

THE BIRTHS, LIVES AND DEATHS OF CORPORATIONS IN LATE IMPERIAL RUSSIA*

Amanda Gregg and Steven Nafziger

Enterprise creation, destruction and evolution support the transition to modern economic growth, yet these processes are poorly understood in industrialising contexts. We investigate Imperial Russia's industrial development at the firm level by examining entry, exit and persistence of corporations. Relying on newly developed balance sheet panel data from every non-financial Russian corporation (more than 2,500 of them) between 1899 and 1914, we examine the characteristics of entering and exiting corporations, how new entrants evolved and the impact of founder identity on subsequent outcomes. Russian corporations evolved within a market environment, conditional on overcoming distortionary institutional barriers to entry that slowed the emergence of these leading firms in the Imperial economy.

Firm entry, evolution and exit are key attributes of an economy's overall performance,¹ yet very little is known about these processes in historical settings. While the cross-sectional size distribution of establishments has been well documented in the United States and other leading economies over the long nineteenth century, the dynamics of how size and structure evolved at the firm level are largely unknown outside of a few industries and small samples of firms. Furthermore, any understanding of the early stages of modern economic growth must grapple with conditions in 'late industrialisers', where firms may have faced institutional obstacles or market imperfections that distorted entry, growth and exit, thereby constraining the adoption of more capital-intensive methods and new technologies, undermining competitive pressures and, potentially, generating aggregate resource misallocation. This paper makes substantial advances in this direction by studying the births, deaths and lives of corporations in late Imperial Russia, a country long associated with late industrialisation (e.g., Gerschenkron, 1962). In identifying the characteristics of corporate 'entrants', the dynamics of these firms after entry and the factors associated with their subsequent exit, we show how corporations in the Russian Empire responded

* Corresponding author: Amanda Gregg, Middlebury College, Warner Hall 316, 303 College Street, Middlebury VT 05753, USA. Email: agregg@middlebury.edu

This paper was received on 23 November 2020 and accepted on 31 January 2024. The Editor was Ekaterina Zhuravskaya.

The data and codes for this paper are available on the Journal repository. They were checked for their ability to reproduce the results presented in the paper. The replication package for this paper is available at the following address: <https://doi.org/10.3886/E196009V1>.

We are incredibly grateful for comments from colleagues and audiences at the World Business History Congress (Bergen), the Bank of Finland Institute for Economies in Transition (BOFIT), Yale, Queens University, Colby, Harvard, Stanford, Binghamton, University of Montreal, the Washington Area Economic History Seminar, the Central New York Economic History meeting, the Association for Slavic, East European and Eurasian Studies, the Economic and Business History Association Meeting, the NBER Entrepreneurship Working Group meetings, the All-UC Economic History conference, the Wisconsin Russian Historical Political Economy workshop, the University of Helsinki, Middlebury and Williams. Giulia Filocca, Tamar Matiasvili, Madeline McFarland, Sanket Vadlamani and Brenda Xu provided exemplary research assistance. We greatly appreciate the aid with sources provided by librarians at Harvard, Middlebury, Williams and the National Library of Finland. Financial support was provided by BOFIT, Middlebury, Williams and the National Science Foundation (SES #s 1658877 and 1658887).

¹ See, for example, Haltiwanger *et al.* (2013), who highlighted the important role of entry for creating new job opportunities, or the discussion of turnover in developing countries in Tybout (2000).

to a market environment subject to institutional frictions. We develop an empirical framework for understanding the dynamics of these firms that leverages uniquely rich information available from the corporate balance sheets of this historical developing economy.

Imperial Russian corporations faced high barriers to entry, largely because the government maintained a costly system of incorporation by special concession.² This key distortion constrained capital investment and firm growth by reducing the number of companies that could benefit from the limited liability and easier access to capital markets that incorporation offered (Gregg, 2020). While Gregg (2020) examined the causal effects of this concession system by comparing corporate and non-corporate manufacturing establishments, this paper takes advantage of new and highly detailed balance sheet and charter information from over 2,500 Russian industrial corporations between 1899 and 1914 to analyse the characteristics and life-cycle dynamics of the industrial firms that did incorporate. What were the features of Imperial Russian firms at the time of incorporation? How did corporations evolve after entry? What attributes of corporations were associated with exit? How did variation across corporations in the cost of entry, firm fundamentals or market conditions impact these dynamics? Our panel dataset presents a unique opportunity to analyse early industrialisation in the face of apparent institutional constraints, thereby contributing to a burgeoning literature on the economic development of Imperial Russia and the Soviet Union (summarised in Zhuravskaya *et al.*, 2024).

Using these data, we estimate entry and exit rates (defined below) for Imperial Russian corporations. Table 1 reports the overall calculated rates for our Russian sample and similar rates in modern settings, in order to situate our subsequent analysis of corporate dynamics in a comparative light. Our takeaway is that the rates of entry and exit of Imperial Russian corporations during this period of early industrial takeoff—8.9% and 4.8%—are in line with those seen in the mature modern economies of the United States and Europe and in modern Russia, while perhaps slightly below those in faster growing emerging markets such as China and Turkey.³ This implies a substantial amount of firm churning, suggesting that there were at least some competitive pressures *within* the corporate sector. However, entry (and possibly exit) rates may very well have been higher under more general incorporation, with possible consequences for resource allocation and industrial growth.

While our data do not allow us to directly investigate a counterfactual without entry barriers, we undertake a series of empirical exercises that shed light on consequences of the concession system of incorporation. We begin with a simple framework, based on insights from the literature on firm life-cycle dynamics (e.g., Hopenhayn, 1992), where entrants pay a fixed cost to enter, but enjoy higher revenues after entry, subject to random shocks that might precipitate firm exit. Our data reveal that Imperial Russian corporations evolved in ways that can be rationalised within this framework. We find that new corporations, especially ones that did not previously exist as partnerships, were weaker upon entry and more likely to exit; these new firms grew rapidly in terms of total assets and market share, approaching, but not quite reaching the levels of incumbents over our sample period; and measures of corporate performance like profitability strongly and negatively predicted exit.

Furthermore, our investigation of key differences across corporations reveals additional ways that the concession system impacted the corporate sector. Corporations with politically connected

² While we focus on the concession system, Cheremukhin *et al.* (2017) also emphasised that collusive practices among incumbent Imperial Russian industrial firms may have also generated substantial entry barriers.

³ Some of the variation in Table 1 is likely due to the unit of observation (e.g., plants versus corporations; compare the UK rates to those we derive) or the timing of the underlying survey around the business cycle.

Table 1. *Modern Evidence on Firm Entry and Exit Rates.*

Country	Years	Unit	Entry rates (%)	Exit rates (%)	Source
Imperial Russia	1900–12	Chartered industrial corporations	8.9	4.8	Current paper
	1999–2010	Registered firms (RUSLANA)	6.4–12.3	2.8–8.6	Gonzalez <i>et al.</i> (2013)
Modern Russia	2008–14	Registered firms (ROSSTAT)	8.9–11.5	3.5–9	Iwasaki <i>et al.</i> (2016)
	1978–2014	Businesses with paid employees	12.30	10.70	BDS, US Census Bureau
United States	1963–82	Manufacturing plants (five-year periods)	41.4–51.8	41.7–50.0	Dunne <i>et al.</i> (1988)
	1972–97	Manufacturing plants	6.20	5.50	Lee and Mukoyama (2015)
Canada	1991–2005	Manufacturing plants	2–16	2–9	Liu and Tang (2017)
	2000–8	Private sector businesses	10.80	9	Ciobanu and Wang (2012)
UK	1986–91	Manufacturing plants	21	18.50	Disney <i>et al.</i> (2003)
China	1998–2007	Industrial firms > 5 million yuan in sales	~ 20	18	He and Yang (2016)
South Africa	2010–4	All formal firms with employees	8	8	Tsebe <i>et al.</i> (2018)
Turkey	2006–16	All manufacturing firms	16	10	Akcigit <i>et al.</i> (2020)
Cross country	1990s	Manufacturing firms with employees	5–23	5–12	Bartelsman <i>et al.</i> (2009)
	2000–15	Small firms, formal and informal	–	8.30	McKenzie and Paffhausen (2019)
	1960s–1980s	Manufacturing firms	6.50	6.50	Caves (1998)
	2000–14	Businesses with < 10 employees	11.3	9.4	Anderton <i>et al.</i> (2019)
	2000–14	Businesses with ≥ 10 employees	1.7	1.4	Anderton <i>et al.</i> (2019)

Notes: Bartelsman *et al.* (2009) data cover the Netherlands, Italy, Argentina, Finland, Estonia, Canada, the United States, Denmark, Portugal, France, Slovenia, Hungary, Romania, the UK, Mexico, Latvia and Brazil. McKenzie and Paffhausen (2019) utilised firm survey data from Indonesia, Mexico, Nigeria, Thailand, Egypt, Ghana, Kenya, Malawi, Sri Lanka, Uganda, Benin and Togo. Caves (1998) summarised data from studies conducted for Belgium, Canada, (West) Germany, South Korea, Norway, Portugal, the UK and the United States. Anderton *et al.* (2019) utilised a business demographic database covering all 28 EU countries. The entry and exit rates for Imperial Russia are the overall averages reported in Table 3. The two modern Russian studies rely on different firm registry databases (reported in parentheses), and we calculate the range of rates by considering the reported annual information from both the two underlying sources.

founders may have faced reduced costs of entry. Indeed, we find some evidence that corporations with politically connected founders entered the corporate sector with observably weaker characteristics, echoing the recent findings of Artunc and Saleh (2022) on pre-independence Egyptian firms. However, such firms were not more likely to exit after founding, implying that political connections may have also entailed real or financial benefits to connected corporations or, less optimistically, that the concession system allowed weaker, but connected corporations to endure. Second, corporate entry was unrelated to the Imperial business cycle, suggesting that the time-consuming process of incorporation imposed real constraints on firm decisions. Third, corporations with more widely held ownership were consistently less profitable and more likely to exit, reflecting the agency costs of dispersed ownership. Thus, the concession system and the characteristics of the corporations it generated mattered for firm dynamics.

Our paper's firm-level examination of entry and exit dynamics speaks to long-standing debates on the trajectory of the Russian economy before the Revolution (see Zhuravskaya *et al.*, 2024). One side (e.g., Gregory, 1982; Markevich and Nafziger, 2017) stresses fairly high rates of industrial growth, characterising the late Imperial economy as relatively dynamic. However, Owen (1991), Allen (2003) and Cheremukhin *et al.* (2017) asserted that significant structural obstacles impeded Russian economic modernisation before the Revolution. Practically no empirical work has been undertaken with micro-level data to examine just how institutional and economic conditions impacted firm behaviour and outcomes. Exceptions include the recent work of Gregg and Nafziger (2019; 2023) and Gregg (2020), who found that firms adopting the corporate form of organisation demonstrated flexible financial strategies, leading to greater capital accumulation, investment in new technologies and growth. Following Shepelev (1973) and Owen (1991), these studies suggest that a more flexible and lower-cost process of incorporation would have improved the level and pace of industrial development prior to 1917.

The nineteenth-century spread of modern industrialisation was accompanied by growing capital requirements. Firms increasingly adopted corporate or limited liability forms of partnerships to finance such larger-scale investments more easily. This was the case in the United States, Britain, Germany and other industrial leaders, but it was also true in Imperial Russia (Gregg, 2020; Gregg and Nafziger, 2023). Historical studies of corporations have concentrated on governance or financial matters (e.g., Fohlin, 2007; Deloof and van Overfelt, 2008; Braggion and Moore, 2013), while research into industry, firm and market dynamics in the past has focused on establishments (plants or firms) and on the 'real side' of the enterprise: output, employment, capital utilisation and productivity (e.g., Sokoloff, 1984; Atack *et al.*, 2008). There is practically no quantitative historical research on firm dynamics in an economy as poor as late Imperial Russia (an important recent exception is Artunc, 2023). Our study helps bridge these gaps in the economic historical literature.

At the same time, we also make several contributions to the modern industrial organization (IO) literature. Classic studies in industrial organisation (e.g., Dunne *et al.*, 1988; Haltiwanger *et al.*, 2013) consider the differences between incumbents and brand-new entrants or entrants diversifying into new industries, but little research has examined differences across incumbents, brand-new firms and those that change enterprise forms, for example, from partnerships to corporations. Our consideration of both newly created and pre-existing (as partnerships or other organisational forms) corporations allows us to study this distinction, which was potentially related to differences in the effective entry barriers faced by firms within the concession system, akin to 'red-tape' or regulatory entry barriers in other contexts (e.g., Djankov *et al.*, 2002). Additionally, because Imperial Russia possessed two types of corporations that reflected

underlying differences in charter provisions, our data also permit a novel examination of variation in life-cycle dynamics among corporations with distinct governance characteristics. Finally, our work makes a novel extension to the IO literature on firm dynamics that relies on productivity-related attributes of manufacturing enterprises by, instead, drawing on the richer financial information provided by corporate balance sheets. This allows us to examine the variables that a firm's managers would consider when making decisions, such as accounting profits and assets.⁴

In the following sections we outline the historical and economic context and then introduce and describe our new dataset, a key contribution of our project. Along the way, we specify a set of hypotheses regarding corporate characteristics and life-cycle outcomes. We then evaluate these hypotheses using a variety of empirical approaches. We conclude with brief remarks on the implications of this paper and our larger project for understanding the early stages of Russian industrial development.

1. From Historical Context to Empirical Hypotheses

Several features of the historical context are relevant for our examination of Imperial Russian corporate dynamics. One is the macroeconomic environment. While the economy remained largely agrarian, Russian per capita income increased relatively quickly (from a very low level),⁵ and the industrial sector experienced substantial growth over this period (Kafengauz, 1994).⁶ Amidst these trends, the late Imperial Russian economy experienced a mid-1890s boom followed by a slide into a downturn that reached its nadir in 1901. There was then growth to 1905, a massive contraction with the 1905 Revolution and a slow and erratic recovery leading up to World War I (Gregory, 1982; Owen, 2013). This underlying business cycle potentially carried implications for the level of, and selection into, (incorporated) firm entry, growth and exit.

A second relevant aspect of the historical context was the industrial organisation of Imperial Russia's traditional and modernising sectors. Over the last decades of the regime, handicraft production, especially in older manufacturing sectors (i.e., textiles), gave way to larger-scale factories using increasingly modern technologies. The timing and extent of this process varied considerably across industries and regions, with implications for the operating size and capital needs of firms. At the same time, the regime allowed price fixing and other potentially collusive arrangements, although policy discussions over this stance continued through the decades we consider (as noted by Shepelev, 1973, ch.5).⁷ Such practices potentially raised the costs of entry by new and outsider firms (Cheremukhin *et al.*, 2017), particularly as these oligopolistic associations could leverage political or economic influence.

⁴ Penrose (2013, p.6) emphasised that corporations are better for studying firm growth than partnerships or single proprietorships, because limited liability frees the firm from resource constraints of constituent individuals.

⁵ The average annual growth rate of Russian GDP per capita from 1900 to 1914 was 0.87% versus 0.49% in Britain, 0.18 in Germany and 0.75 in Japan (Maddison Project Database, version 2020; from Bolt and van Zanden, 2020, but originally from Gregory, 1982; Broadberry *et al.*, 2015; Fukao *et al.*, 2015; Pfister, 2022; respectively).

⁶ The industrial sector grew at over 6% per annum between 1887 and 1913, which was well in excess of the growth rates in Germany, the UK or the United States in the same period (Gregory, 1997). A long line of scholarship interprets this early industrial development as a consequence of various state initiatives in the economy, from tariffs and the gold standard to growing public investments in schooling and infrastructure (Von Laue, 1963; Gerschenkron, 1965).

⁷ Such 'syndicates' were apparently widespread in late Imperial Russian industry (e.g., Gol'dshtein, 1913), but we are not aware of any sources that would allow us to identify their prevalence across industries or over time.

Unfortunately, there has been relatively little study of the size distribution of enterprises, the extent of competition within industries or over time, patterns of firm entry or exit, or the adoption of new technologies or business practices in the Imperial Russian context.⁸ How firms reacted to the incentives of the institutional and economic environment, and the consequences for competition and sectoral change, has only been explored in a limited and largely qualitative or speculative fashion (see, e.g., Guroff and Carstensen, 1983 regarding entrepreneurship).⁹ Only very recently have works such as Kulikov and Kragh (2019) and Gregg (2020) explored larger samples of firms across sectors to better identify the factors underpinning or constraining industrial growth. More extensive empirical evidence on firm dynamics or industrial structure is non-existent. This paper is a first attempt to rectify this by focusing on economically important modernising firms: those that incorporated.

A third critical contextual element is the Imperial legal environment, especially when it came to corporate law. Following Owen (1991), Gregg and Nafziger (2019; 2023) and Gregg (2020) argued that the absence of general incorporation was a critical impediment to late Imperial economic development. The costly and politicised process of chartering a corporation constrained entry into this form, and, as we argue below, this had possible implications for the level of competition, the allocation of resources within and across firms and the pace of industrialisation. This interpretation is consistent with the recent work of Cheremukhin *et al.* (2017), who asserted that late Imperial industrialisation was slowed by excessive market power in more advanced industries, particularly in the form of the collusive arrangements noted above.¹⁰ The legal and policy environment may have reinforced this structure.

However, as we show in Table 1, entry (and exit) rates for Imperial corporations were not substantially out of line with rates in nominally less constrained settings or for more broadly defined units (e.g., establishments or ‘businesses’), including what is observed in modern Russia. To reconcile these aggregate rates with the largely pessimistic literature on the concession system, a clearer understanding of the characteristics associated with corporate entry, exit and survival is invaluable. Moreover, since corporations constituted the primary organisational form in the modernising sub-sectors of Russian industry (Kulikov and Kragh, 2019), the life-cycle dynamics of this type of firm can speak to the broader features of industrial development.¹¹ Before presenting our new dataset, we delve deeper into the relevant legal aspects of the Imperial Russian corporate setting and, drawing on insights from the modern literature on firm dynamics, outline a set of hypotheses regarding the entry, survival and exit of incorporated firms.

⁸ Tugan-Baranovsky (1970) pioneered an investigation of the transition to modern factory production, which drew upon idiosyncratic data from factories in the Moscow region. Various case studies and contemporary accounts have explored the experiences of specific industrial plants (e.g., Markevich and Sokolov, 2005), communities (e.g., Vorderer, 1990), firms (e.g., Grant, 1999) and sectors (e.g., McCaffray, 1996). Varzar and Kafengauz (1929), Gregory (1982) and Kafengauz (1994) documented industry sub-sector-level growth between the early 1880s and 1913. McKay (1970), Shepelev (1973) and Owen (1991) studied business practices among corporations of the period.

⁹ The Imperial financial system is another aspect of the context relevant for understanding corporate dynamics. Retained profits, external loans, bond sales and equity issues—domestically and abroad—were all financing options available to Russian firms. Incorporation lowered the costs for accessing several of these sources. For much more detail on the financing of Russian industrial corporations, see Gregg and Nafziger (2023).

¹⁰ Russia’s size, ongoing internal market development and the technologies at play during its early industrialisation plausibly raised the optimal scale of production. The associated increase in fixed costs implies growing barriers to entry. Such developments would have reinforced the possible advantages of the corporate form.

¹¹ According to Gregg’s (2020) calculations, corporations controlled roughly 5% of all industrial establishments, but these plants generated over 40% of industrial revenue over the period 1894–1908.

1.1. *The Imperial Russian Concession System: Corporate Charters and Corporation Types*

Late Imperial entrepreneurs could select one of a small number of organisational forms: sole proprietorship, simple partnerships and joint-stock corporations. However, Russia failed to introduce either general incorporation or a private (non-corporate) business form that offered complete limited liability (e.g., the PLLC, as defined by Guinnane *et al.*, 2007). Rather, the ‘concession’ system of charter application and approval was a lengthy and costly process that entailed lawyers and numerous bureaucratic steps, potentially involving bribery and/or political imperatives.¹² While executed primarily through the Ministry of Finance, other ministries and government offices could and did intervene in the process for applications that touched on their areas of concern. Overall, the costs of this process likely limited access to incorporation for some Russian firms (Gregg, 2020).¹³ Therefore, factors that conceivably made it easier to obtain a corporate concession—political connections, a record as a pre-existing firm, a lack of resistance by incumbents, etc.—potentially had implications for the types of firms that incorporated. At the same time, the concession system generated considerable variation in corporate structures and governance for those firms that made it through the process.¹⁴ Although the Ministry of Finance provided some guidelines, the bargaining and idiosyncrasies of the corporate approval process meant that the details of the charters frequently differed between otherwise similar firms.

Chartered corporations in Imperial Russia self-identified as one of two types indicative of this underlying variation in organisational characteristics. When formulating their initial charters, the vast majority of corporations labelled themselves as either ‘A-corporations’ or ‘share partnerships’, which, in the text and results that follow, we refer to as ‘widely held’ and ‘not widely held’, respectively.¹⁵ Although the commercial code did not formally distinguish the two variants in terms of their rights or obligations, these identities—related as they were to the terminology employed for the equity shares—likely signalled the nature of corporate enterprises to potential investors.¹⁶ New enterprises that sought outside financing from wider circles of investors tended to define themselves as A-corporations (hence our use of the term ‘widely held’), while issuing smaller par value equities. Existing partnerships that incorporated (perhaps to add a small number of new investors) tended to choose the share partnership label, and they issued relatively

¹² Shepelev (1973, p.189) reported that it took roughly half a year for a charter to wind its way from initial proposal to approval in the 1890s. Even for pre-existing firms, this could delay the initial capitalisation process, inhibit the financing of new investments and constrain new operations. From the 1890s on, these costs generated discussion within the government regarding the need for a more flexible incorporation process (including a criticism of the ‘red tape’ that this system entailed—*ibid.*, p.269), but these ideas were never formally acted upon.

¹³ This institutional barrier was often compounded by the difficulties of finding investors to fulfil the initial capital subscriptions called for in the charter. As a result, many chartered corporations failed to initiate operations quickly or at all (Shepelev, 1973). As we study corporations that generated public balance sheets, these firms had already overcome such initial financial constraints on ‘entry’. Of course, there were other barriers to the formation of large capital-intensive industrial firms, including limited technological capabilities and possible constraints on the supply of labour or land. While we can get at time and regional variation in such factors by including accounting year and headquarter location in our analysis, data constraints prevent a fuller evaluation of these other possible corporate entry barriers.

¹⁴ This impression stems from reading numerous charters and from the analysis of Dayton *et al.* (2023). Shepelev (1973) and Owen (1991) highlighted the heterogeneous issues that arose within each corporation’s chartering process. Corporations that wished to change elements of their charter, such as their system of governance or capitalisation level, had to return to the Ministry and obtain a formal revision.

¹⁵ ‘A-corporation’ is the term employed in Gregg (2020) to refer to corporations that labelled themselves as *aktsionnoe obshchestvo*, i.e., companies that use the term *aktsiia* to denote their shares. In contrast, ‘share partnerships’ were those corporations that self-identified as *tovarichestvo na paikh*, i.e., they utilised the term *pai* to refer to their shares.

¹⁶ Share partnerships possessed many characteristics of private limited liability companies, including small circles of investors and reliance on internal financing. Rozenberg’s (1912, p.42) pamphlet on Russia’s absence of limited liability partnerships complained that the partnership was ‘not a legal, but merely a practical form’.

large par value shares.¹⁷ As Gregg and Nafziger (2019; 2023) documented in greater depth, A-corporations also tended to be larger, made less use of short-term credit relative to longer-term bonds and issued smaller dividends as a share of profits. These financial characteristics evolved following the choice of corporate structure at the time of charter, with potential implications for firm life-cycle dynamics.

1.2. Hypotheses on the Life-Cycle Dynamics of Imperial Russian Corporations

We are interested in whether the concession system and other features of the institutional and economic context affected the processes of corporate entry, survival and exit, thereby possibly influencing industrial development in Imperial Russia.¹⁸ To develop hypotheses that we can take to our data, we build on a simple framework. Firms in the Russian Empire, either new entities or existing concerns organised in non-corporate forms (and potentially differing along other ex ante dimensions), chose to ‘enter’ the corporate form through the concession system if their expected incremental profits were positive, given what we interpret as the large fixed cost of incorporation.¹⁹ The corporate form, under limited liability and other advantages, accrued profits through its lower costs of external funds and the potential for improved internal incentive structures. As such, once corporations entered, they made output, pricing and investment decisions (in more or less competitive market environments), conditional on these advantages and in the face of idiosyncratic productivity or demand shocks.²⁰ Following entry, corporations then chose to exit (i.e., dissolve or merge) if their current or expected profits dipped below some reservation value. Given this underlying structure, we develop a series of hypotheses about how entering corporations possibly differed from incumbents, how those corporations evolved as they aged and what conditions were predicted when they exited.

Three forces potentially shaped the characteristics of newly formed corporations, relative to incumbents (and relative to their future selves). First, new corporations overcame a regulatory (and financial) entry barrier via the concession system, which likely generated positive selection relative to all potential entrants.²¹ Second, however, financial constraints, time to build and, perhaps, learning all suggest that new entrants likely started small and grew over time as they

¹⁷ See Owen (1991, pp.12–3 and 152), Gregg and Nafziger (2019; 2023) and Dayton *et al.* (2023). These different ‘self-identifications’ may have also been associated with underlying differences in shareholder voting rights, board organisation or other features, although there was no one-to-one correspondence.

¹⁸ Our empirical work is informed by Dunne *et al.* (1988). For studies of firm entry and exit in other developed economies, see the papers cited under Table 1 and elsewhere in this section, along with the survey in Caves (1998). Studies of firm creation/entry before World War II are relatively few (exceptions include Lloyd-Jones and Le Roux, 1982; Baten, 2003; Artunc, 2023). See Bartelsman *et al.* (2004; 2009) for surveys of the literature on firm ‘demographics’ in modern developing economies.

¹⁹ There is a literature on regulatory burdens as entry barriers and the implications for firm entry rates that relates to our framework. For example, Bripi (2015) found that areas with lower regulatory (‘red-tape’) barriers in Italy in the mid-2000s saw higher entry rates with little difference in the subsequent performance of firms. Other studies posit entry ‘regulation’ as a source of rent seeking by bureaucrats and politicians (i.e., Djankov *et al.*, 2002). On entry barriers more generally, see McAfee *et al.* (2004). Similar to Hopenhayn (1992) and Melitz (2003), we conceptualise the fixed cost of entry as potentially varying across firms, industries and/or over time.

²⁰ This follows the modern literature on firm dynamics, which posits that productivity ‘shocks’, which can be conceptualised as a pre-entry firm ‘quality’ draw or as shocks experienced once in the market, underpin firm entry and continuation decisions (e.g., Hopenhayn, 1992; Clementi and Palazzo, 2016; Sterk *et al.*, 2021). While we do not observe such productivity shocks in our data, our framework relies on corporate profits, which we do observe. Hopenhayn (1992) and other studies assumed that profits are increasing in these productivity shocks, which we verify in Online Appendix Table A16.

²¹ A high entry barrier would likely reduce the overall entry rate of new corporations, although the comparative evidence (Table 1) suggests that was perhaps not the case here. Another reason that new corporations might be positively

accumulated resources and experience. Third, these new entrants competed with incumbents, who had already been tested by competition and possibly held persistent collusive or non-market advantages. Thus, while entry barriers likely generated positive selection among new entrants, the subsequent evolution of firms was potentially impacted by entrenched incumbents.²² Informally, we can explore these potentially offsetting forces by comparing characteristics of entrants under pooled ordinary least squares (OLS) specifications and via corporation fixed effect models. With corporation fixed effects, we focus on how the firm evolved relative to future observations of itself. We would expect to see evidence of ‘worse’ firm attributes at entry under this second class of models.

Additional corporate characteristics and underlying market conditions may be associated with costs of entry or other aspects of a firm’s life-cycle trajectory. Our data permit us to investigate four such dimensions: whether the corporation was a new firm at the time of chartering, whether the corporation was widely held, whether the firm entered in a recession year and whether the corporation’s founders were politically connected. Corporations that were new firms at the time of incorporation were at the beginning of their lives when they enter our dataset.²³ As such, they may have also faced higher entry barriers, since the Ministry of Finance could not rely on a past history of performance when making the decision over granting a corporate charter. Corporations that had adopted the more widely held form may have been perceived by the government as inherently ‘riskier’ and faced higher entry barriers as a result. Both widely held and newer corporations may have also faced different costs of finance, suggesting further implications for their dynamics.²⁴

In many contexts, firms that enter during recession years are quite different from firms that enter at other moments in the business cycle.²⁵ However, we expect such differences to be small in this case, since corporations could not control the precise timing of their entry, given the length of the chartering process. In the context of the concession system, the personal identities of corporate founders may have influenced which firms could be granted entry. Firms with politically connected founders, for example, may have faced a lower threshold (in terms of, say, productivity) for corporate entry than those without such ties, suggesting relatively weaker performance at founding. On the other hand, those same connections may have entailed real advantages, for example in obtaining external financing.²⁶

Hypotheses regarding the post-entry evolution of corporations largely follow from our predictions about the characteristics of new entrants. As new entrants age, they face competition from incumbents and other new entrants. The selection inherent in survival suggests that, over time,

selected is that they could be more innovative and, therefore, have an immediate cost or competitive advantage. On entry and the characteristics of new firms, see Geroski (1995).

²² Liu and Tang (2017) established that Canadian new entrants are weaker than incumbent firms along a number of dimensions. Many papers find that new firms are more likely to fail (see below), thereby implicitly suggesting that entrants are relatively weak.

²³ Relative to the diversification of existing firms into new activities, the entry of brand-new firms is generally more common in modern settings, although this can vary widely by industry (Dunne *et al.*, 1988; Geroski, 1995).

²⁴ As we noted above, collusive arrangements among incumbents in the Russian context may have imposed numerous constraints on incorporated new firms.

²⁵ In contexts where barriers are relatively low—such as business formation in the modern United States—entry tends to be pro-cyclical, but entrant quality is generally countercyclical (e.g., Clementi and Palazzo, 2016; Tian, 2018). Artunc (2023) found countercyclical firm quality among entrants in early twentieth century Egypt.

²⁶ Studies have found that firms benefit from political connections in all sorts of ways (e.g., Fisman, 2001; Faccio, 2006; Ferguson and Voth, 2008). For example, Braggion and Moore (2013) found that politically involved corporate directors aided the placement of securities in Victorian Britain.

new entrants will increasingly resemble incumbent corporations.²⁷ Thus, if they start smaller and, perhaps, less profitable than incumbents at entry, they should see some convergence in those characteristics. Such trajectories could reflect underlying movement towards some sort of ‘optimal’ in terms of productive capacity and output—i.e., scale, efficiency-enhancing technologies or workforce attributes.²⁸ In terms of benchmarks, Geroski (1995) identified a convergence rate of about ten years for firms to reach incumbent size in developed countries. Disney *et al.* (2003) noted a similar period for market share convergence among UK firms in the late 1980s.

The four dimensions of firm heterogeneity that plausibly impacted entry can also be linked to variation in the post-entry evolution of Imperial Russian corporations. While brand-new firms might have entered with a smaller size and lower rate of profitability, a process of competitive selection implies that they should have converged towards incumbents (and to pre-existing surviving corporations). Widely held corporations that successfully entered and survived were likely to grow relatively quickly given their potential access to cheaper external financing (although this may be offset by greater internal governance costs). Corporate political connections may have eased access to capital, technology, skilled labour, output markets or other factors, thereby generating advantages at the time of entry or, after entry, in the process of catching up to incumbents. Finally, we expect that corporations entering during a recession year may have caught up relatively slowly to incumbents, since they faced difficult demand-side conditions in the critical first year of life.²⁹

We complete our narrative of the lives of Russian corporations by presenting a set of hypotheses linked to exit. As exit is an absorbing state conditional on survival up to that point, our empirical framework makes use of hazard models to estimate how the probability of ‘failure’ varies according to different corporate attributes. This is standard in the industrial organisation literature and has seen historical applications with rich firm-level panel datasets.³⁰ Since we investigate corporations rather than other organisational forms that were potentially easier to dissolve, our baseline hazard rates may be relatively low. However, as suggested by the overall and sectoral exit rates noted in Table 1 and below, exit (as we define it) was prevalent over our sample period, which suggests that evaluating the marginal contributions of various corporate attributes in such a conditional hazard framework is appropriate.

Standard theory implies that corporations exit when, following a demand or productivity ‘shock’, their profits dip below a threshold continuation value necessary to cover variable costs and debt obligations. Thus, lower profitability should be associated with greater likelihood of exit, regardless of the competitive environment. For the same level of profitability, a smaller corporation may be more likely to exit, because it is less diversified (therefore, more subject to negative shocks), potentially has smaller reserves to draw on during lean times and its costs

²⁷ In any environment, new firms may face time-to-build (capital) constraints, while slowly resolving initial uncertainty about demand conditions, costs, productivity, etc. (Jovanovic, 1982; Ericson and Pakes, 1995).

²⁸ Such a shift toward an optimal firm ‘size’ is suggestive of the ‘survivor’ methodology pioneered by Stigler (1958), which Atack (1985) subsequently applied to estimate optimal industrial plant size in the nineteenth century in the United States. However, Geurts and Van Biesebroeck (2016), among other scholars, pointed to a much more complicated interaction between entry, firm size and firm growth, particularly if adjustment costs (in hiring factor services or obtaining additional inputs) are significant, but vary across firms. And, while the convergence of profits may be true in some circumstances (see, e.g., Maruyama and Odagiri, 2002 for mid-century Japanese firms), Cubbin and Geroski (1987) famously found limited evidence among UK firms between the 1950s and 1970s.

²⁹ Moreira (2017) presented evidence for the recent United States that firm size and productivity varies across entering cohorts according to business cycle conditions, and this heterogeneity persists over time. See also Artunc (2023).

³⁰ Studies that model firm exit using a hazard function approach to survival include Audretsch and Mahmood (1995), Klepper (2002), Thompson (2005) and Postel-Vinay (2016). The literature has posited various channels linking firm age to growth, exit or the probability of continued survival (e.g., Kueng *et al.*, 2014).

of dissolution may be smaller. In contrast to most studies in the firm dynamics literature that consider productivity-based outcomes, our focus on the profits of Russian corporations is more directly connected to the likely decision-making processes of managers and directors at the time.

As with the analyses above, we consider four dimensions of corporate heterogeneity in relation to exit.³¹ Even conditioning on profitability and size, corporations born as new firms will potentially exhibit a higher likelihood of exit if there are lingering cost disadvantages, if such firms remained excluded from ongoing collusive agreements or if managerial inexperience constrained responses to crises.³² Similarly, more widely held corporations may have displayed greater fragility due to costly internal agency concerns. Corporations with politically connected founders may have been more or less likely to exit, depending on the nature of the advantages conferred by these connections. On the one hand, such corporations perhaps faced lower barriers to entry, and, if they were subsequently weaker upon entry, they may have been more likely to exit. However, if political connections conferred other advantages, politically connected corporations may have been better able to withstand negative shocks, making exit less likely. Finally, since the business cycle was unlikely to affect patterns of corporate entry, corporations born in a recession year may have faced disadvantages in their first years of life, making them more fragile and thus more likely to exit quickly. However, if such corporations survived these early, difficult years, they may be positively selected and thus better able to withstand later shocks.

We next evaluate this simple framework and our hypotheses about the key characteristics of Russian corporations using a dataset that allows us to follow corporations through their lifespans. In the sections that follow, we describe our dataset and the empirical tests that allow us to disentangle the forces affecting corporate dynamics in this context.

2. Data

Our panel dataset is based on newly compiled balance sheet data on all Imperial Russian non-financial corporations active from 1899 onwards.³³ We first collected financial data from all such corporations reported in the Ministry of Finance's *Yearbooks* published from 1900 through 1915.³⁴ The Ministry of Finance compiled the balance sheet information in their yearbooks from the official commercial periodical *Vestnik finansov i trgovli*,³⁵ where corporations published financial statements as required by the commercial code and by their individual charters.³⁶ These

³¹ An immense literature identifies factors that drive firm, plant or corporate exits (from mergers to closings to liquidations to de-listings) in a wide variety of settings. For useful discussions, see the relevant portions of Dunne *et al.* (1988), Audretsch and Mahmood (1995), Disney *et al.* (2003), Bartelsman *et al.* (2009), He and Yang (2016) and McKenzie and Paffhausen (2019). For a historical study of corporate survivorship in the Australian context, see Panza *et al.* (2018).

³² Regardless of precise organisational form, political connections or initial size, Baldwin and Gorecki (1991) and other scholars emphasised that brand-new firms, although perhaps armed with more advanced technologies or other advantages, tend to fail at higher rates as they struggle to establish customer bases and carve out market shares.

³³ Corporate commercial banks' balance sheets were reported separately; we do not rely on this information, nor do we investigate other types of financial firms.

³⁴ See Russia, Ministry of Finance (1900–15). While such public financial statements were required before 1900, only from that year (and ending in 1914) did the Ministry of Finance collect and publish the relevant data in a unified manner.

³⁵ The full title is *Vestnik finansov i trgovli. Otchety trgovlykh i promyshlennykh prepriiatii*.

³⁶ Figure A1 in the Online Appendix presents an example of such an entry in both sources for the Martens and Daab Partnership in the 1900–1 accounting year. Spot checks suggest that the published tables accurately report the published balance sheet information. Gregg and Nafziger (2019) discussed the basics of accounting in published Russian financial data of the period; see also below.

volumes provide largely complete data on corporations for the accounting years 1899–1914, with a small number of observations from earlier years.³⁷

We matched these company entries over time by hand to form an (unbalanced) panel, taking care to address and reconcile different spellings and marginal changes in corporate names.³⁸ We then match the corporations in the resulting dataset by hand to the RUSCORP database (Owen, 1992) to incorporate the information from founding charters documented in that source, including the identity and status of each corporation's founders.³⁹ We code corporation as having a 'politically connected' founder if at least one founder is either a government official or member of the nobility (defined further below).

The key variables of interest in this paper are the occurrence and rates of exit and entry by corporations, which we define indirectly within our panel. A corporation enters in a given year when that year is the first time it is observed in our dataset.⁴⁰ We use the 1899 cross section as the baseline, since most of the accounts published in our first volume of data correspond to the 1899 accounting year. A corporation is said to exit if it is never observed again after a given accounting year. Following Dunne *et al.* (1988, p.502), we define the aggregate entry rate for an accounting year or for a given group as the number of new corporations in year t divided by the total number of corporations in year $t - 1$. Similarly, the exit rate in accounting year t is the number of corporations in year t that are never observed again in our data, divided by the total number of corporations in year t . Implicitly, we assume that new corporations in 1900 did not exist before our baseline year of 1899 (we have checked this using RUSCORP), and that exiting ones in 1913 did not return after 1914. In our empirical work, we generally truncate the sample after 1912 to ensure that we are identifying 'true' exits.⁴¹

Our definitions may miss two key aspects of broader notions of firm entry or exit. On the entry side, we know whether the firm existed prior to incorporation, but we currently cannot separate mergers of existing corporations from the observationally equivalent exit of two (or more) firms and the entry of a new one into corporate status. On the exit side, we assume that disappearance from our data equates to 'exit' in the sense of corporations shutting down (perhaps with assets acquired by other corporations). Although we are not aware of specific empirical evidence on the prevalence of such cases in Imperial Russia, it is possible that some of what we are calling exits were parts of mergers or other restructurings.⁴² It may be that some corporations 'went private', gave up status as a corporation and stopped publicly reporting financial information to

³⁷ It appears that the Ministry published all available balance sheet information issued in *Vestnik finansov i torgovli*. Our sense is that the number of missing observations is small, although see our discussion of the 1905 data below. We check for the presence of corporations missing from one year in subsequent years, and we condition on cohort or year in most regression specifications. Critically, our use of the balance sheet data to derive the active population of corporations necessarily excludes firms that received a charter (as denoted in Owen, 1992), but may not have ever operated.

³⁸ This process yielded a small number of duplicate observations, which we reconcile following an algorithm described in the [Online Appendix](#).

³⁹ Corporation names as listed in the balance sheets sometimes differed slightly from those listed in RUSCORP. Matching by hand involved human judgement and hence possible error, but, overall, the vast majority of matches were straightforward.

⁴⁰ We also require the corporation to have an age of one year to be a true entrant, a strict definition of entry. The replication package also includes code for a more naïve definition of entry purely based on first appearance. Results are similar with this alternative definition, though entry rates are naturally larger.

⁴¹ Although we cannot match some of our balance sheet observations to RUSCORP, this involves a relatively small number of non-industrial firms, and it appears to be largely idiosyncratic. Furthermore, the dynamics of our sample closely match those implicit in the RUSCORP database. While not identical, our series are comparable to those presented in Shepelev (1973, pp.139 and 225–9).

⁴² Shepelev (1973, pp.227–9) presented the number of corporate 'liquidations' in our period, based on journalistic evidence. These involved fewer firms than our (broader) measure of exits, but the time pattern is similar.

the Ministry of Finance. We do not have strong priors regarding any bias generated by the small likelihood of this type of measurement error.⁴³

In our analysis, we also take advantage of other information reported in the published balances. Following common practices at the time, the balance sheets were divided into ‘active’ and ‘passive’ sections, which roughly correspond to modern definitions of assets and liabilities.⁴⁴ The active columns include property, materials, debits, other items and losses; the passive columns include share capital, reserves, amortisation, other capital and ‘creditors’. We consider ‘property’ to be fixed and movable forms of capital, materials to be intermediate inputs and ‘debits’ to be comparable to accounts receivable. ‘Total assets’ is thus the sum of all items on the active side. ‘Other capital’ includes bonds. ‘Share capital’ is current nominal capital, some of which may not yet be paid in, and we deem ‘creditors’ to be equivalent to accounts payable. [Online Appendix Table A1](#) provides the correspondence between the original Russian and our translations.

Until the 1909 cross section, the balance sheets also reported total revenue and total expenditure by the firm. When the difference between revenues and expenditures was positive, it was reported as net profit, because this account could then be used to pay dividends. When this difference was negative, it was recorded as a loss on the active side of the balance sheet. Our variable *Profit or Loss* records profits when revenues minus expenditures was positive and losses when revenues minus expenditures was negative. After 1909, the published balance sheet information ceased including total annual revenues and expenditures. Instead, the volumes reported direct measures of profit, either the difference between assets and liabilities (‘balance profit’ – 1910 onwards) or a measure of net profits used for dividends (‘profits for distribution’ – 1911 onwards). Since the earlier version of net profit functioned much like a reserve account for paying dividends, we believe ‘profits for distribution’ most closely resembles our earlier definition.⁴⁵ Thus, our preferred measure over the whole panel uses balance profits in 1910 and profits for distribution from 1911 onwards. Because the definition changes slightly, we include controls for the accounting year in our empirical work below.

2.1. Summary Statistics on Imperial Corporations

Our dataset describes 2,722 unique corporations observed in at least one year, for a total of 19,835 observations ([Online Appendix Table A2](#)). From 1700 to 1915, the Russian Ministry of Finance granted corporate charters to only 4,542 firms, of which 345 were finance corporations and thus outside our current database. Despite only covering the last 15 years of Imperial Russia, our dataset covers almost 60% of the total non-financial corporations established in the Empire.⁴⁶

Textiles, foods, metals and mining represent the largest industrial categories in our data ([Online Appendix Table A2](#), panel B). Gregg’s (2020) work on incorporation notes that textiles, metals and mining were capital-intensive industries with high incorporation rates. Moreover, Imperial Russia possessed a large food industry, in terms of both incorporated and non-incorporated

⁴³ We have double checked our matching process to ensure that new and exiting corporations in adjoining years were distinct firms. Our examination of the contemporary literature has turned up no obvious cases of ‘going private’ or of mergers that would violate our assumptions.

⁴⁴ These balance sheets mix concepts related to stocks (assets and liabilities) and flows (of cash), which are typically kept separate in modern accounting practices.

⁴⁵ The values for ‘balance profit’ and ‘profits for distribution’ are very similar for most corporations, and we verify that our results do not change meaningfully when we use the alternative measure.

⁴⁶ Our data include corporations headquartered in the Polish provinces of the Empire. In addition to financial firms, we exclude railroad corporations, which were mostly public or quasi-public entities by our time period.

Table 2. *Descriptive Statistics on Select Balance Sheet Entries and Other Corporate Characteristics.*

Variable	Obs.	Mean	SD	Median	Min	Max
Share Capital	19,835	1,679,213	2,586,215	800,000	1,123	74,774,160
Total Assets (TA)	19,835	4,824,720	14,555,266	1,975,221	0	506,910,144
Creditors/TA	19,832	0.2960	0.2009	0.2793	0.0000	2.1042
Profit or Loss/TA	19,188	0.0291	0.0962	0.0361	-1.0000	5.4336
Revenues	10,015	1,479,924	4,048,841	494,103	0	112,495,306
Market Share	10,014	0.0158	0.0487	0.0038	0.0000	1.0000
Age	19,835	13.4769	12.4804	10.0000	0.0000	83.0000
New Firm	17,156	0.2851	0.4515	0.0000	0.0000	1.0000
Widely Held	19,252	0.5534	0.4972	1.0000	0.0000	1.0000
Political Conn.	17,168	0.2594	0.4383	0.0000	0.0000	1.0000

Notes: 'Share Capital' is current nominal (paid and unpaid) capitalisation. 'Total Assets' are defined as property + goods and materials + accounts receivable + various other assets. 'Creditors' is roughly equivalent to accounts payable. Profit in 1910 is 'balance profit', and profit after 1911 is 'profits for distribution'. Revenues are only defined to 1909 and not for all firms. The 'Age' of the corporation is defined from the age listed in the balance sheet data or the date of entry into the balance sheet data if the former is unknown. 'New Firm' indicates whether the firm existed prior to receiving a corporate charter (= 1) or not (= 0). 'Widely Held' indicates whether the firm used the word 'aktsiia' for share, as opposed to one that utilised the word 'pai' for its shares. 'New Firm' and corporate form are unknown for some corporations in the data. See the text for additional discussion. *Political Conn.* denotes whether the corporation had a politically connected (noble or government) founder.

Source: *Ezhagodnik Ministerstva Finansov* [Ministry of Finance Yearbook] (Russia, Ministry of Finance, 1900–15).

enterprises. Consequently, a large number of our balance sheet observations document food-related enterprises. Finally, the implied annual number of corporations in our database was relatively stable except for some reporting of earlier accounting years in the 1900 Ministry of Finance yearbook ([Online Appendix Table A2](#), panel C). An exception is the year 1905, when data from only 278 firms were reported. This may be attributable to the disruptions caused by the 1905 Revolution, the Russo-Japanese War and general social unrest. We control for accounting year in our regression work to (partly) address this disparity.⁴⁷

Table 2 provides summary statistics of variables from the published corporate balance sheets and original charters that we utilise in this paper. As is standard in the corporate finance literature, we scale a number of these variables by the value of total assets. Every balance sheet item has a right-skewed distribution, with the presence of some extreme large values. Aside from these financial variables, we also draw on information from the RUSCORP database regarding the type of corporation (A-corporation or share partnership, defined by the Russian word used to denote an equity stake), the age of the corporation and whether it was a new firm or not when it obtained a charter. Finally, also from the RUSCORP database, we extract whether any corporate founders were members of the nobility (possessed noble rank) or were government officials (or both), to define an indicator variable for whether a corporation had a 'politically connected' founder. Almost 30% of corporations had such a founder according to this definition.⁴⁸

⁴⁷ Regardless of the publication year, we rely on the reported accounting year to pin down each cross-sectional observation. Many of the 'disappeared' 1905 firms reappear in later years, meaning that absence in 1905 is not treated as exit. We have studied the original *Vestnik finansov i torgovli* from 1905 and 1906 to see if the compilation process 'lost' observations, but that does not seem to be the case. Shepelev (1973, p.226) explicitly noted that the crisis of 1905 reduced demand for incorporation due to the difficulties that firms faced in financing their initial capitalisations, although he did not comment on the apparent decline in reporting of incumbents.

⁴⁸ [Online Appendix Table A15](#) explores robustness to this definition of political connections. The results we present in the main text appear to be mostly driven by the presence of government officials. In coding nobility and government connections, we follow Owen's classification in the RUSCORP founder files.

We employ the panel dataset to derive corporate entry and exit rates over time and across industries. Table 3 reports the former between 1900 and 1912, truncated to avoid mistakenly assigning entry or exit due to the bounded sample period. Entry rates were high at the beginning and end of the period with a lull in the middle (although 1906 appears to indicate a rebound from the crisis year of 1905). Exit rates were relatively constant with a small upward trend. The difference between entry and exit rates is broadly suggestive of three sub-periods: entry dominant until 1904, then a two-year period of relatively more exit and then a rebound in entry. We are wary of attributing too much to the end points of our period, because there may be a mechanical reason for the observed higher rates.

Table 3 also juxtaposes the annual percentage change in real Net National Product (NNP) from Gregory (1982) against our corporate entry and exit rates. Years with negative percentage changes are highlighted in grey; we code these years as ‘recession years’ in several analyses below. In two of the five shaded recession years, the entry rates are small relative to exit rates. Overall, the average entry rate during a recession year is smaller relative to the overall average, though the exit rate is also smaller in these years. This somewhat rough correspondence between NNP and corporate dynamics may be because NNP captures more than just the industrial sector underpinning our dataset. We thus also examine two additional economic indicators: the percentage change in per capita industrial output and the percentage change in grain production. While the agricultural index does not show a strong correspondence to the dynamics we observe, our exit rates exceed entry rates in years where the percentage change in per capita industrial output was negative. However, none of these indices captures corporate entry and exit behaviour perfectly, which may reflect structural issues surrounding the incorporation process.

The pattern of entry and exit shows that some industries have a relatively high level of ‘churning’ (Online Appendix Table A3). While some of the older or primary sector industries such as textiles, agriculture and paper saw relatively little corporate churning over the period, more ‘modern’ sectors such as chemicals, transportation and metals (along with ‘miscellaneous’) saw higher entry and exit rates. Meanwhile, some industries had entry rates that exceed exit rates, perhaps indicating that an industry was in disequilibrium, and that positive profits could still be captured. For example, we find large (net) entry of corporations engaged in trade. This group included shipping companies, wholesalers and companies engaged in foreign trade. Overall, high churning (and even net entry) in new sectors is suggestive of a shift of productive factors into higher-growth corporate sectors.

3. Corporate Entry, Evolution and Exit: Empirical Evidence

Our new dataset covers the universe of industrial corporations in late Imperial Russia. Drawing on these data, we focus on identifying the factors or characteristics associated with corporate creation, destruction and survival in order to address three key questions. First, did economic fundamentals impact these processes in ways that make economic sense, given the particular constraints of the concession system? Second, how did entry and exit of corporations play out over the business cycle? Third, if the Russian context entailed substantial constraints on corporate founding, did the political ‘connections’ of the founders ease them, thereby impacting entry and exit? Our regression exercises that address these questions are not exhaustive and should be interpreted as largely descriptive, as we do not structurally estimate the drivers of entry, survival or exit. Moreover, our focus is on financial attributes and not real productivity, which is driven by the source of our data. However, taken together, our empirical work provides insights into

Table 3. *Number of Corporations, Entry Rates and Exit Rates by Accounting Year.*

Year	Number of active corporations that year	Number of entrants	Number of exiting corporations	Entry rate	Exit rate	Entry rate – exit rate	% Change in NNP in 1913 rubles	% Change in per capita industrial output	% Change in grain production
1900	1,101	191	38	0.202	0.035	0.167	0.001	0.042	−0.021
1901	1,190	140	36	0.127	0.030	0.097	0.041	0.024	−0.125
1902	1,249	69	53	0.058	0.042	0.016	0.103	0.019	0.360
1903	1,274	68	61	0.054	0.048	0.007	−0.056	0.007	−0.064
1904	1,126	49	86	0.038	0.076	−0.038	0.122	0.016	0.163
1905	278	8	34	0.007	0.122	−0.115	−0.096	−0.089	−0.199
1906	1,260	39	32	0.140	0.025	0.115	−0.032	0.043	−0.167
1907	1,280	32	36	0.025	0.028	−0.003	−0.019	0.082	0.153
1908	1,370	75	89	0.059	0.065	−0.006	0.110	−0.007	0.033
1909	1,154	73	64	0.053	0.055	−0.002	0.076	0.033	0.306
1910	1,456	150	77	0.130	0.053	0.077	0.095	0.011	−0.045
1911	1,482	116	58	0.080	0.039	0.041	−0.059	0.050	−0.229
1912	1,605	173	93	0.117	0.058	0.059	0.107	0.080	0.312
Overall averages				0.089	0.048	0.041			
Averages in years with negative NNP				0.072	0.040	0.032			
Averages in years with negative industrial growth				0.050	0.075	−0.025			
Averages in years with negative aggregate growth				0.116	0.042	0.074			

Notes: Years shaded grey are 'recession' years, as suggested by the NNP measure. A corporation enters the data in a given year when that year is the first time the corporation is observed in the dataset and has age 1, using the 1899 cross section as the baseline. A corporation is said to exit the data if it is never observed again after a given accounting year. Following Dunne *et al.* (1988, p.502), the entry rate for accounting year t is the number of new corporations in year t divided by the total number of corporations in year $t - 1$. The exit rate in accounting year $t - 1$ is the number of corporations in year $t - 1$ that are never observed again divided by the total number of corporations in year $t - 1$. We do not report 1913 due to high exit numbers that year, which reflect the truncation of the dataset in 1914. Year is the accounting year. Online Appendix Table A5 lists percentage changes in NNP, industrial output and grain production for additional years.

Source: *Ezhegodnik Ministerstva Finansov* [Ministry of Finance Yearbook] (Russia, Ministry of Finance, 1900–15); Goldsmith (1961, p.448); Gregory (1982, pp.56–7, 'Variant 1'); Markevich and Natfizer (2017).

the nature of corporate churning; the allocation of productive factors across firms, within sectors and over time; and the competitive dynamics of early Russian industrialisation, while prompting further questions regarding the role of the corporation in the late Imperial economy.⁴⁹

3.1. *Entry*

We first consider the balance sheet characteristics of new entrants into corporate status. In a context where ‘entry’ required a substantial and idiosyncratic process of acquiring a charter, how exactly did newly founded corporations compare to their incumbent peers? Table 4 depicts results from regressing size (measured by log total assets) and profitability (profits or losses divided by total assets) on different sets of dummy variables and interactions. The key explanatory variable is a dummy for whether the observed firm is a new entrant in a given year, as we define above. Each specification in this table controls for the accounting year. These regressions and the analyses that follow remove the endpoint years, when entry and exit become more difficult to measure.⁵⁰ The OLS regressions in the odd-numbered columns include a set of dummies for each corporation’s industry and for the macro-regions where corporate headquarters were located.⁵¹ The specifications reported in the even-numbered columns control for corporation fixed effects, which subsume the headquarter and industry dummies. Implicitly, these regressions compare entrants with themselves once they have become incumbents (and are suggestive of the fixed-effect convergence regressions in the next section). The OLS columns also include indicator variables for whether a corporation had a politically connected founder, whether it existed in any form prior to chartering, whether it was founded as an A-corporation and whether it was founded in a recession year.⁵² All columns also interact these features with an indicator for entering corporations, which allows us to further distinguish how, for example, corporations with political connections differed from other entering corporations. The specifications in Table 4 differ in the number of observations due to missing information on the outcome variables or on these fixed firm characteristics.

Table 4, panel A shows that entrants tended to be smaller, both relative to incumbents and relative to future observations of themselves, consistently with a life-cycle model in which corporations tended to accumulate assets after entry. Next, we examine dimensions we associate with potential variation in the entry barrier and market fundamentals: political connections, whether the corporation was a new firm, widely held status and recession years. Overall, corporations with political connections were larger in size, but at the moment of entry, they were smaller relative to incumbent corporations (column (1)). Compared to future observations of themselves, entering corporations with political connections also seemed smaller, though the estimate is noisier. New firms, meanwhile, were smaller than corporations that had existed previously, both overall in the first years of life and relative to future observations of themselves. Widely held corporations and

⁴⁹ The [Online Appendix](#) provides various extensions and robustness checks using sub-samples and alternative specifications to those presented in the main text. All of these generate results consistent with those reported in the main text.

⁵⁰ The entry regressions include accounting years from 1900 through 1913. These regressions are robust to removing additional endpoint years.

⁵¹ There are 14 headquarter regions in the data, including the Polish provinces, Finland and ‘outside of the Empire’. We include these regional dummies to account for possible differences in financial development or input/output markets. Controlling separately for corporations headquartered in Moscow or Petersburg does not change any of our results. The regional breakdown of our observed corporations is available upon request.

⁵² We define a ‘recession year’ to be a year where net national product growth—as documented in Gregory (1982)—was negative.

Table 4. *Entrants versus Incumbent Corporations, 1900–13.*

	OLS (1)	FE (2)	OLS (3)	FE (4)	OLS (5)	FE (6)	OLS (7)	FE (8)	OLS (9)	FE (10)
<i>Panel A: log total assets</i>										
Entrant	−0.687*** (0.041)	−0.095*** (0.014)	−0.617*** (0.041)	−0.059*** (0.013)	−0.713*** (0.060)	−0.092*** (0.019)	−0.747*** (0.042)	−0.095*** (0.016)	−0.660*** (0.064)	−0.055*** (0.020)
Politically Connected	0.076*** (0.026)								0.051** (0.026)	
Entrant × Connected	−0.164* (0.091)	−0.048 (0.035)							−0.091 (0.090)	−0.013 (0.035)
New Firm			0.165*** (0.023)						0.176*** (0.021)	
Entrant × New Firm			−0.371*** (0.081)	−0.154*** (0.033)					−0.379*** (0.084)	−0.155*** (0.033)
Widely Held					−0.023 (0.040)				−0.057 (0.038)	
Entrant × Widely Held					−0.017 (0.075)	−0.011 (0.025)			0.076 (0.077)	0.015 (0.025)
Recession Year							−0.033 (0.053)		0.038 (0.039)	
Entrant × Recession							0.105 (0.077)	−0.031 (0.032)	0.106 (0.076)	−0.039 (0.032)
Obs	15,078	15,115	15,078	15,103	15,048	17,001	15,078	17,543	15,048	15,073
R ²	0.162	0.286	0.165	0.288	0.159	0.241	0.161	0.216	0.164	0.289
Ind. FEs	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Region FEs	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
No. firms	2,074	2,080	2,074	2,079	2,070	2,381	2,074	2,517	2,070	2,075

Table 4. *Continued*

	OLS (1)	FE (2)	OLS (3)	FE (4)	OLS (5)	FE (6)	OLS (7)	FE (8)	OLS (9)	FE (10)
<i>Panel B: profit or loss/total assets</i>										
Entrant	-0.003 (0.003)	0.010*** (0.003)	0.002 (0.003)	0.013*** (0.003)	-0.006 (0.005)	0.010** (0.005)	-0.005* (0.003)	0.012*** (0.004)	-0.003 (0.005)	0.012** (0.005)
Politically Connected	-0.005*** (0.002)								-0.003 (0.002)	
Entrant × Connected	-0.010* (0.005)	0.007 (0.007)							-0.006 (0.005)	0.009 (0.008)
New Firm			-0.010*** (0.002)						-0.008*** (0.002)	
Entrant × New Firm			-0.023*** (0.006)	-0.006 (0.007)					-0.024*** (0.006)	-0.009 (0.007)
Widely Held					-0.014*** (0.002)				-0.012*** (0.002)	
Entrant × Widely Held					0.005 (0.006)	0.004 (0.007)			0.011** (0.005)	0.004 (0.006)
Recession Year							-0.005 (0.004)		-0.020* (0.012)	
Entrant × Recession							0.002 (0.004)	-0.001 (0.009)	0.001 (0.005)	-0.010 (0.006)
Obs	14,689	14,724	14,689	14,712	14,659	16,469	14,689	16,954	14,659	14,682
R ²	0.042	0.031	0.045	0.031	0.044	0.021	0.041	0.022	0.048	0.032
Ind. FEs	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Region FEs	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
No. firms	2,047	2,053	2,047	2,052	2,043	2,345	2,047	2,471	2,043	2,048

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. SEs clustered by industry-year groups for OLS regressions and by firm ID for FE regressions in parentheses. 'FE' denotes panel regressions with firm fixed effects. *New Firm* indicates whether the firm existed prior to receiving a corporate charter (= 1) or not (= 0). The variable 'Entrant' denotes whether a firm in period t was a new entrant, compared to $t - 1$. Industry controls are a set of dummies covering 14 industries (see [Online Appendix Table A2](#)). Year controls are for the accounting year of the associated corporate data. Region controls indicate the location of the corporate headquarters in one of 14 macro-regions, including Poland, Finland and abroad. The 'Recession' variable equals 1 for years in which the growth rate of NNP (See [Table 3](#)) is negative in this window: 1903, 1905, 1906, 1907 and 1911 (and zero otherwise). 'No. firms' refers to the number of corporations supplying observations in each specification. Sample sizes vary due to missing data. All columns include constant terms and year controls.

those born during recession years show little difference relative to other corporations in terms of overall size or size at entry. The weak association between recession years and size upon entry likely reflects the time lag imposed by the concession system: corporations may not have been able to respond quickly to business cycle fluctuations.⁵³

If corporations were smaller upon entry, were they also less profitable? Table 4, panel B highlights the importance of post-entry selection in explaining differences between new entrants and incumbents. Relative to all pooled observations in the OLS columns, new entrants are less profitable. However, when we control for fixed corporation characteristics in the even-numbered columns, new entrants are more profitable at this moment of entry compared to their future observations. Therefore, new entrants appear less profitable in their first years relative to incumbent firms due to post-entry selection among incumbents. Relative to themselves, new corporations are most profitable in their first years, after they have survived the positive selection of the concession system and before they themselves have faced competition from new entrants.

Other fixed characteristics show interesting relationships with profitability and profitability upon entry. Corporations that were new firms (i.e., corporations that did not exist previously as partnerships or sole proprietorships) at the time of incorporation were overall less profitable and less profitable relative to other entrants, though this difference loses statistical significance with the inclusion of corporation fixed effects. For new firms, therefore, forces related to the firm's life cycle dominated any additional entry barrier encountered by brand-new firms in the concession system. Widely held corporations were less profitable in general, but they were more profitable relative to other entrants, perhaps enjoying high profits from external finance before building up assets. Finally, we see few differences between corporations that enter during recession years compared to non-recession years. Since incorporation took place over an extended time horizon, firms could not make quick decisions over this form of entry relative to the business cycle.

The regressions in Table 4 demonstrate how corporations may differ in their first years of life. We next examine how they evolve after entry to better understand firm growth and post-entry competition in this context. Also, further differences across corporations may emerge as these new corporations age.

3.2. *Corporate Life Cycles*

We can further explore the dynamics of corporate characteristics following entry by utilising the panel structure of the dataset. Did surviving firms converge to the financial or market attributes of incumbents in their industry, and if so, what was the speed of convergence and was it consistent with a relatively competitive process of selection? To investigate these questions, we estimate the model

$$Y_{ijtr} = \beta_0 + \gamma_{it} + \eta_i + \mu_t + \lambda_j + \epsilon_{ijtr},$$

where Y is the outcome (log (scaled) revenue, log (scaled) profit or market share in the firm's industry) for firm i in year t , γ is a set of controls for the age of the firm up to ten years old, η is a set of cohort controls (from 1890 to 1913, with pre-1890 corporations in the omitted group) for firm i , μ is a set of accounting year controls and λ controls for industry j . We also estimate versions of this model without cohort controls and versions with firm fixed effects (which subsume cohort and industry controls). The latter specification means that we are comparing characteristics of

⁵³ We find similar results (not shown in the text) if the years of 1904 and 1905 are omitted. Our findings echo the a-cyclical nature of corporate entry that Artunc (2023) established for interwar Egypt.

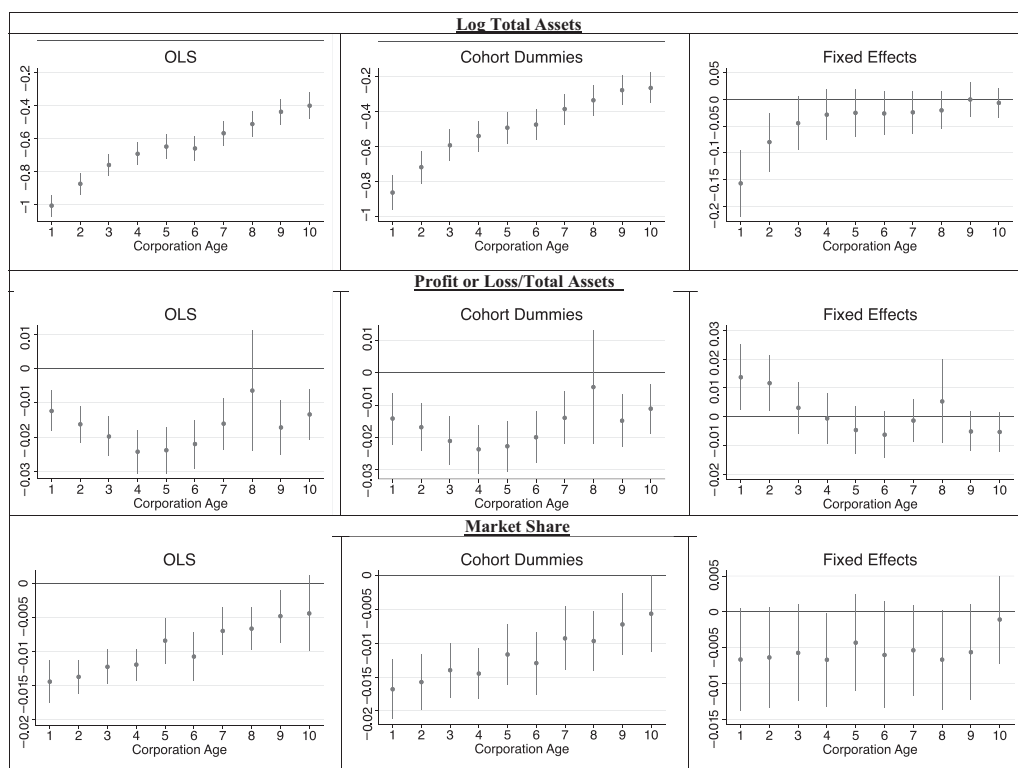


Fig. 1. *Changes over the Life Cycle: Size, Profitability and Market Share.*

Notes: These plots display coefficients and 95% confidence intervals for the regressions in [Online Appendix Table A10](#). All regressions include industry and year controls (though the industry controls are subsumed by corporation fixed effects). The plots were generated using the *coefplot* Stata package.

corporations of a specific age to mean values across all other years *for that corporation*. Like the entry regressions we presented previously, these results only include accounting years 1900 through 1913, though results are robust to excluding additional years.

In this framework, the estimated γ coefficients express the difference between entrant firms at a given age and long-term incumbents (those who have survived more than ten years or the firm itself). If new firms experienced convergence with these incumbents, these coefficients should be smaller at each age (as in a similar exercise studying immigrant assimilation in Abramitzky *et al.*, 2014). Given that many of our corporations were founded prior to 1900, we can estimate a large set of γ coefficients.⁵⁴

Figure 1 presents the results from these exercises.⁵⁵ New Russian corporations began their lives with lower total assets, profitability and market share. Considering the first two columns of Figure 1, total assets and market shares converged towards incumbent levels, whether we control

⁵⁴ Our results are similar if we include age coefficients up to 15 years, although the observations generating estimates for higher ages are sparse given the length of our sample.

⁵⁵ The [Online Appendix](#) includes a tabular version.

for cohort or not, although only the latter fully does so within ten years. Profits initially decline as entrants face competition, rebounding slightly as selection removes weaker corporations.

In the third column of the figure, we extend the model of this section to include firm fixed effects, which account for this post-entry selection. We see that after initially being small (matching the results for Table 4), firms saw total assets quickly achieve their ‘average’ level. The convergence of profits from a slightly higher level relative to the first observation towards a lifetime ‘average’ suggests that corporations encountered significant post-entry competition, driving down profits as more corporations entered. Entrant market shares remained relatively stable, reflecting the combined forces of growth and competition. The dynamics of assets, profits and market share imply that corporate entrants grew, encountered substantial market competition and faced powerful incumbents.

Particular corporate features help reveal underlying frictions in these market processes. Figure 2 proceeds by interacting the age dummies with fixed corporate characteristics: whether the corporation had a political connection, whether the corporation was a new enterprise when incorporated, whether the corporation was widely held (an A-corporation) and whether the corporation was born in a recession year. Though corporations already differed along several of these dimensions at entry, some additional heterogeneity emerged as the corporations aged. Politically connected corporations added assets faster than unconnected firms, but their profits declined faster, while their market shares changed at similar rates. These corporations may have had connections that helped them to gain access to outside investment in order to get larger, but they may have also enjoyed protections that allowed them to survive without performing as well as competitors. New enterprises began at smaller sizes and grew at similar rates as existing enterprises in terms of assets and market share, but they persistently saw profits decline more quickly. Widely held corporations experienced slower profit growth than closely held firms. Such corporations may have consistently underperformed closely held corporations due to agency issues and other costs associated with widely held corporations.⁵⁶ Finally, instead of retaining a persistent disadvantage from starting life during a recession year, the assets, profitability and market share of corporations founded during recession years evolved very similarly to those of corporations founded at other moments in the business cycle.

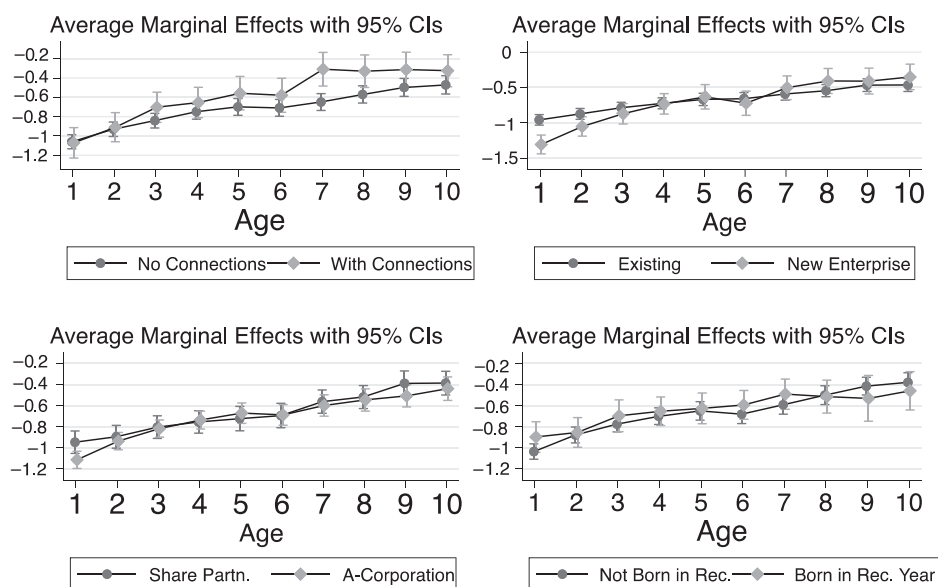
Thus, as firms evolved, several differences we observed between entrants and incumbents gradually disappeared. However, politically connected and widely held corporations retained important differences, and in several specifications, convergence remained incomplete in our sample period. Taken together, these findings demonstrate some persistent effects of pre-existing differences and of those generated during the chartering process, and they are suggestive of constraints on competitive forces in markets characterised by significant entry barriers.

3.3. *Exit*

Imperial Russian firms were constrained in their choice of ‘entering’ the corporate form, but when they did so, their initial and subsequent financial characteristics—relative to incumbents—follow life-cycle patterns likely similar to firms in other environments. Did such ‘normality’ extend to the factors underlying the demise of corporations? In this section, we examine the underlying correlates of corporate exit, defined as the complete disappearance of a firm from our panel dataset. Given that exit is an absorbing state, a natural way to carry out this analysis is in a

⁵⁶ The financial consequences of widely held status are explored in more detail in Gregg and Nafziger (2023).

Log Total Assets



Profit or Loss/TA

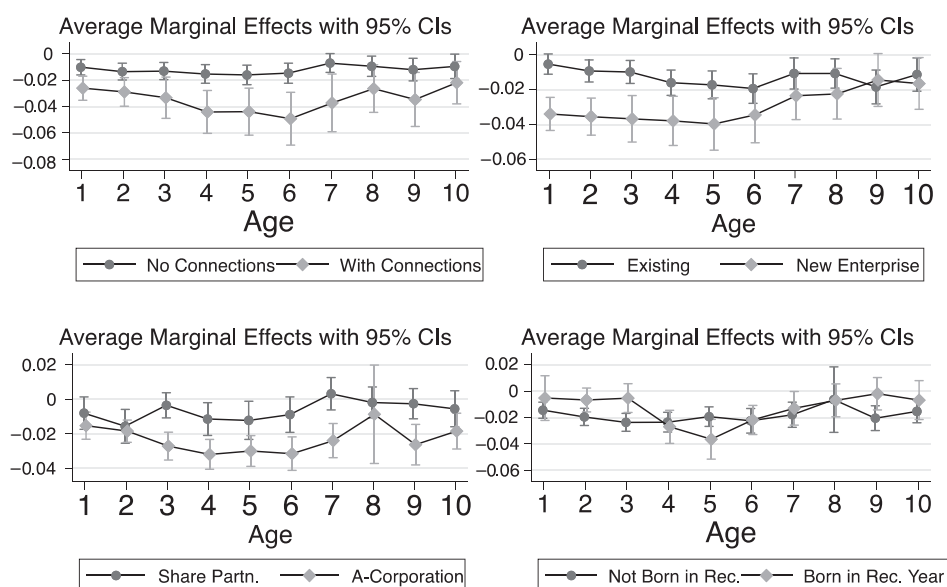


Fig. 2. *Changes over the Life Cycle with Interaction Effects.*

Notes: These plots depict average marginal effects of each age dummy, evaluated for the indicated characteristics denoted as 0 or 1, with 95% confidence intervals, for the OLS regressions in [Online Appendix Table A12](#). All regressions include industry and year controls. The plots were generated using the *marginsplot* Stata package.

Market Share

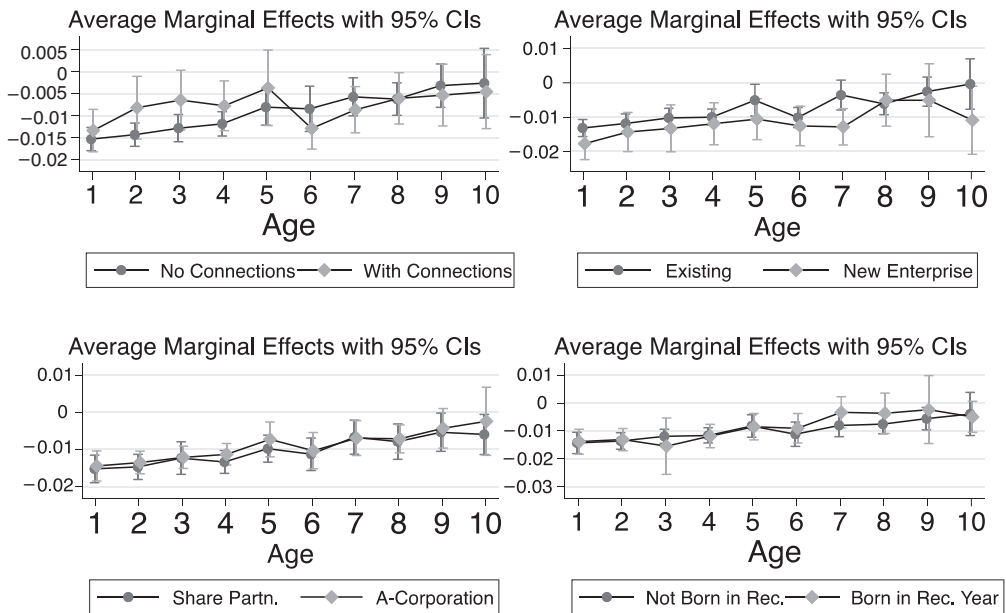


Fig. 2. *Continued.*

Cox proportional hazard framework, which models such conditional survival processes. The first six columns of Table 5 present estimates from such specifications, with different combinations of controls. Coefficients greater than 1 imply an increase in the likelihood of exit relative to the baseline hazard, and coefficients less than 1 imply the opposite.⁵⁷ These estimates include accounting years between 1900 and 1912, since exit behaviour in the final years of the dataset becomes difficult to assess accurately.⁵⁸

In these specifications, we condition on fixed characteristics (whether the corporation was a 'new firm', whether it was chartered as an A-corporation, whether it was founded in a recession year and regional and industry controls) and on the changing size (total assets) and (scaled) profits. The goal is to document whether 'exiters' differed from 'survivors' in ways consistent with a model in which corporations chose to exit when profits dipped below some threshold and whether dimensions typically associated with likelihood of exit, such as firm size and age, also predict exit in the Russian context. We compare the estimates from these hazard models with those from a simple probit model of exit (column (7)), and the results are similar.

The findings of these exercises show the importance of firm fundamentals like size and performance, but also reveal some aspects of the Russian context that mattered for corporate

⁵⁷ The SEs reported in these hazard models are exponentiated. We provide the (asymptotic) confidence intervals reported by Stata. One of the advantages of this type of hazard model is that the functional form of baseline hazard is not explicitly assumed.

⁵⁸ Results are similar with the inclusion of the 1913 accounting year, though the coefficients on *Total Assets* and *New Firm* become noisier. Removing additional accounting years also produces similar results, though given the reduction in sample size, variables that were on the margin of statistical significance such as political connections lose significance.

Table 5. *Regressions Predicting Exit, 1900–12.*

Variables	Cox proportional hazard time to corporate 'exit'						Probit P(exit)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Profit or Loss/ Total Assets	0.014*** (0.003)	0.015*** (0.004)	0.010*** (0.004)	0.016*** (0.004)	0.009*** (0.003)	0.009*** (0.004)	−3.575*** (0.214)
Log (Total Assets)	0.799*** (0.035)	0.816*** (0.035)	0.797*** (0.035)	0.815*** (0.035)	0.819*** (0.035)	0.816*** (0.036)	−0.112*** (0.022)
New Firm	1.078 (0.110)	1.062 (0.109)				1.036 (0.108)	0.016 (0.050)
Widely held	1.317** (0.162)		1.347** (0.166)			1.329** (0.167)	0.147** (0.060)
Born in post-1885 recession year	1.217* (0.125)			1.159 (0.120)		1.152 (0.122)	0.049 (0.051)
Politically Connected	0.898 (0.091)				1.006 (0.101)	0.972 (0.100)	−0.053 (0.052)
Profit or Loss/TA × New Firm		0.652 (0.380)				0.786 (0.468)	
Profit or Loss/TA × Widely Held			1.763 (0.899)			1.339 (0.659)	
Profit or Loss/TA × born in recession				0.440 (0.352)		0.337 (0.224)	
Profit or Loss/TA × Pol. Connected					3.032** (1.385)	2.975** (1.314)	
Corporation age							−0.010*** (0.002)
Observations	12,669	12,696	12,669	12,696	12,696	12,669	13,215
Region controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year controls	No	No	No	No	No	No	No
Pseudo R ²	0.0546	0.0531	0.0541	0.0536	0.0539	0.0560	0.134
No. firms	1,871	1,875	1,871	1,875	1,875	1,871	1,877

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Robust SEs are reported in parentheses. Industry controls are a set of dummies covering 14 industries (see [Online Appendix Table A2](#)). *New Firm* indicates whether the firm existed prior to receiving a corporate charter (= 1) or not (= 0). Region controls indicate the location of the corporate headquarters in one of 14 macro-regions, including Poland, Finland and abroad. The 'Recession' variable equals 1 for years in which the growth rate of NNP (See [Table 3](#)) is negative: 1886, 1888, 1889, 1891, 1895, 1897, 1903, 1905, 1906, 1907 and 1911 (and zero otherwise). 'No. firms' refers to the number of corporations supplying observations in each specification. The probit regression in column (7) includes a constant term, which we do not report.

exit.⁵⁹ More profitable corporations were less likely to exit. Larger corporations (as measured by the size of total assets) were less likely to exit. Even controlling for these fundamentals, however, other characteristics of corporations also predicted corporate exit. Conditional on size and profit levels, widely held corporations were slightly more likely than share partnerships to exit. Widely held status, therefore, even controlling for corporate profit levels, entailed agency and other costs that made corporations more fragile. Similarly, corporations that were new firms at their moment of entry were more likely to exit. As we discussed earlier in the paper, corporations that were founded as new firms were smaller and less profitable, which would unconditionally make new firms more likely to exit. However, even controlling for size and profitability, new firms were more likely to exit, likely because previously existing firms had already faced competitive selection before becoming corporations and were thus better able to survive after entering as corporations. Although we found that corporations that entered during recession years showed little difference

⁵⁹ As with our findings on entry, we observe similar results if we omit the years 1904 and 1905 (not shown in the text).

compared to corporations that entered during normal times, firms that were born in a recession year and hence faced headwinds in their early lives were more likely to exit. Recessions, therefore, may have affected corporate performance once the corporation was founded, even if corporations could not respond swiftly to change in the business cycle when making entry decisions.

Finally, Table 5 shows that firms with a politically connected founder were no more likely to exit than those without. Earlier, we provided evidence that such politically connected corporations were larger, but potentially less profitable when they entered. Such politically connected corporations may have been able to survive because their connections entailed special privileges or real advantages, for example advantageous access to financing. However, less optimistically, if potentially weaker, but better-connected firms entered and persisted within the (advantageous) corporate form, the nature of the concession system may have generated substantial constraints on overall industrial development.

4. Conclusion

The corporate form provided clear advantages (Gregg, 2020), but acquiring a charter was a costly barrier for Imperial Russian firms. Politically connected corporations were financially weaker, and corporate entry was unrelated to the business cycle. Similar to findings in other contexts, and consistent with the modern theoretical literature, the concession system was an entry barrier with important implications for firm dynamics.

At the same time, this paper engages in a series of empirical exercises that, in sum, suggest that the entry, growth and exit of Imperial Russian corporations can be understood within a market framework, whereby entry costs, competitive selection, profitability and random shocks drove dynamics. Our results speak to some modicum of flexibility and competitive pressures among industrial firms, though, as Owen (1991) and others have argued, the Imperial Russian incorporation process entailed some inefficiencies and empowered incumbents.

It was typically costlier and more time consuming to become or dissolve a corporation than ‘simpler’ types of firms such as partnerships or sole proprietorships, which implies that the seemingly reasonable entry and exit rates we observe in our data are certainly lower bounds on the likely demographics of all late Imperial Russian firms. Some further evidence on this possibility is provided in Online Appendix Table A4, which utilises data on *all* Russian industrial establishments observed in 1894, 1900 and 1908 to document entry and exit rates over these multi-year periods for corporate and non-corporate entities (Gregg, 2020). Corporate exit rates were an order of magnitude lower than the corresponding rate for non-corporations (0.237 versus 0.629 in 1894, and 0.317 versus 0.485 in 1900), and corporate entry rates were also quite low (0.297 versus 0.600 in 1908), though in 1900 the corporate entry rate was quite high, given the few corporations in existence prior to that year. Thus, despite our overall portrait of a rather dynamic Russian corporate sector, data that include all forms of enterprise show evidence of the importance of entry barriers.

Moreover, if weaker, politically connected firms had easier access to chartering, and these firms were also less likely to exit, then we might expect substantial factor misallocation across the industrial sector. While rich, our data are financial in nature and do not cover a number of sectors (railroads, financial firms, most of agriculture) or non-corporate firms across the sample period, and, therefore, we cannot measure the extent of the possible misallocation. Therefore, and despite the findings regarding the dynamics into, out of and within the corporate sector that we establish, our results are consistent with hypotheses linking costly Imperial incorporation to

relatively slow economic development. This suggests that we cannot entirely reject the arguments proposed by Owen (1991) and Cheremukhin *et al.* (2017).

Further research could dig deeper into the corporation's role in early Russian industrialisation. Matching balance sheet information to sources describing the internal organisation of these firms, such as the original charters and charter amendments, and to input usage and output data drawn from manufacturing surveys, would generate important insights into how legal structure, financing and production were connected within the corporate sector. Such an approach would constitute a valuable contribution towards our understanding of the corporation's role in the early stages of modern industrial development, both in Imperial Russia and in other low-income countries.

Middlebury College, USA
Williams College, USA

Additional Supporting Information may be found in the online version of this article:

Online Appendix Replication Package

References

- Abramitzky, R., Boustan, L.P. and Eriksson, K. (2014). 'A nation of immigrants: Assimilation and economic outcomes in the age of mass migration', *Journal of Political Economy*, vol. 122(3), pp. 467–506.
- Akcigit, U., Akgunduz, Y.E., Cilasun, S.M., Tok, E.O. and Yilmaz, F. (2020). 'Facts on business dynamism in Turkey', *European Economic Review*, vol. 128, pp. 103490–513.
- Allen, R.C. (2003). *From Farm to Factory: A Reinterpretation of the Soviet Industrial Revolution*, Princeton, NJ: Princeton University Press.
- Anderton, R., Di Lupidio, B. and Jarmulska, B. (2019). 'Product market regulation, business churning, and productivity: Evidence from the European Union countries', Working Paper 2332, European Central Bank.
- Artunc, C. (2023). 'The impact of business cycle conditions on firm dynamics and composition', *Journal of Economic History*, vol. 83(2), pp. 398–430.
- Artunc, C. and Saleh, M. (2022). 'The power of connections: Colonialism, nationalism, and corporate performance in Egypt, 1890–1950', Discussion Paper DP17424, Centre for Economic Policy Research.
- Attack, J. (1985). 'Industrial structure and the emergence of the Industrial Corporation', *Explorations in Economic History*, vol. 22, pp. 29–52.
- Attack, J., Bateman, F. and Margo, R.A. (2008). 'Steam power, establishment size, and labor productivity growth in nineteenth century American manufacturing', *Explorations in Economic History*, vol. 45, pp. 185–98.
- Audretsch, D. and Mahmood, T. (1995). 'New firm survival: New results using a hazard function', *The Review of Economics and Statistics*, vol. 77(1), pp. 97–103.
- Baldwin, J. and Gorecki, P. (1991). 'Firm entry and exit in the Canadian manufacturing sector, 1970–1982', *The Canadian Journal of Economics*, vol. 24(2), pp. 300–23.
- Bartelsman, E., Haltiwanger, J. and Scarpetta, S. (2004). 'Microeconomic evidence of creative destruction in industrial and developing countries', Working Paper 3464, World Bank.
- Bartelsman, E., Haltiwanger, J. and Scarpetta, S. (2009). 'Measuring and analyzing cross-country differences in firm dynamics', in (T. Dunne, J.B. Jensen and M.J. Roberts, eds.), *Producer Dynamics: New Evidence from Micro Data*, pp. 15–76, Chicago: University of Chicago Press.
- Baten, J. (2003). 'Creating firms for a new century: Determinants of firm creation around 1900', *European Review of Economic History*, vol. 7(3), pp. 301–29.
- Bolt, J. and Van Zanden, J.L. (2020). 'Maddison style estimates of the evolution of the world economy. A new 2020 update', Working Paper WP-15, Maddison Project.
- Braggion, F. and Moore, L. (2013). 'The economic benefits of political connections in late Victorian Britain', *The Journal of Economic History*, vol. 73(1), pp. 142–76.
- Bripi, F. (2015). 'The role of regulation on entry: Evidence from the Italian provinces', *The World Bank Economic Review*, vol. 30(2), pp. 383–411.
- Broadberry, S.N., Campbell, B., Klein, A., Overton, M. and Van Leeuwen, B. (2015). *British Economic Growth 1270–1870*, Cambridge: Cambridge University Press.

- Caves, R.E. (1998). 'Industrial organization and new findings on the turnover and mobility of firms', *Journal of Economic Literature*, vol. 36, pp. 1947–82.
- Cheremukhin, A., Golosov, M., Guriev, S. and Tsyvinsky, A. (2017). 'The industrialization and economic development of Russia through the lens of a neoclassical growth model', *Review of Economic Studies*, vol. 84(2), pp. 613–49.
- Ciobanu, O. and Wang, W. (2012). 'Firm dynamics: Firm entry and exit in Canada, 2000–2008', Working paper, Statistics Canada.
- Clementi, G.L. and Palazzo, B. (2016). 'Entry, exit, firm dynamics, and aggregate fluctuations', *American Economic Journal: Macroeconomics*, vol. 8(3), pp. 1–41.
- Cubbin, J. and Geroski, P. (1987). 'The convergence of profits in the long-run: Inter-firm and inter-industry comparisons', *The Journal of Industrial Economics*, vol. 35(4), pp. 427–42.
- Dayton, A., Gregg, A. and Nafziger, S. (2023). 'Shareholder democracy under autocracy: Voting rights and corporate performance in imperial Russia', Working paper, Williams College.
- Deloof, M. and Van Overfelt, W. (2008). 'Were modern capital structure theories valid in Belgium before World War I?', *The Journal of Business Finance & Accounting*, vol. 35(3–4), pp. 491–515.
- Disney, R., Haskel, J. and Heden, Y. (2003). 'Entry, exit and establishment survival in UK manufacturing', *The Journal of Industrial Economics*, vol. 51(1), pp. 91–112.
- Djankov, S., La Porta, R., Lopez-de-Silanes, F. and Shleifer, A. (2002). 'The regulation of entry', *The Quarterly Journal of Economics*, vol. 117(1), pp. 1–37.
- Dunne, T., Roberts, M.J. and Samuelson, L. (1988). 'Patterns of firm entry and exit in U.S. manufacturing industries', *The Rand Journal of Economics*, vol. 19(4), pp. 495–515.
- Ericson, R. and Pakes, A. (1995). 'Markov-perfect industry dynamics: A framework for empirical work', *The Review of Economic Studies*, vol. 62(1), pp. 53–82.
- Faccio, M. (2006). 'Politically connected firms', *The American Economic Review*, vol. 96(1), pp. 369–86.
- Ferguson, T. and Voth, H.-J. (2008). 'Betting on Hitler – the value of political connections in Nazi Germany', *The Quarterly Journal of Economics*, vol. 123(1), pp. 101–37.
- Fisman, R. (2001). 'Estimating the value of political connections', *The American Economic Review*, vol. 91(4), pp. 1095–102.
- Fohlin, C. (2007). *Finance Capitalism and Germany's Rise to Industrial Power*, Cambridge: Cambridge University Press.
- Fukao, K., Bassino, J.-P., Makino, T., Paprzycki, R., Settsu, T., Takashima, M. and Tokui, J. (2015). *Regional Inequality and Industrial Structure in Japan: 1874–2008*, Tokyo: Maruzen Publishing.
- Geroski, P. (1995). 'What do we know about entry?', *International Journal of Industrial Organization*, vol. 13, pp. 421–40.
- Gerschenkron, A. (1962). *Economic Backwardness in Historical Perspective*, Cambridge, MA: Belknap Press of Harvard University Press.
- Gerschenkron, A. (1965). 'Agrarian Policies and Industrialization, Russia 1861–1917', in (H.J. Habakkuk and M. Postan, eds.), *The Cambridge Economic History of Europe (VI). The Industrial Revolutions and After: Incomes, Population and Technological Changes (2)*, pp. 706–808, Cambridge: Cambridge University Press.
- Geurts, K. and Van Biesebroeck, J. (2016). 'Firm creation and post-entry dynamics of *De Novo* entrants', *International Journal of Industrial Organization*, vol. 49, pp. 59–104.
- Gof'dshtein, I.M. (1913). *Blagopriatna li Russkaia Deistvitel'nost' dlia Obrazovaniia Sindikatov i trestov*, Moscow: O.L. Somov.
- Goldsmith, R.W. (1961). 'Economic growth of Tsarist Russia 1860–1913', *Economic Development and Cultural Change*, vol. 9(3), pp. 441–75.
- Gonzalez, A., Iacovone, L. and Subhash, H. (2013). 'Russian volatility: Obstacle to firm survival and diversification', Working Paper 6605, World Bank.
- Grant, J. (1999). *Big Business in Russia: The Putilov Company in Late Imperial Russia, 1868–1917*, Pittsburgh: University of Pittsburgh Press.
- Gregg, A. (2020). 'Factory productivity and the concession system of incorporation in late imperial Russia', *American Economic Review*, vol. 110(2), pp. 401–27.
- Gregg, A. and Nafziger, S. (2019). 'Capital structure and corporate performance in late imperial Russia', *European Review of Economic History*, vol. 23(4), pp. 446–81.
- Gregg, A. and Nafziger, S. (2023). 'Financing industrial corporations in a developing economy: Panel evidence from imperial Russia', *Financial History Review*, vol. 30, pp. 125–61.
- Gregory, P.R. (1982). *Russian National Income, 1885–1913*, Cambridge: Cambridge University Press.
- Gregory, P.R. (1997). 'Searching for consistency in historical data: Alternate estimates of Russia's Industrial production, 1887–1913', *The Journal of Economic History*, vol. 57(1), pp. 196–202.
- Guinnane, T., Harris, R., Lamoreaux, N. and Rosenthal, J.-L. (2007). 'Putting the corporation in its place', *Enterprise and Society*, vol. 8(3), pp. 687–729.
- Guroff, G. and Cartensen, F., eds. (1983). *Entrepreneurship in Imperial Russia and the Soviet Union*, Princeton, NJ: Princeton University Press.
- Haltiwanger, J., Jarmin, R.S. and Miranda, J. (2013). 'Who creates jobs? Small versus large versus young', *Review of Economics and Statistics*, vol. 95(2), pp. 347–61.

- He, C. and Yang, R. (2016). 'Determinants of firm failure: Empirical evidence from China', *Growth and Change*, vol. 47(1), pp. 72–92.
- Hopenhayn, H. (1992). 'Entry and exit in long run equilibria', *Econometrica*, vol. 60(5), pp. 1127–50.
- Iwasaki, I., Maurel, M. and Meunier, B. (2016). 'Firm entry and exit during a crisis period: Evidence from Russian regions', *Russian Journal of Economics*, vol. 2, pp. 162–91.
- Jovanovic, B. (1982). 'Selection and the evolution of industry', *Econometrica*, vol. 50(3), pp. 649–70.
- Kafengauz, L.B. (1994). *Evolutsiia Promyshlennogo Proizvodstva Rossii*. Moscow: Russian Academy of Sciences.
- Klepper, S. (2002). 'The capabilities of new firms and the evolution of the US automobile industry', *Industrial and Corporate Change*, vol. 11(4), pp. 645–66.
- Kueng, L., Yang, M.-J. and Hong, B. (2014). 'Sources of firm life-cycle dynamics: Differentiating size vs. Age effects', Working Paper 20621, National Bureau of Economic Research.
- Kulikov, V. and Kragh, M. (2019). 'Big business in the Russian Empire: A European perspective', *Business History*, vol. 61(2), pp. 299–321.
- Lee, Y. and Mukoyama, T. (2015). 'Entry and exit of manufacturing plants over the business cycle', *European Economic Review*, vol. 77, pp. 20–7.
- Liu, H. and Tang, J. (2017). 'Age-productivity profiles of entrants and exits: Evidence from Canadian manufacturing', *Structural Change and Economic Dynamics*, vol. 40, pp. 26–36.
- Lloyd-Jones, R. and Le Roux, A.A. (1982). 'Marshall and the birth and death of firms: The growth and size distribution of firms in the early nineteenth-century cotton industry', *Business History*, vol. 24(2), pp. 141–55.
- Markevich, A. and Nafziger, S. (2017). 'State and market in Russian industrialization, 1870–2010', in (K.H. O'Rourke and J. Williamson, eds.), *Industrial Growth in the Global Periphery Since 1870*, pp. 33–62, Oxford: Oxford University Press.
- Markevich, A. and Sokolov, A. (2005). 'Magnitka Bliz Sadovogo Ko"ts": Stimula k Rabote na Moskovskom Zavode "Serp i molo", 1883–2001 Gg, Moscow: Rosspen.
- Maruyama, N. and Odagiri, H. (2002). 'Does the "persistence of profits" persist?: A study of company profits in Japan, 1964–97', *International Journal of Industrial Organization*, vol. 20, pp. 1513–33.
- McAfee, R.P., Mialon, H. and Williams, M. (2004). 'What is a barrier to entry?', *American Economic Review (Papers and Proceedings)*, vol. 94(2), pp. 461–5.
- McCaffrery, S.P. (1996). *The Politics of Industrialization in Tsarist Russia: The Association of Southern Coal and Steel Producers, 1874–1914*, DeKalb, IL: Northern Illinois University Press.
- McKay, J.P. (1970). *Pioneers for Profit: Foreign Entrepreneurship and Russian Industrialization: 1885–1913*, Chicago: University of Chicago Press.
- McKenzie, D. and Paffhausen, A. (2019). 'Small firm death in developing countries', *Review of Economics and Statistics*, vol. 101(4), pp. 645–57.
- Melitz, M. (2003). 'The impact of trade on intra-industry reallocations and aggregate industry productivity', *Econometrica*, vol. 71(6), pp. 1695–725.
- Moreira, S. (2017). 'Firm dynamics, persistent effects of entry conditions, and business cycles', Working Paper 17-29, U.S. Census Bureau.
- Owen, T.C. (1991). *The Corporation under Russian Law, 1800–1917*, Cambridge: Cambridge University Press.
- Owen, T.C. (1992). 'RUSCORP: a database of corporations in the Russian Empire, 1700–1914', Interuniversity Consortium for Political and Social Research [distributor], <https://doi.org/10.3886/ICPSR09142.v3>.
- Owen, T.C. (2013). 'Measuring business cycles in the Russian Empire', *Economic History Review*, vol. 66(3), pp. 895–916.
- Panza, L., Ville, S. and Merrett, D. (2018). 'The drivers of firm longevity: Age, size, profitability and survivorship of Australian corporations, 1901–1930', *Business History*, vol. 60(2), pp. 157–77.
- Penrose, E.T. (2013). *The Theory of the Growth of the Firm*, Mansfield Centre, CT: Martino Publishing.
- Pfister, U. (2022). 'Economic growth in Germany, 1500–1850', *The Journal of Economic History*, vol. 82(4), pp. 1071–107.
- Postel-Vinay, N. (2016). 'What caused Chicago bank failures in the Great Depression? A look at the 1920s', *The Journal of Economic History*, vol. 76(2), pp. 478–519.
- Rozenberg, V.V. (1912). *Tovarishchestvo s Ogranichennoi Otvetstvennost'iu: o Neobkhodimosti Vvedeniia Etoi Formy v Rossii*, St. Petersburg: Ministry of Finance Publishing.
- Russia, Ministry of Finance. (1900–15). *Ezhгодnik Ministerstva Finansov [Yearbook of the Ministry of Finance]*, St. Petersburg: N.P.
- Shepelev, L. (1973). *Aksionernye Kompanii v Rossii*, Leningrad: Nauka.
- Sokoloff, K.L. (1984). 'Was the transition from the artisanal shop to the nonmechanized factory associated with gains in efficiency?: Evidence from the U.S. manufacturing censuses of 1820 and 1850', *Explorations in Economic History*, vol. 21, pp. 351–82.
- Sterk, V., Sedláček, P. and Pugsley, B. (2021). 'The nature of firm growth', *The American Economic Review*, vol. 111(2), pp. 547–79.
- Stigler, G.J. (1958). 'The economies of scale', *Journal of Law & Economics*, vol. 1, pp. 54–71.
- Thompson, P. (2005). 'Selection and firm survival: Evidence from the shipbuilding industry, 1825–1914', *The Review of Economics and Statistics*, vol. 87(1), pp. 26–36.

- Tian, C. (2018). 'Firm-level entry and exit dynamics over the business cycle', *European Economic Review*, vol. 102, pp. 298–326.
- Tsebe, M., Vukeya, V., Lewis, C., Calvino, F. and Criscuolo, C. (2018). 'Firm dynamics in South Africa', Working Paper 1528, Organisation for Economic Co-operation and Development.
- Tugan-Baranovsky, M. (1970). *The Russian Factory in the 19th Century*, 3rd edn., Homewood, IL: Richard T. Irwin.
- Tybout, J.R. (2000). 'Manufacturing firms in developing countries: How well do they do, and why?', *Journal of Economic Literature*, vol. 38(1), pp. 11–44.
- Varzar, V.E. and Kafengauz, L. (1929). *Svod statisticheskikh dannyykh po fabrichno-zavodskoi promyshlennosti c 1887 po 1926 god. Chast' 1: Promyshlennost' 1900 goda*. Moscow: N.P.
- Von Laue, T. (1963). *Sergei Witte and the Industrialization of Russia*, New York: Columbia University Press.
- Vorderer, S.M. (1990). 'Urbanization and industrialization in late imperial Russia: Ivanovo-Voznesensk, 1880-1914', PhD Thesis, Boston College.
- Zhuravskaya, E., Markevich, A. and Guriev, S. (2024). 'New Russian economic history', *Journal of Economic Literature*, forthcoming.