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Predators or Watchdogs? Bankers on Corporate Boards in the Age of Finance Capitalism

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Abstract: Using newly collected data on investment banks and NYSE-traded railroads, this paper analyzes how bank-firm relationships affected corporate governance and firm outcomes in the early twentieth century. The paper provides a new view into this question by exploiting a regulatory intervention that attempted to curtail bankers' presence on boards of directors. Following the Pujo Committee investigation of the "money trust" in 1912, the Clayton Antitrust Act of 1914 included provisions intended to weaken the influence of bankers in nonfinancial corporations. In particular, the Act restricted the ability of bankers to sit on boards of competing firms, or, in the case of railroads, to sit on boards at all. The paper exploits this exogenous source of variation in bankers' presence on boards to determine in a causal manner whether the influence of bankers was beneficial or harmful to shareholders.

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1 Introduction

The financial meltdown of 2008 has put concerns about the role of the financial sector in the economy at the forefront of academic and public debate. Although the current scale and complexity of financial institutions is historically unprecedented (Philippon and Reshef, 2009), the debate about the appropriate role of the financial sector is not. Arguments about the unchecked power and influence of Wall Street today are reminiscent of the backlash against financiers that followed the panic of 1907. An examination of the financial system in that era, and the regulatory response generated by the anti-Wall Street backlash, may produce important insights into the consequences of financial regulations, the role of financiers in the corporate sector, and the influence that these interactions have on the organization of American finance and industry.

The power and influence of bankers, and their prominence in industry and in the financial markets, probably reached its apex during the first two decades of the twentieth century, which have been termed the era of “finance capitalism.” Compared to other advanced economies at the time, the financial sector of the United States was organized in a peculiar way, with private banking partnerships holding a position of preeminence (Carosso and Sylla, 1991). Mostly organized as private partnerships, these investment banks were virtually unregulated and subject to few (if any) disclosure requirements.¹ Their partners often held directorships with the firms they financed, and participated in their management. They also frequently held seats on the boards of other financial companies, such as commercial banks, trust companies, and insurance corporations.

Whether or not these banker-directors’ presence was beneficial to the shareholders of the firms they helped manage was a contentious question at the time. Progressive critics of Wall Street argued that bankers utilized their client firms’ resources for their own benefit, issuing excessive amounts of securities in exchange for exorbitant fees, and raising firms’ indebtedness to unsustainable levels (Brandeis, 1913). But the effects of banker representation on a firm’s board include many potential benefits, as well as costs. On the one hand, a close bank-firm relationship may help solve agency conflicts, if the bankers act like independent directors, and facilitate access to capital. The presence of a banker on a firm’s board might also “certify” that firm to the financial markets.

¹Some trust companies also engaged in investment banking, and some national banks entered the industry as well, through securities affiliates (White, 1986; Kroszner and Rajan, 1997). Most investment banks, however, remained organized as private partnerships until the 1970s, when the NYSE permitted publicly traded corporations to join (see Morrison and Wilhelm, 2008).

Alternatively, bank control may be detrimental if bankers have monopolistic power over the firms' access to capital, or could engage in extensive self-dealing. Moreover, easy access to capital through close relationships with bankers might enable executives to finance value-destroying projects. This question is difficult to resolve empirically, since bank-firm relationships are endogenously determined, and there is clear evidence in modern data that bankers tend to be represented on the boards of firms that are in many ways atypical (Kroszner and Strahan, 2001).

This paper analyzes the effect of bankers on corporate boards in the era of finance capitalism. To establish a causal link between bankers' presence and firm outcomes, an ideal strategy would consist of randomly allocating board seats to bankers. We propose to use the Clayton Antitrust Act of 1914 as a natural experiment that attempted to sever bank-firm relationships. Influenced by the findings of the Pujo Committee investigation of the "money trust" of 1912, the Clayton Act restricted bankers' role on firm boards, and thus created an exogenous source of variation in the incidence of banker-directors. Because it exploits this exogenous severing of the ties between bankers and nonfinancial firms, this strategy represents a substantial step forward in establishing causal implications of the effect of banker-directors on firm outcomes.

Better known for its terms restricting anticompetitive practices, the Clayton Act imposed very specific regulations on corporate directors in particular industries. For railroad corporations, it effectively forbade self-dealing, in which a banker-director would underwrite a railroad's securities: either the bankers on a road's board had to resign, or they could remain on the board but cease to act as the firm's bankers.² Implemented in 1921, the terms of the Clayton Act relative to railroads create an ideal quasi-experiment with which to estimate the effects of bankers on firm boards. The focus of this paper is therefore on publicly traded railroads, which were among the most important issuers of securities in the early twentieth century (see Edwards, 1938).

By comparing the outcomes for firms that had bankers on boards with those that did not before and after the Clayton Act, our strategy enables us to analyze whether the presence of bankers on boards was detrimental or beneficial for corporations. An important concern in a difference-in-difference strategy is to be able to rule out other factors that may have altered the value of

²For industrial corporations, the provisions of the Act were somewhat different. The Act prohibited anyone to serve on the boards of competing firms. As many powerful bankers sat on the boards of large numbers of firms that could be considered to be competitors in the language of the Act, these directors would have needed to resign from many of those firms' boards.

firm-bank relationships. Other changes during this period that may have influenced the value of firms' financial ties include the rise of a broader investor class after the Liberty Bond drives during World War I, the increase in the availability of financial information as more firms listed on the NYSE, the introduction of new securities issuance regulations ('blue sky laws'), and the founding of the Federal Reserve. Even if these events contributed to a decline in bank-firm relationships, it is not clear that they would have led to a differential effect in outcomes across firms. Moreover, these potentially confounding factors mostly affected firms slowly over time, whereas the timing of the Clayton Act is more discrete. The Act was passed in 1914 and implemented immediately for industrial firms, but its implementation was postponed until 1921 for railroad companies. Thus, the effect on railroads should be centered around this later date.³

Analyzing the effect of the Clayton Act requires having information on the characteristics of firms, their boards, and their ties to banks. We use a newly hand-collected dataset on NYSE-listed railroads from 1901-1929.⁴ For each railroad, we collect detailed accounting data from their income statements and balance sheets, as well as a complete description of their board members. Moreover, we measure the ties of railroads to banks by identifying the railroad directors that were members of investment and commercial banks. Thus, an important contribution of our paper is to present the first-ever comprehensive characterization of the incidence of banker directors among publicly traded firms.

The results of the empirical analysis indicate that the participation of investment bankers in the management of railroads benefitted those firms. Using a quasi-experimental framework, in which we compare the performance of roads with bankers on their boards to those without, both before and after the implementation of the Clayton Act, we find that the rates of return and valuation (as measured by Tobin's Q) of roads with investment-banker directors fell relative to others in the post-Clayton Act period. The results also provide some insight into the channels through which these effects occurred. The rate of interest that railroads with investment bankers on their boards paid on their debt rose after the implementation of the Clayton Act, relative to the rates paid by

³While our current analysis focuses on railroads, the differential in the timing for industrials and railroads will allow us to differentiate the Clayton Act from other explanations further when the accounting data for industrial firms is available.

⁴Railroads were amongst the largest corporations at that time, and the presence of bankers on their boards was even more prevalent than in other types of firms. In the future, we will expand our analysis to include industrial corporations as well.

other roads.

The data and results of this paper contribute to several areas of research. An important question in modern corporate finance is whether the presence of bankers as directors is beneficial for the shareholders of a firm. A large empirical literature has studied this question using modern data in countries in which bankers have an extensive presence on boards, such as Germany (Gorton and Schmid, 2000; Agarwal and Elston, 2001) and Japan (Weinstein and Yafeh, 1998; Mørck and Nakamura 1999), as well as in those with a modest presence of bankers, like the US (Booth and Deli, 1999; Kroszner and Strahan, 2001; Güner, Malmendier and Tate, 2007). An important limitation of these studies is that they are not able to address the endogeneity of board composition (Hermalin and Weisbach, 1988; 1998) or bank affiliations. This paper improves upon those earlier works by exploiting a quasi-experiment that generates exogenous variation in bankers' presence on boards.

Among economic historians, the role of financial firms in the economy in the early twentieth century has been the focus of a longstanding and important literature (see, for example, Edwards 1938; Redlich, 1951; Carosso and Sylla, 1991; and Calomiris, 1995). Most of the empirical contributions to this literature have focused almost exclusively on the activities of one firm, J.P. Morgan and Company (DeLong, 1991; Ramirez, 1995; and Simon 1998). It is unclear whether the results of those studies generalize to other, less prominent firms. Moreover, like the modern corporate finance literature, this work can not address the problem of the endogeneity of relationships between bankers and firms: perhaps the positive effects found for the presence of a Morgan partner on a firm's board were simply the result of the fact that J.P. Morgan and Company formed relationships with superior firms. The results of this paper build on that earlier work by extending it to all banks and firms, and by improving on their identification strategies.

2 Bankers in the Era of Finance Capitalism

In the second half of the nineteenth century, the United States witnessed the emergence of large, professionally managed enterprises, beginning with railroads, and, with the wave of mergers that came in the 1890s, industrial companies (Lamoreaux, 1985). These firms were in some cases organized and in others reorganized by private investment banks, which gradually achieved the capabilities necessary to facilitate the enormous financings required by big business. Investment

banking firms provided a range of services to their clients, including underwriting securities issues, serving as depositories and fiscal agents, issuing letters of credit, and dealing in foreign exchange and commercial paper (Carosso, 1970). Many of them also had very close relationships, and held large ownership stakes and board seats, with commercial banks and trust companies, which provided credit to finance underwritings, and also with insurance corporations. Some trust companies, and, in the years after 1910, national banks entered the investment banking business, becoming important bond underwriters in the 1920s (see, for example, White, 1986, and Kroszner and Rajan, 1997). The relationships investment bankers formed with client firms were often quite durable and were generally exclusive, and it was common practice beginning in the late-nineteenth century for investment banks to hold one or more seats on the boards of these firms, in some cases through the voting power of their shares, in others, through a voting trust or some other legal device (Redlich, 1951).

Prior to the panic of 1907, popular suspicion of financial institutions and concern over the anticompetitive practices of some of the industrial “trusts” produced legislative efforts to reign in the power of these institutions, for example with proposals for federal incorporation of firms engaged in interstate commerce (see, for example, Mitchell, 2007).⁵ But the crisis provoked shock and outrage, and therefore the calls for strict regulations became more forceful. The panic of 1907 began with the collapse of several trust companies and ended with a series of rescues organized almost single-handedly by J.P. Morgan (see Bruner and Carr, 2007). Bankers were accused not only of profiting from the crisis—an accusation made plausible by J.P. Morgan’s arrangement for U.S. Steel to acquire a controlling stake in an important competitor held by a failing brokerage house during the crisis—but also of actually *causing* the crisis (Carosso, 1987).

After various investigations and legislative efforts at both the state and federal level, the U.S. House of Representatives authorized an investigation of the so-called “money trust,” the financiers believed to secretively and self-servingly control all access to capital, in 1912. Led by Representative Arsène P. Pujo, the House Committee on Banking and Currency and its influential council, Samuel Untermyer, conducted extensive hearings, calling many important bankers to testify. The

⁵The term “trust” was used at the time to denote all the great combinations that dominated industries, since the first such enterprises were legally organized as trusts. The term was used synonymously with “monopoly”—hence the term, “antitrust.” These “trusts” are not to be confused with *trust companies*, which were financial intermediaries similar to banks but subject to fewer regulations.

committee also collected copious information on banking and the financial system. Although the committee was never able to fully complete the work Untermyer hoped to undertake, it issued a very thorough report (Pujo Committee, 1913b). This report compiled important information on the ties between financiers and corporations, and included a long series of recommendations for the regulation of financial institutions, the protection of investors, and the restraint of anticompetitive practices in finance and industry.

Although the recommendations from the Pujo investigation were never passed as legislation, the committee's findings were nonetheless enormously influential. The Federal Reserve Act of 1913 reflected the committee's concerns about the concentration of financial power in the northeast, in that it created a somewhat decentralized system of regional Federal Reserve Banks. More importantly, the Clayton Antitrust Act of 1914 contains provisions that were intended to limit the power of financiers, and the anticompetitive practices they were believed to facilitate.

One of the most important reasons for the lasting influence of the Pujo Committee's activities was a series of essays written by the progressive lawyer Louis Brandeis, and published as the book *Other Peoples' Money and How the Bankers Use It* in 1913. Brandeis wove the data and findings of the committee into a powerfully articulate narrative that attacked what Woodrow Wilson called the "money monopoly" on many fronts. Brandeis showed that the most powerful bankers in the country, the partners of J.P. Morgan & Co., the directors of First National Bank, National City Bank, and the various other bank and trust companies they controlled, altogether held directorships in hundreds of corporations, whose total assets amounted to more than \$20 billion, a staggering sum at the time. Brandeis claimed that the presence of even one of these bankers on the board of a corporation gave them control of the firm's resources, which they could utilize for the benefit of the other companies they controlled at the expense of the company's shareholders. Brandeis stated that "when once a banker has entered the Board his grip proves tenacious and his influence usually supreme; for he controls the supply of new money" (1913, p. 11). In his view, bankers got their clients to issue excessive amounts of securities at exorbitant fees; forced their firms to do business with other firms they controlled; and coordinated anticompetitive arrangements among their companies. Brandeis argued that, in the extreme, the bankers' actions could even cause the failure of corporations.

Since the publication of Brandeis' book, some financial historians have expressed skepticism

of this negative view of investment banks' influence on their client firms. Morrison and Wilhelm (2007) argue that investment banker activism in firms' management improved corporate governance and helped resolve problems arising from informational asymmetries, and De Long (1991), Ramirez (1995), and Cantillo (1998) all find positive effects of the presence of J.P. Morgan partners on a firm's board. In a view that is not entirely compatible with these findings, other historians have expressed skepticism about the extent of influence bankers obtained from the one or two board seats they typically held on their client firms. Carosso (1970, p. 152), for example, claimed that investment bankers were "unable to impose their will upon the other directors, who were always more numerous than the representatives of Wall Street." Redlich (1951) argues that investment bankers mainly selected the top executives of firms, and then delegated management to them.

3 Data

No comprehensive dataset of accounting data or board composition exists for the early twentieth century. We have collected such a dataset for this paper. Our main source is *Moody's Manuals of Railroads and Corporation Securities*, which presents firm-level data for large numbers of corporations, obtained from those corporations' annual reports to shareholders. Prior to the Securities and Exchange Acts, publicly traded firms were not required to disclose financial data. However, beginning around 1900, the NYSE began to require listed corporations to disclose basic income statement and balance sheet data, so our sample is restricted to NYSE-traded firms.

Our current sample includes all railroads that traded at the NYSE in 1907, 1915, and 1920 (a total of 84 roads).⁶ For each railroad, we collect financial information for each year from 1900 to 1929 using the statements presented in *Moody's Manuals*.⁷ This allows us to construct an unbalanced panel dataset containing information on revenues, costs, leverage, interest coverage, dividend payouts, and various measures of firm performance (such as return on assets and Tobin's Q, for example). We also collect stock price data at an annual frequency from the *New York Times*.

Due to the lack of standardization in the disclosure of financial information, an important

⁶We are in the process of constructing similar data for all industrial firms that traded at the NYSE in 1907 and 1915.

⁷For most firms, the manuals from 1900 to 1915 provide two years of financial data, so we can collect annual financial information for every year in which the company traded at the NYSE using manuals from every other year. Later manuals contain five to six years of data, allowing us to use fewer volumes while still collecting information at an annual frequency.

challenge is to interpret companies' accounting statements in a consistent manner to construct a uniform set of variables.⁸ We will use alternate definitions of these variables in our analysis to take these idiosyncrasies into account.

While the accounting data is constructed at an annual frequency, we obtain board composition and bank membership data at two- to five-year intervals. This restriction is imposed both due to the large magnitude of the data collection effort and the difficulty in obtaining some of the rare primary sources we work with. However, because directors of nonfinancial and financial firms change slowly over time, we are still able to capture important variation in the composition of boards over time. We collect the names of all directors and managers as listed in *Moody's Manuals*.⁹ To identify which directors are bankers, we use various data sources containing information on members of financial firms. For investment banking partnerships, we collect lists of all partners from stock exchange directories and partnership directories for various years in our sample period.¹⁰ We also obtain lists of directors of commercial banks and trust companies from the *Rand McNally Bankers' Directory*.¹¹ In order to restrict our dataset to the individuals most likely to serve on the boards of major corporations, we focus on investment banking partnerships that were registered members of the NYSE, and of commercial bankers (that is, the president and directors of commercial banks and trust companies) in New York, Chicago and Boston.

Cross-referencing the lists of investment and commercial bankers with those of corporate directors enables us to create a detailed panel dataset on the presence of bankers on boards. After carefully correcting the name entries by comparing those for the same firm over time, we match the names of corporate directors to those of bankers based on last name and first and second initial. A concern that arises in this procedure is that matching on names may lead to erroneous matches. For example, our matching procedure will lead us to assume that investment banker J. A. Smith is also the director listed as J. A. Smith, when these may in fact be two different individuals. We

⁸Lack of consistency in accounting data is particularly problematic for industrial firms but less severe for railroads because their accounts became much more standardized after the Hepburn Act of 1906. Although there remained significant variation across companies in the accounts that were presented on their financial statements, the variation across firms diminished over time.

⁹For railroads, we have this information for 1905, 07, 09, 11, 13, 15, 20, and 1923. For industrial firms, we collected board data for 1907, 09, 11, 13, 15, and 1917.

¹⁰We observe investment banking partnerships in 1906, 10, 13, 15, 17, 20, and 1923. When matching these data to those of directors, we link 1906 information to board data in both 1905 and 1907, and 1910 data for both 1909 and 1911.

¹¹We have collected this information for 1905, 07, 09, 11, 13, 15, 20, and 1923.

have performed several checks to address this important concern. First, at least one of our sources often lists the full name of the individual. In that case, we can match initials and full names by using the name of the firm the individual belonged to. Also, we match bankers based on names and cities when the geographical information is available.¹² It is possible that our matching procedure still exaggerates the degree of interlocking across directorates and financial institutions. However, the presence of bankers on boards that we document in this paper is so high that our results are surprising even taking mismeasurement into account. Moreover, there is no reason to believe that these matching concerns are systematically changing over time. Thus, measurement error in the matching procedure cannot explain changes in the presence of bankers on boards over time.

4 Bankers on Railroad Boards and the Clayton Act

Table 1 presents summary statistics for the boards of the sample railroads, calculated over 1905-23, by matching the names of railroad directors to the names of partners in investment banks, and to the names of directors of commercial banks, for the same year. These statistics were calculated by matching lists of 6,851 railroad director names, 38,550 commercial bank director names, and 14,689 investment bank partner names.

The matching results, presented in table 1, contain some genuine surprises. Whereas today, relatively few publicly traded firms in the U.S. have bankers on their boards (about 30% among large firms; see Kroszner and Strahan, 2001), in the early twentieth century, 94% of railroads had a commercial banker on their board, and nearly 60% had a partner from an investment bank on their board. Relative to today, bankers enjoyed an extraordinary degree of influence in the economy, and participated in the management of a far greater share of large corporations.

The data in the table indicate that of the twelve total directorships for an average railroad, five of those were typically held by commercial bank directors. Moreover, those five banker-directors on average held directorships with ten different commercial banks, creating a large web of connections with the commercial banking community.¹³ In contrast, the representation of investment banking

¹²We also plan to verify accuracy of our matches by consulting published Directories of Directors for board members residing in New York City or Boston, and by contrasting our results with the lists of directorships held by bankers provided in the Pujo Committee reports.

¹³Interlocks among the directorates of commercial banks were common; the commercial bank directors who sat on our sample railroads' boards held directorships with 2.2 commercial banks on average.

Table 1:
Bank representation on railroad boards, 1905-1923

	Mean	SD	Min	Max
<i>Board characteristics</i>				
Board Size	12.43	3.20	4	26
<i>Commercial bank representation on board</i>				
At least one commercial banker on board	.94	–	0	1
Seats held by commercial bankers	5.05	3.35	0	14
Number of different commercial banks represented	9.99	8.14	0	34
<i>Investment bank representation on board</i>				
At least one investment banker on board	.59	–	0	1
Seats held by commercial bankers	1.14	1.29	0	6
Number of different commercial banks represented	1.00	1.13	0	6

Note: Statistics calculated from 551 firm-year observations taken at intervals of two to five years over 1905-23.

partnerships on railroads suggests that relationships between these two types of firms were often exclusive. On average, only one seat was held by an investment banker, who represented only one investment banking firm.

How would the Clayton Act have influenced these numbers? The Act did not forbid bankers from sitting on firms' boards, and arguably did not even forbid a banker from lending to a railroad on which he was a director. Instead, the Clayton Act prohibited an institution with which a railroad shared a director from underwriting securities for that railroad, which is the primary function of investment banks. Specifically, Section 10 states that:

No common carrier engaged in commerce shall have any dealings in securities...to the amount of \$50,000, in the aggregate, in any year, with another firm, partnership, or association, when the said common carrier shall have upon its board of directors or as its president, manager or as its purchasing or selling officer...any person who is at the same time a director, manager, or purchasing or selling officer of, or who has any substantial interest in, such other corporation, firm, partnership or association...¹⁴

Thus the act effectively forbade 'self-dealing,' with banker-directors underwriting the railroad's securities. Investment bankers could choose to remain on railroads' boards, and cease to act as their bankers, or resign. A relatively small number of commercial banks and trust companies participated in securities underwritings, and therefore faced the same choice. In sum, we would

¹⁴Oct. 15, 1914, ch. 323, 38 Stat. 730. This term was repealed in 1988. The act did contain an exception for a competitive bidding process with directors' firms.

expect a significant fraction of investment bankers to resign from railroads' boards after the Act was implemented, although we would expect some to remain. For commercial bankers, we would expect a far lower fraction to resign.

In order to gauge the impact of the Clayton Act's terms relative to railroads, which were implemented in 1921, and to understand the historical trends in these data that preceded the Act, figure 1 plots data for banker representation on railroad boards by year. In panel (a), the proportion of firms with a banker on their board is shown for 1905-23. For commercial bankers, this rate displays a slight decline over time, but it never falls below 89%, and it actually increases somewhat in the years following 1915. The rate for investment bankers is somewhat more volatile, and exhibits many of the same fluctuations as the line for commercial bank representation, only magnified. The most important difference between the two lines is the change that occurs between 1920, before the Clayton Act was implemented for railroads, and 1923, after its implementation. Over this interval, the fraction of railroads with an investment banker on their boards fell from 59% to 41%, whereas the share of railroads with commercial bankers on their boards actually increased somewhat.¹⁵ The pattern of investment banker resignations thus conforms to our expectations about the effect of the Clayton Act.

The lower panel of figure 1 displays the median proportion of bankers among railroads' directors over time. For commercial bankers, this rate gradually decreases, falling from 55% (about 7 banker-directors) in 1905 to 23% (about 3) in 1923. The pattern for investment bankers is quite different. The median fraction of investment bank partners among railroad directors is remarkably stable up until 1920, at around 7% (one investment banker). In 1923, after the Clayton Act, this falls to 0—the median railroad no longer had an investment banker on their board. Many investment bankers of course remained on railroads' boards, and some even had large numbers of investment bankers. But the mean proportion of investment-banker seats on railroads boards fell by 29%, from 9% to 6.3%.

Over the sample period, the fall in the number of bankers on railroad boards created a decrease in the number of railroads to which individual banks had ties. For banks represented on at least one

¹⁵Another sizable decline in the fraction of investment bankers on boards occurred from 1911 to 1915, suggesting that some bankers left boards in response to the backlash during the Pujo investigation and the enactment of the Clayton Act, even if the Act did not immediately applied to railroads. Partners of J.P. Morgan & Co., for example, famously stepped down from many railroad boards in January 1914 (Simon 1998).

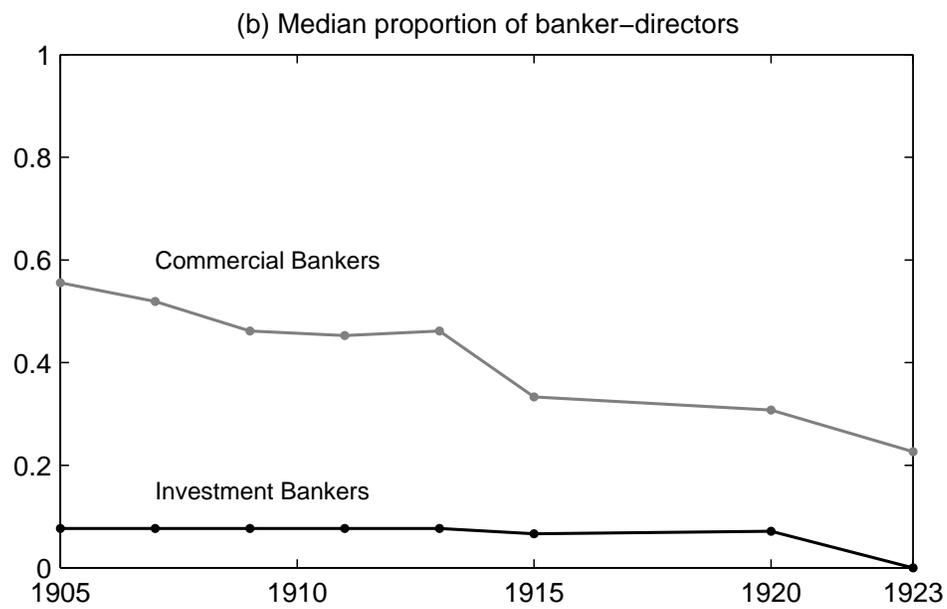
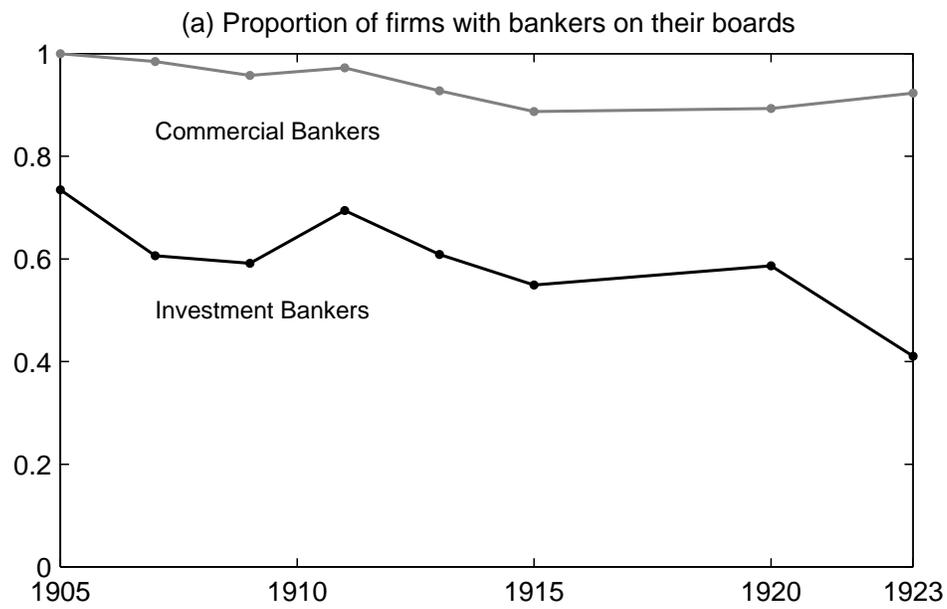


Figure 1: Evolution of banker representation on railroad boards

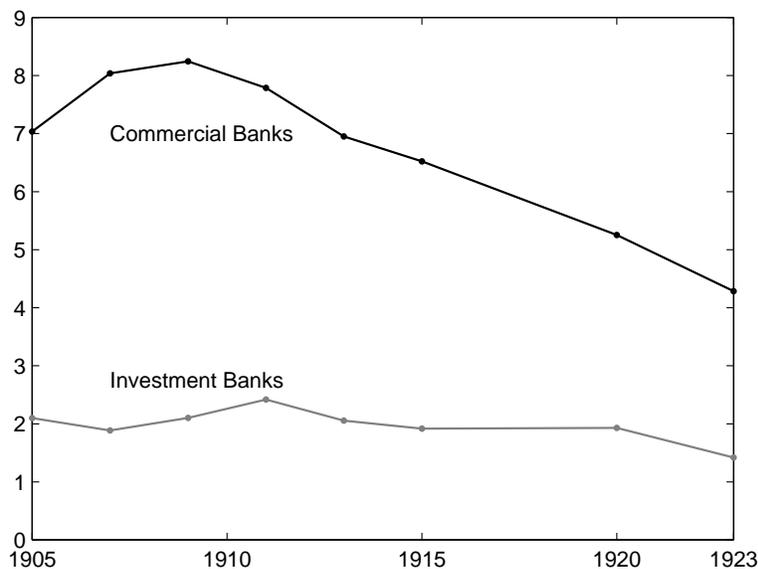


Figure 2: Mean number of railroads where each bank had director representation

board, figure 2 plots the average number of railroads on which the bank had at least one director, for 1905-23. For commercial banks, the number of railroads with whom they had a director in common fell dramatically after 1909, decreasing from a peak of more than 8 to just over 4 in 1923. In contrast, throughout the entire period, investment banks typically had ties to only about two railroads (again, conditional on having ties with at least one). This is at least suggestive evidence that the relationships between investment banks and railroads functioned somewhat differently than the relationships between commercial banks and railroads, perhaps due to the larger scale of commercial banks' capital, or perhaps due to the different role played by investment bankers' in firms' management and capital structure decisions. It should also be noted that, consistent with the Clayton Act having a significant impact on investment banks, the year 1923 saw a significant decrease in this number.

Finally, deeper insights into changes in bankers' representations on railroads' boards can be obtained by calculating measures of turnover among banker-directors. We define 'net turnover' in a given year as the number of new banker-directors—that is, those who were not on the board in the previous period—minus the number of banker-directors departing from the board (i.e., those that were on the board in the previous period but not in the current period). This is a 'net' concept

Table 2:
Turnover among banker directors, 1907-1923

Year	Investment bankers	Commercial bank directors
	On railroad boards: Net turnover	On railroad boards: Net turnover
1907	-0.24	-0.43
1909	-0.11	0.05
1911	0.17	0.07
1913	-0.06	-0.22
1915	-0.07	-0.61
1920	0.09	-0.17
1923	-0.25	-0.69

of turnover since it explicitly incorporates replacements for directors who may have resigned.

Table 2 displays this data for commercial bank directors and investment bank partners on firms' boards. Consistent with the gradual decline in the number of commercial bankers on railroad boards over the period, our net turnover measure for commercial bankers is negative for five of the seven intervals in the table. Between 1920 and 1923, almost one commercial banker left the average firm in the sample, quite a substantial decline considering that commercial bankers held on average 4 seats in each railroad in 1920. The level of mean net turnover is considerably lower for investment bankers, but becomes quite negative in 1923, which is consistent with a large effect of the Clayton Act's provisions in that year. Indeed, the average firm lost a quarter of an investment banker in the 1920-23 period, more than a 20 % decline relative to a mean of 1.16 seats in each board held by partners of investment banks in 1920.

What effect did the Clayton Act's provisions on railroads have on their performance? The press certainly noted the sudden changes made in the composition of railroad boards in response to the Act, and reported concerns among railroad officials that the resignations would "work to the great disadvantage" of the affected roads.¹⁶ On the other hand, progressives lauded the Act's provisions to "forbid...acts of piracy" by forbidding self-dealing among railroad directors.¹⁷ Some labor activists argued that bankers' control over both steel firms and equipment producers, on the one hand, and railroads, on the other hand, enabled them to maintain high prices for railroad

¹⁶ "Many Changes Soon in Railroad Boards," *New York Times*, 23 January 1921. The resignations of prominent banker-directors attracted considerable attention in the press; see, for example, "Schiff and Kahn Quit Union Pacific," "Mellon Leaves the P. R. R.," "Two New Erie Directors," *New York Times*, 2 December, 13 January, and 24 July 1921, respectively.

¹⁷ *Machinists' Monthly Journal*, January 1921, p. 61.

supplies, thereby extracting resources from the railroads—and “unconscionable misuse” of their power.¹⁸ The next section presents an empirical analysis of this question.

5 Railroads, Investment Banks and Performance

5.1 Accounting data

The board composition data analyzed in the previous section were matched to the financial data collected from Moody’s to create a dataset that can be used to analyze the effect of the Clayton Act on the performance of railroads. Thus far, we have completed coding the data for approximately 50% of the NYSE-traded railroads. A total of 86 railroads had common and/or preferred stock listed on the NYSE during our sample years, and of those, we have coded data for 44. For these 44 railroads, data was available on average for about 21 years, producing a dataset of 947 firm-years. On average, for each year in the sample, which covers 1902-29, we have data for 34 railroads. All of the results that follow are based on this preliminary and incomplete version of the dataset.

Definitions and summary statistics for the accounting data are presented in table 3.¹⁹ As the first few rows of the table make clear, the NYSE-traded railroads were extraordinarily large enterprises, certainly some of the largest in the United States. The average value of the total assets of our firms is about \$281 million, and the bulk of that, or 71%, was in the form of “Property, Plant & Equipment (PP&E),” the long-term physical assets such as the road itself, and locomotives and rail cars. Of those assets, about 43% were financed by long-term debt, an indication that securities underwriting was quite important for these firms. Using the balance sheet and income statement data, we calculated an “interest rate” variable, a rough proxy for the rate paid on the debt, as their total interest expense divided by all long-term interest-bearing liabilities.²⁰ On average, this was around 4.6%. One common measure of the ability of firms to meet their interest obligations is the “interest coverage ratio,” the ratio of earnings before interest and taxes (EBIT) to interest expense. For the sample railroads the average value of this measure was 2.4, a reasonable margin

¹⁸“Rail Unions Charge Plot by Financiers to Force Idleness,” *New York Times*, 20 April 1921.

¹⁹To prevent our estimates from being influenced by outliers, we trim all variables at the top and bottom 1 percent of the distribution for all years.

²⁰Because of poor accounting reporting during the First World War years, short-term borrowing is difficult to measure separately from trade credit and other current liabilities. Thus, we focus on long-term debt, which account for most of the roads’ borrowing.

Table 3:
Definitions of accounting variables

Variable	Definition	Mean	SD	Min	Max
EBIT	Operating revenues - operating expenses	13,507,430	16,403,220	-5,226,344	100,606,700
PP&E	Property, plant and equipment	198,708,600	207,549,400	4,203,827	1,214,251
Assets	Total assets	281,249,200	299,722,800	5,316,000	1,721,697,000
Book leverage ratio	$\frac{\text{Long-term debt}}{\text{Assets}}$	.430	.143	0	.713
Interest coverage ratio	$\frac{\text{EBIT}}{\text{Interest expense}}$	2.386	1.664	-544	12.373
Interest rate	$\frac{\text{Interest expense}}{\text{Interest-bearing liabilities}}$	.046	.011	.020	.101
Cash flows	$\frac{\text{Net income}}{\text{Lagged PP\&E}}$	.028	.026	-.029	.112
Return on assets	$\frac{\text{Net income}}{\text{Assets}}$	.018	.017	-.025	.068
Return on equity	$\frac{\text{Net income}}{\text{Shareholders' equity}}$	.052	.047	-.147	.196
Dividend payout rate	$\frac{\text{Dividends on common stock}}{\text{Net income}}$	.384	.372	0	1.995
Tobin's Q	$\frac{\text{Market value of assets}}{\text{Book value of assets}}$	.860	.152	.382	1.459

Note: Data calculated for all available firm-years. N ranges from 947 to 892 for most variables. However, for Q, which requires stock prices, $N = 617$, as many railroads' stocks were illiquid and traded infrequently.

of safety, but not a terribly high one.

In terms of the performance of these enterprises, their return on assets was around 1.8%, and their return on equity 5.2%, with the difference generated by the high degree of leverage of the roads. On average, the railroads generated cash flows equivalent to about 2.8% of their PP&E, and paid out about 38% of their net income in the form of dividends on common stock. The average value of Tobin's Q for the roads was about .86.

5.2 Railroads with and without bankers

How did the roads with at least one investment banker from any firm on their boards in 1920 (the year before the implementation of the Clayton Act) compare to those that did not?²¹ A simple comparison of means between the two groups of firms over the entire sample provides some insight into the nature of railroads' selection into these relationships. Although prior work has shown that J.P. Morgan & Company was affiliated with firms that were superior relative to their peers (DeLong, 1991), it is not obvious that we should expect selection to be positive in general: distressed firms,

²¹We focus our analysis on investment bankers because the Act was designed to affect the relationship between railroads and those financial institutions that underwrote their securities. It is likely that a few commercial banks in our sample also engaged in the underwriting of securities at that time, and we are planning on exploring this channel as well in the future.

Table 4:
Characteristics of railroads with and without bankers,
All firm-years, 1901-1929

	Means:		
	No investment Banker on board (1)	Investment banker On board (2)	$P > |t|$ (3)
<i>Physical characteristics</i>			
Total mileage	3,135	3,165	.890
Log assets	18.707	18.936	.006
Age	33.672	31.846	.271
<i>Debt and liquidity</i>			
Book leverage ratio	.417	.439	.025
Interest coverage ratio	2.736	2.196	.000
Interest rate	.048	.045	.000
<i>Performance</i>			
Cash flows	.034	.024	.000
Return on assets	.023	.016	.000
Return on equity	.062	.046	.000
Dividend payout rate	.469	.329	.000
Tobin's Q	.916	.841	.000

Note: Column (1) presents means for all firm-years for railroads that did not have an investment banker on their board in 1920, column (2) presents means for all firm-years for railroads that had an investment banker on their board in 1920, and column (3) presents the significance level of a two-sided test for differences of means.

or firms in need of restructuring or improved access to credit might seek out these relationships. Indeed it is precisely under these circumstances that many firms took on investment bankers as directors (Carosso, 1970; Ramirez, 1995).

Comparisons of means between railroads with and without investment-banker directors are presented in table 4. Although the roads with bankers on their boards were somewhat larger, as measured by total assets, they were similar in terms of mileage and age. But measures of their performance almost uniformly indicate they were inferior: they had lower rates of return, generated lower cash flows, had lower valuations, and generated lower earnings relative to their interest expense. They did, however, pay less interest relative to their interest-bearing liabilities, and were somewhat more leveraged.

These differences across the two types of firms are of course not causal. The railroads with investment bank affiliations may have performed better than they otherwise would have without the participation of their bankers in their management. To obtain evidence of the effect of the bankers' role in railroads management, we perform regressions exploiting the natural experiment

of the Clayton Act.

5.3 Empirical Specification

In 1920, 42 different investment banks had at least one of their partners on the board of a railroad. The partners of these firms likely provided financial expertise, and also represented their firms in underwriting transactions. The Clayton Act severed these relationships, effectively forbidding investment-banker directors from acting as a road's investment banker. As we discussed in Section??, an unusually large fraction of investment bankers stepped down from boards between 1920 and 1923, suggesting an important impact of the Act on the presence of investment bankers on boards. Our basic specification to determine the effect of this on railroads is:

$$\pi_{it} = \alpha_i + \gamma_t + \beta X_{it} + \lambda \text{Bankeronboard} \times \text{PostClayton}_t + \epsilon_{it}, \quad (1)$$

where π_{it} is one of the measures of firm performance of interest, such as valuation (Tobin's Q), rate of return, or leverage; α_i and γ_t are firm and time fixed effects; X_{it} is a vector of time-varying firm characteristics, and $\text{Bankeronboard} \times \text{PostClayton}_t$ is an indicator equal to one for all firms where at least one investment banker was a director in 1920 (prior to the implementation of the Act), multiplied by an indicator for the post-Clayton Act period, which takes a value of one for any year including or after 1921. In this framework, λ is the local average treatment effect of the Clayton Act's prohibition on self-dealing by banker-directors, and it is estimated using variation in the presence of bankers across railroads before the Clayton Act was implemented.

A priori, the estimated effect of the Act could be of either sign. If the presence of a banker on a board were detrimental because it allowed bankers to tunnel resources out of the firm (for example by over-issuing securities), then we would expect to find a positive effect ($\lambda > 0$) on firm value. In contrast, it is possible that the presence of a banker on the board was beneficial. Especially when financial markets are in an early stage of development and investors have little information on firms, asymmetries of information may severely restrict access to financing. In this context, a financial institution may only be willing to transact with a firm if they are able to obtain private information, for example through a seat in the board of directors. It is also possible that in some cases bankers had seats on boards without acting as the banker of the company. If the only role

of the bankers' presence were to provide financial advice or certification of the quality of the firm, we would not expect to see a change in value due to the regulation, as the Act would not alter the bank-firm relationships.

5.4 Estimation Results

The results are reported in table 5. The table presents results for regressions as specified in equation (1), with and without firm (that is, railroad) fixed effects. The specifications without firm fixed effects are a useful reference point, since they include an indicator variable for the presence of an investment banker on a firm's board (which would be captured in the firm fixed effect.) These indicators provide some insight into the selection of railroads into affiliations with investment banks, conditional on characteristics such as size and age. All specifications include year fixed effects, which account for all time-varying influences that affected all railroads, such as macroeconomic conditions, developments in labor relations, or changes in government regulations on railroad rate setting.

The estimates in the first rows of the upper and lower panels of the table show the differences (for all firm-years) between railroads with and without bankers in 1920. These estimates are consistent with the mostly negative selection of these railroads we have described in the summary statistics. Railroads with investment bankers on their boards produced lower cash flows, paid out less of their earnings in dividends, had lower interest coverage ratios, lower rates of return, and lower valuations, as measured by Tobin's Q. The one respect in which these railroads showed superior performance was in the rate of interest they paid on their debt, which was lower.

But the interaction terms for the post-Clayton era, in the second row of the upper and lower panels of the table generally show that the bankers actually benefitted their railroads. In particular, after their relationships with investment banks were severed by the Act, the railroads that had affiliations with investment banks produced lower returns on equity, paid higher rates of interest on their debt, and had lower interest coverage ratios, in part because of their higher interest rates. These effects are all of substantial magnitudes as well. In the case of the interest rate variable, for example, the Act eliminated the advantage firms with investment bank affiliations enjoyed; the coefficient on the interaction term is of precisely the same magnitude, and the opposite sign, as the coefficient on the investment bank affiliation (Column (5)). In addition, the firms' cash flows, return on assets, dividend payout rate, and valuation (Q) also fell for railroads with affiliations to

Table 5: Regressions: Effect of Clayton Act on firms with investment bankers on their boards

	Dependent Variable:							
	Cash flows		Interest Coverage ratio		Interest rate		Book leverage	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment banker on board, 1920	-0.008** (0.002)		-0.338** (0.115)		-0.004** (0.001)		0.018+ (0.010)	
Investment banker × Post-Clayton Act	-0.005 (0.004)	-0.008** (0.003)	-0.695* (0.275)	-1.030** (0.220)	0.004** (0.001)	0.004** (0.001)	-0.003 (0.018)	0.002 (0.009)
Firm age	0.000** (0.000)	0.000 (0.000)	0.007** (0.002)	0.010 (0.008)	0.000** (0.000)	0.000 (0.000)	0.000** (0.000)	-0.001** (0.000)
Log(assets)	0.005** (0.001)	0.004 (0.005)	0.008 (0.058)	-0.511 (0.442)	-0.001** (0.000)	0.000 (0.003)	0.046** (0.004)	0.023 (0.022)
Constant	-0.061** (0.014)	-0.051 (0.076)	3.358* (1.386)	11.470 (7.551)	0.062** (0.006)	0.04 (0.046)	-0.400** (0.085)	0.091 (0.359)
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Firm fixed effects	no	yes	no	yes	no	yes	no	yes
Observations	838	838	846	846	840	840	883	883
R-squared	0.26	0.59	0.16	0.56	0.20	0.44	0.27	0.84

	Dependent Variable:							
	Return On assets		Return On equity		Dividend Payout rate		Tobin's Q	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Investment banker on board, 1920	-0.006** (0.001)		-0.010** (0.003)		-0.111** (0.028)		-0.063** (0.012)	
Investment banker × Post-Clayton Act	-0.003 (0.002)	-0.005* (0.002)	-0.014* (0.007)	-0.010+ (0.006)	-0.059 (0.052)	-0.124** (0.036)	-0.024 (0.020)	-0.056** (0.017)
Firm age	0.000** (0.000)	0.000 (0.000)	0.000** (0.000)	0.000 (0.000)	0.004** (0.000)	-0.005** (0.002)	0.001** (0.000)	-0.002** (0.001)
Log(assets)	0.002** (0.000)	-0.002 (0.003)	0.006** (0.001)	0.009 (0.007)	0.060** (0.011)	-0.180** (0.044)	0.047** (0.006)	-0.094** (0.029)
Constant	-0.014 (0.009)	0.049 (0.042)	-0.043 (0.027)	-0.104 (0.122)	-0.694** (0.236)	2.979** (0.718)	0.098 (0.119)	2.455** (0.481)
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Firm fixed effects	no	yes	no	yes	no	yes	no	yes
Observations	874	874	873	873	870	870	587	587
R-squared	0.20	0.61	0.19	0.53	0.20	0.60	0.42	0.77

Note: Robust standard errors in parentheses. **, *, and + denote significance at 1%, 5%, and 10%, respectively.

investment banks after the implementation of the Act, relative to other railroads, but these effects are much larger in absolute magnitude and more precisely estimated when railroad fixed effects are included.

In order to compare the approach of earlier work on this period, which focused almost exclusively on J.P. Morgan & Co., with the approach of this paper, separate regressions were performed with the “Investment banker on board” variables replaced with “J.P. Morgan & Co. partner on board” variables and interactions. To be specific, our treatment group consists of all firms that had at least one partner of J.P. Morgan & Co. on their boards in 1920. These results are reported in table 6. Again, the first rows in the upper and lower panel illustrate the nature of selection among railroads into affiliations, this time with J.P. Morgan. These estimates suggest that Morgan-affiliated firms were a highly selected group. Whereas railroads affiliated with investment banks in general tended to produce lower cash flows, lower rates of returns, and lower valuations, relative to other firms, the Morgan-affiliated firms produced higher cash flows, higher rates of return, and had higher valuations. The interaction terms, which show the effect of the Clayton Act on firms with Morgan partners on their board relative to other firms, indicate that the effect of the Act was even more severe for these firms. Their valuations and rates of return fell, and the magnitude of these changes was approximately twice as large as the magnitude estimated from affiliation to any investment bank.

Taken together, the results of tables 5 and 6 imply that the focus on J.P. Morgan & Co. among previous research was an important first step, but did not provide a full and complete representation of the effects of bank affiliations among nonfinancial firms such as railroads in the early twentieth century. J.P. Morgan was the most prominent and powerful firm of its kind, and it is perhaps not surprising that its client firms enjoyed high valuations and high rates of return. The results of this paper, tentative as they are, have shown that investment bankers’ participation in the management of railroads benefitted those firms, and this effect was not limited to the partners of J.P. Morgan & Company.

Table 6: Regressions: Effect of Clayton Act on firms with J.P. Morgan & Co. partners on their boards

	Dependent Variable:							
	Cash flows		Interest Coverage ratio		Interest rate		Book leverage	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
J.P. Morgan & Co. partner on board, 1920	0.019** (0.004)		0.946** (0.152)		-0.003 ⁺ (0.002)		-0.042** (0.012)	
J.P. Morgan & Co. × Post-Clayton Act	-0.001 (0.006)	-0.001 (0.006)	-0.320 (0.371)	-0.238 (0.306)	0.005** (0.002)	0.005** (0.002)	-0.093** (0.019)	-0.100** (0.011)
Firm age	0.000** (0.000)	0.000 (0.000)	0.009** (0.002)	0.014 ⁺ (0.008)	0.000** (0.000)	0.000 (0.000)	0.000** (0.000)	-0.001* (0.000)
Log(assets)	0.003** (0.001)	0.006 (0.005)	-0.070 (0.057)	-0.169 (0.447)	-0.001** (0.000)	-0.001 (0.003)	0.052** (0.004)	0.022 (0.021)
Constant	-0.039** (0.014)	-0.094 (0.077)	4.466** (1.369)	5.765 (7.649)	0.063** (0.007)	0.060 (0.045)	-0.496** (0.087)	0.096 (0.343)
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Firm fixed effects	no	yes	no	yes	no	yes	no	yes
Observations	838	838	846	846	840	840	883	883
R-squared	0.26	0.59	0.15	0.54	0.18	0.44	0.29	0.85

	Dependent Variable:							
	Return On assets		Return On equity		Dividend Payout rate		Tobin's Q	
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
J.P. Morgan & Co. partner on board, 1920	0.013** (0.001)		0.028** (0.003)		0.194** (0.046)		0.046* (0.023)	
J.P. Morgan & Co. × Post-Clayton Act	-0.002 (0.003)	-0.013** (0.003)	-0.025** (0.007)	-0.019** (0.006)	-0.026 (0.062)	-0.013 (0.048)	-0.116** (0.029)	-0.138** (0.024)
Firm age	0.000** (0.000)	0.000 (0.000)	0.000** (0.000)	0.000 (0.000)	0.004** (0.000)	-0.005** (0.002)	0.001** (0.000)	-0.002** (0.001)
Log(assets)	0.001* (0.000)	-0.010** (0.003)	0.004** (0.001)	0.012 (0.007)	0.042** (0.011)	-0.144** (0.046)	0.045** (0.007)	-0.083** (0.030)
Constant	0.001 (0.009)	0.220** (0.055)	-0.021 (0.027)	-0.156 (0.121)	-0.455 ⁺ (0.242)	2.369** (0.747)	0.087 (0.132)	2.251** (0.483)
Year fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Firm fixed effects	no	yes	no	yes	no	yes	no	yes
Observations	874	854	873	873	870	870	587	587
R-squared	0.20	0.71	0.18	0.53	0.18	0.59	0.39	0.79

Note: Robust standard errors in parentheses. **, **, and + denote significance at 1%, 5%, and 10%, respectively.

6 Discussion and Conclusion

The role of financiers in the economy in the early twentieth century was extraordinarily contentious. Unlike today, when banker participation in the management of nonfinancial companies is relatively rare, financiers were commonly represented on the boards of directors of large corporations at that time. Progressives and labor activists saw a vast conspiracy among East Coast financiers—a “money trust”—to control American business. But many officials in these firms, and many financial historians since then, have argued that the influence of these bankers on their client firms was actually beneficial.

This paper has presented the first comprehensive evidence of the presence of bankers on the boards of American railroads in the early twentieth century, and has used the quasi-experiment of the Clayton Antitrust Act, implemented in 1921, to estimate the causal effects of bankers on their client firms’ operations. The results suggest that investment bankers benefitted railroads’ operations when they participated in railroad management, despite the obvious opportunities for “self-dealing” or tunneling created by their positions. In the years following the implementation of the Act, the valuations and rates of return of railroads with investment bankers on their board fell relative to other roads. Although these results are quite preliminary, and can not be considered conclusive until the full dataset of railroad financial data is completed, they do indicate that the power of bankers in the era of finance capitalism may not always have been wielded in ways that harmed the enterprises they managed.

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