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GOVERNMENT-MADE BANK DISTRESS:  
INDUSTRIALISATION POLICIES AND THE RUSSIAN  
FINANCIAL CRISIS OF 1899-1902

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*Government-made bank distress:  
industrialisation policies and the Russian financial crisis of 1899-1902*

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How can industrial policies lead to bank distress? In the 1890s, when undergoing rapid state-led industrialisation, the Russian Empire grew by foreign capital inflows into national debt and by state procurement of industrial output. Concurrently, state policies incentivised, but did not compel, commercial banks to finance industry. In 1899, the inflow of foreign capital fell sharply, initiating a financial crisis. Using newly-collected historical data and extensive narrative evidence, I find the banks which experienced greater distress in the crisis had more personal connections to the government officials who were close to the epicentre of policymaking. Moreover, these banks had more personal ties to the companies which had been most-stimulated by state policies to expand production. Taken together, these two findings suggest that national development policies had a destabilising impact on bank performance.

*Keywords:* financial crises, bank failures, development policies, political economy, Russia.

*JEL Classification:* G01, L5, O25, P16.

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## **1. Introduction**

In the mid- to late 1890s, industry in the Russian Empire showed exceptional growth. The value of manufactured output between 1893 and 1900 rose by nearly 10 per cent per year (Borodkin, 2011a, 2011c), making it the fifth largest manufacturing producer in the world (League of Nations, 1945, p. 13). The state acted as a catalyst for economic growth by procuring industrial products and stimulating industry to expand operations to match the constantly-rising demands from the state and the private sector (Gindin, 2007c). Simultaneously, I find evidence that state policies incentivised commercial banks to finance this industrial expansion. In 1899, this successful setup started to come apart due to a sudden drop in the rate of inflow of European capital to Russian government bonds and the securities of industrial enterprises. This led to a rapid stock market decline, disastrous corporate performance and overwhelming bank losses (Bovykin, 1967, 1984). Because banks supplied over half of the industrial sector's financing, banking distress threatened the successes of the whole decade.

What caused the reversal in the robust industrial growth? Among a number of possible causes, one reason offered by the then-Minister of Finance was the state industrialisation policies of the 1890s, which had over-stimulated heavy industry, leading to its overexpansion and eventual contraction (Gindin, 1996). The purpose of this paper is to examine how far government policies contributed to bank losses in the crisis of 1899-1902, if at all. This enquiry is important because the influence of the state on a banking system is often significant and can be negative. When it is negative, banking distress and failure may follow, which is likely to lead to a fall in the supply of money (Friedman & Schwartz, 1963) and other non-monetary ill effects (Bernanke, 1983; Hall, 2010) on economic activity overall.

I identify three channels through which the Russian government affected the banks' inclination to finance industry and, consequently, their financial outcomes. The first was information that bank staff gathered through their personal connections with government

officials and corporate board members. In particular, banks obtained information about the future direction of industrialisation policies, such as which industries the government would protect and support, and about state procurement decisions, such as which factory would receive a lucrative procurement contract. The second channel was the government's expectation that banks would finance the modernisation of industry. The third was the development policy of the State Bank, a quasi-central bank, which provided commercial banks with regular credit. This paper focuses on the first channel because I argue the other two channels contributed little to the increase in the banks' financing of industry.

In order to trace the flow of information from the state to the banks, I record personal connections, or more formally interlocks, between members at banking boards, government officials, and company board members.<sup>1</sup> Specifically, a well-informed political interlock was recorded when a bank board member, or his sibling, was part of a group of top government officials who were well-informed – due to their proximity to the Finance Minister Sergei Witte – about state procurement decisions and the expected trajectory of the industrialisation policies. Witte, as the architect of the industrialisation policies and the final decision-maker on state procurement contracts, was at the epicentre of policymaking (Bovykin, 1967; Shepelev, 1981).

A quite different heavy industry interlock is recorded when a bank's board member was also a board member in a heavy industrial firm, or when that banker's sibling served this function. This type of interlock presents an alternative way of tracing the effect of state policies on bank performance, because heavy industrial firms were highly reliant on state procurement; when the crisis caused procurement to fall, industry suffered. Moreover, the government itself acknowledged the danger posed by the existence of corporate interlocks. In

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<sup>1</sup> For lucidity, I refer to the members of a board of directors or a management committee as simply 'board members', unless otherwise specified.

one of the few corporate laws passed in response to the crisis, authorities forbade an executive board member of a bank to serve on a corporation's board (Complete Collection of Laws, 1903). I also specify three additional types of interlock: to capture bankers' connections with a wider range of government officials and with non-financial companies, and to trace connections with rival banks.

Next, I assess how the presence of government, industrial, and banking connections in each bank affected bank performance during the crisis. Bank distress is measured in the form of: (1) the net losses sustained by banks on investment portfolios over the whole crisis period; and (2) the drop in bank share prices over the first year of the crisis, the only period during the crisis that was largely free from direct government intervention in the stock market.

My main finding is that the banks which experienced greater distress during the crisis had more connections to the government officials who were well-informed about the industrialisation policies and/or state procurement contacts in the lead-up to the crisis. The inference is that the banks which had been most influenced by these policies exposed their finances most to heavy industrial companies and consequently lost most.

Additionally, I find that the banks which experienced greater distress during the crisis had more personal connections to heavy industrial companies. The interpretation is that those banks which suffered heavier losses had greatest exposure, via direct loan financing or securities underwriting, to the companies most stimulated by state policies. Put together, these two complementary findings indicate the negative effect of the national development policies on bank performance during Russia's state-led growth.

The findings of this paper add to four strands of existing literature. First, the paper provides empirical evidence to support the long-standing belief that government can contribute to, and even originate, banking crises. Research on this subject comes in the form of descriptive evidence (Hammond, 1957; Cameron, 1967; Krugman, 1998; Cassis, 2002;

Rajan, 2011; Calomiris & Haber, 2014; Turner, 2014). For example, Calomiris & Haber (2014) argue that the root cause of the 2007-09 financial crisis in the U.S. was the deal struck between banks and government to loan money to unqualified mortgage borrowers in exchange for relaxed banking regulation. The unique contribution of this paper is that it educes qualitative evidence and takes a quantitative approach to link government policies with subsequent bank distress. My statistical analysis adds to and confirms the narrative evidence, rather than merely claiming causality without substance.

Second, this paper augments Russian economic history. Alexander Gerschenkron maintained that the Russian state was the ‘agens movens of industrialisation’ (Gerschenkron, 1962, p. 20), or the primary driver of economic development, largely responsible for the country’s economic outcomes. The present research supports Gerschenkron’s arguments, and at the same time questions Gregory’s (1991, 1994) revisionist view that the Russian state was not a vital player in the industrialisation of the 1890s. Specifically, Gregory contends that state expenditures on industrial products, such as military hardware, were too small to affect industrial growth unduly. This paper shows that state procurement accounted for up to 50 per cent of heavy industry output.

Third, this paper throws new light on the impact of bankers’ personal connections on bank performance. Researchers have found political interlocks can have both a negative (Duchin & Sosyura, 2012; Grossman & Imai, 2016) and positive impact (Braun & Raddatz, 2010; Acemoglu et al., 2016) on the financial outcomes of banks. This paper shows that a negative influence is indeed a possibility. When it comes to banks’ interlocks with non-financial firms, my research supports the established view that in times of stress this type of connection typically has a negative effect on banks (Laeven, 2001; La Porta et al., 2003; Colvin, 2014; Colvin et al., 2015). A distinguishing feature of this paper is that it identifies exactly the type of information that passed through personal contacts and produced the

quantified effect. In contrast, nearly all academic articles on interlocks do not go beyond hypothesising why interlocks have a negative or positive effect.

Fourth, this paper contributes to the historical literature on the role of bank-industry connections in the economic growth of the nineteenth century. Although banks' interlocks with companies brought little tangible benefits during Germany's industrialisation (Fohlin, 1999), they were essential for the economic development of New England (Lamoreaux, 1996), and improved firms' access to credit in South Yorkshire (Newton, 1996). This paper's findings suggest that bank-industry ties played a significant role in the development of Russia's heavy industry.

The arguments are built as follows. Section 2 provides the historical setting of the study. Section 3 outlines the proximate causes of the crisis. Section 4 quantifies government's role in expanding industrial production in the 1890s. Section 5 examines the information channel through which government affected banks' willingness to finance industry. Section 6 defines the empirical strategy and variables. Section 7 reports empirical results and Section 8 concludes. Appendices provide summary statistics and robustness tests, explain the choice behind dependent variables, and discuss the two other channels through which government might have influenced banks' investment and lending decisions.

## **2. Industrialisation in the 1890s**

In the 1880s, Russia's share of world manufacturing production was far behind those of other major nations. Whereas the U.K.'s share was 26.6 per cent and France's 8.6 per cent, Russia's was only 3.4 per cent (League of Nations, 1945). In 1893, the newly-appointed Finance Minister, Sergei Witte, introduced fresh economic policies aimed at rapid industrialisation. The goal was to catch up with the already industrialised countries in Europe and make Russia great again in the world economic, political and military arena (Gindin,

1957). Witte believed an economy based solely on agriculture was at the mercy of ‘a quite obvious, unsheltered exploitation of its productive forces’ (Gindin, 1957, p. 154) by the already industrialised countries.<sup>2</sup> In fact, the humiliating fiasco in the Crimean War of 1853-56 and the diplomatic restrictions imposed on Russia at the Congress of Berlin in 1878 vividly showed that economic backwardness and military defeats are closely related (Crisp, 1976).

Along with foreign investors, whose role is discussed in the next section, 39 joint-stock commercial banks financed Russia’s industrial growth. Banks supplied well over half the industrial financing, according to my estimates.<sup>3</sup> Ten banks were headquartered in St. Petersburg, the capital, where the government was located; five were based in Moscow, which was the centre of light industry; while the rest operated in provincial centres, from present-day Poland to Siberia. Appendix Table A1 lists the names and characteristics of banks.

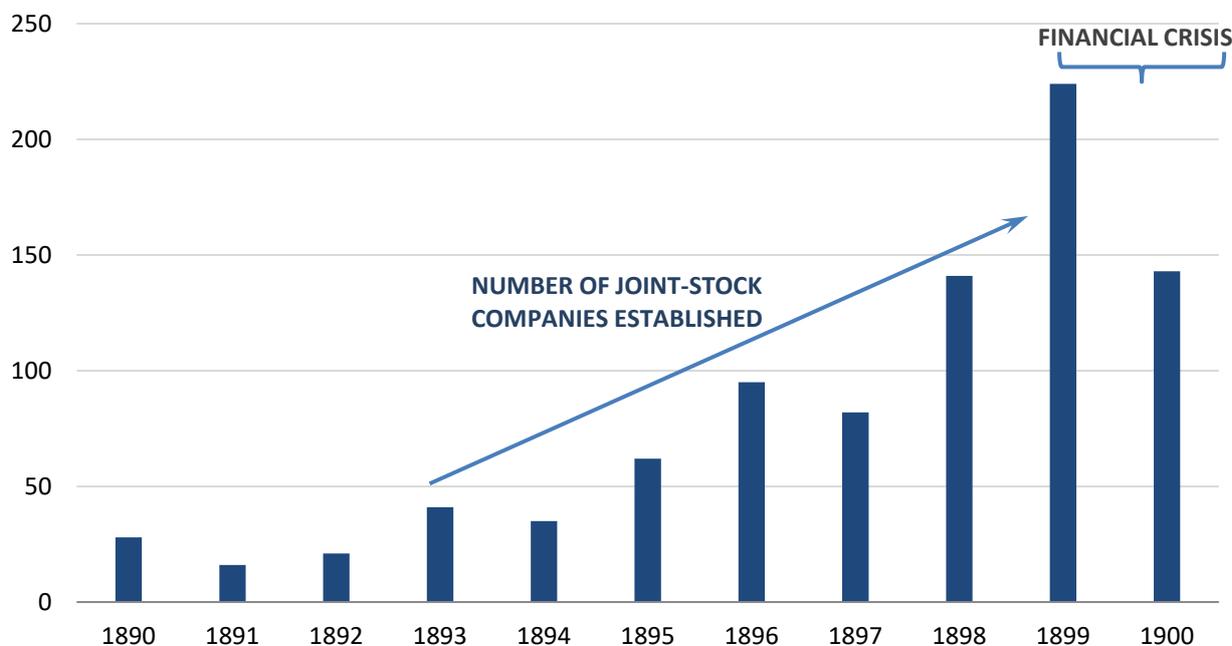
Rapid industrialisation turned out to be a success. Figure 1 shows that, throughout the 1890s, 745 public companies were established, as opposed to 216 firms in the prior decade.<sup>4</sup> Between 1893 and 1900, the value of output manufactured by heavy and light industry rose by 87 and 52 per cent, respectively (Borodkin, 2011a, 2011c). By 1900, Russia was producing 5.0 per cent of global manufacturing output, which ranked close to France, the world’s fourth largest manufacturer (League of Nations, 1945).

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<sup>2</sup> Author’s translation, as are all other instances of text translated from Russian language.

<sup>3</sup> I estimate that banks supplied some 61 per cent of joint-stock company financing. The banks’ role in financing heavy industrial companies was probably greater still. For comparison, Bovykin (1967) estimates that banks supplied half of all heavy industry’s finance. Calculated from data in Bovykin (1894); Dmitriev-Mamonov (1903); Golubev (1905); State Bank (1899); and Russian State Historical Archive (RSHA) (collection 587, inventory 33, file 98).

<sup>4</sup> Calculated from data in Dmitriev-Mamonov (1903).



**Figure 1.** Number of joint-stock companies established per year, 1890-1900  
*Sources:* Dmitriev-Mamonov (1903).

### 3. The proximate causes of the crisis

The sound industrial growth of the 1890s was interrupted by the financial crisis of 1899-1902, which began with a much reduced inflow of foreign capital to Russian government bonds and the securities of industrial enterprises. Beginning from 1899, the Russian government found it almost impossible to sell its debt on the Parisian market, which had been Russia's primary source of external funding (Ministry of Finance, 1900-1907b).<sup>5</sup> The rate of capital inflows to corporate equity and debt securities also began to decelerate: from a 35 per cent increase in 1899 to just 1 per cent in 1902 (Ol, 1925). This contrasts markedly with the interest expressed by French, Belgian, and German investors in the years before the crisis who saw in Russia a highly attractive opportunity. The net amount of foreign capital from

<sup>5</sup> Gregory (2003) estimates that in 1898 foreigners owned as much as 57 per cent of government debt. A bond of 159 million rubles was placed with French investors in May 1901 and another 182 million rubles in April 1902, together equivalent to 17.5 per cent of state revenues in 1902, but that did not make much difference to national finances (Siegel, 2015). State revenues are from Ministry of Finance (1902d).

abroad soared by over 66 per cent between 1893 and 1900, from 2,951 to 4,910 million rubles (Bovykin, 1984).<sup>6</sup>

The decline in foreign capital inflows was due to the shortage of capital in Europe, itself attributable to various economic and political factors (Ministry of Finance, 1900a; Witte, 1898b). The scarcity of capital was plain from the rise of official interest rates across Europe as early as the summer of 1898. In a note to the Czar, Witte mentioned that on 29 October 1898, German interest rates stood at 5.5 per cent, unprecedented since the Baring crisis of 1890 (Witte, 1898b). The fact that interest rates in Europe first rose six months before the crisis began in Russia suggests that the sudden stop in capital flows was unrelated to Russia's industrial performance. In October 1899, the Second Boer War broke out, depriving Great Britain of access to considerable gold supplies in South Africa, which further tightened capital constraints on Europe's money markets (Ministry of Finance, 1900a).

Consequently, the St. Petersburg stock exchange index began a three-year decline from February 1899 to the end of 1901, when the index had fallen by 45.4 per cent.<sup>7</sup> In 1901-02, heavy industry went into recession and its output declined by 7.7 per cent.<sup>8</sup> Three banks failed during the crisis and two banks shortly after, while 35 other banks survived through intensive help from the State Bank (RSHA, 587, 33, 101, 12-13). Despite these efforts, the crisis lasted longer in Russia than parallel industrial crises in Germany and Belgium (Brandt, 1902). The reason for its duration, according to the contemporary view of the Association of Industrial and Trade Enterprises, was primarily the government's action, which the

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<sup>6</sup> The net flow of foreign capital of 1,959 million rubles between 1893 and 1900 was equivalent to 208.6 million GBP, or 10.6 per cent of the nominal British GDP in 1900. Foreign exchange is calculated as the average rate on a 3-month bill of exchange drawn from St. Petersburg on London between 1893 and 1900. Data on the rates are from Borodkin (2011b). GDP is from Thomas & Williamson (2018).

<sup>7</sup> Calculated from data in Goetzmann et al. (n. d.a).

<sup>8</sup> Calculated from data in Borodkin (2011a, 2011b).

association believed, ‘exacerbate[d] the crisis in every possible way. In periods of industrial recessions, government, one of the largest buyers, reduce[d] its procurement by an exceptionally great extent. Such was the case with the construction of railways after 1900’ (Council of Congresses, 1914, p. 73). Other contemporary pundits agreed on these root causes of the crisis (Ozerov, 1905; Kanel, 1906).

Other causes were thought by contemporaries to be insufficient consumer demand for industry products, such as the use of passenger trains, that could have compensated for declining state procurement (State Comptroller, 1902), and weak corporate and stock exchange regulation (Witte, 1898a). Interestingly, the crisis was never attributed to inadequate banking regulation, perhaps because Russia possessed one of the most stringent regulatory and supervisory banking frameworks in Europe, according to a comparative study by the Ministry of Finance (Gindin, 1960).<sup>9</sup>

#### **4. Government industrial policy**

To determine the impact of state policies on bank performance, one must first identify how far the government contributed both to the expansion of industrial production and the bank financing of industry in the years leading up to the crisis. This section deals with the state’s impact on industry.

Industrialisation policies created a protectionist environment which encouraged firms to expand operations. Among the reasons for this stimulus were the state procurement of industrial products which intensified after 1893; protective tariffs on industrial imports; subsidies to key industries, including targeted loans from the state; the introduction of the

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<sup>9</sup> For example, the average capital ratio of St. Petersburg banks was over 25 per cent before the crisis, on the basis of data in Golubev (1905). For comparison, capital ratios of UK banks in 1900 were about 12 per cent (Sheppard, 2006). The exception was Germany, where credit banks in 1904 had a capital to assets ratio of 44 per cent (Calomiris, 1995).

gold standard in 1897 to attract foreign capital to domestic enterprises; and official encouragement to establish joint-stock companies (Gindin, 2007c). The push for rapid industrialisation that began in 1893 is confirmed by a notably increased number of the joint-stock companies which began to be set up, as shown in Figure 1.

In this policy of stimulus, state procurement was foremost. Constantly rising demand from both state and private sectors throughout the 1890s motivated industrialists to expand operations. In fact, the general press attributed the crisis primarily to industrial over-expansion (Migulin, 1907). Perhaps no other evidence speaks stronger in support for this than the one that comes directly from the Finance Minister. In a report at a special meeting on 10 April 1903, Witte, looking back at the crisis, acknowledged that the true cause of the calamities to manufacturing industry had been the rapid railroad construction and industrial development initiated by the government (Gindin, 1996). For twelve consecutive years (1887-1899), strong demand for manufacturing products had outrun supply, encouraging industrialists to constantly expand production capacity. In 1900, ‘the law of [continual] growth in consumption’ (Gindin, 1996, p. 137) was broken and supply exceeded demand for the first time. The overstretched financial position of factories, Witte added, put them at risk of immediate failure (Gindin, 1996).

Moreover, the prospect of obtaining state orders often led firms to make over-optimistic decisions, especially concerning the management of costs. Firms too small to tackle state contracts sought to extend their operations solely to attract state orders. This strategy often absorbed all the firms’ profits and drove them into debt (Afanasiev, 1900; Gindin, 1996). A typical case was the growth and bankruptcy of a major mining enterprise, which led to two of the three bank failures (Gertsenshtein, 1903).<sup>10</sup>

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<sup>10</sup> Namely, the Alekseevski Mining and Joint-Stock Enterprise and the Kharkov Trade and Ekaterynoslavsky commercial banks.

State procurement played a particularly important role because the state was a dominant buyer. According to estimates by Varzar, a leading economist of the time, pig iron, iron, steel and products manufactured from these materials across the country were in 1900 consumed in the following proportion: 48 per cent of the total by government, 22 per cent by private enterprises, 14 per cent by the general population and 16 per cent by unidentified parties (Ozerov, 1905). Note that the industries that extracted and employed these items in their production accounted for over 62 per cent of the total heavy industry output.<sup>11</sup> Further evidence comes from the Coalition of Southern Miners which, from their own data, indicated that in 1899 the government's share of procurement of such products from Southern mining factories amounted to 47 per cent of the total; while a representative from the Coalition of Polish Miners stated that government demand in his region amounted to a 'mere' 31 per cent of the aggregate (Gindin, 1996, p. 74).

Qualitative records likewise indicate how heavily the private sector depended on state orders. The report of the State Comptroller (1902, p. 55) to the Czar for 1901 states that '[c]urrently, there is little doubt that the crisis stemmed from the recent artificial and excessive growth of manufacturing industry, which had originated in the protectionist policy, large government orders and speculation using cheap foreign capital'.

While government procurement had a stimulating effect on industry in the 1890s, it had the opposite effect during the crisis, because the state could no longer sustain procurement at pre-crisis levels. In a memorandum to senior authorities, Zhukovski, the ex-managing director of the State Bank, stressed that the crisis had resulted in a 'lack of government orders' (Matveeva, 1987, pp. 52-53). *The Economist*, in its issue of 29 June 1901, reported that

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<sup>11</sup> Calculated from data in Borodkin (2011a, 2011b).

‘while production rapidly increased, the ordinary consumptive demand steadily declined and when the Government, owing to its financial embarrassments, had to curtail its railway building and its orders for material, the hot-house industries it had fostered collapsed and with them the inflated market for industrial securities’ (p. 969).

## **5. Government information**

Having established the role of government in industry’s expansion, this section now describes the first channel through which the government affected banks’ willingness to finance industry – namely, information about industrialisation policies that banks gathered through personal connections, or interlocks. First, I identify which officials were most likely to possess privileged information. Second, I examine how banks acted on privileged information. Third, I document how banks leveraged their government connections. The evidence suggests that banks were greatly influenced by such information.

Appendix Section C examines the two other channels through which government affected banks’ willingness to finance industry: (1) the government’s expectation that banks would finance industrial development; and (2) the State Bank’s policy vis-a-vis the banking sector. The evidence suggests that these two channels played minor, if not negligible, role in affecting banks’ decisions.

### ***5.1. Government interlocks***

The current literature suggests that banks set up interlocks with government officials in order to benefit from officials’ industry-specific or managerial expertise; to enhance a firm’s prestige from having a notable politician on their team; to gain access to preferential treatment, such as protection from competitors; and to obtain preferential information on future government actions, such as state procurement plans or regulatory changes (Faccio,

2006; Grossman & Imai, 2016).<sup>12</sup> The last two motives represent a form of rent-seeking that can distort market competition to favour connected firms and their clients, which, in turn, might impede overall economic growth.

Previous studies also suggest that banks establish interlocks with companies to reduce information asymmetries and to influence clients' corporate strategy (La Porta et al., 2003). However, corporate connections do not come without risk. Corporate interlocks may develop a strong influence on a bank and persuade it to finance dubious projects.

The Russian government affected banks' decisions first through the privileged information that they received about state procurement decisions and/or the future course of its industrialisation policies. Banks obtained this information by establishing personal connections with government officials and corporate board members.

Of the myriad of Russian government officials, some carried more weight and were better informed than others. The central figure to the country's development was Witte, the architect of the industrialisation policies of the 1890s and the final decision-maker on procurement contracts, corporate subsidies and other forms of economic support (Bovykin, 1967; Shepelev, 1981). One example of the centrality of Witte's position was his drive to consolidate power over the economic affairs of the nation in his own 'enlightened stewardship' (Gindin, 1959, p. 123). Witte believed that this would ensure the successful orchestration of industrialisation (Gindin, 1959). His power steadily grew as the Ministry of Finance became a 'super ministry' (Solovyov, 2003, p. 165), whose reach expanded well beyond its remit, for example, when it acquired absolute control over the Ministry of Railways (Solovyov, 2003). Last, the historian Gindin (1996, 2007a, 2007b, 2007c, 2007d) provides many examples of Witte's omnipresent reach across Russia's economic affairs.

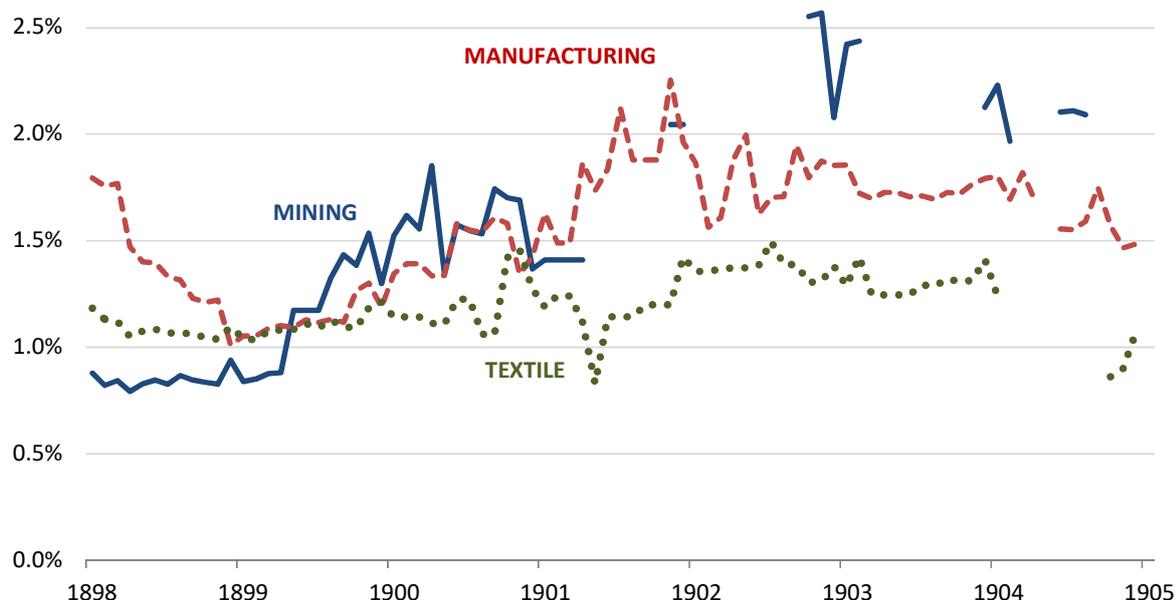
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<sup>12</sup> For an extensive literature review on the role of interlocks at corporations, see Adams et al. (2010).

This evidence justifies the view that all major economic policy decisions emanated from Witte and that he handled most of the state's procurement contracts. From this, it may be inferred that the top government officials who were in close and regular contact with Witte were in the best position to obtain privileged information. In addition to these men, top officials at the Ministry of Railways, Agriculture, Defence and Maritime Affairs were well-placed to acquire privileged information, because they each had to procure goods from private sector companies for their ministries. Such products were then used in building state-sponsored railways, in the timber industry and in arms for the army and navy (Gindin, 2007a). But even before they placed industrial orders these officials had first to outline their procurements plans in petitioning the Ministry of Finance for fiscal resources (Machlai, 2011).

## ***5.2. The effect of government information***

On the basis of written correspondence between bankers and government officials and corporate board members, Bovykin (1967) documents many cases of banks obtaining and then acting on privileged information. Banks learned from privileged information that certain industrial companies presented low-risk, high-return opportunities. Certain industrial firms were low-risk because the government often signed multi-year procurement contracts (Gindin, 2007c), which convinced firms that state procurement would continue indefinitely and at a constant level. Indeed, Figure 2 shows that, on the eve of the crisis, the bond risk premium of heavy industrial companies (extractive and manufacturing) was as low as that of long-established and conservative light industrial companies, represented here by the textile industry. Furthermore, the risk premium of corporate securities was just one percent above that of the safest government bonds.



**Figure 2.** Monthly corporate bond risk premium by industry (in percent), 1898-1904

*Notes:* The corporate bond risk premium is the excess of current yield on corporate bonds of each of the three industries over the current yield of the highest-rated government security, the four percent Russian government bond of 1894. Current yield of each corporate bond is calculated based on price and coupon data of 37 individual bonds. Gaps in the series are due to no trades in those months. Industry yield is the average yield of traded bonds in every month weighted by the outstanding amount of each bond.

*Sources:* Price and coupon data is from the Ministry of Finance (1900-1907a). The quantity of bonds outstanding is from Dmitriev-Mamonov (1903).

In addition to being low-risk, certain industrial companies represented high-return opportunities because government bought at above-market prices (Lyaschenko, 1949; Gindin, 2007c). Indeed, data between 1893 and 1898 reveal that heavy industries (extractive and manufacturing) then averaged 11.7 per cent in return on equity, the ratio of net income to capital stock.<sup>13</sup> Industry recipients of government orders probably made even more profit.

This suggests that the policies intended to develop heavy industry inadvertently encouraged banks to devote more of their assets to financing heavy industry. Indeed, a government audit of one of the troubled banks revealed that ‘in its activities, the bank broke through the strict limits of its statute, putting significant sums of money into emerging industrial enterprises both through acquiring shares in such enterprises and opening credit to them’ (Bovykin & Petrov, 1994, p. 105).

<sup>13</sup> Extractive and manufacturing industries accounted for about 90 per cent of all heavy industries’ capital stock. Calculated from data in the Ministry of Finance (1901b).

Furthermore, Witte's reports on state revenues and expenditures over time emphasised the need for unabated industrialisation. In one such report from 1897, Witte states that, since the government 'has followed the protectionist system with an unwavering rigor and consistency' for some time, the premature loosening of these policies would be 'a great political mistake and a source of major shocks to the economic organism' (Ministry of Finance, 1896a, p. 14). Even at the beginning of the crisis, in the official industrialisation programme presented to the Czar, dated February 1899, Witte continued to stress the need for uninterrupted industrialisation (Von Laue, 1954).

In this situation, it was natural for banks to expect the government to continue procuring even in times of crisis. It might, thus, be argued that banks were more inclined to finance riskier heavy industry projects because they expected government to support industry. In fact, this is exactly what happened when the government organised a massive bailout of industrial firms (Gindin, 1996). However, if banks indulged in riskier financing on the expectation of industry bailouts, this simply makes state policies answerable for bank losses.

Witte's continued emphasis on adhering as closely as possible to the existing course of action may also explain why banks with well-informed connections did not envisage a crisis in industry. Politicians and corporate board members simply may have not realised how Witte's promises might fail to materialise and hence did not advise their banking interlocks to disengage immediately from financing industry.

Regarding the importance of interlocks between banks, the current literature suggests that the presence of personal ties can result in a bank's adopting a competitor's corporate strategy, which may result in the alignment of investment and lending positions (Connelly et al., 2011). In times of crisis, banks with similar characteristics or exposure to the same sectors can experience greater distress due to information contagion effects (Helwege & Zhang, 2016). This implies that any corporate strategy chosen by Russian banks with political

and corporate interlocks could have passed to banks with no such connections via personal ties between the banks.

### ***5.3. Leveraging government interlocks***

Banks were often compensated for their underwriting services by the securities themselves, often content to retain the securities on their books (Bovykin, 1967). This suggests that banks did not engage in underwriting-to-distribute. It was also common for banks to lend accepting the industrial securities of clients as collateral (Bovykin, 1967). This kept such securities on the books while the loan lasted. Had the banks doubted the positive prospects of their clients, they would have refused this kind of collateral.

Moreover, individual bank board members and directors were compensated with corporate securities (Bovykin, 1967). This suggests that some bankers had personal skin-in-the-game and genuinely believed in the soundness of their clients. Bankers were also rewarded by becoming members of corporate boards; or the reverse sometimes occurred (Bovykin, 1967). However, given that bank board members held directorships and ownership stakes with many corporations, they are best regarded as bankers on the boards of corporations, not the other way around.

As banks became financially and interpersonally intertwined with companies, they began to leverage their government connections to benefit their corporate clients. Some banks directly petitioned ministries to procure goods from their clients (Bovykin, 1967). This practice may count as rent-seeking and could have resulted in the suboptimal direction of state orders. However, there is at least one reason to believe that banks' petitions on their own could not have so severely misallocated funds as to produce the deep recession of 1901-02 in heavy industry. In the 1890s, industrial opportunities were abundant – 456 new joint-stock companies were established between 1893 and 1898 (Dmitriev-Mamonov, 1903). Banks did

not have to mislead government into buying from a client-company if it was poorly-managed. The bank could disinvest its holdings and invest in something better. In fact, Bovykin (1967) documents how banks consistently rejected unattractive investments and lending opportunities and sold unsuitable assets.

## **6. Empirical strategy and variables**

Having established the role of government officials and corporate board members in banks' decision-making in the 1890s, I next analyse the impact of interlocks on bank performance during the crisis of 1899-1902. For that, I estimate OLS regression models, such that:

$$\text{Distress}_i = \beta_0 + \beta_1 (\text{interlock variables}) + \beta_2 (\text{bank-specific variables}) + \varepsilon_i^{14}$$

### ***6.1. Dependent variables***

To quantify bank distress, I use two separate dependent variables. In the first instance,  $\text{Distress}_i$  comes in the form of the net losses banks sustained on investment portfolios over the whole crisis period, calculated as the ratio of net investment portfolio losses between 1899 and 1902 to the average value of the investment portfolio owned by the bank over the same period. Note that, for the reasons discussed in Appendix Section B2, I assign a zero for banks which made net investment profits over the crisis. I calculate the denominator only for the years when the bank was in operation if it went bankrupt before the end of 1902.

To perform these calculations, I hand-collected investment profits and losses for 1899-1902 from banks' individual annual reports in the Russian National Library and the Russian State Historical Archive, both in St. Petersburg. See Appendix Table A1 for the banks whose annual reports I located. Where annual reports were missing, I collected

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<sup>14</sup> Logarithmic and square root transformations do not substantially improve the fit of the models.

investment profits and losses for 1899-1900 from *Statistics on short-term credit* (Golubev, 1905).

For 1901-02, investment gains and losses were gathered from *The Bulletin of Finance, Industry and Trade* (Ministry of Finance, 1902-1903c). Both publications were initially compiled from individual banks' annual reports. However, for several reasons, original annual reports remain the most precise source for investment losses, and thus, whenever possible, I draw data from them. Finally, I obtained end-of-year investment portfolio holdings for 1899-1902 from *Statistics on short-term credit* (Golubev, 1905).

In the second instance,  $Distress_i$  takes the form of the percentage change in the bank share price from the maximum to the minimum level over 1899, the first year of the crisis. During this period, the St. Petersburg Stock Exchange experienced a rapid decline of 10.6 out of the 45.4 per cent total during the crisis (Goetzmann et al., n.d.a). I obtained bank share prices from the dataset constructed by Goetzmann et al. (n.d.b). See Appendix Section B2 for the reasons why these particular distress measures were chosen.

## **6.2. Independent variables**

To capture the effect of government and corporate connections on bank performance, I add interlock variables to my models. I register two broad categories of interlock: direct and indirect. First, I recognise a direct interlock when the same person holds office in two entities – a bank and a government body, or a bank and a company. This occurs only when the first, middle and surnames of two individuals match. Second, I consider an indirect interlock when a board member at a bank is connected to his sibling, either in the government or at a company. This occurs when the surnames and middle names of two individuals match.<sup>15</sup> This

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<sup>15</sup> Another way an interlock could be established was via a father-son connection, but no such linkages appeared. Women did not hold board positions at this time.

is because in Russia, the father's first name customarily becomes the child's middle name, a tradition that has been followed since the 18th century (King & Wilson, 2011; Lisbach & Meyer, 2013). What also ensures that I match true siblings is the fact that, for two individuals to be identified as siblings, both must have made great progress in their respective careers. After all, only a selected few became top government officials or corporate board members. Furthermore, a good portion of bankers' surnames, including Nobel, Bark, Gromme and Lego, were unique and of non-Russian descent.

Next, I establish five different types of interlock: two government, two corporate and one banking. I consider an interlock with government when a bank board member himself (direct interlock), or his sibling (indirect interlock), is employed by a government entity – that is, a state department, organisation, or agency – through which he may gather preferential intelligence. To identify which government organisations to include in my dataset, I review all the public entities that operated in Russia, as listed in the *Address-Calendar* (1898). I keep nearly all entities, except the ones whose employees were absolutely unrelated to the industrialisation process, for example, those in the Department of the Orthodox Confession. I then gather the names of officials employed by the state in 1898 from the *Address-Calendar* (1898) and the names of board members employed by banks in 1898 from *Russian Banks* (Golubev, 1899). Note that I treat all government officials as equal, not differentiating higher- from lower-ranks. Instead, I create a separate type of a government interlock, as follows.

Not all political connections are equal in value. Access to officials close to the epicentre of policy-making should be more beneficial to bankers than ties to officials who are remote from it. With this in mind, I record an interlock with the Finance Minister's circle of well-informed officials when there is a direct or indirect interlock between a bank board member and the highest-ranked officials who were likely to be in close and regular contact with Witte. Namely, I include top officials at (1) the Ministry of Finance, the centre of

policy-making as regards all national economic affairs (Raskin, 1998); (2) the Ministry of Railways, one of the largest buyers in the country (Solovyov, 2003); (3) the Ministries of Agriculture, Defence and Maritime Affairs which procured from companies; (4) the State Bank, which provided loans to industry and banks; (5) the State Nobles' Land Bank which extended loans to the nobility, some of whom owned industrial enterprises; (6) the State Treasury, responsible for managing national finances (Raskin, 1998); (7) the Government Senate, the supreme supervisory body, where Witte often presented reports (Raskin, 1998); and (8) the Council of the State, the supreme law-making body (Raskin, 1998). Consequently, only the most influential government bodies are included. The limited number of top officials in them should ensure that my interlock variables capture the passing of privileged information alone.

Because banks sustained losses related to industry, I also track bank ties with the corporate world. I consider the occurrence of an interlock with non-financial firms when a bank board member either personally sits on the board or management committee of a non-financial firm, or when that banker's sibling does so. I include in my dataset a full range of non-financial companies: heavy industrial, light industrial and non-industrial. The names of corporate board members active at the end of 1896 are sourced from *Statistics on Joint-Stock Businesses in Russia* (Pushkin, 1897). The aim was to pick a data source that was not too close to the crisis in 1899, since it took time for ideas of newly-appointed corporate board members to translate into bank strategy. Besides, corporate board members were elected for five-year periods (Rudjuk, 2005), indicating that the composition of the majority of boards was unlikely to have changed between the end of 1896 and 1899. Note that I consider

different types of corporate board members as equivalent: chairmen, vice-chairmen and regular members are treated as identical.<sup>16</sup>

Not all corporate connections are equal in value. Since the state targeted the development of heavy industrial companies, bankers' connections with such firms represent another way of tracing the effect of state policies on bank performance. Hence, I record an interlock with heavy industrial firms when a bank board member is also a board member of a heavy industrial firm, or when the banker's sibling is. I include in my dataset all firms operating in heavy industries, namely: extractive industries, such as oil and minerals; manufacturing industries that produced end-products as railroad tracks and ships; the chemical industry; the timber industry; and state-owned railroad companies.<sup>17</sup> When it is unclear whether a particular firm was heavy industrial, I consult company descriptions provided by Dmitriev-Mamonov (1903). To identify state-owned railroad companies, I refer to *The Statistical Yearbook of the Ministry of Railways* (Ministry of Railways, 1901).

To discern whether banks mimicked corporate strategy in competitor banks, I document an interlock with banks when a bank board member is connected to a board member at another bank, either personally or via a sibling. In all, I end up with five types of interlock variable: bank board members connected to government officials, to the Finance Minister's circle, to all kinds of non-financial firms, to heavy industrial companies and to other banks.

What do these interlocks capture? As discussed above, personal ties capture the passing of privileged information. If they registered corruption, we would expect to see little

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<sup>16</sup> I do not rank board members because the purpose of my analysis is to identify whether corporate connections mattered, rather than to pinpoint the board members whose rank was more consequential than someone else's.

<sup>17</sup> Banks' inability to find buyers for state-backed railroad bonds during the crisis forced them to keep the bonds on their books, thus impairing their performance.

bank distress. This is because the suboptimal redistribution of state orders could not on its own have led to the deep recession of 1901-02 in heavy industry.

It could also be asserted that bank losses had little to do with government policies and were simply the result of banks' speculation with industrial securities. There was indeed a fair amount of speculative activity among banks and the general public, especially towards the beginning of the crisis (Brandt, 1904). However, as discussed in detail in Appendix Section B2, banks' losses were primarily due to the massive reintermediation of industrial securities onto banks' balance sheets because industrial clients became unprofitable and unable to service their bank loans. This suggests that banks' ruinous performance was not due to securities speculation, but rather to the industry's economic downturn.

Finally, it could be argued that omitted factors, such as banks' poor oversight of industrial clients, drive the presence of both interlocks and bank losses. However, the industrialisation policies and the information that came with them occurred first, while any omitted factors can have resulted only from these information conditions.

My next step is to identify actual interlocks by matching banker names with the names of government officials and in turn with the names of corporate board members. I use a source code written specifically for this task. The matching process of 416 bankers, 3,378 corporate board members and 7,596 officials reveals that there were 49 bankers with personal links to 63 officials and 142 bankers with personal ties to 418 corporate board members. The matching also indicates that 74.2 per cent of all banker connections to the political and corporate world were arranged via a sibling, while the remaining 25.8 per cent took place via a direct interlock.

As the final step, I sum the number of bank board members with connections of either type and use the total amounts in regression analysis. Note that if a particular banker is connected to multiple corporate board members, I count this as a single interlock of a

particular type for that bank. In other words, for me to record ten bank board members with interlocks, all ten members must have one or more corporate ties. The same method applies to bank connections with government officials.

I also add bank-specific variables to my regressions to control for the heterogeneity of banks. These variables are based on data from December 1898, when bankers hardly expected the imminent crisis, yet only two months before the beginning of the stock market downturn. My choice of these variables is as follows, with full descriptions located in Table 1: bank age, number of bank locations, leverage, liquidity, asset growth in the year before the crisis and board size. I collect these variables from *Statistics on Short-Term Credit* (Golubev, 1905), with the exception of bank age, which comes from *Russian Banks* (Golubev, 1899). Lastly, Appendix Tables A2 and A3 provide correlation matrices for all variables.

## **7. Empirical results**

To preview my results, I examine the distribution of interlocks among banks. Appendix Table A4 shows that banks located in St. Petersburg, the capital, were more connected to industry than banks located in Moscow and the provinces. The table also shows that St. Petersburg's banks were the group most connected with heavy industry. Their 35 personal linkages resulted in the number of connections per board member being four times the number of those in Moscow or the provinces. Given that St. Petersburg banks sustained the greatest financial losses of the three banking groups, as shown in the summary statistics in Table 2, their high interconnectedness with heavy industry implies that personal ties may have played a role in bank distress. St. Petersburg's banks were also the group most connected with the Finance Minister's circle. Their 15 connections were three times the number of those in

Table 1: Definitions of variables used in regression analysis

| Variables   | Unit   | Definition   |
|---|--------|--|
| <i>Dependent variables</i>                                |        |  |
| Net investment losses                                     | Ratio  | Net losses on equity and bond investments, 1899-1902 to Average value of investments, 1899-1902  |
| Share price   | Ratio  | Percentage change in bank share price, from maximum to minimum value over 1899                   |
| Net investment profits                                    | Ratio  | Net profits on equity and bond investments, 1895-1898 to Average value of investments, 1895-1898 |
| <i>Control variables</i>                                  |        |  |
| Bank age  | Years  | Bank age   |
| Number of locations                                       | Number | Number of bank locations in 1898, including headquarters, branches, and agencies                 |
| Leverage  | Ratio  | Total debt to Total assets   |
| Liquidity   | Ratio  | Percentage of total assets held in cash at the State Bank and other depository institutions      |
| Asset growth  | Ratio  | Change in total assets over 1898   |
| Board size  | Number | Total members present on the bank board of directors and management committee                    |
| <i>Interlock variables</i>                                |        |  |
| Direct interlock  | Number | A bank board member holds office at a government or corporate entity                             |
| Indirect interlock  | Number | A bank board member is connected to his brother at a government or corporate entity              |
| Member connected to non-financial firms                   | Number | Bank board members interlocked with non-financial firms, end of 1896                             |
| Member connected to heavy industrial firms                | Number | Bank board members interlocked with heavy industrial firms, end of 1896                          |
| Member connected to the government                        | Number | Bank board members interlocked with government officials in 1898                                 |
| Member connected to the Finance Minister's circle         | Number | Bank board members interlocked with government officials close to the Finance Minister in 1898   |
| Member connected to banks                                 | Number | Bank board members interlocked with competitor banks, end of 1898                                |
| Interlocks with non-financial firms                       | Number | Connections between bank board members and non-financial firms, end of 1896                      |
| Interlocks with heavy industrial firms                    | Number | Connections between bank board members and heavy industrial firms, end of 1896                   |
| Interlocks with the government                            | Number | Connections between bank board members and officials in 1898                                     |
| Interlocks with the Finance Minister's circle             | Number | Connections between bank board members and officials close to the Minister of Finance in 1898    |
| Interlocks with banks                                     | Number | Connections between bank board members and competitor banks at the end of 1898                   |
| Share of board connected to non-financial firms           | Ratio  | Bank board members connected to non-financial firms in 1896 to All bank's board members          |
| Share of board connected to heavy industrial firms        | Ratio  | Bank board members connected to heavy industrial firms in 1896 to All bank's board members       |
| Share of board connected to the government                | Ratio  | Bank board members connected to government officials in 1898 to All bank's board members         |
| Share of board connected to the Finance Minister's circle | Ratio  | Bank board members connected to officials close to the Min. of Fin. in 1898 to All board members |
| Share of board connected to banks                         | Ratio  | Bank board members connected to other banks, end of 1898 to All bank's board members             |

Table 2: Summary statistics

|   | N  | mean  | median | SD    | min   | max   |
|---|----|-------|--------|-------|-------|-------|
| Net investment losses (all banks)                         | 39 | 0.06  | 0.03   | 0.09  | 0.00  | 0.42  |
| Net investment losses (St. Petersburg banks)              | 10 | 0.14  | 0.13   | 0.13  | 0.00  | 0.42  |
| Net investment losses (Moscow banks)                      | 5  | 0.02  | 0.03   | 0.01  | 0.00  | 0.03  |
| Net investment losses (Provincial banks)                  | 24 | 0.03  | 0.01   | 0.05  | 0.00  | 0.22  |
| Share price (all banks)                                   | 26 | -0.16 | -0.16  | 0.11  | -0.41 | 0.00  |
| Share price (St. Petersburg banks)                        | 9  | -0.23 | -0.22  | 0.09  | -0.41 | -0.07 |
| Share price (Moscow banks)                                | 4  | -0.21 | -0.22  | 0.07  | -0.27 | -0.14 |
| Share price (Provincial banks)                            | 13 | -0.09 | -0.07  | 0.08  | -0.29 | 0.00  |
| Net investment profits (all banks)                        | 36 | 0.16  | 0.10   | 0.17  | 0.00  | 0.73  |
| Net income (all banks)                                    | 35 | 0.08  | 0.08   | 0.03  | 0.02  | 0.14  |
| Bank size   | 39 | 9.86  | 10.13  | 1.32  | 6.84  | 12.06 |
| Bank age  | 39 | 21.82 | 26.00  | 9.70  | 1.00  | 34.00 |
| Number of locations                                       | 39 | 7.64  | 4.00   | 8.93  | 1.00  | 30.00 |
| Leverage  | 39 | 0.59  | 0.61   | 0.16  | 0.09  | 0.81  |
| Liquidity   | 39 | 0.05  | 0.04   | 0.03  | 0.00  | 0.17  |
| Asset growth  | 39 | 0.20  | 0.13   | 0.30  | -0.66 | 1.15  |
| Board size  | 39 | 10.33 | 9.00   | 5.46  | 3.00  | 25.00 |
| Member connected to the government                        | 39 | 1.26  | 0.00   | 2.12  | 0.00  | 9.00  |
| Member connected to the Finance Minister's circle         | 39 | 0.56  | 0.00   | 1.12  | 0.00  | 5.00  |
| Member connected to non-financial firms                   | 39 | 3.62  | 3.00   | 3.47  | 0.00  | 12.00 |
| Member connected to heavy industrial firms                | 39 | 1.41  | 1.00   | 1.90  | 0.00  | 8.00  |
| Member connected to banks                                 | 39 | 1.05  | 0.00   | 1.83  | 0.00  | 7.00  |
| Interlocks with the government                            | 39 | 1.62  | 0.00   | 2.71  | 0.00  | 11.00 |
| Interlocks with the Finance Minister's circle             | 39 | 0.69  | 0.00   | 1.38  | 0.00  | 6.00  |
| Interlocks with non-financial firms                       | 39 | 9.67  | 5.00   | 11.30 | 0.00  | 43.00 |
| Interlocks with heavy industrial firms                    | 39 | 3.03  | 1.00   | 4.29  | 0.00  | 17.00 |
| Interlocks with banks                                     | 39 | 1.08  | 0.00   | 1.90  | 0.00  | 7.00  |
| Share of board connected to the government                | 39 | 0.09  | 0.00   | 0.12  | 0.00  | 0.38  |
| Share of board connected to the Finance Minister's circle | 39 | 0.04  | 0.00   | 0.08  | 0.00  | 0.27  |
| Share of board connected to non-financial firms           | 39 | 0.33  | 0.35   | 0.26  | 0.00  | 1.00  |
| Share of board connected to heavy industrial firms        | 39 | 0.12  | 0.09   | 0.15  | 0.00  | 0.56  |
| Share of board connected to banks                         | 39 | 0.07  | 0.00   | 0.11  | 0.00  | 0.42  |

Moscow.<sup>18</sup> Table 2 presents summary statistics on the interlock and non-interlock variables for all banks.

My core evidence is presented in Table 3, which reports the results of five regression models, the only difference between each specification being the type of the interlock variable used. Note that these models incorporate both direct and indirect interlocks. Robust standard errors are used in all models. Model (1) shows that, with each additional bank board member connected to a variety of officials, both close to the Minister of Finance and not directly related to his circle, a bank experienced 1.1 per cent of extra investment portfolio losses, though the result is not statistically significant at standard levels. Model (2) tests exclusively for bank board members connected to officials close to the Minister of Finance. The model reveals that, with each additional interlock of this type, a bank lost much more, or 6.3 per cent of extra portfolio losses.

It may be concluded that the banks which had been influenced most by the industrialisation policies exposed themselves financially to heavy industrial companies and hence experienced greater losses. Importantly, it can be inferred that the banks which sustained greater losses were the financiers of heavy industry, because the value of heavy industrial equities declined by substantially more than the light industrial companies.<sup>19</sup>

Model (3) in Table 3 provides evidence of the presence of a bank board member connected to all kinds of non-financial firms resulting in 2.4 per cent of additional investment

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<sup>18</sup> The share of banks with connections to the Finance Minister's circle was 28 per cent. For comparison, Grossman & Imai (2016) find that in 1900 the share of British banks connected to members of the Parliament was about 24 per cent.

<sup>19</sup> The 52 heavy industrial companies traded between the peak and trough on the St. Petersburg Stock Exchange experienced an average and median stock price decline of 56.2 and 65.5 per cent, respectively. This contrasts to the 22.2 and 27.3 per cent declines for the 7 light industrial companies. The closest available stock price was used for the periods when stocks were not traded. Thinly-traded stocks and second and subsequent stock offerings were excluded. Calculated based on data from Goetzmann et al. (n.d.b).

Table 3: Net investment losses 1899-1902, OLS model

|   | 1                 | 2                   | 3                   | 4                   | 5                 |
|---|-------------------|---------------------|---------------------|---------------------|-------------------|
| Member connected to the government                | 0.011<br>(0.015)  |                     |                     |                     |                   |
| Member connected to the Finance Minister's circle |                   | 0.063***<br>(0.021) |                     |                     |                   |
| Member connected to non-financial firms           |                   |                     | 0.024***<br>(0.007) |                     |                   |
| Member connected to heavy industrial firms        |                   |                     |                     | 0.044***<br>(0.009) |                   |
| Member connected to banks                         |                   |                     |                     |                     | 0.013<br>(0.012)  |
| Bank age  | -0.000<br>(0.002) | -0.001<br>(0.002)   | -0.000<br>(0.001)   | -0.000<br>(0.002)   | -0.000<br>(0.002) |
| Number of locations                               | 0.000<br>(0.001)  | -0.002<br>(0.002)   | -0.001<br>(0.001)   | -0.001<br>(0.001)   | -0.000<br>(0.001) |
| Leverage  | -0.068<br>(0.143) | 0.057<br>(0.107)    | -0.068<br>(0.098)   | 0.018<br>(0.073)    | -0.055<br>(0.123) |
| Liquidity   | 0.604<br>(0.869)  | 0.018<br>(0.417)    | 0.505<br>(0.674)    | -0.073<br>(0.344)   | 0.584<br>(0.815)  |
| Asset growth                                      | 0.077<br>(0.059)  | 0.069<br>(0.049)    | 0.086*<br>(0.046)   | 0.083*<br>(0.045)   | 0.066<br>(0.052)  |
| Board size  | 0.001<br>(0.003)  | -0.001<br>(0.003)   | -0.006*<br>(0.003)  | -0.005**<br>(0.002) | 0.002<br>(0.003)  |
| Constant  | 0.021<br>(0.057)  | 0.030<br>(0.077)    | 0.045<br>(0.045)    | 0.035<br>(0.050)    | 0.016<br>(0.053)  |
| Observations                                      | 39                | 39                  | 39                  | 39                  | 39                |
| Adjusted $R^2$                                    | -0.038            | 0.345               | 0.357               | 0.572               | -0.016            |

Robust standard errors in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

losses. Model (4) narrows the range of personal connections to bank board members connected specifically to heavy industrial companies and reveals that the presence of this type of interlock led to even greater distress, equal to 4.4 per cent of additional portfolio losses. This suggests the particularly unfortunate effect of personal ties to heavy industrial firms, those that were over-stimulated by the government.

Models (6) to (10) in Table 4 add an interaction term between bank board members connected to the Finance Minister's circle and heavy industrial companies. First, model (9) shows that, for the bank with no connections to the Finance Minister's circle, the independent effect of a heavy industry interlock is a net investment loss, just as expected. Second, model (7) reveals that, for the bank with no connections to heavy industry, the effect of an interlock with the Finance Minister's circle is not statistically significant. This suggests that banks had to have heavy industry connections to sustain investment losses. Third, the positive and statistically significant interaction term in model (7) suggests that the effect of having a heavy industry interlock is strengthened by an interlock with the Finance Minister's circle.

Models (11) and (12) in Table 4 model the effect of interlocks with both government and industry. Model (12) reveals that with each additional bank board member connected simultaneously to the Finance Minister's circle and heavy industrial companies, the bank experienced a 9.9 per cent of extra investment losses. As expected, this loss is larger in magnitude than of an interlock with the Finance Minister's circle alone, as shown in model (2). These results are robust to additional tests (see Appendix B).

Univariate models (13) to (16) in Table 5 largely confirm the results discussed in models (1) to (4) by testing the impact of interlocks on another distress variable, namely the percentage change in the bank share price over the first year of the crisis.<sup>20</sup> These models

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<sup>20</sup> Not all banks were publicly traded on the St. Petersburg Stock Exchange; hence the limited sample size of 26. Henceforth, the models using bank share price are univariate.

Table 4: Net investment losses 1899-1902, OLS model

|   | 6                   | 7                   | 8                   | 9                   | 10                  | 11               | 12                 |
|---|---------------------|---------------------|---------------------|---------------------|---------------------|------------------|--------------------|
| Member connected to the government                | -0.007<br>(0.006)   |                     |                     |                     |                     |                  |                    |
| Member connected to the Finance Minister's circle |                     | -0.008<br>(0.023)   |                     |                     |                     |                  |                    |
| Member connected to non-financial firms           |                     |                     | 0.013***<br>(0.005) |                     |                     |                  |                    |
| Member connected to heavy industrial firms        |                     |                     |                     | 0.023***<br>(0.008) |                     |                  |                    |
| Member connected to banks                         |                     |                     |                     |                     | 0.001<br>(0.006)    |                  |                    |
| Interaction                                       | 0.012***<br>(0.001) | 0.012***<br>(0.003) | 0.009***<br>(0.001) | 0.007***<br>(0.001) | 0.011***<br>(0.002) |                  |                    |
| Baseline controls                                 | ✓                   | ✓                   | ✓                   | ✓                   | ✓                   | ✓                | ✓                  |
| Member connected to gov./non-fin. firms           |                     |                     |                     |                     |                     | 0.026<br>(0.023) |                    |
| Member connected to FM's circle/heavy industry    |                     |                     |                     |                     |                     |                  | 0.099**<br>(0.039) |
| Constant  | 0.051<br>(0.042)    | 0.063<br>(0.045)    | 0.070*<br>(0.040)   | 0.052<br>(0.049)    | 0.061<br>(0.047)    | 0.032<br>(0.054) | 0.024<br>(0.071)   |
| Observations                                      | 39                  | 39                  | 39                  | 39                  | 39                  | 39               | 39                 |
| Adjusted $R^2$                                    | 0.557               | 0.545               | 0.656               | 0.648               | 0.544               | 0.048            | 0.372              |

Robust standard errors in parentheses. Baseline controls are bank age, locations, leverage, asset growth, and board size. Interaction term is member connected to the Finance Minister's circle \* member connected to heavy industrial firms.

Member connected to gov.-non/fin. firms refers to a member simultaneously connected to the government and non-financial firms. Member connected to FM's circle/heavy industry refers to a member simultaneously connected to the Finance Minister's circle and heavy industrial firms.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table 5: Bank share price percentage change 1899, OLS model

|   | 13                   | 14                   | 15                   | 16                   | 17                   |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| Member connected to the government                | -0.011<br>(0.010)    |                      |                      |                      |                      |
| Member connected to the Finance Minister's circle |                      | -0.031**<br>(0.013)  |                      |                      |                      |
| Member connected to non-financial firms           |                      |                      | -0.014**<br>(0.005)  |                      |                      |
| Member connected to heavy industrial firms        |                      |                      |                      | -0.021**<br>(0.009)  |                      |
| Member connected to banks                         |                      |                      |                      |                      | -0.026**<br>(0.011)  |
| Constant  | -0.142***<br>(0.026) | -0.136***<br>(0.021) | -0.094***<br>(0.031) | -0.118***<br>(0.024) | -0.125***<br>(0.024) |
| Observations                                      | 26                   | 26                   | 26                   | 26                   | 26                   |
| Adjusted $R^2$                                    | 0.002                | 0.095                | 0.157                | 0.131                | 0.154                |

Robust standard errors in parentheses. Univariate model.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

incorporate both direct and indirect interlocks. The models reveal that the presence of a bank board member connected to the Finance Minister's circle and separately to heavy industrial companies translated into an extra reduction in the bank's share price.

Model (5) in Table 3 shows that the presence of a bank board member connected to competitor banks did not lead to statistically significant investment losses. However, model (17) in Table 5 shows that having a board member of this type led to a 2.6 per cent extra decline in the bank's stock price. These results suggest that we need further evidence to make a fully conclusive statement on the role of banking connections.

How much distressed were banks by industrial losses? Official audits revealed that key banks were practically bankrupt or on the verge of collapse and it was only the massive assistance from the State Bank that prevented the larger half of the banking system from failure (Bovykin, 1984).

## **8. Conclusions**

The main finding of my research is that the banks which experienced greater distress in the crisis of 1899-1902, Imperial Russia's last financial crisis, had more connections to those government officials who were closest to the epicentre of policy-making, and to those companies which had been most-stimulated by state policies to expand production in the lead-up to the crisis. These findings indicate the negative effect of the national development policies on bank performance following Russia's rapid economic growth in the 1890s.

The findings suggest that it is not only banking regulation that can alter banks' behaviour, but also other policy-conceived incentives. In industrialising Russia, it was policies targeted at the development of the real economy that enticed banks to expose themselves financially to new technology companies. These badly-designed incentives culminated in disastrous bank performance when heavy industry experienced a slowdown. In

the end, even the possession of a stringent regulatory and supervisory banking framework did not safeguard banks from near failure.

Put differently, during the crisis, sound investment and lending opportunities turned out to be less safe than market participants, bankers and government officials had supposed before the crisis. History offers many examples of similar cases. What this paper has attempted to show is that government itself can point to seemingly secure and low-risk opportunities that eventually turn out to be inept and costly decisions for banks.

The findings also suggest that it is worth considering the possible political ramifications of economic development policies. The financial crisis aggravated the already poor working and living conditions for ordinary workers, contributing to the spread of labour strikes (Geftner, 1955; Gindin, 1950). The First Russian Revolution of 1905, which began only two and a half years after the conclusion of the crisis, was initiated by workers in the very industries the government had tried to develop (Vvedensky, 1952).

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## Appendix A. Summary statistics

Table A1: List of banks

| Bank name                                      | Headquarters   | Total assets | Branches | Bank age | Annual report |
|--|----------------|--------------|----------|----------|---------------|
| Volzhsko-Kamski Commercial Bank                | St. Petersburg | 173,402      | 22       | 28       | 1900-1902     |
| St. Petersburg International Commercial Bank   | St. Petersburg | 145,697      | 29       | 29       | 1900-1903     |
| Russian for Foreign Trade Bank                 | St. Petersburg | 108,231      | 14       | 27       | 1900-1903     |
| Russo-Chinese Bank                             | St. Petersburg | 96,715       | 24       | 2        | 1900-1903     |
| St. Petersburg Discount and Loan bank          | St. Petersburg | 73,734       | 2        | 29       | 1900-1902     |
| Russian for Trade and Commerce Commercial Bank | St. Petersburg | 67,437       | 17       | 8        | 1902-1903     |
| St. Petersburg Private Commercial Bank         | St. Petersburg | 48,878       | 3        | 34       | 1900-1903     |
| St. Petersburg-Azovcky Commercial Bank         | St. Petersburg | 45,127       | 9        | 11       |               |
| St. Petersburg Muscovy Commercial Bank         | St. Petersburg | 28,272       | 1        | 14       | 1902-1903     |
| Credit Lyonnais                                | St. Petersburg | 28,203       | 3        | 7        |               |
| Moscow Merchant Bank                           | Moscow         | 117,016      | 4        | 32       | 1900-1903     |
| Moscow International Trade Bank                | Moscow         | 60,701       | 30       | 25       |               |
| Moscow Trade Bank                              | Moscow         | 32,863       | 1        | 27       | 1900-1903     |
| Moscow Discount Bank                           | Moscow         | 23,849       | 2        | 28       | 1900-1903     |
| South-Russian Industrial Bank                  | Moscow         | 15,993       | 8        | 27       | 1900-1903     |
| Azovsko-Donskoi Commercial Bank                | The provinces  | 81,522       | 28       | 27       |               |
| Commercial Bank in Warsaw                      | The provinces  | 55,574       | 9        | 28       |               |
| Siberian Trade Bank                            | The provinces  | 31,476       | 13       | 26       | 1900-1903     |
| Riga Commercial Bank                           | The provinces  | 28,954       | 6        | 26       | 1902-1903     |
| Trade Bank in Lodz                             | The provinces  | 25,819       | 4        | 26       | 1900-1903     |
| Orlovsky Commercial Bank                       | The provinces  | 25,527       | 22       | 26       | 1900-1903     |
| Odessa Discount Bank                           | The provinces  | 25,152       | 3        | 19       | 1900-1903     |
| Tiflis Commercial Bank                         | The provinces  | 24,355       | 4        | 26       |               |
| Vilnius Private Commercial Bank                | The provinces  | 15,959       | 6        | 26       | 1901-1903     |
| Kiev Private Commercial Bank                   | The provinces  | 15,008       | 1        | 30       | 1900-1903     |
| Kharkov Trade Bank                             | The provinces  | 12,143       | 1        | 30       |               |
| Minsk Commercial Bank                          | The provinces  | 11,414       | 12       | 25       | 1900-1903     |
| Warsaw Discount Bank                           | The provinces  | 10,745       | 1        | 27       | 1900-1903     |
| Pskov Commercial Bank                          | The provinces  | 10,183       | 5        | 25       |               |
| Voronezh Commercial Bank                       | The provinces  | 5,497        | 4        | 25       |               |
| Nizhny Novgorod Merchant Bank                  | The provinces  | 5,242        | 1        | 28       | 1900-1903     |
| Kazan Merchant Bank                            | The provinces  | 3,981        | 1        | 25       | 1900-1902     |
| Commercial Bank in Kostroma                    | The provinces  | 3,948        | 2        | 27       |               |
| Lodz Merchant Bank                             | The provinces  | 3,444        | 1        | 1        | 1900-1903     |
| Ekaterynoslavsky Commercial Bank               | The provinces  | 3,308        | 1        | 26       |               |
| Commercial Bank in Bialystok                   | The provinces  | 2,827        | 1        | 1        |               |
| Rostov-on-Don Merchant Bank                    | The provinces  | 2,338        | 1        | 5        |               |
| Baltic Commerce and Industry Bank              | The provinces  | 2,236        | 1        | 1        |               |
| Central Asian Commercial Bank                  | The provinces  | 932          | 1        | 17       |               |

*Notes:* sorted by location of headquarters and then by total assets. Total assets are in thousands of rubles.

*Sources:* Golubev (1899, 1905)

Table A2: Correlation of outcome and bank-specific predictor variables

|                            | (1)     | (2)     | (3)   | (4)     | (5)   | (6)  | (7)     | (8)   | (9)   | (10) |
|----------------------------|---------|---------|-------|---------|-------|------|---------|-------|-------|------|
| (1) Net investment losses  | 1.00    |         |       |         |       |      |         |       |       |      |
| (2) Share price            | -0.46** | 1.00    |       |         |       |      |         |       |       |      |
| (3) Net investment profits | 0.72*** | -0.41** | 1.00  |         |       |      |         |       |       |      |
| (4) Bank size              | 0.47**  | -0.50** | 0.37* | 1.00    |       |      |         |       |       |      |
| (5) Bank age               | 0.02    | 0.31    | 0.20  | -0.05   | 1.00  |      |         |       |       |      |
| (6) Number of locations    | 0.01    | -0.29   | -0.11 | 0.60*** | -0.06 | 1.00 |         |       |       |      |
| (7) Leverage               | 0.06    | 0.13    | 0.18  | 0.31    | 0.10  | 0.06 | 1.00    |       |       |      |
| (8) Liquidity              | 0.26    | 0.07    | -0.02 | 0.22    | -0.26 | 0.20 | -0.07   | 1.00  |       |      |
| (9) Asset growth           | -0.02   | 0.07    | -0.02 | -0.37*  | 0.07  | 0.01 | -0.43** | -0.22 | 1.00  |      |
| (10) Board size            | 0.34    | 0.00    | 0.03  | 0.44**  | 0.12  | 0.18 | 0.22    | 0.08  | -0.08 | 1.00 |

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A3: Correlation of interlock predictor variables

|   | (1)     | (2)     | (3)     | (4)    | (5)  |
|---|---------|---------|---------|--------|------|
| (1) Member connected to the government                | 1.00    |         |         |        |      |
| (2) Member connected to the Finance Minister's circle | 0.61*** | 1.00    |         |        |      |
| (3) Member connected to non-financial firms           | 0.66*** | 0.55*** | 1.00    |        |      |
| (4) Member connected to heavy industrial firms        | 0.42*** | 0.66*** | 0.81*** | 1.00   |      |
| (5) Member connected to banks                         | 0.70*** | 0.42*** | 0.65*** | 0.39** | 1.00 |

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table A4: Distribution of bank board member connections

|  |                | Bank board member connected to: |                      |                |                               |             | Total bank board members |
|--|----------------|---------------------------------|----------------------|----------------|-------------------------------|-------------|--------------------------|
| Location   |                | Non-financial firms             | Heavy industry firms | The government | The finance minister's circle | Other banks |                          |
| Direct interlock   | St. Petersburg | 54                              | 29                   | 12             | 9                             | 12          | 120                      |
| Indirect interlock   | St. Petersburg | 8                               | 6                    | 8              | 6                             | 5           |                          |
| Total  | St. Petersburg | 62                              | 35                   | 20             | 15                            | 17          |                          |
| <i>Interlocks with heavy industry firms as % of those with all non-financial firms</i> | St. Petersburg |                                 | 56%                  |                |                               |             |                          |
| <i>Interlocks with the Finance Minister's circle as % of those with the government</i> | St. Petersburg |                                 |                      |                | 75%                           |             |                          |
| Direct interlock   | Moscow         | 30                              | 4                    | 14             | 1                             | 15          | 72                       |
| Indirect interlock   | Moscow         | 1                               | 0                    | 7              | 2                             | 4           |                          |
| Total  | Moscow         | 31                              | 4                    | 21             | 3                             | 19          |                          |
| <i>Interlocks with heavy industry firms as % of those with all non-financial firms</i> | Moscow         |                                 | 13%                  |                |                               |             |                          |
| <i>Interlocks with the Finance Minister's circle as % of those with the government</i> | Moscow         |                                 |                      |                | 14%                           |             |                          |
| Direct interlock   | Provincial     | 39                              | 13                   | 4              | 1                             | 3           | 224                      |
| Indirect interlock   | Provincial     | 10                              | 3                    | 4              | 3                             | 2           |                          |
| Total  | Provincial     | 49                              | 16                   | 8              | 4                             | 5           |                          |
| <i>Interlocks with heavy industry firms as % of those with all non-financial firms</i> | Provincial     |                                 | 33%                  |                |                               |             |                          |
| <i>Interlocks with the Finance Minister's circle as % of those with the government</i> | Provincial     |                                 |                      |                | 50%                           |             |                          |
| All banks  |                | 142                             | 55                   | 49             | 22                            | 41          | 416                      |

*Notes:* Direct interlock occurs when a bank board member holds once in the government or at a company. Indirect interlock occurs when a bank board member is connected to his brother either in the government or at a company. Location is the location of the bank's headquarters. Member connected to non-financial firms is the number of bank board members interlocked with non-financial firms. Member connected to heavy industrial firms is the number of bank board members interlocked with heavy industrial firms. Member connected to the government is the number of bank board members interlocked with all types of government officials. Member connected to the Finance Minister's circle is the number of bank board members interlocked with government officials who were in close contact with the Minister of Finance. Member connected to other banks is the number of bank board members interlocked with competitor banks. Total bank board members is the total number of bank board members at all banks.

## **Appendix B. Robustness**

Models (18) to (22) in Appendix Table B1 show that personal connections brought significant value to banks in the years before the crisis. In particular, Model (19) portrays that having a bank board member with both direct and indirect connections to the Finance Minister's circle resulted in 9.2 per cent of extra investment profits between 1895 and 1898. Model (21) shows that connections with heavy industrial firms brought rewards as well, allowing the bank to outperform by 6.5 per cent. These were considerable gains because in this period the stock market appreciated by a mere 6.9 per cent.<sup>21</sup>

Models (23) to (27) in Appendix Table B2 and models (28) to (32) in Appendix Table B3 use a different set of interlock variable, capturing only direct interlocks. These models confirm the results of the core models (1) through (5).

Models (33) to (37) in Appendix Table B4 and models (38) to (42) in Appendix Table B5 use yet another set of interlock variable, capturing only indirect interlocks. These models confirm the results of core models (1) through (10), except that the effect of connections with the Finance Minister's circle is not fully conclusive, as seen in model (34).

Also note that in models (35) and (36) the coefficients on indirect interlocks with non-financial and heavy industrial companies are higher than on direct interlocks, as shown in models (25) and (26). Intuitively, we would expect direct interlocks to bring more distress. One potential explanation for the opposite result is that direct interlocks were not the main decision-makers, while bank board members with indirect connections were.

Models (43) to (47) in Appendix Table B6 and models (48) to (52) in Appendix Table B7 use a different set of interlock variable, or the share of bank board members with both direct and indirect connections of all board members at a bank. These models confirm the results of the core models.

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<sup>21</sup> Calculated from data in Goetzmann et al. (n. d.).

Table B1: Net investment profits 1895-1898, OLS model

|   | 18               | 19                 | 20                  | 21                  | 22               |
|---|------------------|--------------------|---------------------|---------------------|------------------|
| Member connected to the government                | 0.020<br>(0.019) |                    |                     |                     |                  |
| Member connected to the Finance Minister's circle |                  | 0.092**<br>(0.041) |                     |                     |                  |
| Member connected to non-financial firms           |                  |                    | 0.047***<br>(0.014) |                     |                  |
| Member connected to heavy industrial firms        |                  |                    |                     | 0.065***<br>(0.020) |                  |
| Member connected to banks                         |                  |                    |                     |                     | 0.021<br>(0.016) |
| Baseline controls                                 | ✓                | ✓                  | ✓                   | ✓                   | ✓                |
| Constant  | 0.158<br>(0.107) | 0.179*<br>(0.104)  | 0.178*<br>(0.091)   | 0.133<br>(0.102)    | 0.153<br>(0.099) |
| Observations                                      | 36               | 36                 | 36                  | 36                  | 36               |
| Adjusted $R^2$                                    | -0.125           | 0.110              | 0.317               | 0.256               | -0.120           |

Robust standard errors in parentheses. Baseline controls are bank age, number of locations, asset growth, and board size.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B2: Net investment losses 1899-1902, OLS model

|  | 23               | 24                 | 25                  | 26                  | 27               |
|--|------------------|--------------------|---------------------|---------------------|------------------|
| Member connected to the government (direct interlock)                | 0.013<br>(0.019) |                    |                     |                     |                  |
| Member connected to the Finance Minister's circle (direct interlock) |                  | 0.088**<br>(0.036) |                     |                     |                  |
| Member connected to non-financial firms (direct interlock)           |                  |                    | 0.021***<br>(0.007) |                     |                  |
| Member connected to heavy industrial firms (direct interlock)        |                  |                    |                     | 0.047***<br>(0.011) |                  |
| Member connected to banks (direct interlock)                         |                  |                    |                     |                     | 0.005<br>(0.011) |
| Baseline controls  | ✓                | ✓                  | ✓                   | ✓                   | ✓                |
| Constant   | 0.015<br>(0.059) | 0.015<br>(0.074)   | 0.046<br>(0.054)    | 0.051<br>(0.050)    | 0.005<br>(0.059) |
| Observations   | 39               | 39                 | 39                  | 39                  | 39               |
| Adjusted $R^2$   | -0.050           | 0.262              | 0.213               | 0.462               | -0.069           |

Robust standard errors in parentheses. Baseline controls are bank age, number of locations, leverage, liquidity, asset growth, board size.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B3: Bank share price percentage change 1899, OLS model

|  | 28                   | 29                   | 30                   | 31                   | 32                   |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| Member connected to the government (direct interlock)                | -0.013<br>(0.016)    |                      |                      |                      |                      |
| Member connected to the Finance Minister's circle (direct interlock) |                      | -0.041<br>(0.028)    |                      |                      |                      |
| Member connected to non-financial firms (direct interlock)           |                      |                      | -0.013**<br>(0.005)  |                      |                      |
| Member connected to heavy industrial firms (direct interlock)        |                      |                      |                      | -0.022**<br>(0.010)  |                      |
| Member connected to banks (direct interlock)                         |                      |                      |                      |                      | -0.024*<br>(0.012)   |
| Constant   | -0.147***<br>(0.029) | -0.142***<br>(0.024) | -0.104***<br>(0.029) | -0.122***<br>(0.025) | -0.136***<br>(0.025) |
| Observations   | 26                   | 26                   | 26                   | 26                   | 26                   |
| Adjusted $R^2$   | -0.020               | 0.036                | 0.108                | 0.097                | 0.083                |

Robust standard errors in parentheses. Univariate model.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B4: Net investment losses 1899-1902, OLS model

|  | 33               | 34                | 35                 | 36                 | 37                 |
|--|------------------|-------------------|--------------------|--------------------|--------------------|
| Member connected to the government (indirect interlock)                | 0.023<br>(0.037) |                   |                    |                    |                    |
| Member connected to the Finance Minister's circle (indirect interlock) |                  | 0.071<br>(0.044)  |                    |                    |                    |
| Member connected to non-financial firms (indirect interlock)           |                  |                   | 0.054**<br>(0.025) |                    |                    |
| Member connected to heavy industrial firms (indirect interlock)        |                  |                   |                    | 0.088**<br>(0.035) |                    |
| Member connected to banks (indirect interlock)                         |                  |                   |                    |                    | 0.091**<br>(0.039) |
| Baseline controls  | ✓                | ✓                 | ✓                  | ✓                  | ✓                  |
| Constant   | 0.009<br>(0.061) | -0.005<br>(0.078) | -0.016<br>(0.054)  | -0.026<br>(0.071)  | 0.016<br>(0.048)   |
| Observations   | 39               | 39                | 39                 | 39                 | 39                 |
| Adjusted $R^2$   | -0.046           | 0.117             | 0.170              | 0.210              | 0.220              |

Robust standard errors in parentheses. Baseline controls are bank age, number of locations, leverage, liquidity, asset growth, and board size.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B5: Bank share price percentage change 1899, OLS model

|  | 38                   | 39                   | 40                   | 41                   | 42                   |
|--|----------------------|----------------------|----------------------|----------------------|----------------------|
| Member connected to the government (indirect interlock)                | -0.033<br>(0.022)    |                      |                      |                      |                      |
| Member connected to the Finance Minister's circle (indirect interlock) |                      | -0.058**<br>(0.023)  |                      |                      |                      |
| Member connected to non-financial firms (indirect interlock)           |                      |                      | -0.042*<br>(0.023)   |                      |                      |
| Member connected to heavy industrial firms (indirect interlock)        |                      |                      |                      | -0.058<br>(0.037)    |                      |
| Member connected to banks (indirect interlock)                         |                      |                      |                      |                      | -0.081**<br>(0.030)  |
| Constant   | -0.141***<br>(0.023) | -0.140***<br>(0.020) | -0.132***<br>(0.023) | -0.140***<br>(0.021) | -0.127***<br>(0.021) |
| Observations   | 26                   | 26                   | 26                   | 26                   | 26                   |
| Adjusted $R^2$   | 0.028                | 0.103                | 0.094                | 0.078                | 0.158                |

Robust standard errors in parentheses. Univariate model.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B6: Net investment losses 1899-1902, OLS model

|   | 43                | 44                | 45                  | 46                  | 47                |
|---|-------------------|-------------------|---------------------|---------------------|-------------------|
| Share of board connected to the government                | 0.211<br>(0.195)  |                   |                     |                     |                   |
| Share of board connected to the Finance Minister's circle |                   | 0.545*<br>(0.282) |                     |                     |                   |
| Share of board connected to non-financial firms           |                   |                   | 0.184***<br>(0.047) |                     |                   |
| Share of board connected to heavy industrial firms        |                   |                   |                     | 0.371***<br>(0.089) |                   |
| Share of board connected to banks                         |                   |                   |                     |                     | 0.251<br>(0.192)  |
| Baseline controls   | ✓                 | ✓                 | ✓                   | ✓                   | ✓                 |
| Constant  | -0.016<br>(0.072) | -0.045<br>(0.083) | -0.051<br>(0.055)   | -0.035<br>(0.062)   | -0.015<br>(0.058) |
| Observations  | 39                | 39                | 39                  | 39                  | 39                |
| Adjusted $R^2$  | 0.010             | 0.189             | 0.272               | 0.369               | 0.049             |

Robust standard errors in parentheses. Baseline controls are bank age, number of locations, leverage, liquidity, asset growth, and board size.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B7: Bank share price percentage change 1899, OLS model

|   | 48                   | 49                   | 50                   | 51                   | 52                   |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| Share of board connected to the government                | -0.257<br>(0.171)    |                      |                      |                      |                      |
| Share of board connected to the Finance Minister's circle |                      | -0.531***<br>(0.171) |                      |                      |                      |
| Share of board connected to non-financial firms           |                      |                      | -0.191***<br>(0.066) |                      |                      |
| Share of board connected to heavy industrial firms        |                      |                      |                      | -0.294**<br>(0.128)  |                      |
| Share of board connected to banks                         |                      |                      |                      |                      | -0.202<br>(0.129)    |
| Constant  | -0.132***<br>(0.028) | -0.129***<br>(0.022) | -0.078**<br>(0.030)  | -0.109***<br>(0.027) | -0.137***<br>(0.028) |
| Observations  | 26                   | 26                   | 26                   | 26                   | 26                   |
| Adjusted $R^2$  | 0.038                | 0.143                | 0.172                | 0.155                | 0.020                |

Robust standard errors in parentheses. Univariate model.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Models (53) to (57) in Appendix Table B8 and models (58) to (62) in Appendix Table B9 use yet another set of interlock variable, or the aggregate number of both direct and indirect connections at a bank. These models support the results of the core models.

Models (63) to (67) in Appendix Table B10 and models (68) to (72) in Appendix Table B11 use another method to calculate robust standard errors. I employ the iteratively reweighted least squares algorithm which assigns a weight to each observation. The results of these models confirm those of the core models. Note that, following Abadie et al. (2017), I do not cluster standard errors, because I use the entire population of banks in my analysis.

Models (73) to (77) in Appendix Table B12 show the ninth and final robustness check which uses Tobit models to address censoring issues. These issues arise because the dependent variable, net investment losses, is censored at zero for banks which made net investment profits during the crisis. These models confirm the results of the core models.

Table B8: Net investment losses 1899-1902, OLS model

|   | 53                | 54                | 55                  | 56                  | 57               |
|---|-------------------|-------------------|---------------------|---------------------|------------------|
| Interlocks with the government                | 0.005<br>(0.010)  |                   |                     |                     |                  |
| Interlocks with the Finance Minister's circle |                   | 0.035*<br>(0.020) |                     |                     |                  |
| Interlocks with non-financial firms           |                   |                   | 0.008***<br>(0.002) |                     |                  |
| Interlocks with heavy industrial firms        |                   |                   |                     | 0.017***<br>(0.005) |                  |
| Interlocks with banks                         |                   |                   |                     |                     | 0.015<br>(0.013) |
| Baseline controls                             | ✓                 | ✓                 | ✓                   | ✓                   | ✓                |
| Constant                                      | -0.005<br>(0.058) | -0.007<br>(0.080) | 0.031<br>(0.039)    | 0.031<br>(0.051)    | 0.008<br>(0.050) |
| Observations                                  | 39                | 39                | 39                  | 39                  | 39               |
| Adjusted $R^2$                                | -0.038            | 0.175             | 0.491               | 0.382               | 0.028            |

Robust standard errors in parentheses. Baseline controls are bank age, number of locations, leverage, liquidity, asset growth, and board size.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B9: Bank share price percentage change 1899, OLS model

|   | 58                   | 59                   | 60                   | 61                   | 62                   |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|
| Interlocks with the government                | -0.009<br>(0.009)    |                      |                      |                      |                      |
| Interlocks with the Finance Minister's circle |                      | -0.021*<br>(0.012)   |                      |                      |                      |
| Interlocks with non-financial firms           |                      |                      | -0.004***<br>(0.001) |                      |                      |
| Interlocks with heavy industrial firms        |                      |                      |                      | -0.011***<br>(0.004) |                      |
| Interlocks with banks                         |                      |                      |                      |                      | -0.025**<br>(0.009)  |
| Constant                                      | -0.143***<br>(0.026) | -0.141***<br>(0.022) | -0.103***<br>(0.027) | -0.113***<br>(0.023) | -0.126***<br>(0.024) |
| Observations                                  | 26                   | 26                   | 26                   | 26                   | 26                   |
| Adjusted $R^2$                                | -0.001               | 0.044                | 0.195                | 0.194                | 0.156                |

Robust standard errors in parentheses. Univariate model.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B10: Net investment losses 1899-1902, OLS model

|   | 63                  | 64                  | 65                 | 66                  | 67                |
|---|---------------------|---------------------|--------------------|---------------------|-------------------|
| Member connected to the government                | -0.013**<br>(0.005) |                     |                    |                     |                   |
| Member connected to the Finance Minister's circle |                     | 0.063***<br>(0.016) |                    |                     |                   |
| Member connected to non-financial firms           |                     |                     | 0.008**<br>(0.003) |                     |                   |
| Member connected to heavy industrial firms        |                     |                     |                    | 0.018***<br>(0.004) |                   |
| Member connected to banks                         |                     |                     |                    |                     | -0.002<br>(0.006) |
| Baseline controls                                 | ✓                   | ✓                   | ✓                  | ✓                   | ✓                 |
| Constant  | 0.026<br>(0.032)    | 0.014<br>(0.064)    | 0.046<br>(0.033)   | 0.003<br>(0.030)    | 0.041<br>(0.038)  |
| Observations                                      | 39                  | 39                  | 39                 | 39                  | 39                |
| Adjusted $R^2$                                    | 0.276               | 0.286               | 0.171              | 0.375               | 0.072             |

Robust standard errors in parentheses, calculated using iteratively reweighted least squares.

Baseline controls are bank age, number of locations, leverage, liquidity, asset growth, and board size.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B11: Bank share price percentage change 1899, OLS model

|   | 68                   | 69                   | 70                  | 71                   | 72                   |
|---|----------------------|----------------------|---------------------|----------------------|----------------------|
| Member connected to the government                | -0.012<br>(0.012)    |                      |                     |                      |                      |
| Member connected to the Finance Minister's circle |                      | -0.032*<br>(0.017)   |                     |                      |                      |
| Member connected to non-financial firms           |                      |                      | -0.014**<br>(0.006) |                      |                      |
| Member connected to heavy industrial firms        |                      |                      |                     | -0.021*<br>(0.010)   |                      |
| Member connected to banks                         |                      |                      |                     |                      | -0.030**<br>(0.011)  |
| Constant  | -0.139***<br>(0.027) | -0.132***<br>(0.024) | -0.090**<br>(0.036) | -0.115***<br>(0.029) | -0.113***<br>(0.023) |
| Observations                                      | 26                   | 26                   | 26                  | 26                   | 26                   |
| Adjusted $R^2$                                    | 0.002                | 0.088                | 0.132               | 0.112                | 0.207                |

Robust standard errors in parentheses, calculated using iteratively reweighted least squares. Univariate model.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Table B12: Net investment losses 1899-1902, Tobit model

|   | 73                | 74                  | 75                  | 76                  | 77                |
|---|-------------------|---------------------|---------------------|---------------------|-------------------|
| Member connected to the government                | 0.010<br>(0.016)  |                     |                     |                     |                   |
| Member connected to the Finance Minister's circle |                   | 0.061***<br>(0.021) |                     |                     |                   |
| Member connected to non-financial firms           |                   |                     | 0.031***<br>(0.008) |                     |                   |
| Member connected to heavy industrial firms        |                   |                     |                     | 0.046***<br>(0.009) |                   |
| Member connected to banks                         |                   |                     |                     |                     | 0.015<br>(0.013)  |
| Baseline controls                                 | ✓                 | ✓                   | ✓                   | ✓                   | ✓                 |
| Constant  | -0.028<br>(0.078) | -0.001<br>(0.087)   | 0.012<br>(0.058)    | 0.002<br>(0.067)    | -0.034<br>(0.073) |
| Observations                                      | 39                | 39                  | 39                  | 39                  | 39                |

Robust standard errors in parentheses. Baseline controls are bank age, number of locations, leverage, liquidity, asset growth, and board size. Dependent variable is zero for banks that made net investment profits over 1899-1902.

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## **Appendix C. Government banking policy**

### ***C1. Government expectations***

Given that it was crucial for Russia to industrialise, it is likely that government expected the banking sector to finance industrial development. This was the second channel of government influence. However, there are several reasons to believe that the government's direct influence, assuming that it was indeed present, probably had a minimal impact on individual banks' lending and investment decisions.

The following studies point that government influence was no more than an expectation and surely not a requirement, because authorities have never explicitly told banks how to conduct their business and what sectors or individual companies to finance. A detailed study of financing deals by the St. Petersburg International Commercial Bank, a key banker to the government, found no evidence of the bank being exploited as an instrument of the state (Lebedev, 2003).

It is still possible that the government's expectation carried considerable weight in banks' decisions, since the Ministry of Finance was both their regulator and supervisor. For example, the ministry could decline a bank's petition to open a new branch or deprive a bank of its securities trading license by modifying its statute. This in effect would turn an innocuous expectation into a powerful requirement. To address this issue, I examined banks' statutes between 1895 and 1898 and found that that no statute was curtailed.<sup>22</sup> Also, an archival study of the ministry's policies vis-a-vis banks yielded no indication that the ministry abused its regulatory power (Gindin, 1960).

It is also possible that the government had substantial leverage on the decisions of a few banks which were bankers to the government, because it could threaten the loss of lucrative government business. I conclude that the government's expectation probably did

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<sup>22</sup> Banks' statutes are from *Complete Collection of Laws* (1899a, 1899b, 1900, 1901).

have a meaningful impact on these banks.<sup>23</sup> However, given that heavy industrial firms were highly profitable and banks' profitability was never at immediate risk, the question of how to balance industry financing without damaging the relationship with authorities was probably not an issue these bankers had to take seriously. The other banks were not bankers to the government and thus had no risk of losing government business.

## ***C2. The State Bank's policy***

The third channel through which the government affected banks' decisions was the protectionist policy of the State Bank regarding banks. I argue that this policy, too, had a minimal impact on inducing banks to finance industry.

It is known that the State Bank was highly protective of banks under stress ever since the first bank failure in 1875 (Gindin, 1960). Indeed, only nine banks were liquidated after the establishment of the first commercial bank in 1864 (Gindin, 1960). Keeping banks stable was important for another reason: on the eve of the crisis, banks supplied well over half of industrial financing. Modern economists point out that the banks which expect to receive a bailout tend to increase their risk-taking activities (Stern & Feldman, 2004).

If the banks were indeed counting on a bailout, then we should expect to have seen them hastily extending new loans in the first months of the crisis, seeking to tie themselves to the industrial companies which were so important for industrialisation. To test whether this ever happened, I track the change in the bank loans that were most indicative of heavy industry financing.<sup>24</sup> I find that the eight banks which were most likely to be bailed out by the State Bank reduced their lending by 27 per cent on average between January and December

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<sup>23</sup> How far each bank provided financial services to the government is unknown, and thus this factor cannot be controlled for in regression analysis.

<sup>24</sup> Namely, I calculate the change in term loans backed by corporate securities and call loans backed by government and corporate securities. Loan quantities are from Golubev (1905).

1899.<sup>25</sup> This suggests that these banks did not engage in last-minute gambling for resurrection and, therefore, had not been counting on a bailout.

Furthermore, even in non-crisis times, the State Bank provided credit to nearly all banks and rediscounted their bills in order to facilitate their functioning as credit suppliers to the economy (Gindin, 1960). Thus, the banks constantly receiving more financial assistance from the State Bank may have been more inclined to engage in industry financing. To test whether this even happened, I examine the allocation of State Bank loans to banks. In 1898, these loans amounted to merely 6.1 per cent of banks' lending to the economy.<sup>26</sup> If these loans were evenly distributed between banks, then the effect of the State Bank can be considered insubstantial. I estimate that most of the State Bank's assistance went to banks in the provinces.<sup>27</sup> This suggests that the impact of the State Bank's lending programmes did not much matter; otherwise, we would have seen provincial banks incurring large losses during the crisis, but only 4 out of 25 provincial banks experienced sizable distress.

#### **Appendix D. The choice of dependent variables**

I have chosen net investment losses and bank share price as my distress measures for four reasons. First, given that both measures were determined by stock market participants, these measures were least affected by banks' fraudulently understating losses on income statements (Bovykin, 1984). Although banks did tend to overestimate their investment assets (Lebedev,

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<sup>25</sup> I consider the banks which sustained ten per cent or greater investment portfolio losses over the crisis to be the most likely candidates for bailout.

<sup>26</sup> Bank credit data are from Golubev (1905). The State Bank's loans are from the State Bank (1899).

<sup>27</sup> As of December 1898, out of 46.3 million rubles of total assistance to banks, 10.8 million was distributed by the State Bank's St. Petersburg office (State Bank, 1899), which almost exclusively assisted banks based in St. Petersburg and Moscow (RSHA, 588, 1, 247; 588, 1, 277; 588, 1, 593), while 35.5 million was given out by Moscow and provincial offices, which lent to banks based in Moscow and in provincial centres.

2003), there was a mandatory requirement to mark investment portfolios to market every year.<sup>28</sup> This mark-to-market requirement forced banks sooner or later to document investment losses during the three-year-long stock market downturn.

Second, net investment losses capture the reintermediation of collateral onto banks' balance sheets throughout the crisis as heavy industrial companies defaulted on their loans. As a result of this reintermediation, banks' portfolio holdings increased by an estimated 55 per cent between January and December 1899 alone.<sup>29</sup> Indeed, an annual report of the St. Petersburg International Commercial Bank (1901) documented the occurrence of this takeover of collateral. This massive reintermediation was one of the primary reasons why banks sustained heavy losses. Thus, using this variable, I can capture banks' involvement in heavy industry financing – exactly the type of data that would have been ideal for capturing exposure to government policies.

Third, both measures of distress were less affected by the substantial anti-crisis assistance provided to banks by the State Bank, than by other distress measures, such as net income. In particular, the share price variable was probably least affected because a state-funded investment fund, introduced to support the value of banking and industrial shares, began to acquire shares mainly in 1900, after the period over which the variable is calculated.<sup>30</sup>

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<sup>28</sup> The statute of each individual bank specified the annual mark-to-market requirement.

<sup>29</sup> Own estimation, calculated as the increase in corporate securities on banks' balance sheets, in a rapidly and constantly declining securities market.

<sup>30</sup> Although the investment fund was established as early as October 1899, it seems to have begun acquiring large bundles of shares only in 1900. I determine this by using Bugrov's (2003) data on the composition of the fund's portfolio in February 1901 and the price for which the shares were acquired by the fund. I then match this price with the actual market price, drawn from Goetzmann et al. (n.d.b), to identify the month and year when the acquisitions were probably made. This reveals that the fund bought shares of 20 companies at some point in 1900 or later, and of three companies in 1900 or possibly in 1899.

Fourth, net investment losses, which are censored at zero for banks which made a net profit, are preferable to net investment profits, which would not be censored at zero. From archival evidence we know that some banks simply deemed it inappropriate to finance heavy industry. They made net investment profits over the crisis, despite having an above-average number of board members connected to government and the Finance Minister's circle (Gindin, 1958; Gindin, 1960).<sup>31</sup> Therefore, using net profits in regression analysis would not capture the true relationship between the presence of interlocks and bank distress.

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<sup>31</sup> The Moscow International Trade Bank and the Central-Asian Commercial Bank are examples.