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Lychakov, Nikita

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The distributional effect of a financial crisis: Russia 1899-1905

Nikita Lychakov *

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Who pays for financial crises? This paper examines the period between the major Russian financial crisis of 1899-1902 and the Russian Revolution of 1905. Using newly-constructed aggregate-level data and narrative evidence, this paper finds that in response to the crisis, the Russian government and industry transferred income and wealth from ordinary workers to industrialists and investors. The recipients of transfers weathered the crisis well and profited during the recovery, while employees' wages and wealth fell behind. The evidence also suggests that businesses required their staff to work more intensively.

Keywords: financial crises, businesses, labour, income distribution, Russia.

JEL Classification: D31, G01, J8.

* National Research University Higher School of Economics, Moscow, Russia. Postdoctoral fellow. E-mail: nlychakov@hse.ru

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1. Introduction

Recent scholarship has established that financial crises lead to greater inequality and increased poverty (van Dijk, 2013). However, the mechanisms by which these consequences emerge remain debatable. The standard view has been that crisis-induced economic shocks, such as the loss of employment or the decline in wealth due to a stock market downturn, reduce households' income and net worth (Manuelyan & Walton, 1998; Hurd & Rohwedder, 2010; Banks et al., 2012). A less common view has been that an unequal response by government to a crisis, such as bailing out banks using taxpayers' money, can benefit some citizens at the expense of others, causing what is known as the distributional effect (Halac & Schmukler, 2004; Stiglitz, 2013). This paper brings new evidence to this debate by turning to the case of Imperial Russia's last financial crisis that occurred between 1899 and 1902 and that ended just two and a half years before the Russian Revolution of 1905, a period of nationwide worker unrest.

In this paper, I examine (1) the immediate effect of the financial crisis of 1899-1902 on key participants in the economy – banks, industry and government; and (2) how these participants responded to the crisis and in the process affected the fourth key group – the working class. In order to do so, I collected aggregate-level data on the economic performance of these four participants. My primary data source is a series of yearbooks published by the Russian Ministry of Finance. I also pool together economic data sourced from a variety of secondary sources, along with non-economic data, such as the number of labour strikes at companies. Lastly, I obtain narrative evidence to identify how and why the economic participants responded to the crisis as they did.

My main finding is that the government's actions during and after the crisis resulted in a transfer of income and wealth from ordinary workers to industrialists and investors. The

recipients of transfers weathered the crisis well and profited during the recovery, while the wages and wealth of labour fell behind. The evidence also suggests that industry required the workforce to make greater effort at the expense of their physical well-being.

The findings of this paper add to existing literature on distributional effects of financial crises. Empirical studies have found that a response by government to a financial crisis can lead to the redistribution of wealth among key groups of citizens. To the best of my knowledge, there is little research on this subject. In particular, Halac & Schmukler (2004) show that public bailouts of banks in five Latin American countries in the 1980s-2000s led to the redistribution of wealth from ordinary taxpayers to banks and their clients. Matsaganis & Leventi (2013) find that austerity measures instituted by Greek authorities in response to the 2008-09 financial crisis resulted in higher unemployment and poverty levels, but lower inequality. Callan et al. (2014) study the distributional impact of austerity policies in Ireland.

The present paper adds to this literature by using quantitative data to document the redistribution of income and wealth. It then provides historical evidence that the distributional effect undermined workers' well-being. A unique contribution of this paper is to show that a crisis response by economic participants other than government – in this case businesses and banks – can also have regressive consequences. This finding supports Piketty's (2014) research in inferring that the distribution of wealth is jointly determined by 'economic, social and political actors' (p. 20).

My newly-constructed data series also permit me to tell the most comprehensive account to date of Russian economic conditions between 1899 and 1904. In particular, my research supplements narrative studies on Russian finances (Siegel, 2015; Malik, 2018), stock market

analysis (Annaert et al., 2019), economic inequality (Lindert & Nafziger, 2014), and the macro-analysis of the economy in the period (Gregory, 1982, 1994; Owen, 2013).

The arguments are built as follows. Section 2 documents the impact of the financial crisis on three of the key economic participants – banks, industry and government – and their immediate responses to the crisis. Section 3 traces the way in which these participants affected the remaining key group, the working class. Section 4 concludes.

2. The effect of and responses to the financial crisis

This section documents the effects of the financial crisis on key participants in the economy – banks, industry and government – and their responses to the crisis. To quantify the effect of the crisis, I hand-collected aggregate-level data on the economic performance of these participants from individual *Yearbooks of the Ministry of Finance* (Ministry of Finance, 1900-1907a). Although these publications are well-known among economic historians, as far as I know, the data I gathered have not been used in previous research. I gathered monthly, quarterly, semi-annual and annual data, whichever were available. I also use additional economic data, as well as non-economic data, such as the number of work-related casualties, which I extracted from a variety of secondary sources. I also obtain narrative evidence to identify how and why the economic participants responded to the crisis as they did.

2.1. Banking distress and banks' response

The financial crisis of 1899-1902 interrupted the rapid industrialisation of the 1890s. The crisis was triggered by the reduction in foreign capital inflow into government bonds and the securities of industrial enterprises.

One of the first economic participants to be affected was the banking sector. Figure 1a shows that bank shares fell more rapidly and steeply than the index of the St. Petersburg Stock Exchange, which itself declined by 45.4 per cent between the peak in February 1899 and the trough in 1901.¹ Banks experienced large losses, primarily because of the investments they had made in the 1890s in heavy industrial companies (Gindin, 1948, pp. 116-7). Three banks failed during the crisis and two went bankrupt in 1904; the other 35 banks survived due to intensive help from authorities.

<< INSERT FIGURE 1a-c HERE >>

Authorities intervened with a massive rescue package (Gindin, 1950, 1980). Certain aspects of the rescue were very successful. To demonstrate this, I construct monthly credit and money supply time series based on data from *Yearbooks*. Figure 1b shows that the private credit supply fell only by 2.5 per cent from a peak in May 1899 to a trough in June 1900. The figure also shows that the government's credit supply, as represented mostly by credit from the quasi-central State Bank, continued an upward trend. Figure 1c reveals that the total money supply, as measured by deposits and physical money in circulation, did not deviate much from its upward direction; the largest peak-to-trough decline being only 3.7 per cent. In sum, the vast rescue package prevented the contraction of the credit and money supply, which are both essential for sustained performance in the broader economy (Friedman & Schwartz, 1963; Bernanke, 1983).

Nevertheless, beneath the positive aggregate trends, banks' lending patterns were changing, with serious consequences for industry. Banks disproportionately extended credit to larger and existing clients, while curtailing credit to smaller and new ones (Gindin, 1948, p. 124-6). *The Economist*, in its May 1901 issue, reported that Russian '(b)anks generally have been in

¹ Calculated from data in Goetzmann et al. (n. d.a, n. d.b).

difficulties from having sunk too much money in loans to factories as working capital, which, though paying a high rate of interest, could not be readily called in when money was urgently required' (p. 667). As is often the case, it is companies with better financial backing that weather a crisis, not necessarily the most efficient ones (Franklin et al., 2015; Hilt, 2017). As a result, banks' response to the crisis created corporate winners and losers by propping up large companies whilst limiting credit to smaller firms. Indeed, based on the individual company data from *Yearbooks*, one contemporary analyst calculated that between 1901 and 1904, large joint-stock enterprises, as measured by capital stock, performed increasingly better in financial terms, while smaller firms declined over the same period (Bovykin, 1984, p. 126-7). This evidence suggests that banks' response to the crisis strengthened the financial position of large companies.

2.2. Recession and industry response

The crisis affected another key economic participant – heavy industry, which consisted of the manufacturing, mining and chemical industries. According to the Ministry of Finance, in the 1890s, the supply of heavy industrial products consistently lagged behind demand. In 1900, supply shifted out faster than demand for the first time (Gindin, 1996, pp. 136-7). As a result, as shown in Figure 2a, heavy industry went into recession in 1901-02. The monetary value of its output declined by 7.7 per cent and its revenues declined by 6.8 per cent.² Light industry, which consisted of the textile, paper and ceramic industries, was unaffected.

<< INSERT FIGURE 2a-d HERE >>

² Industry output is calculated from data in Izmesteva (1998) and revenues are from the *Yearbooks* (Ministry of Finance, 1900-1907a).

To show the degree of industry's financial difficulties in more detail, I calculate the corporate bond risk premium for manufacturing, mining and textile industries as the excess of the current yield on corporate bonds over the highest-rated government security, the four per cent Russian government bond of 1894. To calculate the current yield, I use monthly price and coupon data that I collected from *Yearbooks* for 37 individual bonds, the total number of bonds traded. Figure 2b shows that the cost of borrowing for corporations rose sharply as the crisis began. Some companies faced low demand for their bond securities as can be inferred from the gaps in trading. Because it was customary for industrial companies to use bond proceeds to cover operating expenses, the rising cost of borrowing and the lack of buyers made many enterprises illiquid, and effectively bankrupt (Russian State Historical Archive, collection 587, inventory 56, file 296, pp. 10-11).

Figure 2c shows that additional funding pressures began in 1901, when foreign investments in corporate securities declined abruptly, netting only 7 million rubles during the year, as opposed to 69 million rubles the year before. In subsequent years, the net foreign capital inflow diminished further and in 1904 turned negative.³ An additional blow came from the deflationary pressures that are known to be particularly destructive to real sector companies (Fisher, 1933). The prices of the key commodity inputs used in industrial production declined sharply. Figure 2d shows that the price of coal fell by 35.3 per cent between 1900 and 1903, oil by 57.3 per cent between 1900 and 1902, and cast iron and iron beams by 33.7 and 42.7 per cent, respectively, between 1900 and 1903.⁴ Despite the fall in demand and prices, heavy industry

³ Calculated from data in OI (1925, pp. 12-3).

⁴ Calculated from data in Lyashchenko (1956, p. 414-15).

continued to maintain its production. Between 1900 and 1901, the mining industry increased its output by 5.3 per cent and the manufacturing sector decreased it slightly by 0.4 per cent.⁵

2.3. Fiscal stress and government response

The third economic participant affected by the crisis was the government. The biggest adverse shock to state finances came from abroad. To show this, I collect annual data on foreign and domestic government debt outstanding from *Yearbooks*. Figure 3 reveals that with the onset of the crisis foreign investors stopped purchasing government bonds, the proceeds from which the state had relied on to procure the industrial output (Gindin, 2007a, p. 68). In response to the failure to find foreign buyers for government bonds, the authorities shifted part of the budget shortfall onto domestic investors. Figure 3 shows that the government was able to increase its bond sales to domestic investors, but only beginning from 1901. In 1899, state finances suffered an additional blow because of the decline in grain exports, which led to a negative trade balance of 56 million rubles, compared to the average trade surplus of 106 million rubles over the previous two years.⁶ In 1901, a further blow was dealt by an especially poor harvest, the worst of its kind since the devastating famine of 1891-2 (Mikhailovsky, 1921, p. 4).

<< INSERT FIGURE 3 HERE >>

The depleting of government finances in 1899 due to the lack of foreign buyers had a big impact on the economy because the state in the 1890s was a dominant buyer of heavy industrial production, purchasing nearly half the output of the metalworking industry (Ozerov, 1905, p. 118). This industry, which manufactured final products from pig iron, iron, and steel, was the

⁵ Calculated from data in Izmeteva (1998). Data on the output of the chemical industry are not available.

⁶ Calculated from data in Valetov (2017).

centrepiece of Russia's industrialisation, accounting for over 54.4 per cent of the monetary output of the entire heavy industry.⁷ Left with much reduced monetary resources at its disposal, the state was forced to curtail its procurement and to ration its orders, delegating them primarily to the companies that had been receiving state orders before the crisis (Gefter, 1953, p. 84; Gindin, 2007b, p. 77). Because typical state orders were large, only large companies had sufficient production capacity to qualify for them (Gindin, 2007b, p. 63). The recession of 1901-02 affected heavy industrial companies that were not receiving state orders especially severely. This led to the strengthening of large enterprises and the weakening of the rest. Another way in which the government assisted industry was by initiating a massive lending programme along with the purchase of corporate bonds for which no private buyers were found (Gindin, 1950, 1980).

To assist industry, the authorities also openly encouraged industrial firms to collude and form cartels and syndicates. This policy was the polar opposite of the stance taken by the government in the 1890s, when it had pushed for intense market competition in order to make Russian industry more competitive in foreign markets (Gindin, 2007a, p. 69). In November 1901, the Ministry of Finance openly noted in its official newspaper, *The Bulletin of Finance*, that 'larger factories (we)re getting ahead' (Gindin, 2007b, p. 74), and, if this continued, only a very limited number of companies would survive. The choice for firms was thus twofold: either organise a syndicate that would include all firms as its members 'or let small and weak firms perish', while letting the remaining enterprises 'occupy a monopoly position' (Gindin, 2007b, p. 74).

⁷ Calculated from data in Izmesteva (1998).

This policy had unintended consequences: from the late 1901 companies began to collude, but not all firms agreed to join in. Large companies receiving state procurement found it more profitable to stay away from these alliances (Shpolyanski, 1953, pp. 84-98). Fierce competition broke out between the syndicated companies and the recipients of state orders. While the syndicates tended to limit production as to drive prices upwards, the recipients leaned towards reducing prices (Shpolyanski, 1953, pp. 84-98). The result was that this badly-designed government programme distorted market competition and contributed to the creation of industrial winners and losers, with larger companies taking the lead.

3. Impact on workers

Having established the financial channels through which the crisis affected major economic participants –banks, industry and the government – and having analysed their immediate response to the crisis, this section turns to examining how these parties affected another key member in the economy – the industrial workers.

3.1. Industry and workers

Figure 4a traces how, in response to the crisis, heavy industrial companies downsized their labour force by an average of three per cent per year between 1901 and 1903.⁸ As analysed below, firms in all likelihood exacerbated their exploitation of the remaining workers, which I define as increasing the intensity of a worker's task, given the same or smaller number of hours worked.

<< INSERT FIGURE 4a-d HERE >>

⁸ Calculated from data in Izmesteva (1998).

Figure 4b shows that workers had organised many strikes since 1895, but the financial crisis did not coincide with the greater incidence of strikes. It was only in 1903, the year after the recession in heavy industry, that the number of strikes shot up to unprecedented levels, two-and-a-half times the number in the previous year.⁹ In 1903, strikes occurred in 65 out of 78 provinces and involved workers of nearly all vocations (Korelin et al., 2005, p. 90). In 1904, Russia went to war with Japan, and the number of strikes fell to a historical average. This was because the government, in collaboration with company managers, made sure that the most rebellious workers were sent to the war front. Vacant positions were filled with newly-recruited peasants from the countryside who were too new to the scene to protest (Korelin et al., 2005, p. 138-9).

Note that the period between the crisis and the revolution of 1905 is unique because it saw a struggle for better material conditions and democratic rights. Workers did not seek to unseat the Czar or to replace the social order by socialism. In fact, in the minds of workers, the figure of the monarch was not associated with the government and its repressive state policies (Korelin et al., 2005, p. 95). On the eve of the revolution, workers who said anything against the Czar were quickly muted by their fellow workers. The word ‘socialism’ was regarded by them as a profanity. Illegal political parties and labour unions concentrated on disseminating ideas of democratic rights and material betterment, and seldom discussed the topic of socialism (Korelin et al., 2005, p. 96). Indeed, based on a detailed description of all known individual strikes that took place in the period 1895-1904, Pushkareva et al. (2011, p. 106) conclude that only a small number of strikes was associated with political demands and such slogans as ‘Down with

⁹ Calculated from data in Pushkareva et al. (2011, pp. 68-9).

autocracy!', 'Down with government!' and 'Long live socialism!'.¹⁰ In 1903, the most rebellious year before the revolution, the percentage of workers who put forward political demands in addition to economic demands was only 8.5 per cent of all strikers (Pushkareva et al., 2011, p. 74). The remaining 91.5 per cent had purely economic wishes, expressed by slogans such as 'An eight-hour working day!' and 'Down with fines!' (Pushkareva et al., 2011, p. 110). Unlike industrial workers, the peasants, who in 1897 constituted 77.1 per cent of Russia's population (Rubakin, 1912, p. 54), were not a major force behind social unrest before 1905 (Korelin et al., 2005, pp. 77-89).

Two facts suggest that worker hardships were on the rise even before the escalation in strikes in 1903 and before the end of the financial crisis in 1902. First, Figure 4c shows that, between 1900 and 1901, the number of workers who made a work-related complaint nearly doubled, from about 24,000 to almost 48,000.¹¹ This suggests that worker discontent had already risen markedly amidst the crisis; it was merely expressed in a more civil manner. Second, as early as October 1902, the Finance Minister Sergei Witte expressed the view in conversation

¹⁰ The data on strikes represents a collection of individual strikes that were compiled by historians from a multitude of primary sources, such as archival materials of police and the Ministry of Internal Affairs, over the course of several decades (Pushkareva et al., 1992, pp. 3-28).

¹¹ Calculated from data in Pushkareva et al. (2011, p. 322). The original data source is the statistics on complaints collected by factory inspectors. Factory inspectors collected data from all firms with 15 workers or greater operating in the Russian Empire, except those in the mining industry, some manufacturing industries, and state-owned enterprises (Pushkareva et al., 2011, p. 41). This suggests that the actual total number of complaints was higher than reported by Pushkareva. The number of firms supervised by factory workers fell between 1900 and 1904 by 11.6 per cent (Volodin, 2007, p. 51), suggesting that the actual number of complaints was higher still.

with the Minister of Internal Affairs that the worker movement had reached such dangerous levels that it would be impossible to stop it even by repressive measures (Korelin et al., 2005, p. 135). Witte was one of the most informed government officials in the country. Over 200 factory inspectors, who oversaw companies' compliance with labour laws and managed disputes between workers and firms, reported to him (Korelin et al., 2005, p. 99). Wagerworker dissatisfaction must notably have increased in 1902 for Witte to have expressed such an alarming view.

The next piece of evidence speaks more directly to the possible exploitation of workers. It is indicated by the share of work-related injuries and deaths at all the mining plants and coal, iron, manganese and copper mines out of the total workers employed there. Note that in 1899 these enterprises employed over 72 per cent of the workforce in heavy industry.¹² In 1897, 1.9 per cent of this workforce suffered from work-related injury; in 1899, the first year of the crisis, 3.5 per cent were affected; in 1902, an unprecedented 33,613 workers, or 5.4 per cent of the total were affected. I also have data on a portion of these enterprises – the coal mines located in the South. In 1897, 0.4 mineworkers were injured or killed for every 10,000 tonnes of coal and anthracite extracted; in 1902 this number soared to 3.3 workers and in 1903 to 5.0 workers.¹³ In a

¹² Calculated from data in Izmeteva (1998) and Shilnikova (2013a).

¹³ Calculated from data in Shilnikova (2013b). For comparison, in the U.S. coal industry in 1930, the first year when data are available, only 0.9 workers were injured or killed for every 10,000 tonnes of coal extracted (Moyer et al., 1952, p. 52). The original data source is the statistics on injuries and deaths compiled by the Council of Miners of Southern Russia (1901, 1903, 1905). A further evaluation of these data is not possible given the insufficient description of the data provided in the original source.

matter of two years, Southern coal mines became over six times more dangerous for those who worked in them.

The next set of data provides another perspective on workers' conditions. The share of strikes in which the workers in the mining industry demanded improvements in working conditions, namely, in the quality of machines and tools they used at work and the social benefits they received, increased from an average of 7.5 per cent over the period 1895-99 to 9.4 per cent over 1900-4. In the manufacturing industry, this share increased by an even greater amount – from a mean of 5.7 per cent over the period 1895-99 to 9.8 per cent over 1900-4 (Shilnikova, 2012, p. 20). Worker demands increased partly because workers were becoming increasingly conscious of their unacceptable working conditions, thanks to the illegal political parties that were raising their awareness (Korelin et al., 2005, p. 92). However, as can be seen in Figure 4d, the percentage of strikes in the manufacturing industry organised under the direct influence of illegal political parties declined from about 46 per cent in 1900 to 16 per cent in 1904, while the number of strikes continued to rise.¹⁴ This suggests that factors other than greater awareness contributed to worker discontent.

The next fragment of evidence concerns worker exploitation from the point of view of joint-stock company financials, which I collected from *Yearbooks*.¹⁵ Figure 5a shows that during the entire crisis manufacturing and chemical companies (although not mining) were able, despite declining sales, to maintain their profitability, as measured by the profit margin, or the ratio of

¹⁴ Calculated from data in Pushkareva et al. (2011, p. 126). The data on the mining industry are not available.

¹⁵ In 1899, there were 1,009 joint-stock companies and in 1904, there were 1,159 firms (Ministry of Finance, 1900a, 1905a).

net income to sales. In 1903, when the number of strikes rose two and a half times and workers lost many days at work for this reason, manufacturing companies made an extra 0.9 per cent in profit margins over the previous year's. In 1904, the year when Japan and Russia were at war and the sales at the heavy industries plummeted by 62.5 per cent, all the heavy industries – manufacturing, mining and chemical – doubled or tripled their profit margins. Industrialists retained high profitability in all circumstances: economic upturns and downturns, the diverging performance of larger versus smaller companies and periods of social unrest and war. To maintain such stellar bottom-line performance, companies had to skilfully manage the costs of inputs and the use of machinery and the labour force. This evidence suggests that the steady profitability was not achieved solely thanks to proficient managerial skills.

<< INSERT FIGURE 5a-b HERE >>

This next set of data examines the non-financial characteristics of the ferrous metallurgical industry – that is the metallurgy of iron and its alloys – which in 1899 employed over 31 per cent of the heavy industry workforce.¹⁶ Figure 5b plots the number of workers, the cumulative horsepower of the engines available for use, and the output produced in tones by this industry. Recall that 1903 was distinguished by a surge in worker unrest and 1904 by the war with Japan and disastrous corporate sales. Between 1903 and 1904, the number of workers in ferrous metallurgy stayed virtually unchanged, horsepower declined by nearly 9 per cent, while physical output rose by 16 per cent.¹⁷ A natural question to ask is: did workers become more productive or more exploited over this period? It is known that during the financial crisis companies introduced higher-powered and more efficient steam and internal combustion engines

¹⁶ Calculated from data in Izmesteva (1998).

¹⁷ Calculated from data in Kafengauz (1994, pp. 505-16).

(Kafengauz, 1994, pp. 79-80), so this may account for some increases in productivity. However, the fluctuations in physical output, as in the 16 per cent increase over 1903-4, could also indicate that the industry taking advantage of workers by shifting from capital intensive to labour intensive production. Indeed, during the war with Japan in 1904, overtime work became obligatory whenever companies had rush military orders to fulfil (Korelin et al., 2005, p. 138). According to factory inspectors introduced above, out of all work-related complaints the share related to forced overtime work increased steadily each year from 3.7 per cent in 1902 to 5.8 per cent in 1904.¹⁸

Moreover, the financial crisis and the associated decline in demand led to some machinery being unused. In 1904, ferrous metallurgy underused its machine capacity by 43.2 per cent in rail production and by 28.3 per cent in iron production (Kafengauz, 1994, p. 86). Instead of incurring costly capital expenditures to refurbish idle machinery (Kafengauz, 1994, p. 86), industrialists could rely on cheap and abundant labour. Sometime later Stalin (1952) observed that '(c)apitalism stands for new technology when that offers the greatest profits. Capitalism stands against new technology and for the transition to manual labour when new technology does not promise the greatest profits anymore' (p. 40).

Lastly, using statistical analysis of industry-level data between 1895 and 1904, Andreev and Borodkin (2003) find a negative correlation between the number of workers on strike and the level of nominal wages in industry, and also a small positive correlation between the number of strikers and the monetary value of industry output. Their results suggest that workers were more inclined to go on strike when their wages fell and when industry experienced economic growth. The latter result is consistent with the distributional effect hypothesis.

¹⁸ Calculated from data in Ministry of Finance (1903-7c).

Taken together, the above evidence on the rise in strikes, workers' complaints and work-related casualties, as well as the evidence on the increase in corporate profitability despite collapsing sales and on the increase in physical output despite declining horsepower, suggests that industrialists' response to the crisis transferred a good portion of their financial burden to the working class. In the 1901 article entitled *The lessons of the crisis*, Lenin (1967) recorded the events he had been observing on the ground: 'during the industrial upturn ... workers gained concessions (from capitalists) more than once between 1894 and 1898; but with the coming of the crisis, the capitalists not only t[ook] back the concessions [the workers] ha[d] made, but also exploit[ed] workers' helplessness to further lower their wages' (pp. 84-5). In the next section, we see that the second part of this statement is not far from the truth.

3.2. Government and workers

Another economic participant with a direct impact on workers' well-being was the government. First, I determine how the government treated companies compared to workers. To do so, I gathered the figures for corporate taxes from *Government Revenues and Expenditures* (Ministry of Finance, 1899-1906b). First, in 1899, the corporate taxes of 54.1 million rubles were small in absolute terms compared with liquor and other indirect taxes on daily consumer products of 463.4 million rubles. Second, between 1899 and 1904 corporate tax rates stayed unchanged, implying that the government continued to favour the prosperity of companies over ordinary citizens.¹⁹ As a result, Figure 6 shows that in this period the collected amount of corporate income tax increased by 14 per cent.

¹⁹ To determine corporate tax rates, I review all the tax-related laws in *Polnoe sobranie zakonov* (1902a, 1902b, 1903, 1904, 1905, 1907).

<< INSERT FIGURE 6 HERE >>

Next, I show in Figure 6 that government revenues continued rising despite the failure to find foreign buyers for government bonds. The government benefited from rising tariff revenues, liquor tax collections, indirect tax collections on consumer goods, various registration and court fees, and income from state-owned railways.²⁰ The government then channelled taxpayer money to assist industry, as described in Section 2.3, above. The result was a distributional effect in the form of an income transfer from regular taxpayers to capitalists. To quantify this effect, I collect data on the flow of funds between major economic groups between 1900 and 1905, the period for which data are available for comparison. I rely on both primary and secondary sources. In particular, the data on taxes, government revenues and capital gains on investments come from *Government Revenues and Expenditures*. Corporate net income is taken from *Yearbooks*. Nominal worker wages are taken from Pushkareva et al. (2011, p. 290).²¹ Physical output and the number of workers in the mining industry are retrieved from Izmesteva (2011).

Figure 6 shows that industrialists fared well during the crisis. Between 1900 and 1904, corporate net income increased by 25.9 per cent. Note that in this period companies significantly understated their real financial performance to minimize taxable income (Gindin, 1964, pp. 140-3). Investors too fared well. I calculate the capital gains realized by investors from owning corporate securities as the capital gains tax collected by the government divided by the five per

²⁰ Inferred from Ministry of Finance (1899-1906b).

²¹ The original data source is the statistics on wages compiled by factory inspectors (Ministry of Finance, 1902-1907c). Allen and Khaustova (2019) report nearly identical wages for workers in large scale industry.

cent capital gains tax rate that had been in effect since 1885.²² Figure 6 shows that capital gains, which were mostly derived from dividends, increased by a striking 23.1 per cent.

Figure 6 also reveals that after benefiting from government assistance, industrialists did not pass a fair share of the profits to workers. The productivity of the mining industry, calculated as the industry's physical output per the number of workers employed, rose by 24.2 per cent.²³ Corporate net income, as mentioned above, increased by 25.9 per cent. Yet workers' average annual wages lagged noticeably behind, increasing by only 10.9 per cent. This was important because many workers did not even have enough money to maintain adequate nutrition (Allen and Khaustova, 2019, p. 27; Kirjanov, 1979, pp. 154-212).²⁴

While industrialists and investors prospered, workers' wealth lagged behind. Lenin (1963, p. 283), who studied the data on state savings branches, by far the most popular state-owned financial institutions among the general public for depositing money, concluded that in 1899 only 8.3 per cent of all factory workers had a deposit account. A third of them had a net worth of 25 rubles or less, equivalent to 1.6 months of an average worker's pay.²⁵ The working class also ranked last as measured by the amount of savings in rubles per deposit account, without counting soldiers whose monetary needs were partially taken care of by the state (Lenin,

²² The tax rate is from Polnoe sobranie zakonov (1885).

²³ To keep on the conservative side, I assume that the hours worked per worker stayed constant over this period. The lack of data on the physical output of other industries does not allow me to estimate their productivity.

²⁴ Workers' wages are from Pushkareva et al. (2011, p. 292). Inflation is from Allen and Khaustova (2019).

²⁵ An average worker's pay in 1900 was 15.6 roubles per month, according to Pushkareva et al. (2011, p. 290). Allen and Khaustova (2019) report nearly identical results.

1963, p. 283). Even domestic workers with 143 rubles per account had more money than industrial workers with 136 rubles of savings (Lenin, 1963, p. 283). Using data from *Yearbooks*, I calculated an average worker's wealth, as measured by the amount of savings per deposit account. As shown in Figure 6, between 1899 and 1904 an average worker's wealth increased by nearly 10 per cent, but almost 40 per cent of this increase was invalidated by inflation.²⁶ Although workers' savings rose in absolute terms, their wealth increased by less than that of personal investors, suggesting that workers paid relatively more for the financial crisis than other social groups.

4. Conclusions

The mainstream literature has established that financial crises depress households' income and wealth. The case of Russia between 1899 and 1905 supports an alternative view. I find that the response to the financial crisis by government and industry transferred income and wealth from ordinary workers to capitalists. The recipients of transfers profited during the recovery, while the workers' material conditions either fell behind or deteriorated. Some evidence also suggests that industry required the labour force to work more intensively, thus further damaging their physical well-being.

The extant literature has established that workers' poor working and living conditions were the central reason behind the occurrence of labour strikes (Harcave, 1970, p. 23; Korelin et al., 2005, p. 92). In light of this fact, my findings suggest that the inequitable sharing of the economic shocks across different social groups might have made labour strikes more likely to happen. Therefore, my findings open up an avenue for future research. Using company-level

²⁶ Inflation is from Allen and Khaustova (2019).

data, in future work I hope to test empirically whether the strikes in the years leading up to the revolution were driven by the crisis-induced economic shocks or by the response to these shocks by businesses.

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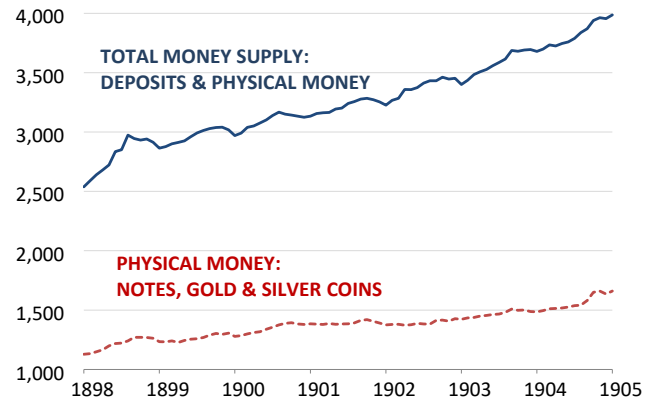
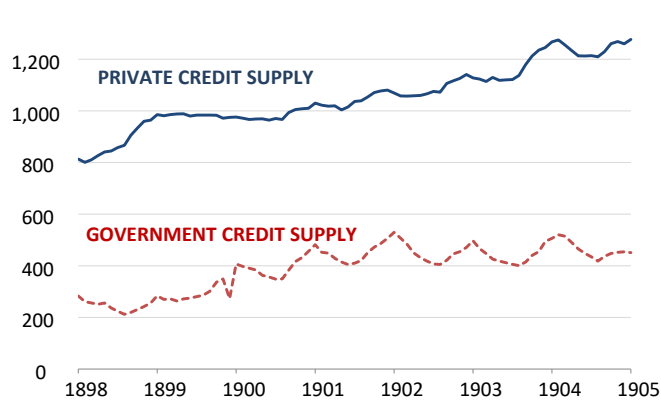
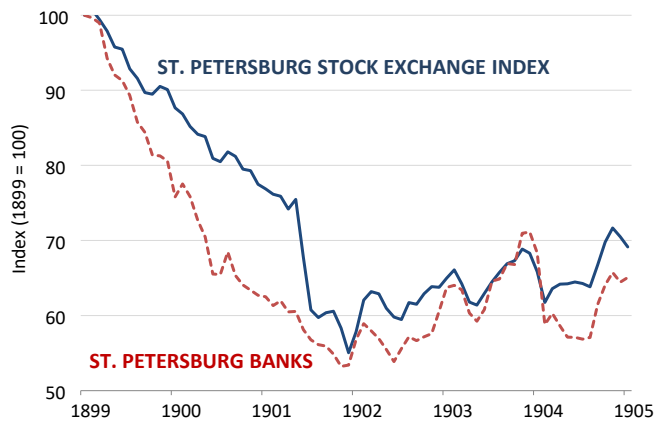


Figure 1a (left above). Monthly indices of the St. Petersburg Stock Exchange and the commercial banks headquarterd in St. Petersburg, equally weighted (index 1899 = 100), 1899-1905

Notes: Included in the index of St. Petersburg banks are the Volzhsko-Kamsky, the St. Petersburg-Azovcky, the St. Petersburg International, the St. Petersburg Muscovy, the St. Petersburg Private, the Russian for Trade and Commerce commercial banks, as well as the Russian for Foreign Trade, the St. Petersburg Discount and Loan, and the Russo-Chinese banks. Credit Lyonnais did not trade on the exchange.
Sources: The stock exchange data is from Goetzmann et al. (n. d.a) and individual banks data is from Goetzmann et al. (n. d.b)

Figure 1b (left below). Monthly credit supply (in millions of rubles), 1898-1905

Notes: Private credit supply includes credit supplied by joint-stock commercial banks (based on original monthly data), private commercial banks (interpolated linearly from beginning- and end-of-year data), and cooperative savings associations (interpolated linearly from semiannual data). Government credit supply includes credit supplied by the State Bank (monthly data) and the Russo-Chinese Bank that was partially owned by government (beginning- and end-of-year data).
Sources: Ministry of Finance (1900-1907a)

Figure 1c (right below). Monthly money supply (in millions of rubles), 1898-1905

Notes: The total money supply includes physical money in circulation, deposits held by the public at the State Bank (based on original monthly data), the Russo-Chinese Bank (interpolated linearly from beginning- and end-of-year data), joint-stock commercial banks (monthly data), private commercial banks (beginning- and end-of-year data), cooperative savings associations (interpolated linearly from semiannual data), as well as state savings branches, public city banks, credit partnerships, city banks, and savings and loan partnerships (interpolated linearly from beginning- and end-of-year data). Physical money includes paper notes (monthly data) and gold and silver coins (both interpolated linearly from beginning- and end-of-year data).

Sources: Ministry of Finance (1900-1907a)

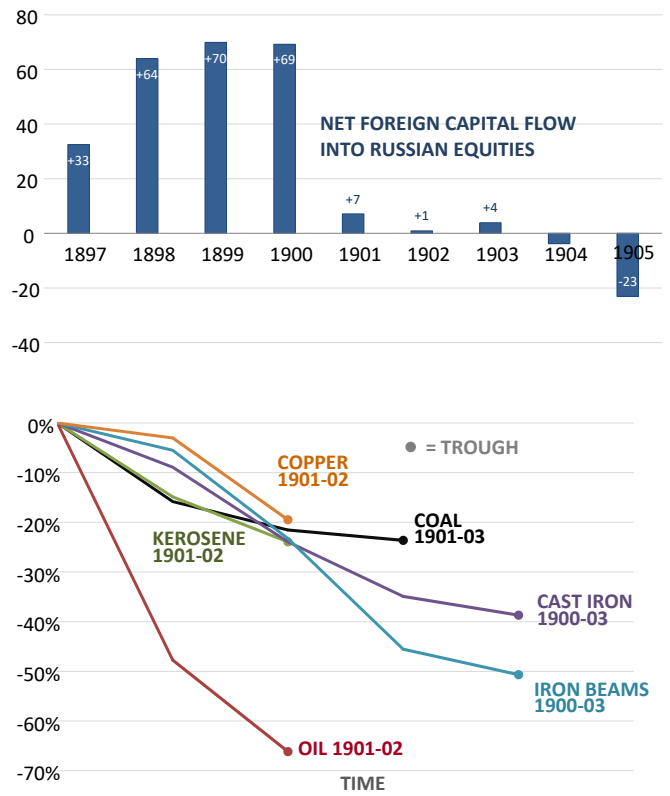
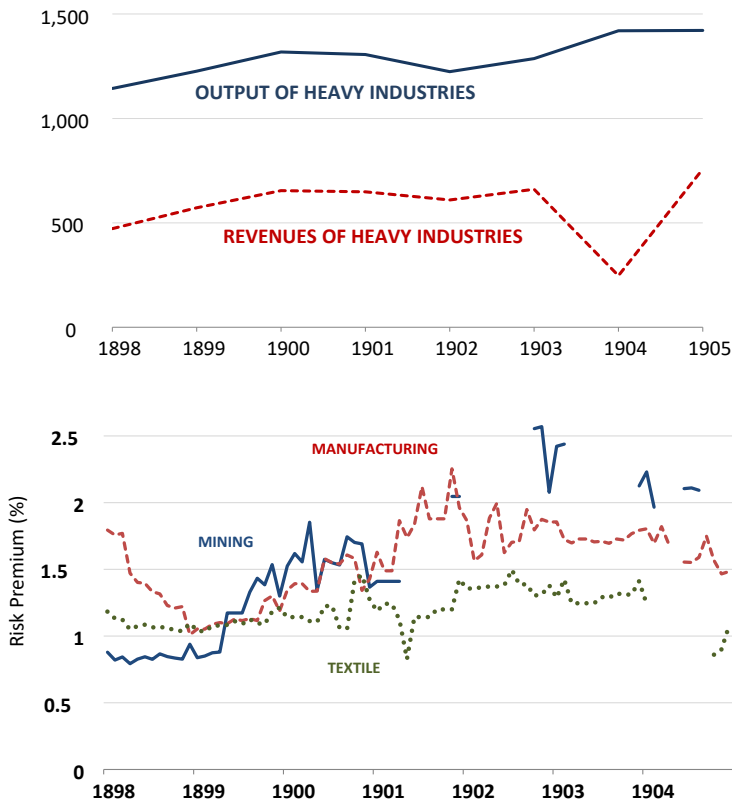


Figure 2a (left above). Annual monetary value of output and revenues of heavy industry (in millions of rubles), 1898-1905

Sources: Output is from Izmesteva (1998) and revenues are from Ministry of Finance (1900-1907a)

Figure 2b (left below). 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 no trades in those months. Industry yield is the average yield of bonds traded every month weighted by the outstanding amount of each bond.

Sources: Price and coupon data is from Ministry of Finance (1900-1907a). Bonds outstanding are from Dmitriev-Mamonov (1903)

Figure 2c (right above). Annual net foreign equity investments in mining and manufacturing companies (in millions of rubles), 1897-1905

Sources: OI (1925, pp. 12-3)

Figure 2d (right below). Prices of heavy industry products, fall from peak to trough at annual frequency (in percent)

Sources: Lyashchenko (1956, pp. 414-5)

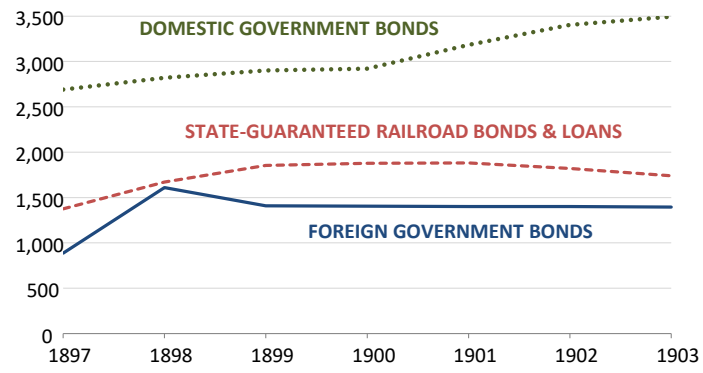


Figure 3. Annual foreign and domestic government debt outstanding (in millions of rubles), 1897-1903
Sources: Ministry of Finance (1900-1907a)

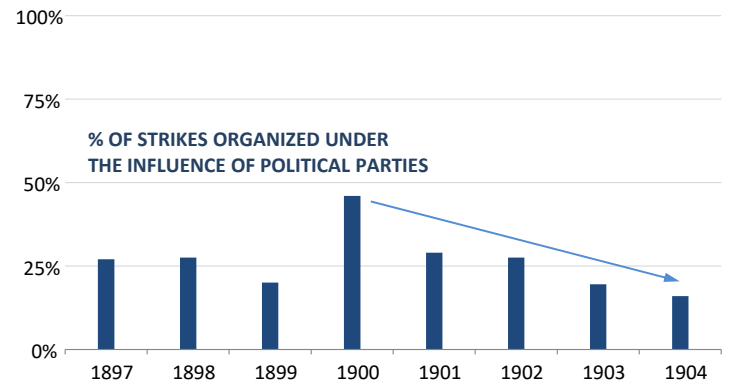
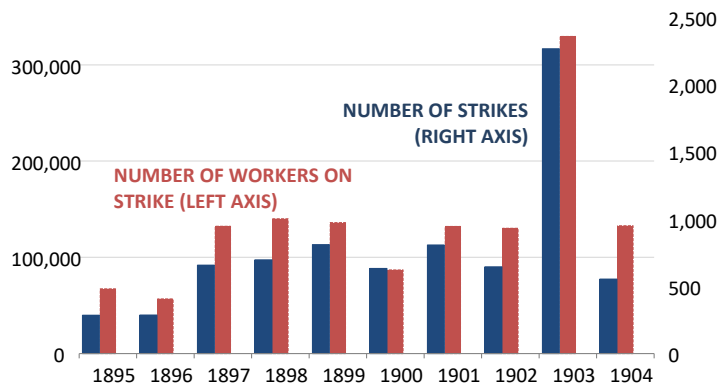
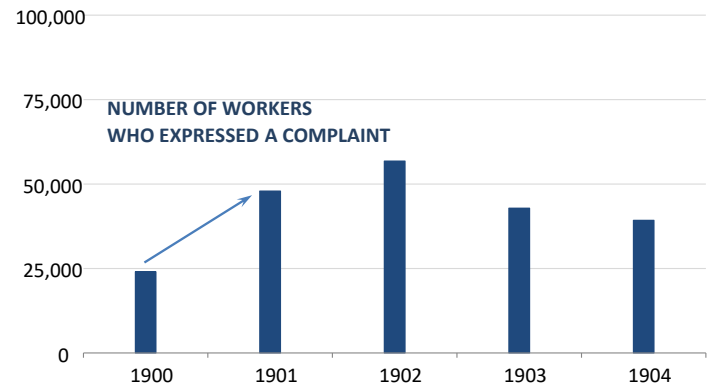
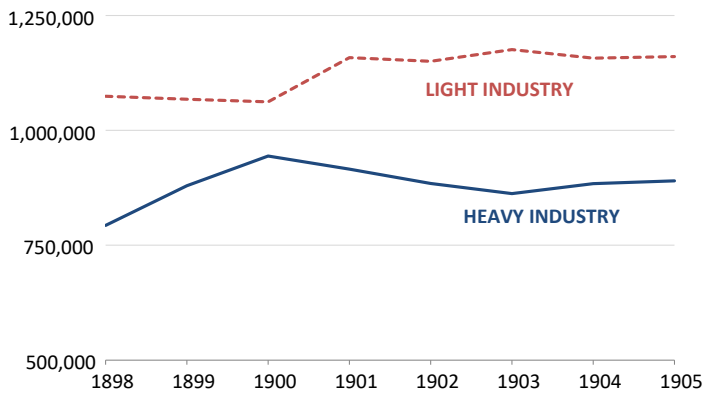


Figure 4a (left above). Annual number of workers at industrial companies, 1898-1905
Sources: Izmesteva (1998)

Figure 4b (left below). Annual number of strikes organized by workers, 1895-1904
Sources: Pushkareva et al. (2011, pp. 68-9)

Figure 4c (right above). Annual number of workers who expressed a complaint, 1900-1904
Sources: Pushkareva et al. (2011, p. 322)

Figure 4d (right below). Influence of political parties at manufacturing firms, 1897-1904
Sources: Pushkareva et al. (2011, p. 126)

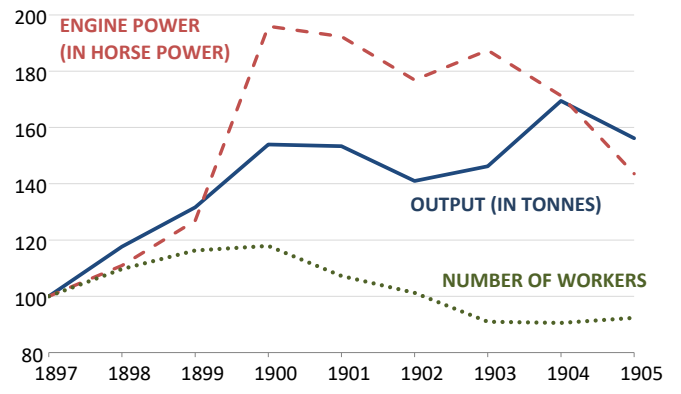
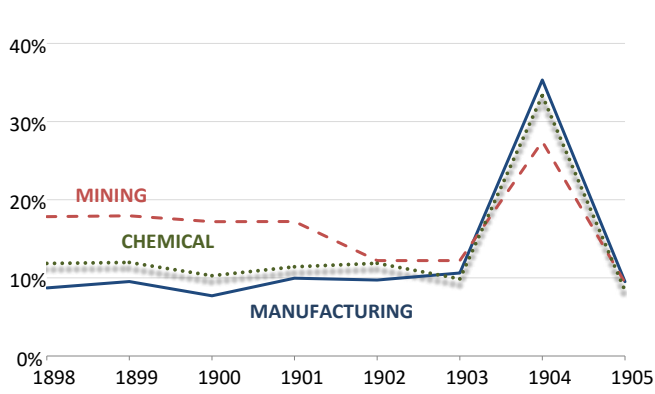


Figure 5a (left). Annual heavy industry profit margins (in percent), 1898-1905

Notes: Profit margin is net income divided by revenues.

Sources: Net income and revenues are from Ministry of Finance (1900-1907a)

Figure 5b (right). Annual physical output, machine power, and the number of workers in the ferrous metallurgical industry (index 1898 = 100), 1897-1905

Sources: Kafengauz (1994, pp. 505-16)

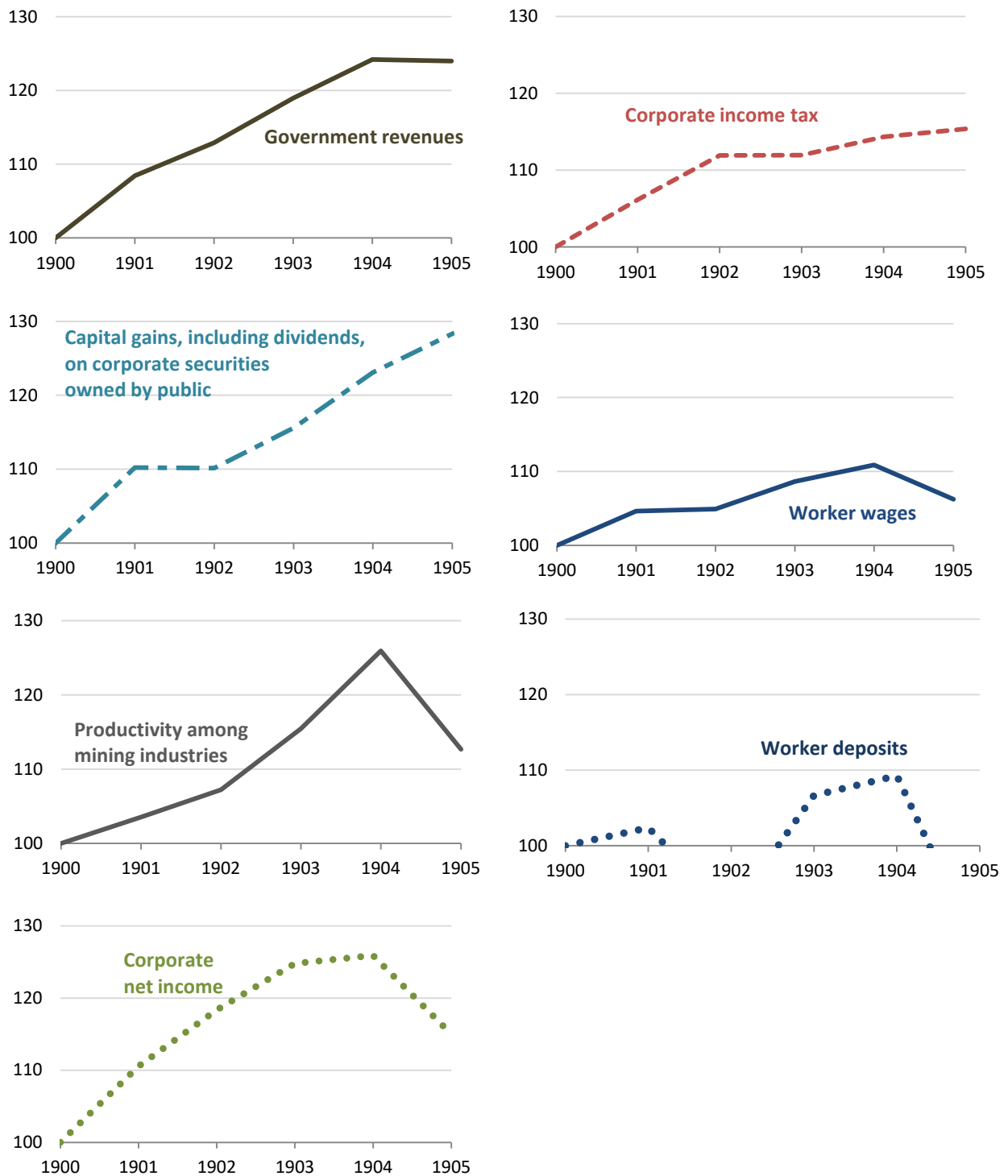


Figure 6. Financial conditions of key economic groups (index 1900 = 100), 1900-1905

Notes: Capital gains are calculated as the taxes collected from the corporate securities owned by the general public divided by the five per cent flat capital gains tax that was effective since 1885 (Polnoe sobranie zakonov, 1885).

Productivity among mining industries is calculated as the change in physical output per the number of workers. To ensure that the estimation is conservative, I assume that the number of hours worked per worker stayed constant over the years. Mining industries include coal, iron ore, copper, oil, manganese, gray pyrite, silver-lead, zinc ore, chromium ore, asbestos, salt, gold, platinum, and peat; and do not include the coke industry (due to the lack of data), which represented 6.4 per cent of the aggregate monetary output of the mining industries.

Worker wages are nominal average annual wages.

Sources: Taxes and government revenues are from Ministry of Finance (1899-1906b). Corporate net income and revenues are from Ministry of Finance (1900-1907a). Worker wages are from Pushkareva et al. (2011, p. 290). Physical output and the number of workers at mining industries are from Izmesteva (2011).