bank assets. When we add the four banks for which we have cross-sectional data, our sample of banks covers two-thirds of all bank assets.

The third body of evidence focuses on a downstream industry that received related loans from the banks—cotton textiles. We note that the Mexican cotton textile industry is an ideal natural laboratory with which to study the impact of related lending on the real economy. In the first place, cotton textiles were Mexico's largest manufacturing industry. In the second place, the industry was finance-dependent, but at the same time it approximated the requirements of perfect competition to an unusual degree. Mexican law posed no direct barriers to entry into the industry. Nor were their indirect barriers to entry posed by patent protection, proprietary technology, control of raw materials, advertising, branding, or control of wholesale or retail distribution. The capital equipment was easily divisible and scale economies were exhausted at small-firm sizes, compared to such industries as steel, cement, paper, and chemicals. The industry was also characterized by a high degree of entry and exit. Finally, high tariffs protected the industry from foreign competition.

We study the effect of related lending on this industry by employing the Razo-Haber textile data set. We draw seven censuses from their data set:

8. We retrieved records of these loans by examining interbank loan sales to the state-owned Caja de Préstamos para Obras de Irrigación. See the *Sesiones Administrativas de la Caja de Préstamos*, Box 1, located in Galería 2 of the Archivo General de la Nación in Mexico City. Data for the total size of the loan portfolios of these banks were retrieved from their end-of-year balance sheets published in the *Economista Mexicano*.

1888, 1891, 1893, 1895, 1896, 1912, and 1913.⁹ These censuses are enumerated at the mill level and contain information on inputs and outputs as well as information about location and ownership. We also draw state and national data on textile inputs and outputs from their data set for every year from 1891 to 1913. This state and national data allow us to make certain that the years for which we have mill-level censuses are not outliers. Table 6.1 presents data on the overall size and growth of this industry.

We then coded the data set in order to capture relationships between bankers and textile mill owners. Specifically, we code for bank board members who were also the sole proprietors of a textile mill, a partner in a firm that owned a textile mill, or who served on the board of directors of a joint stock corporation that owned a textile mill. We denote such mills as being “bank-related.”¹⁰

Table 6.2 presents aggregate data on the relationships between mill owners and bankers. In 1888, 21 percent of textile mills were owned by bank directors or their close relatives. Eighty-eight percent of the bank-related mills were fully owned by directors, the remainder being organized as joint stock companies. By 1913, the proportion of bank-related mills had grown to 54 percent, and the proportion of such mills organized as joint-stock

9. This data set links mills and firms across manufacturing censuses and excise tax records over the period 1850–1932. For a discussion of the sources and methods used to build the panel, see Razo and Haber 1998. The census records employed in this study can be found in García Cubas (1893); *Mexico, Dirección General de Estadística 1894*; Mexico, Secretaría de Fomento (1890); Mexico, Secretaría de Hacienda (1896a); Mexico, Secretaría de Hacienda (1896b); Archivo General de la Nación, Ramo de Trabajo, box 5, file 4; Archivo General de la Nación, Ramo de Trabajo, box 31, file 2. We have recoded their data set to more effectively follow firms during the 1888–1913 period. We have also recalculated the real value of output by substituting the Gómez-Galvarriato and Musacchio price index for the INEGI cotton textile price index employed by Razo and Haber (1998). In addition, we have culled stamping and knitting mills from the data set and checked the data set against original manuscripts to verify observations with inordinately high or low values.

10. We note that our definition of bank connection is restrictive. Entrepreneurs who were connected to a bank in some way other than overlap between their membership on a bank board and ownership of a textile firm (for example, overlapping board memberships in a third, unobserved firm in a different industry, or marriage to a relative of a member of a bank board) are coded as “non-related” firms. We note that the assumption that overlap between mill ownership and a bank dictatorship is a good proxy for bank credit is consistent with three fundamental facts about Mexican banking. First, we know from case studies by historians that some banks were founded by textile entrepreneurs for the purpose of financing their existing manufacturing ventures (Gamboa Ojeda 1985; Gamboa Ojeda and Estrada 1986; Rodríguez López 1995). Second, in the case of Banamex (Mexico’s largest bank), some of its board members were textile industrialists and the bank itself was a major stockholder in one of the country’s largest textile companies. We know from the minutes of the bank’s board meetings that it lent heavily to these enterprises (Maurer 2002, 98). Third, evidence from other large banks (reviewed below) makes it clear that they lent primarily to their own board members, members of their families, and their business associates. We also know that the directors of many of these banks also owned textile mills. The list of banks related to textile entrepreneurs or joint stock textile companies consists of Banamex, the Banco de Londres y Mexico, the Banco Oriental, the Banco de Nuevo León, the Banco de Durango, the Banco de Coahuila, the Banco Mercantil de Veracruz, the Banco de Guanajuato, the Banco de Estado de México, and the Banco de Zacatecas.

Table 6.1 **The Mexican textile industry**

| | Number of mills | Output in 1900 pesos | Output in meters | Spindles | Workers | Price index |
|------|-----------------|----------------------|------------------|----------|---------|-------------|
| 1878 | 73 | n.a. | 73,597,000 | 249,294 | 11,922 | |
| 1888 | 84 | 11,484,000 | n.a. | 249,591 | 15,083 | 94 |
| 1891 | 85 | 13,795,758 | 93,526,834 | 277,784 | 14,051 | 87 |
| 1893 | 113 | 19,925,011 | 122,550,335 | 370,570 | 21,963 | 96 |
| 1895 | 98 | 26,013,666 | 170,928,751 | 411,090 | 18,208 | 91 |
| 1896 | 100 | 25,338,269 | 206,411,839 | 430,868 | 19,771 | 93 |
| 1898 | 112 | n.a. | n.a. | 469,547 | n.a. | 93 |
| 1899 | 120 | 32,564,462 | 231,685,692 | 491,443 | 23,731 | 91 |
| 1900 | 122 | 35,458,578 | 261,397,092 | 588,474 | 27,767 | 100 |
| 1901 | 133 | 35,553,376 | 262,043,539 | 591,506 | 26,709 | 95 |
| 1902 | 124 | 27,938,569 | 235,955,965 | 595,728 | 24,964 | 103 |
| 1903 | 115 | 31,338,693 | 262,169,838 | 632,601 | 26,149 | 118 |
| 1904 | 115 | 34,645,972 | 280,709,989 | 635,940 | 27,456 | 123 |
| 1905 | 130 | 46,097,321 | 310,692,041 | 678,058 | 30,162 | 111 |
| 1906 | 130 | 44,894,422 | 349,711,687 | 688,217 | 31,673 | 114 |
| 1907 | 129 | 41,325,963 | 376,516,577 | 693,842 | 33,132 | 125 |
| 1908 | 132 | 35,303,315 | 368,370,354 | 732,876 | 35,816 | 121 |
| 1909 | 129 | 36,656,495 | 314,227,874 | 726,278 | 32,229 | 118 |
| 1910 | 121 | 39,118,584 | 315,322,022 | 702,874 | 31,963 | 129 |
| 1911 | 119 | 39,286,480 | 341,441,477 | 725,297 | 32,147 | 131 |
| 1912 | 126 | 46,848,154 | 319,668,409 | 762,149 | 32,209 | 136 |
| 1913 | 128 | 36,642,671 | 298,897,198 | 752,804 | 32,641 | 147 |

Sources: Haber 1989, table 8.1; Haber, Razo, Maurer 2003, tables 5.2 and 5.8. Original censuses for 1888, 1891, 1893, 1895, 1896, 1912, and 1913 can be found in: México, Secretaría de Fomento, 1890; México, Departamento de Fomento, 1893; México, Dirección General de de Estadística, 1894; México, Secretaría de Hacienda, 1896a; México, Secretaría de Hacienda, 1896b; México, Archivo General de la Nación, Ramo de Trabajo, Box 5, file 4; and Box 31, file 2.

Note: n.a. = not available.

Table 6.2 **Mexico's textile industry, by bank relation, 1888–1913**

| | Number of mills related to banks | Percent of mills related to banks | Percent of output (by value) produced by bank related mills | Percent of output (by volume) produced by bank related mills | Percent of capacity (by spindlage) installed in bank related mills |
|------|----------------------------------|-----------------------------------|---|--|--|
| 1888 | 18 | 21 | | 32 | 33 |
| 1891 | 17 | 20 | | 32 | |
| 1893 | 33 | 30 | 48 | 51 | 51 |
| 1895 | 38 | 39 | 58 | 59 | 59 |
| 1896 | 40 | 40 | 58 | 60 | 62 |
| 1900 | 70 | 57 | 75 | | |
| 1904 | 64 | 55 | 75 | | |
| 1912 | 69 | 55 | 79 | 80 | 82 |
| 1913 | 69 | 54 | 77 | 78 | 80 |

Source: See table 6.1.

companies had risen to 27 percent. The percentage of installed capacity controlled by related mills increased from 33 percent in 1888 to 80 percent in 1913.¹¹

6.3 Related Lending and the Mexican Banking System

In 1878, the Mexican banking system was so small as to be practically nonexistent. Only two chartered banks existed in the entire country. One was a branch of a British bank that operated in Mexico City and focused primarily on financing foreign trade. The other was a small American-founded operation chartered by the government of the border state of Chihuahua.¹²

Within a few years, however, Porfirio Díaz (Mexico's ruler from 1876 to 1911) enacted legislation that engendered the rapid expansion of the banking system from this extremely low base—by providing bankers with a series of segmented monopolies and duopolies. Only the two national banks—the Banco Nacional de México (henceforth Banamex) and the Banco de Londres y México (henceforth BLM)—were permitted to branch freely across state lines. Other banks were prohibited from branching outside their concession territories, which were generally contiguous with state lines. Federal law also erected extremely high barriers to entry. First, banks without a federal charter were prohibited from issuing notes, meaning that they could not effectively compete against chartered banks.¹³ Second, the government levied a 2 percent tax on bank capital and a 5 percent tax on banknotes—but exempted the first bank in each state to receive a federal charter. Third, it established a minimum capital requirement of 250,000 dollars—five times the minimum capital needed to found a national bank in the United States. Finally, in case these barriers proved insufficient, the law gave the Finance Minister the right to approve all issues of new bank stock, which was one of the primary ways Mexican banks raised new resources during this period. The fact that the brother of the finance minister between 1893 and 1911 sat on the board of directors of the country's largest bank provided him with an obvious incentive to exercise his veto.¹⁴

11. Following Kane 1988, we measure installed capacity by spindles, which constitute the most important capital input for the production of cotton textile goods.

12. Until the growth of the chartered banking system in the decades after 1884, most financial intermediation took place in merchant houses, which issued bills of exchange and advanced credits to entrepreneurs in their social networks. These institutions did not, however, have any of the advantages of banks: they did not sell equity to outside investors, they did not have limited liability, they did not take deposits, and their bills of exchange had to be 100 percent backed by specie reserves. In short, they were different from modern banks in a fundamental sense: they made money by speculating with the funds of their proprietor, rather than with funds that belonged to people other than the proprietor. For an examination of how such a merchant house operated see Walker 1987.

13. See Maurer 2002, ch. 2; Haber, Razo, and Maurer 2003, ch. 4.

14. See Maurer 2002 and Haber, Razo, and Maurer 2003.

Table 6.3 The Mexican banking industry, 1896–1912

| | Number of reporting banks ^a | Total bank assets (in U.S.\$ millions) | Banamex market share (%) | BLM market share (%) | Herfindahl index ^b |
|------|--|--|--------------------------|----------------------|-------------------------------|
| 1896 | 6 | 50 | 58 | 28 | 0.42 |
| 1897 | 10 | 54 | n.a. | n.a. | n.a. |
| 1899 | 13 | 78 | 51 | 26 | 0.34 |
| 1900 | 17 | 113 | 39 | 25 | 0.22 |
| 1901 | 20 | 107 | 38 | 22 | 0.20 |
| 1902 | 23 | 107 | 35 | 19 | 0.17 |
| 1903 | 25 | 130 | 37 | 17 | 0.18 |
| 1904 | 26 | 184 | 41 | 15 | 0.20 |
| 1905 | 26 | 205 | 39 | 18 | 0.20 |
| 1906 | 28 | 264 | 40 | 16 | 0.21 |
| 1907 | 28 | 301 | 44 | 14 | 0.23 |
| 1908 | 34 | 339 | 40 | 12 | 0.19 |
| 1909 | 35 | 283 | 37 | 12 | 0.17 |
| 1910 | 35 | 302 | 39 | 12 | 0.18 |
| 1911 | 35 | 385 | 39 | 12 | 0.18 |
| 1912 | 34 | 342 | 36 | 11 | 0.16 |

Source: Calculated from balance sheets published in *El Economista Mexicano*.

Note: Banamex indicates the Banco Nacional de México. BLM indicates the Banco de Londres y México.

^aIn 1911 there were 42 banks in operation, but only 35 reported data to the Secretary of the Treasury. The banks that did not report were small operations.

^bComputed nationally, this assumes that banks with territorial concessions could operate in one another's concession territories. Thus, this is a lower bound estimate.

The short-term consequence of these high barriers to entry was a rapid expansion of the banking system. By 1897, when the law took its final form, the number of banks had risen to 10, with total assets of 50 million dollars. By 1911, there were 42 banks, controlling assets of 385 million dollars (see table 6.3). The ratio of commercial bank assets to GDP was 27 percent, roughly the same as its ratio in 2004 (33 percent).

The long-term consequence of high barriers to entry, however, was that Mexico remained relatively under-banked. In 1910, even if we include mortgage banks and private unchartered banks dedicated primarily to financing foreign trade, there were only 42 banks in the entire country with assets totaling US\$414 million. Mexico possessed 364,286 inhabitants per bank, compared to 3,852 in the United States. The ratio of bank assets to GDP was only 27 percent, versus 65 percent in the United States.

The level of concentration in this banking system was extremely high. Banamex's share of total assets never fell below 36 percent. The Herfindahl concentration stabilized around 0.20, meaning that a system with 42 banks (35 of which provided data) was roughly as concentrated as one with five equally sized banks. In fact, measures of the total Mexican banking market greatly overstate the degree of competition. The lack of interstate

competition (outside a few northern border states and the Distrito Federal) and limits on the number of banks in any given region meant that Banamex and the BLM were able to use their privileged position to operate like inefficient monopolists: they held excess liquidity to ration credit and drive up their rate of return (Maurer 2002, 70–92).

One might think that powerful politicians might have objected to this cozy arrangement, until you consider that they received a steady stream of rents from the banks. For example, Banamex's board of directors was populated by members of Díaz's coterie, including Pablo Macedo (the President of Congress and long-serving congressman from the Distrito Federal), Roberto Núñez (the under-secretary of the treasury), Sebastián Camacho (senator for the Distrito Federal), Pablo Escandón (congressman from Guanajuato, governor of Morelos, and Porfirio Díaz's chief of staff), and Julio Limantour (the brother of the finance minister). The chairman of the board of Banamex's largest competitor, the Banco de Londres y México, was none other than the secretary of war (and former mayor of Mexico City, former secretary of the interior, and former secretary of development), Manuel González Cosío. Joining him on the board was Rafael Dondé (senator from the state of Sonora). In addition, Julio Limantour was a major stockholder in the bank. The Banco Internacional Hipotecario, a mortgage bank, was similarly populated with political notables, including Julio Limantour, Porfirio Díaz Jr. (the dictator's son), and Emilio Pardo (federal deputy from the states of Hidalgo, México, and the Distrito Federal, senator from Tlaxcala, and ambassador to Belgium and the Netherlands). The board of the Banco Mexicano de Comercio e Industria also contained insiders. Its chairman was Pablo Macedo (see above). Joining Macedo on the board was Guillermo de Landa y Escandón (a senator from the state of Chihuahua and governor of the Federal District; Haber, Razo, and Maurer 2003).

These arrangements were paralleled at the state level. The only difference was that state governors, rather than cabinet ministers, sat on the banks' boards and received a steady stream of directors' fees, stock distributions, and dividends. In some cases, the governor himself received the bank concession. In point of fact, the banking system was deliberately conceived to distribute benefits to the state governors, and give them a stake in the maintenance of Porfirio Díaz's rule.¹⁵

The banks of the southern states of Chiapas and Oaxaca clearly illustrate the pattern. Emilio Rabasa served as governor of Chiapas in 1891–1894. Rafael Pimentel succeeded him in 1895–99. The Rabasa family owned a large stake in the Banco de Chiapas, and a member of the Pimentel family sat on the bank's board of directors. Another member of the Pimentel family, Emilio Pimentel, governed Oaxaca from 1902 to 1911, and

15. See Maurer 2002, 33–47, 93–114; Razo 2003; Haber, Razo, and Maurer 2003.

it should come as no surprise that the Pimentel family was represented on the board of the Banco de Oaxaca as well. The president of the Banco de Oaxaca, Luis Mier y Terán, had himself served as governor of the state between 1884 and 1887.

Northern state governors played as prominent a role in the banking system as their southern counterparts. In Durango, the founders of the Banco de Durango placed Governor Juan Manuel Flores on their board of directors (Rodríguez López 1995, 22). In San Luis Potosí, two members of the Díez Gutiérrez family governed the state between 1881 and 1898—both sat on the board of the Banco de San Luis Potosí. In the state of Sinaloa, Governor Mariano Martínez de Castro (governor from 1881 to 1884 and again in 1888–92) sat on the board of directors of the Banco Occidental. In the state of Zacatecas, Governor Génaro García Valdez (1900–04) served as president of the Banco de Zacatecas and sat on the board of the Banco Occidental in Sinaloa. In Chihuahua, Luis Terrazas and his relatives sat on the boards of all the state's major banks. In fact, Enrique Creel, Terrazas' son-in-law, received the concession for the Banco Minero de Chihuahua. Creel himself would later serve as governor of the state. In the central state of Mexico, the founders of the Banco del Estado de México reserved a board position for the former governor, José Zubieta, who governed from 1881 to 1889.¹⁶

In other cases, the connection to the state governor was less direct than a seat on the board, but strong nonetheless. In Puebla, for example, Governor Mucio Martínez received neither stock in the Banco Oriental nor a seat on the board. The Banco Oriental did, however, lend over 264,000 pesos to Martínez. This debt, along with an additional 400,000 pesos held by individual creditors, was never repaid. Instead, the major financiers of Puebla, among whom were the principal shareholders of the Banco Oriental, bailed Martínez out by forming a partnership with him and effectively assuming his liabilities (Gutiérrez Alvarez 2000, 125–26).

Financial markets could not substitute for banks in an environment characterized by high information costs. Mexico created a general incorporation law in 1889, but very few firms used the law to sell stock directly to the public. The reason was that stockholders had few ways to monitor the directors of public companies. Financial reporting requirements were not enforced. In fact, firms often went for years without publishing their financial statements, despite a law mandating that they do so. Moreover, investors had no way of determining whether the founders of a firm (who typically served as its directors) had divested themselves of their holdings in the firm. The result was that the public tended to invest only in enterprises controlled by individuals with established reputations for political

16. Board members from the *Boletín Financiero y Minero*, 2/28/1907, 6/18/1907, 6/10/1908, and 4/14/1908. Political careers from Camp (1991), appendix F.

connections and financial solvency: that is, enterprises that were already connected to banks (Maurer 2002).

In an environment characterized by extremely high information costs, bank directors had strong incentives to protect their reputations and monitor one another. There was neither deposit insurance nor guarantees that banks would redeem their notes for specie on demand. As Huybens, Luce, and Pratap have shown, depositors policed bank behavior by withdrawing funds from banks that pursued risky strategies (Huybens, Luce, and Pratap 2005). In addition, Mexico's banks typically had capital-adequacy ratios of 30–35 percent. In part, these capital ratios were driven by the legal requirement that note issues not exceed two (sometimes three) times a bank's cash on hand, or three times its paid-in capital (Maurer 2002, 43, 111). In equal part, however, these capital ratios were driven by risk aversion on the parts of both bankers and their creditors (depositors and noteholders). Banks usually did not, in fact, issue notes up to their legal maximum.

Bank directors owned substantial stakes in their banks. As of the 1884 Commercial Code, receiving a bank charter required the founding group (who became the directors) to subscribe to the first tranche of the bank's capital. Banks could later sell additional tranches of capital to outsiders. In addition, bank directors could (and often did) sell parts of their original stakes. These outside shareholders (who owned a majority of bank stock) then insisted on the appointment of independent directors (typically other bankers) who monitored the founding board members. This meant that directors had strong incentives to monitor each other (because their own capital and reputations were at risk) and that shareholders possessed a mechanism to monitor directors.¹⁷ In fact, we have direct historical evidence that this mechanism was employed by outside shareholders. In March 1908, the outside shareholders of the Banco de Jalisco, displeased with the discovery of severe irregularities in the bank's books, replaced the entire board of directors save Vice President Eugenio Cuzin (Maurer 2002, 113).

Mexico's bankers started out by making arm's-length loans, but quickly shifted to related lending. Banamex, the largest bank in the country, received one of the first federal charters (in 1884). It began by making arm's-length loans. The problem was that it lacked good mechanisms to assess the quality of borrowers or the collateral they offered. It therefore responded by placing onerous requirements on borrowers, but these only worked to create adverse selection. The history of one of its largest manufacturing loans is perhaps instructive in this regard. In 1884, it opened a 200,000 peso credit line (roughly \$200,000) to the Hercules textile factory for the purpose of purchasing a new plant and equipment. Banamex charged an in-

17. See Ludlow 1985, 299–346; Gamboa Ojeda 2003, 106, 111, 116, 129, 132; Ludlow 2003, 147–49, 152; Cerutti 2003, 196, 211–13; Romero y Barra 2003, 229; Rodriguez Lopez 2003, 271–2; Maurer 2002, 74–80, 94–95, 111–13.

terest rate of 8 percent and required that the loan be collateralized with 250,000 pesos worth of the factory's inventory, with the warehousing costs to be borne by the factory. Given that the factory had to finance the cost of the inventory, this implied an effective interest rate of 18 percent. Terms like these, of course, tend to attract low-quality borrowers—and this case was not an exception to that general rule. The Hercules mill was unable to make its payments. Eventually, Banamex sold a portion of the loan to a New York trading house (for only 65 percent of its face value) and recouped the rest by converting the loan into an equity interest in the mill.

This loan, as well as a series of others in which the collateral turned out to be fictitious or unrecoverable, caused Banamex's directors to shift strategy: after 1886 it lent primarily to its own directors, members of their families, or their close business associates. In fact, from 1886 to 1901 *all* of the private (nongovernment) loans made by Banamex went to its own directors. After 1901 Banamex extended credit to nonrelated borrowers, but only if they satisfied one of two criteria: the borrower had a loan guarantee from the federal government (as was the case with some railroad companies); or the borrower was either the Banco Oriental or one of that bank's directors. The reason given by Banamex board members for the latter exemption is instructive: most of the loans made by the Banco Oriental went to its own directors, all well-known textile magnates. Loans to them, and to their bank, were a means of investing in their manufacturing enterprises. Thus Banco Oriental loans were deemed low risk precisely because the bank practiced related lending.¹⁸

Related lending, in fact, appears to have been standard business practice. Data we have retrieved on the loan portfolio of the Banco Mercantil de Veracruz indicates that 86 percent of its loans to individuals from 1898 to 1906 went to the bank's own directors.¹⁹ Banamex's largest competitor, BLM (which controlled, on average, 17 percent of total bank assets), also made sizable loans to its own board members to finance manufacturing start-ups (Maurer 2002, 103). A cross-section of loans we have drawn for 1908 for four other banks indicate similar lending strategies. Twenty-nine percent of the Banco de Nuevo León's loans went to a single firm, owned by one of its directors. Thirty-one percent of the Banco Mercantil de Monterrey's loans also went to a single firm owned by one of its directors. Fifty-one percent of the Banco de Durango's loans went to enterprises owned by the family members of one of its directors. An astounding 72 percent of the Banco de Coahuila's loans went to a single firm owned by family members

18. See Maurer 2002, 95–103, 108–10; Maurer and Sharma 2001, 953–56. The case of the Banco Oriental and its relationship to the Puebla textile industry is detailed in Gamboa Ojeda (1985) and Gamboa Ojeda and Estrada (1986).

19. The data for this estimate come from a random sample of 50 entries in the *Libro de Responsibilidades* of the Banco Mercantil de Veracruz, located in Galería 2 of the Archivo General de la Nación in Mexico City.

of a director.²⁰ Qualitative evidence from case studies by historians on the Banco de la Laguna, the Banco Occidental, and the Banco de Durango concur with our quantitative analysis.²¹

Mexico's bankers did not choose to lend to a particular company and then demand a seat on that company's board of directors. Rather, a group of textile mill owners, for example, would obtain a bank charter in conjunction with a powerful politician, sell shares in the bank to outside investors, issue bank notes, and then lend those notes to textile mills that he already owned (or, in some cases, found an entirely new mill). Of the 34 textile mills that switched from being nonrelated to being bank-related between 1888 and 1912, only one was a firm that was purchased by an existing banker. Thirty-three were owned by textile entrepreneurs who later became bankers. In short, bankers did not look at their banks as independent credit intermediaries in the textbook sense of the term. Instead, they looked at them as the investment arms of their widespread commercial and industrial interests.

6.4 Related Lending and the Performance of the Banking System

Did Mexican bankers use related loans to loot their own banks? One would imagine that they had strong incentives to do so. Mexico was hit by an external shock in 1908 that drove down the prices of its major export commodities by between 14 and 56 percent, depending on the product. Export prices declined 19 percent in the 1908–1909 fiscal year. They declined an additional 2 percent in 1909–10 (Cárdenas 2003, 240). The decline in prices caused mineral and agricultural producers to curtail production by between 20 and 64 percent (depending on the product), which in turn caused the demand for manufactured goods to fall by 9 to 20 percent (also depending on the product). The export crisis coincided with a severe drought in northwestern Mexico and the Gulf states, which caused the price of corn (Mexico's primary staple crop) to rise 128 percent between June 1908 and June 1909, and engendered a spike in agricultural imports (Cárdenas 2003, 242–43). The decline in Mexico's export, agricultural, and manufacturing sectors soon threatened the banking system. Deposits fell, interest rates on commercial paper rose from 8 percent to 10 percent, and net new lending dropped to zero. Indeed, total bank assets declined 17 percent from 1908 to 1909.²²

20. We retrieved records of these loans by examining interbank loan sales to the state-owned Caja de Préstamos para Obras de Irrigación. See the *Sesiones Administrativas de la Caja de Préstamos*, Box 1, located in Galería 2 of the Archivo General de la Nación in Mexico City. Data for the total size of the loan portfolios of these banks were retrieved from their end-of-year balance sheets, published in the *Economista Mexicano*.

21. See Aguilar 2003, 74; Rodríguez López 2003, 272, 278–79; Cerutti 2003, 169–70, 196, 204.

22. Bank balances and the interest rate on commercial paper from *Economista Mexicano*. Bond price data from Escalona Salazar (1998).

In response to the crisis, the government quickly organized a rescue. In September 1908 the federal government chartered the Caja de Préstamos para Obras de Irrigación y Fomento de la Agricultura. The Caja was financed by requiring Mexico's four largest banks to purchase 10 million pesos of its shares, 25 percent of which they were not permitted to sell. The Caja then issued 44.5 million pesos of government-guaranteed bonds in Europe, with an effective coupon rate of 5.1 percent. (The nominal yield on Mexican government bonds in 1908 was 4.3 percent.) The Caja used the funds from the bond and equity sales to purchase bank loans and bank-issued mortgage bonds in order to inject liquidity into the banking system (Maurer 2002, 66–68). The financial press greeted the plan with cries of relief. “Inasmuch as it is empowered to take over from the other chartered Banks the long-time loans to agricultural and industrial concerns which they are now carrying,” wrote the *Mexican Herald* (Sept. 3, 1908), “its foundation will greatly ease the local business situation, and enable the other Banks to give more efficacious financial assistance to the commercial community and to the general public.”²³

By mid-1909, the Caja's outstanding purchases of bank loans totaled 23.8 million pesos. In addition, it had purchased an additional 8.9 million pesos of securities (mostly bonds issued by the clearinghouse used by the regional banks), and it had deposited 20.7 million pesos directly into the banking system (Maurer 2002, 67). The Caja de Préstamos was particularly vital in rescuing Mexico's second-largest bank, the Banco de Londres y México. In inflation-adjusted terms, the Banco de Londres y México's loans and discounts fell an astonishing 40 percent between the beginning of 1908 and the end of 1909 (Maurer 2002, 68). By June 1910, funds advanced from the Caja to BLM made up 21 percent of the Caja's asset portfolio.²⁴

The Caja de Préstamo's statutes were carefully written to reduce the incentive for the banks to pass bad debts to the taxpayers. First, the Caja's charter required the banks to “unconditionally” guarantee the loans they sold to the Caja (*Economista Mexicana* 1908). Second, as a matter of policy, the Caja often agreed to rebate to the banks 1 percentage point of the interest it collected on the loans that the banks transferred to Caja.²⁵ Third, the banks were required to purchase 25 percent of the equity in the Caja, which they were not allowed to resell (*Economista Mexicana* 1908). Through these measures, the designers of the 1908 bank bailout hoped to be able to act as a lender of last resort and provide the banks with desperately-needed liquidity without creating moral hazard and a liability for the federal government.

23. See the *Mexican Herald* (9/3/1908).

24. Calculated from data in the *Sesiones Administrativas de la Caja de Préstamos*, Archivo General de la Nación, Mexico City.

25. *Sesiones Administrativas de la Caja de Préstamos*, Box 1, various entries.

6.4.1 Did Directors Loot?

The most obvious sign of bankers extracting resources from their own banks would be an unstable banking system. The evidence indicates, however, that Mexico's banking system was remarkably stable. As shown in table 6.3, the number of reporting banks and total bank assets increased steadily. The only downturn in real bank assets occurred in 1909, as a result of the crisis of 1908, but the system's growth resumed in 1910.

One might argue that although the system was stable, directors were still able to extract resources from outside shareholders. That hypothesis, however, is not consistent with the fact that Mexican banks were extremely profitable. The real return on the book value of equity in 1901–12 was 12 percent. These returns were not driven by the profits earned by a few large banks: the unweighted average real return-on-equity for all banks was 10 percent per year.

Mexican banks returned high profits to shareholders by paying out regular dividends. In fact, over the 1901–10 decade, the banks paid out almost all of their profits in the form of dividends.²⁶ Steady dividends translated into high returns from banking stock. As table 6.4 shows, someone who purchased an index of banking stock weighted by market capitalization would have earned a real return of 9 percent per year. Our estimate of market returns is not driven by the high returns available from owning the stock of the largest banks: an investment strategy based on purchasing equally sized stakes in all the banks would have yielded a slightly higher real annual return of 10 percent. The returns available to investors in Mexican banking stock were, in fact, more than twice those available from investing in the Dow Jones Industrials (see table 6.4).

One might argue that the high returns investors earned in the banking sector were simply compensation for risk. If this were the case, then we would expect the value of banking stock to be highly discounted. We therefore estimated two measures of the discount on banking stock: market-to-book ratios and dividend yields. Table 6.5 shows the average (weighted and unweighted) market-to-book value ratio for Mexican banks in 1900–11. Bank stock traded at an average premium of 33 percent over its book value.²⁷

26. In fact, banks paid dividends worth 106 percent of their profits over the 1901–10 period. We estimated this figure from balance sheets published in the *Economista Mexicano*. Profits were calculated as changes in real net worth (adjusted for issues of new stock) plus dividends in 1900 pesos. Real net worth was calculated by revaluing assets and liabilities in 1900 pesos and subtracting the value of new stock issues, if any.

27. Only the Banco de Michoacán in the years 1909 and 1910 was valued at less than its book value. The Banco de Michoacán was hard hit by the financial panic in 1909. Banamex agreed to accept responsibility for redeeming the Banco de Michoacán's banknotes if the Banco de Michoacán would agree to abandon its right to issue further notes. There were no losses to depositors or noteholders (Maurer 2002, 80).

Table 6.4 Real rates of return on Mexican banking, 1901–1912 (%)

| | Real returns on book equity | | Real returns from owning an index of bank stocks | | Real returns from the Dow Jones index (peso terms) |
|-------------------|-------------------------------|--------------------|--|--------------------|--|
| | Weighted average ^b | Unweighted average | Weighted average ^b | Unweighted average | |
| 1901 | 10 | 10 | 11 | 17 | -7 |
| 1902 | 14 | 13 | 16 | 17 | -7 |
| 1903 | 1 | 0 | 8 | 14 | -24 |
| 1904 | 4 | 7 | 6 | 7 | 41 |
| 1905 | 40 | 29 | 33 | 29 | 37 |
| 1906 | 23 | 13 | 16 | 20 | -5 |
| 1907 | 4 | 6 | 6 | 8 | -41 |
| 1908 | 0 | 4 | 2 | 3 | 52 |
| 1909 | 14 | 9 | 12 | -1 | 7 |
| 1910 | 4 | 3 | 9 | 10 | -21 |
| 1911 | 20 | 14 | -8 | -4 | 9 |
| 1912 ^a | 11 | 10 | -2 | 1 | 1 |
| Average | 12 | 10 | 9 | 10 | 4 |

Source: Stock prices and dividends reported in the *Economista Mexicano*. Dow Jones data from Haber, Razo, Maurer, table 5.12.

Note: All values converted to 1900 pesos using the Gómez-Musacchio (1998) index.

^aFirst semester, annualized.

^bWeighted by market capitalization.

Table 6.5 Market-to-book ratios for Mexican banks

| | Weighted average ^a | Unweighted average |
|---------|-------------------------------|--------------------|
| 1901 | 1.52 | 1.20 |
| 1902 | 1.63 | 1.27 |
| 1903 | 1.69 | 1.25 |
| 1904 | 1.84 | 1.27 |
| 1905 | 1.95 | 1.35 |
| 1906 | 1.81 | 1.44 |
| 1907 | 1.76 | 1.41 |
| 1908 | 2.09 | 1.45 |
| 1909 | 2.14 | 1.33 |
| 1910 | 2.09 | 1.37 |
| 1911 | 1.90 | 1.33 |
| Average | 1.86 | 1.33 |

Source: Stock prices and dividends reported in the *Economista Mexicano*.

^aWeighted by market capitalization.

Table 6.6 Banking stock yields (%)

| | Average yield on bank shares ^a | Average yield on government bonds | Bank share premium |
|------|--|--------------------------------------|-----------------------|
| 1901 | 9.4 | 5.0 | 4.4 |
| 1902 | 8.4 | 4.9 | 3.5 |
| 1903 | 8.3 | 4.9 | 3.4 |
| 1904 | 7.5 | 4.8 | 2.7 |
| 1905 | 8.1 | 4.3 | 3.8 |
| 1906 | 8.0 | 4.3 | 3.7 |
| 1907 | 7.1 | 4.4 | 2.7 |
| 1908 | 7.5 | 4.3 | 3.2 |
| 1909 | 6.8 | 4.3 | 2.5 |
| 1910 | 7.4 | 4.3 | 3.1 |
| 1911 | 7.7 | 4.5 | 3.2 |
| 1912 | 7.6 | 4.6 | 3.0 |

Source: Stock prices and dividends reported in the *Economista Mexicano*. Government bond yields from Escalona Salazar (1998, 93).

^aDividends divided by market price of common stock.

The data on banking yields is also inconsistent with the hypothesis that investors heavily discounted banking stock. As table 6.6 demonstrates, between 1901 and 1912 the difference between the yield on Mexican banking stock and Mexican government bonds dropped from 4.4 percentage points to 3.0 percentage points. In other words, the risks associated with owning banking stock appear to have declined over time.

Did the banks succeed in weathering the crisis through the expedient of passing off their bad related loans to the Caja de Préstamos—much the way that Mexican banks passed off their bad loans to the fund for the protection of bank savings (FOBAPROA) after the 1995–98 bailout? If that were the case, then we would expect the Caja de Préstamos to have lost money. The evidence, however, indicates that the opposite occurred—the Caja de Préstamos earned positive returns. In point of fact, the Caja de Préstamos may be the only government-organized banking rescue in world history to have made money. We calculate that the Caja generated a real return to all claimants on its assets (bondholders and shareholders) of 4.9 percent in 1909, 6.0 percent in 1910, and 5.7 percent in 1911.²⁸

6.5 Did Related Lending Misallocate Capital?

One might argue that even if bankers did not loot enough to jeopardize the health of the banking system, they may have nonetheless used their related enterprises to transfer resources from bank depositors and outside

28. Calculated from the balance sheets of the Caja de Préstamos, published in *Economista Mexicano*.

Table 6.7 Average annual growth in capacity across census periods (%)

| | Years between censuses | Bank-related mills | Nonrelated mills |
|-----------|------------------------|--------------------|------------------|
| 1888–1893 | 5 | 5.5 | 4.0 |
| 1893–1895 | 2 | 11.0 | 8.4 |
| 1895–1896 | 1 | 7.6 | 4.1 |
| 1896–1912 | 16 | 2.4 | 0.4 |

Source: See table 6.1.

Note: Annualized rate of growth in capacity, measured in spindles, among firms listed in both censuses. Thus, the 1888–1993 cohort represents firms listed in both the 1888 and 1893 censuses.

shareholders to themselves. In order to test this hypothesis we turn to our panel of textile mills. If bankers were using their textile mills to channel resources from the banks to themselves, then we would not expect bank-related mills to grow. The mills would simply be mechanisms to extract the wealth of the bank.

When we look at the growth in the size of mills, however, we find precisely the opposite: not only did bank-related mills grow, they grew faster than their nonrelated competitors. In table 6.7 we calculate the growth rates of mills that existed across various census periods. In each intercensus period, we find that mills that were bank-related outgrew mills that were not.

One might argue, however, that bank directors used their banks in order to quickly build up their enterprises and then sell them for cash. The evidence, however, indicates that bankers who invested in textile mills viewed them as long-term investments. Of the 70 bank-related mills in 1900 (when the number of bank-related mills peaked) only seven had changed hands by 1913.²⁹

6.5.1 Technical Efficiency

A somewhat weaker argument would suggest that bankers may have used their banks to support their own relatively inefficient firms. In this view, bank-related mills may have been productive enterprises (rather than zombie firms whose purpose was to extract bank resources), but would be less productive than their competitors. If this hypothesis holds, it implies that related lending misallocated capital.

We estimate a time series, cross-sectional regression on labor productivity. The results are in table 6.8.³⁰ We control for mill age, location, bank re-

29. An additional seven mills shut down over the period.

30. We measure output as the real value of production. Following Atack (1985) and Sokoloff (1984) on productivity in the United States, and Bernard and Jones (1996) on international productivity comparisons, we took the number of workers as the measure of the labor input. We adjusted, however, for changes in the legal length of the workday. We also estimated an OLS regression on labor productivity in which we controlled for mill size and capital intensity. That regression produced similar results. We therefore do not report them.

Table 6.8 Labor productivity regressions

| | Spec 1 | Spec 2 |
|---------------------|--------------------|--------------------|
| No. of observations | 486 | 486 |
| No. of mills | 164 | 164 |
| R^2 | 0.2706 | 0.2808 |
| Constant | 6.47*** (98.69) | 6.45*** (83.78) |
| 1895 | 0.59*** (8.19) | 0.62*** (6.69) |
| 1896 | 0.60*** (8.29) | 0.64*** (6.91) |
| 1912 | 0.58*** (7.94) | 0.53*** (4.73) |
| 1913 | 0.60*** (8.25) | 0.57*** (5.18) |
| Bank-Related | | |
| 1893 | | 0.06 (0.46) |
| 1895 | | -0.13 (-0.10) |
| 1896 | | -0.05 (-0.40) |
| 1912 | | 0.10 (0.85) |
| 1913 | | 0.09 (0.76) |

Source: See table 6.1.

Notes: Functional form is OLS. Controls for mill age, location, and traded status did not materially affect the results. Dependent variable = (ln) output per worker (in 1900 pesos). *T*-statistics in parentheses.

***Significant at the 99 percent level.

**Significant at the 95 percent level.

*Significant at the 90 percent level.

lation, and whether it was publicly traded.³¹ The results do not support the hypothesis that bank-related mills had lower labor productivity than their nonrelated competitors: none of the coefficients on bank-relation are significant.³²

A skeptical reader might argue that our productivity measures treat each

31. We do not report the results on mill age, location, and traded status because none of the coefficients were large or significant, and because the addition of these variables had no material impact on our cross-sectional dummies or the interaction of the cross-sectional dummies with the dummy for bank relation.

32. The year dummies indicate rapid productivity growth from 1893 to 1895, and then flat productivity growth after 1895.

Table 6.9 Weighted labor productivity, by mill type

| | Output per worker (1900 pesos) | | |
|------|--------------------------------|--------------|----------------|
| | Nonrelated | Bank-related | Difference (%) |
| 1893 | 991 | 1,049 | 6 |
| 1895 | 1,243 | 1,266 | 2 |
| 1896 | 1,204 | 1,201 | 0 |
| 1912 | 1,371 | 1,403 | 2 |
| 1913 | 1,384 | 1,373 | -1 |

Source: See table 6.1.

observation (one mill-year) equally. The regressions do not weight the results by firm sizes. Thus, it might be the case that small, particularly efficient, related mills drive the regression results. We therefore break the sample of mills into two sectors, nonrelated and bank-related, and calculate the labor productivity of each sector in the aggregate for individual census years. The results, reported in table 6.9, indicate that for the entire period under study, there were no significant differences in productivity between the bank-related mills, taken as a whole, and their nonrelated competitors.

6.5.2 Economic Efficiency

An even more skeptical reader might argue that the lack of difference in technical efficiency between bank-related and nonrelated mills is to be expected. The inefficient mills went out of business and hence dropped out of our data set. Such a reader would argue that the right criterion is economic efficiency, and that bank-related mills were less economically efficient than their nonrelated competitors. In order to test this hypothesis, we employ a Cox maximum-likelihood proportional hazards model to estimate the effect of bank relation on the probability of mill failure. Mills are defined as “failed” when they disappeared from the subsequent census, never to reappear. All coefficients (and standard errors) are transformed into hazard rates.

Our findings, presented in table 6.10, are not consistent with the hypothesis that bank-related mills were less economically efficient. In fact, we find exactly the opposite: bank-related mills were only 23 percent as likely to fail as their nonrelated competitors. This result is robust to the addition of conditioning variables for mill size, labor productivity, and age.

The Cox hazard model also suggests that being big was endogenous to being bank related. Bank-related firms lived longer and therefore grew larger. This is consistent with our finding—that bank-related mills grew much faster than their competitors (reported in table 6.7).

Table 6.10 Cox proportional hazard model

| | Spec. 1 | Spec. 2 | Spec. 3 | Spec. 4 |
|---|--------------------|-------------------|--------------------|-------------------|
| No. of observations | 467 | 431 | 275 | 271 |
| Prob > χ^2 | 0 | 0 | 0.0001 | 0.0004 |
| Bank-related dummy | 0.23*** (-3.96) | 0.39** (-2.53) | 0.32*** (-2.62) | 0.34** (-2.45) |
| ln (installed spindlage)—Proxy for size | 0.59*** (-3.92) | 0.63** (-2.06) | 0.66* (-1.76) | |
| ln (output per worker)—Real value | | 0.89 (-0.49) | 0.92 (-0.36) | |
| Age of mill | | | 0.98 (-1.25) | |

Source: See table 6.1.

Notes: Dependent variable = 1 if survive, 0 if fail. *T*-statistics in parenthesis. When coefficients are transformed into hazard rates they represent the effect that the independent variable has on the mill failing. The smaller the coefficient, the greater the independent variable's impact. For example, a coefficient of 0.23 on the bank connection dummy means that a bank-connected mill has a 23 percent chance of failing in any given period compared to an independent mill. Output per worker data adjusted for changes in length of legal workday.

***Significant at the 99 percent level.

**Significant at the 95 percent level.

*Significant at the 90 percent level.

6.5.3 Relative Returns

A dedicated skeptic might argue that although there is no evidence that bank-related mills were less efficient than other mills, the textile sector as a whole might have been less profitable than other sectors of the economy. From the available evidence, however, this seems unlikely. An investor who purchased shares in a comprehensive sample of Mexican manufacturing stocks (excluding textiles) would have earned a real return of only 3.3 percent between 1902 and 1910 (Haber 1989, 120). A similar sample of mining stocks available on the Mexico City stock exchange would have *lost* money between 1902 and 1910, returning an average real return of -5.9 percent. (This calculation includes mining stocks that paid high dividends for a few years and then disappeared, as befits a bonanza industry like mining.)³³ Railroads did little better: all of the major trunk lines lost money during the first decade of the twentieth century at annual rates ranging between -0.3 percent and -2.2 percent (Maurer 2002, 105). In short, it seems difficult to argue that related lending caused overinvestment in cotton textiles, as compared to other industries for which we have data.

33. Calculated from stock prices and dividend coupons published in *Economista Mexicano*.

Table 6.11 Average textile mill size (in spindles), by mill type

| | Nonrelated mills | Bank-related mills | Size ratio (bank related/nonrelated) |
|------|------------------|--------------------|--------------------------------------|
| 1888 | 2,549 | 4,611 | 181% |
| 1893 | 2,320 | 5,467 | 236% |
| 1895 | 2,759 | 6,711 | 243% |
| 1896 | 2,862 | 6,417 | 224% |
| 1912 | 2,303 | 8,725 | 379% |
| 1913 | 2,234 | 8,680 | 389% |

Source: See table 6.1.

6.5.4 Related Lending and Market Structure

If bank-related firms grew at a much faster rate than their nonrelated competitors, then it logically follows that there should have been big size differences between bank-related and nonrelated mills. Table 6.11 is unambiguous on this point: in 1888, bank-related mills were, on average, almost twice the size of unrelated mills; by 1913, they were nearly four times as large.

If bank-related mills were larger than nonrelated mills, then it logically follows that the market structure of the textile industry became more concentrated as the proportion of bank-related mills grew. In order to measure concentration, we aggregate mills into firms, and estimate four-firm concentration ratios and the Herfindahl index.

In order to determine how low concentration would have been in the absence of related lending, we specify three counterfactuals. The first compares Mexico to itself over time. Constant returns to scale and the absence of entry barriers characterized cotton textile manufacturing. We should expect that, in the absence of related lending, concentration should have fallen as the industry grew. The second compares Mexico to countries that had large textile industries but that did not have Mexico's banking system. We focus on the United States, Brazil, and India (Haber 1991, 1997, 2003). The third, following Sutton, compares the Mexican textile industry's actual market structure to a hypothetical fully-competitive industry, in which the market structure was a function solely of industry size and a stochastic growth process.³⁴

The results of all three experiments, displayed in table 6.12, indicate that the Mexican cotton textile industry was too concentrated. First, concentration in Mexico actually increased over time, even though the industry

34. The method assumes that all firms in a market have an identical chance of gaining or losing market share over time. Even under perfect competition, therefore, firms will have unequal market shares in equilibrium, but the market share of the largest firms will solely be a function of the number of firms in the industry and a stochastic growth process (see Sutton 1998).

Table 6.12 Industrial concentration in cotton textiles: Mexico, Brazil, India, and the United States

| Circa | Four firm ratio (%) | | | | | Herfindahl index | | |
|-------|---------------------|-----------------|--------|-------|---------------|------------------|--------|-------|
| | Mexico | Mexico expected | Brazil | India | United States | Mexico | Brazil | India |
| 1888 | 18 | 19 | 37 | | 8 | 0.022 | 0.058 | |
| 1891 | 20 | 19 | | | | 0.020 | | |
| 1893 | 29 | 15 | | | | 0.038 | | |
| 1895 | 33 | 17 | 35 | | | 0.042 | 0.059 | |
| 1896 | 30 | 16 | | | | 0.041 | | |
| 1900 | 30 | 14 | | 19 | 7 | 0.038 | 0.028 | 0.018 |
| 1904 | 33 | 15 | 21 | | | 0.042 | | |
| 1912 | 30 | 14 | | 19 | 8 | 0.039 | | 0.018 |
| 1913 | 31 | 14 | 14 | | | 0.041 | 0.014 | |

Sources: For Mexico, see table 6.1; for Brazil, Haber 1997; for India and the United States, Haber 2003.

was growing quickly (in the United States, Brazil, and India, concentration fell or remained stable as the textile industry grew). Second, the Mexican cotton textile industry was much more concentrated than the U.S., Brazilian, or Indian cotton textile industry. Third, the Mexican cotton textile industry showed much higher four-firm ratios compared to the ratio that would be expected in a perfectly competitive market, given the number of firms in the industry.

We note that even though Mexico's textile industry was concentrated by world standards, the industry did not depart very far from perfect competition. The four-firm ratio never exceeded 38 percent, and the number of firms hovered around 110. It is hard to believe that this level of concentration was sufficient to allow even the largest firms to exercise market power. This interpretation is consistent with the historical evidence about firm behavior during this period.³⁵

6.6 Conclusions and Implications

We argue, based on a study of a banking system characterized by widespread related lending, that there is no *necessary connection* between related lending and looting. We also argue that there is no *necessary connection* between related lending and a misallocation of capital. Mexican bankers during the Porfiriato did not choose to lend to firms that were systematically less productive than their competitors.

We also argue that related lending is not a consequence of inadequate regulation and supervision, but rather is a rational response to high levels

35. See Haber 1989, 94–95, and Gómez-Galvarriato 1999.

of default risk. High levels of default risk can exist for any number of reasons, but prominent among them are weak institutions to enforce contract rights and high costs of obtaining information about potential borrowers. Related lending mitigates these problems. First, bankers do not need recourse to the formal legal system to sanction related borrowers. Rather, they can do so through a wide variety of informal means. Second, bankers can obtain information about related borrowers at relatively low cost.

It logically follows that attempts to eliminate related lending through supervision and regulation will not produce the first-best outcome of arm's-length lending based on objective performance criteria. Rather, in the context of high default risk, the close regulation and supervision of banks so as to preclude related lending will produce very little lending of any type. The canonical case of this phenomenon also comes from Mexico, where regulators have been quite effective in curtailing related lending since a series of accounting and regulatory reforms in 1997. The response of Mexico's banks has been to drastically curtail private lending, shifting their assets into corporate and government securities, as well as loans to states and municipalities (Haber and Musacchio 2004).

Unfortunately, the institutional problems that give rise to high levels of default risk (weak property rights and high costs of information) cannot be reformed at the stroke of a pen. Enhancing the enforcement of contract rights requires, in the first place, that governments actually have the capacity to adjudicate and enforce those rights. This requires more than the power of coercion. It requires that the government has an efficient administrative apparatus that can adjudicate disputes at low cost to the contracting parties.³⁶ The *capacity* to enforce contracts is, however, only half the battle. As a large literature in economic history and political science has demonstrated, any government that has the power to effectively adjudicate contract rights also has the power to abrogate or selectively enforce them. Thus, the effective enforcement of contract rights also requires that there be self-enforcing political institutions that limit the authority and discretion of public officials.³⁷ To argue, therefore, that governments can

36. If the cost of adjudication to the parties is high, then economic agents will only make contracts whose rate of return exceeds the cost of contract enforcement. This will curtail the number of contracts into which agents enter, and thereby depress economic activity.

37. Constraints on public officials and government capacity are causally linked. If the power of public officials is not limited, economic agents will be subject to expropriation risk. They will therefore refrain from investments whose rate of return does not compensate them for expropriation risk. The result will be lower levels of investment, which, in turn, will reduce the pool of wealth and income that the government can tax. With fewer resources, the government will be less able to develop an effective administrative and coercive apparatus that can adjudicate property rights. This fundamental dilemma of governance was noted as long ago as the Middle Ages (Greif et al. 1994), but in recent years it has spawned a sizable political science literature. For representative works see: North and Weingast 1989; Shepsle 1991; Hoffman and Norberg 1994; McGuire and Olson 1996; Weingast 1997a, 1997b; North et al. 2000; Olson 2000; Bates 2001; Haber, Razo, and Maurer 2003.

enhance property rights enforcement at the stroke of a pen is to engage in a nirvana thesis.

Related lending need not, however, be economically inefficient. Three conditions appear to be necessary to prevent related lending from turning into organized looting. First, the banks must be well-capitalized. In our case, for example, the capital asset ratios were four times the levels recommended by Basel. Second, bank directors must own substantial equity shares in their own banks. This gives bank directors incentives to monitor one another. Third, outside shareholders must have their own money at risk, and depositors must not be fully insured. This gives depositors and outside shareholders incentives to monitor the activities of the directors.

We note that the results we obtained for the Mexican case are consistent with those of other cases—particularly, contemporary India.³⁸ They are also consistent with the results obtained in historical case studies of the nineteenth-century United States and continental Europe.³⁹ We would submit, therefore, that more research is needed into the causes and consequences of related lending before academics and public officials embrace any particular set of policy recommendations.

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38. See Khanna and Fisman 2004; Khanna and Palepu 2000a, 2000b.

39. See Calomiris 1995; Lamoreaux 1994.

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