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Political connections and their effects on capital investment, legislation, and consumer and worker safety: evidence from Victorian railways

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POLITICAL CONNECTIONS AND THEIR EFFECTS ON CAPITAL INVESTMENT, LEGISLATION, AND CONSUMER AND WORKER SAFETY: EVIDENCE FROM VICTORIAN RAILWAYS

by

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Far better an approximate answer to the right question, which is often vague, than an exact answer to the wrong question, which can always be made precise. - John Tukey

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ABSTRACT

The political connections of businesses bear implications for the economy. This dissertation studies the political connection of railways in the United Kingdom during the 19th century using several novel data sets. The first chapter of the dissertation begins by quantitatively investigating the implications of the political connections of railways for capital investment. Politically connected railways did significantly more capital investment than their non-connected counterparts. In addition, within-firm increases in political connections were associated with increased subsequent capital investment. The latter part of chapter one introduces the private bill process in the legislature as a likely channel relating political connections and capital investment. Politically connected firms proposed and passed considerably more legislation enabling capital investment than non-politically connected firms. Chapter two of the dissertation focuses on consumer and employee safety, relating safety to political connections and showing that politically connected railways were considerably deadlier

than non-politically connected railways. A century of fatal railway accidents data is presented along with supplementary data sources to demonstrate this point. Chapter three of the dissertation looks at political connections as the outcome rather than as the explanatory variable. Political connections are related to voting rights in U.K. constituencies across five general elections spanning major franchise reforms. Within-constituency results show that for a given constituency increases in the franchise are associated with decreased likelihood that railway directors will run or win seats in the House of Commons.

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List of Abbreviations

B. o T.	.....	Board of Trade
CI	.....	Confidence Interval
FE	.....	Fixed Effects
HofC	.....	House of Commons
HofL	.....	House of Lords
LSE	.....	London Stock Exchange
LHS	.....	Left Hand Side
LNWR	.....	London and North Western Railway
LR	.....	Long Run
M.P. or MP	.....	Member of Parliament
NBER	.....	National Bureau of Economic Research
PAC	.....	Political Action Committee
SR	.....	Short Run

Chapter 1

Between the Boardroom and Parliament: Special Legislation, Capital Investment, and Railway Directors in Parliament, 1864-1901

1.1 Introduction

Are politically connected firms larger than non-connected firms? Do politically connected firms invest more than non-connected firms? Do the political connections of individual firms play a role in determining which firms do capital investment? Chapter 1 argues political connections can play a large role in determining the allocation of capital investment by private firms. Focusing on a historical episode in which political connections were visible and capital investments were enormous, U.K. Railways in the 19th C, this chapter presents a large-scale case-study of the role of political connections in private capital investment. In this chapter the politically connected railways are shown to be larger than non-connected railways. The politically connected railways do much more capital investment. Increases in the degree of political connections are shown to lead increases in capital investment. An empirical test exploiting plausibly exogenous changes in the political connections of railways generated by elections suggests this positive association between political connections and subsequent capital investment may be causal in nature.

Empirical study of the role of political connections in the economy is generally constricted by the fact that in most modern settings direct measurement of political connections is often not possible. In modern democracies there exists a body of conflict of interest legislation barring current members of the legislature or other branch of government from contemporaneously directing a private firm. Because of their nature, individuals and/or firms who do have political connections generally have incentives to hide them from researchers and the public. This can be due to either an outright illicit aspect of the political connection or that public awareness of a political connection is likely to erode the rents gleaned from that political connection. Measuring political connections is generally difficult for these reasons. The empirical literature on political connections generally relies on proxies given the difficulty in directly observing political connections. In the seminal empirical political connections paper in the economics literature the measure of political connections isn't directly observed but is rather proxied by the subjective assessment of an economic consultancy regarding how connected (ordinal) a firm is to Suharto or his children ([Fisman, 2001]). In a historical context recent work on the McKinley Assassination uses "whether or not a member of a firm's board of directors graduated from Harvard in same year and/or was in same clubs at Harvard" as a proxy for political connections of firms to President Teddy Roosevelt. In the same paper, political connections to President McKinley are proxied by whether or not a firm contributed to his election campaign ([Baker et al., 2018]).

This chapter explores the impact of political connections on economic outcomes in a specific institutional setting, railways in the United Kingdom (U.K.) during the second half of the 19th C. The institutional context was one in which there was no *de jure*, let alone *de facto*, prevention of privately interested individuals from taking on legislative positions in Parliament. That is, for the time-place in study a lack of con-

flict of interest legislation allowed individuals with direct-financial interests to serve as both elected Members of Parliament (M.P.s) in the House of Commons as well as Peers in the non-elected House of Lords. The permissive institutional structure allowed directors of corporations to concurrently direct their firms while also maintaining legislative positions as M.P.s and Peers. During the 19th C, firm-directors in Parliament helped choose what legislation was considered, amended and argued proposed legislation under consideration, voted on, and generally influenced the course of proposed legislation through both houses of the legislature, *including legislation that directly impacted their firms.* In the case of the railways, railway directors in both houses of Parliament voted on public bills that directly concerned them, such as a bill requiring railways to offer cheap third-class travel or a bill implementing general accounting standards for railways. These same railway directors also argued, amended, and voted on special legislation, firm-specific private bills, that authorized various capital investments and granted various powers and responsibilities to railways. That is, these railway directors simultaneously legislated on their own firms and their competitors. Capital investment in railways in Victorian Britain was financed and planned largely on private capital and initiative, however the institutional role of special legislation and the legal standing of railways meant that private capital and initiative had to go through political games in Parliament before being transformed into realized capital investment. The political connections of various railways mattered for their success in these political games and this in turn played a role in determining the allocation of capital investment across railways.

This chapter is organized as follows. Section 1.2 discusses the sources and construction of the data used to investigate the relationships between political connections and capital investment and special legislation. Definitions are provided of director-M.P.s and director-Peers as well as how political connections are measured

throughout this dissertation. Time trends of the data digitized for this study are presented in section 1.3.1 along with additional sources in order to both illustrate the industry as well as highlight why this is a good setting in which to study the relationship of political connections, capital investment, and special legislation. Section 1.4 presents the main results relating political connections to capital investment, exploiting plausibly exogenous variation in political connections induced by elections to argue the relationship is likely causal. Special legislation is highlighted as a key mechanism by which political connections influenced capital investment and quantitative evidence is offered in support of this mechanism in section 1.5. Section 1.6 concludes. A brief, tabular summary of the most relevant empirical work on political connections and economics is provided in the appendices (p. 51).

1.2 Data: Sources and Construction

This section discusses the historical sources digitized for the analysis in this chapter, defines the measures of political connections used in the analysis, and states how these variables are constructed from the historical sources. Data detailing firm-level capital investment and political connections of U.K. railways during the 19th century was digitized from annual editions of *Bradshaw's Railway Manual, Shareholders' Guide, and Official Directory.*[1] Data on firm-specific private bill legislation was also digitized from the special legislation summary appendices of these same sources, discussed below. Throughout this chapter, *Bradshaw's* will be used to refer to the annual editions of *Bradshaw's Railway Manual, Shareholders' Guide, and Official Directory*, the main data source in this chapter. Though less well-known than the famous railway-timetables produced by the same Bradshaw, these encyclopedic investment manuals were

[1]Political connections and aggregate capital investment were digitized from the following 31 annual editions of Bradshaw's: 1864, 1866, 1867, 1869, 1871, 1873, 1874, 1876-1890, 1892-1894, 1896-1901.

immensely popular among investors, brokers, banks, and railway officers and directors. These manuals provided annually updated information for investors that they regarded as relevant. The wealth of information contained in these detailed documents can be readily summarized by the subtitle commonly used for the annual editions. The edition for 1876 is typical in this regard, the full title being *Bradshaw's Railway Manual, Shareholders' Guide, and Official Directory for 1876; Containing the History and Financial Position of Every Company, British, Foreign, and Colonial; Statistics, Powers, and Other Data to the Close of the Year, the Railway Interest in Parliament, Etc.* (See figure 1·9 on page 55 in the Appendix.) Note that these manuals provided detailed information on all three types of variables considered in this chapter: capital investment ('Financial Position of Every Company'), special legislation ('History' and 'Powers'), and political connections ('The Railway Interest in Parliament'). Investors in U.K. railways were aware that political connections and firm-specific special legislation played a role in capital investment and the financial success of railway corporations. Their demand for this information provided a market for *Bradshaw's* to compile, produce, and sell these wonderful treasure troves of data.

Bradshaw's contains alphabetized entries for each U.K. railway extant in the year. (Colonial and Foreign railways are also included, but are not considered in this chapter.) Entries contain histories of the Acts of Parliament and related legal powers and obligations of these railways. Details of the railways' equity and debt structures as well as their capital and revenue accounts. Aggregate capital expenditure is taken from the capital accounts and used to construct annual capital investment, the LHS variable of interest in the main results in this chapter. Importantly for this study, company entries in Bradshaw's contain a list of the directors and officers of the firm. These railway directorate lists include full titles of the individuals on the corporate boards (See figure 1·1 on page 7), allowing for the construction of firm-year measures

of political connections in the House of Commons and House of Lords measured by the number of firm-directors in either House of Parliament in that year.

1.2.1 Definitions and Measurement of Political Connections

Figure 1·1 is an excerpt from the 1884 edition of *Bradshaw's.* showing the directorate of the London and North Western Railway (LNWR). Director-M.P.s are highlighted in blue boxes and a director-Peer, the Duke of Sutherland, is boxed in orange. These company directorates as well as the listing of individual directors and their firms in the Railway Interest Appendices are used to construct counts of director-M.P.s and director-Peers for all railway-years for which the data are available.

The following definitions are useful in discussing political connections in this context and are auxiliary to the definitions of political connections used throughout this chapter which follow.

Definition (M.P.): *An M.P. is a Member of Parliament who serves in the House of Commons. M.P. is an elected legislative position.*

Definition (Director-M.P.): *A Director-M.P. is an M.P. who concurrently serves as a member of the board of directors of one or more private corporations.*

Definition (Railway Director-M.P.): *A Railway Director-M.P. is an M.P. who concurrently serves as a member of the board of directors of one or more railways.*

Definition (Peer): *A Peer is a Member of Parliament who serves in the House of Lords. Peer is a non-elected legislative position.*

Definition (Director-Peer): *A Director-Peer is a Peer who concurrently serves as a member of the board of directors of one or more private corporations.*

Definition (Railway Director-Peer): *A Railway Director-Peer is a Peer who concurrently serves as a member of the board of directors of one or more railways.*

The railway directorate of the LNWR in 1884 as shown in figure 1·1 contains five

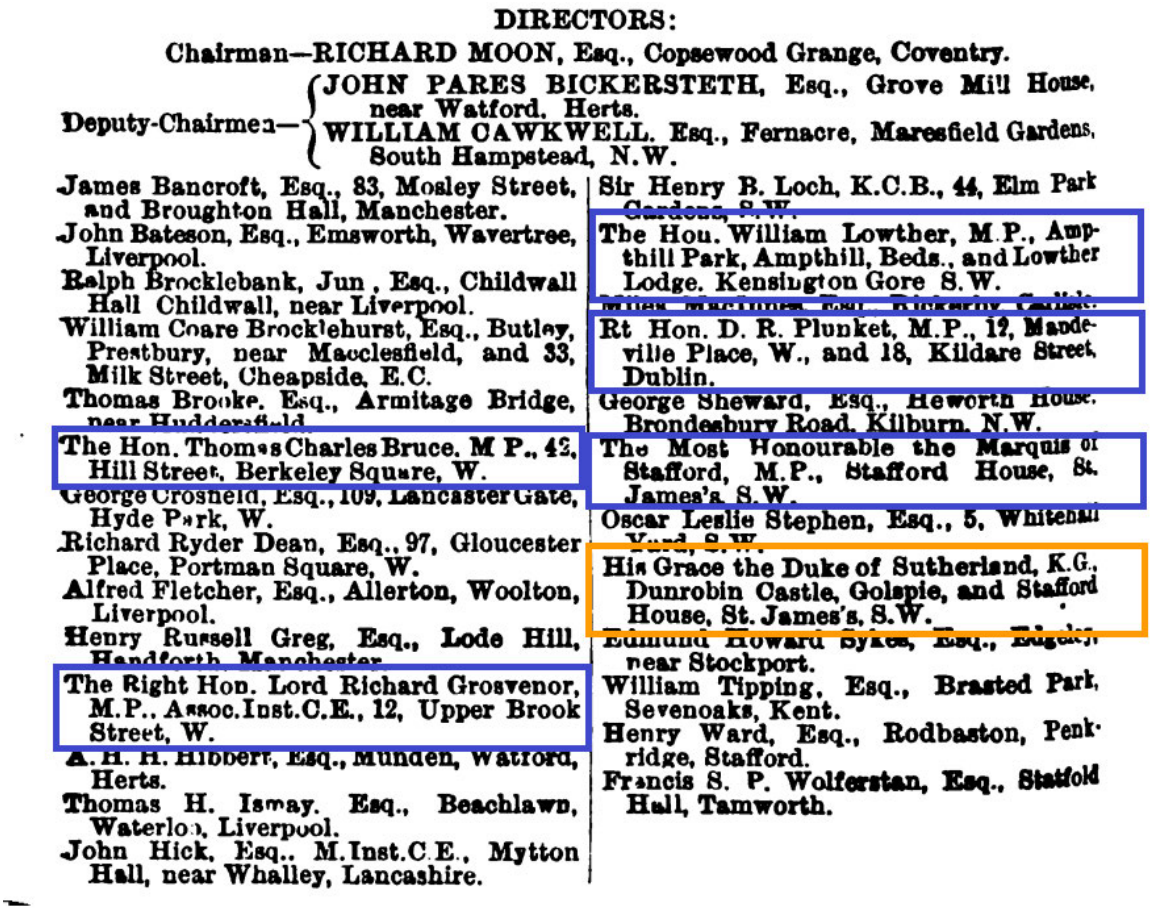

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Figure 1·1: Bradshaw's - Example of Directorate (London and North Western Railway, 1884)

railway director-M.P.s, denoted by blue boxes in the figure. The LNWR also had a railway director-Peer in 1884 which I have denoted with an orange box in the figure.

The unit of observation in this chapter is the company-year, or more specifically the railway-year. Because political connections are the primary explanatory variable of interest in this chapter, I offer concrete definitions below of political connections for both intensive and extensive margins. These definitions are used in constructing the measures of political connections used in the main regression specifications. I first present definitions used for measuring political connections across both houses,

and then analogously define these margins for both Houses of Parliament separately. These definitions of political connections defined at the company-year level are the working definitions of the explanatory variables of interest in this study.

Definition (Political Connections to Government (Intensive Margin)): *A railway i in year t is said to be more politically connected to government when the number of director-M.P.s and director-Peers on the board of i in t is larger. The number of director-M.P.s and director-Peers on railway i in t is denoted by GOV_{it}.*

Definition (Political Connections to Government (Extensive Margin)): *A Railway i in year t is said to be politically connected to government if there is at least one director-M.P. or director-Peer on the board of i in t. Whether or not railway i is connected to government in t is denoted by $\mathbb{1}\{GOV_{it} > 0\}$.*

Definition (Political Connections to the House of Commons (Intensive Margin)): *A railway i in year t is said to be more politically connected to the House of Commons when the number of director-M.P.s on the board of i in t is larger. The number of director-M.P.s on railway i in t is denoted by MP_{it}.*

Definition (Political Connections to the House of Commons (Extensive Margin)): *A Railway i in year t is said to be politically connected to the House of Commons if there is at least one director-M.P. on the board of i in t. Whether or not railway i is connected to the House of Commons in t is denoted by $\mathbb{1}\{MP_{it} > 0\}$.*

Definition (Political Connections to the House of Lords (Intensive Margin)): *A railway i in year t is said to be more politically connected to the House of Lords when the number of director-Peers on the board of i in t is larger. The number of director-Peers on railway i in t is denoted by $PEER_{it}$.*

Definition (Political Connections to the House of Lords (Extensive Margin)): *A Railway i in year t is said to be politically connected to the House of Lords if there is at least one director-Peer on the board of i in t. Whether or not railway i*

is connected to the House of Lords in t is denoted by $\mathbb{1}\{PEER_{it} > 0\}$.

Returning to the example of the directorate of the LNWR in 1884 (Figure 1·1), we can see how the above measures of political connections are used when $i = LNWR$ and $t = 1884$. $GOV_{LNWR,1884} = 6$, that is there are a total of 6 M.P.s and Peers on the board of the LNWR in 1884. It immediately follows that $\mathbb{1}\{GOV_{LNWR,1884} > 0\} = 1$, i.e. the LNWR was connected to government at the extensive margin in 1884. $MP_{LNWR,1884} = 5$ and $PEER_{LNWR,1884} = 1$, which immediately implies the LNWR was politically connected to both the House of Commons and the House of Lords in 1884.

1.2.2 Measuring Annual Capital Investment

The outcome variable of interest in the main specifications in this chapter is the annual capital investment done by each railway. Though *Bradshaw's* typically lists aggregate capital expenditure done to date for each railway, the annual capital expenditure is only listed for a small subset of firms. To get around this problem and to construct measures of annual capital investment for the railways, this chapter exploits the availability of consecutive years of *Bradshaw's* to calculate annual capital expenditure as the year-on-year change in aggregate capital expenditure, which I call capital investment in this chapter.

Several things must be noted here regarding timing. First, the annual editions of *Bradshaw's* used in this chapter were printed in December immediately prior to the year they are published in. For example: the 1884 edition of *Bradshaw's* was printed at the very end of 1883 and available very early in 1884. For the main explanatory variables of interest in this study, political connections, *Bradshaw's* updated changes in directorates up to the end of the year, *and appended errata if they changed since publication.* For example, the 1886 *Bradshaw's* contains an appended list of changes

to directorates, including changes in the titles of director-M.P.s who won/lost their seats in the November-December election of 1885. Thus political connections for year t are consistently measured as they stood at the start of that year.

The capital expenditures given in *Bradshaw's* for a given year t are measured in the summer of the year prior. To return to our running example of the LNWR, the aggregate capital expenditure listed in the 1884 edition *Bradshaw's* is the aggregate capital expenditure of the LNWR up to summer of 1883. Two-options arise for measuring annual capital investment (annual capital expenditure). The first option is to measure annual capital expenditure in year t as the change in aggregate capital expenditure between $t - 1/2$ and $t + 1/2$. To do this for year t, requires the capital expenditure listed in the year t edition of *Bradshaw's* and the $t + 1$ edition. This option is unappealing because part of the annual capital expenditure measured is occurring prior to the political connections in that year.

The other option is to measure annual capital expenditure for year t as the change in aggregate capital expenditure between the late summer of year t and the late summer of the following year. In effect, lagging capital expenditure for year t by a half a year. In this chapter, this is the option used. The measures of annual capital investment for a year t always lag the timing of the measured connections by a half year. One drawback to this approach is that relating political connections to annual capital investment in this manner requires three consecutive years of *Bradshaw's*.

1.2.3 Special Legislation - Firm-Specific Private Bills

Section 1.5 relates the political connections of railways in the House of Commons and the House of Lords to the railways' proposal of firm-specific private bills, their passage rates conditional on proposal, and the overall effect on the receipt of Private Acts of Parliament by the railways. In order to construct the relevant outcome variables

and samples for regression specifications exploring these relationships, I digitized information on private bill proposal and passage from appendices in *Bradshaw's*.

Annual editions of *Bradshaw's* contain appendices listing proposed special legislation, that is firm-specific private bills deposited with the Railway or Harbour Department of the Board of Trade in advance of the upcoming Parliamentary session in order to be considered for passage into Private Acts of Parliament. These appendices were used to construct a variable that is the number of private bills proposed at the railway-year level.

Additional appendices list the railway Private Acts of Parliament passed into law and receiving the royal assent in the prior year. From these appendices railway-year-level measures of Private Acts received, or overall bill passage, are digitized. These appendices are retrospective, looking back at the past year. Thus in order to measure bills passed in year t, I use the bill passage appendices in the $t+1$ edition of *Bradshaw's*. Relating political connections in year t to bill passage in year t thus requires two consecutive years of the editions of *Bradshaw's*.

The conditional bill passage rate, defined as the likelihood of passing legislation conditional on proposing legislation, is another item of interest in section 1.5. The outcome variable is the same as that for overall bill passage, but the sample is restricted to the railways that proposed legislation for that year. Similar to overall bill passage, exploring how this relates to political connections requires two consecutive years of the data source.

1.3 U.K. Railways - Broad Industry Dynamics

1.3.1 Railways: The Big Industry

Figure 3·1 plots the number of distinct railway corporations in the U.K. by year as given in various editions of *Bradshaw's*. This number includes only current railway

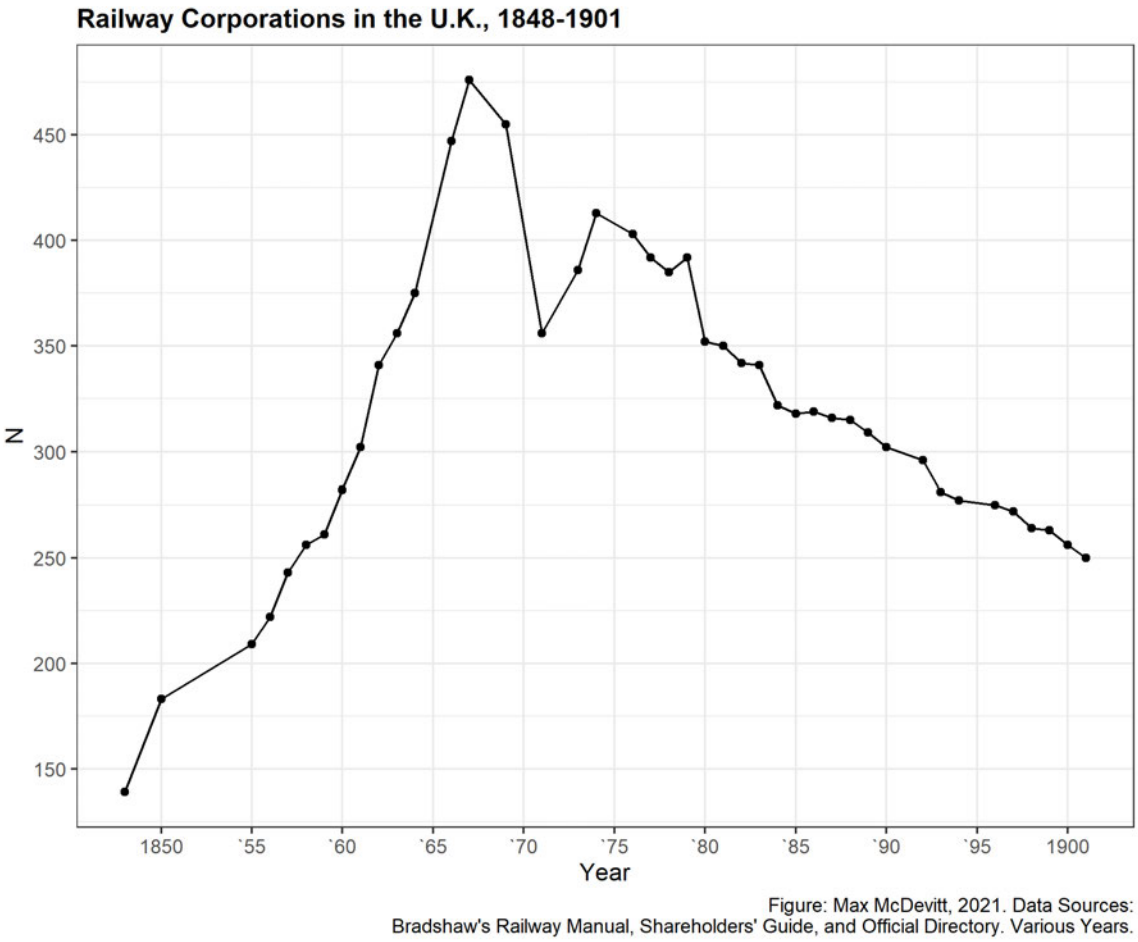


Figure 1·2: Size of U.K. Railway Industry, 1848-1901

corporations and thus does not include provisional companies, that is prospective railways that had formed committees and submitted an incorporation bill, a type of railway Private Bill allowing for the legal formation of the firm, but had not yet received an Act of Parliament incorporating the railway. Increases over time in the number of railways comes from the incorporation of new railways through Private Acts of Parliament. Decreases in the number of railway corporations over-time comes primarily through mergers and acquisitions as well as failed railways being wrapped up by Parliament and/or the courts. The incorporation of new railways by Private Acts of Parliament occurred frequently during the first two decades shown in the

graph. In 1848, 139 railways operated in the U.K.. The number of railways increased monotonically over the following 19 years to an all time high of 476 in 1867, an increase of more than 240%. Note that these changes are net changes and thus the increase in the series *does not imply* that mergers and firm-exits did not occur during this period. Rather the contraction in the number of firms resulting from mergers, acquisitions, and exits during this period is smaller in magnitude than the expansion of new railways through Private Acts of Parliament incorporating new railways during these years.

Following the zenith in 1867, the number of railways contracted sharply to 356 in 1871 before expanding again to 413 in 1874. The timing of these reversals coincide, with about a 1-2 year lag, with the dating of the business cycle in *British Economy of the Nineteenth Century*: 1866 and 1873 are listed as 'peak' years with business cycle 'troughs' in 1868 and 1879 ([Rostow, 1948]). The fact that the inflections in the number of railways lags Rostow's dating for the 1860s and 1870s is unsurprising: formation of new railways through incorporation bills typically took several years of prior planning and investment by provisional committees, these are more commonly planned during business cycle expansions and incorporation bills which had already been invested in are likely to have gone before Parliament even if the market was contracting. As for mergers, acquisitions, and the dissolution of corporations, these would have been more likely to be planned after the start of a recession and thus would be highly unlikely to show up in Parliamentary legislation until at least a year later. The number of railways expanded again to 413 in 1874, one year after Rostows' business cycle peak of 1873, before declining steadily to 250 firms in 1901.

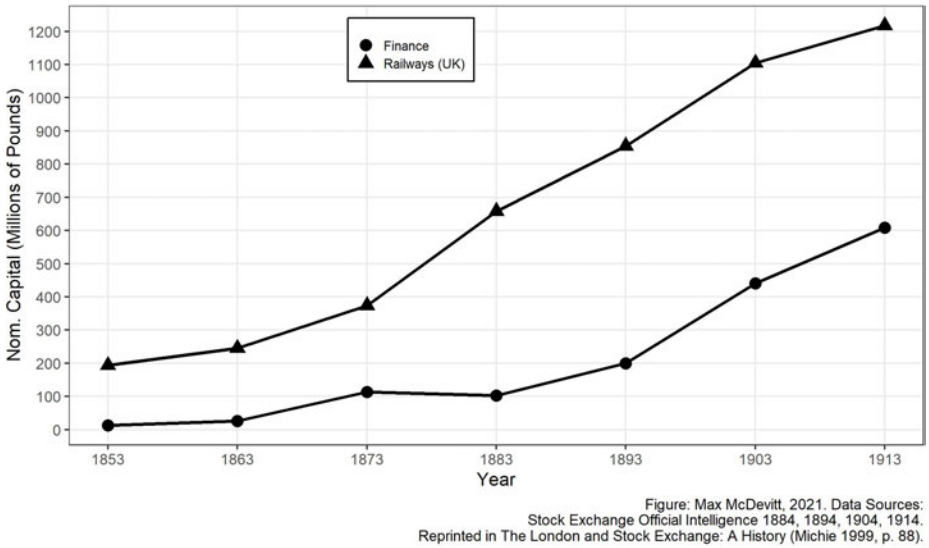
The dynamics of the number of railways in the U.K. shown in figure 3·1 begins to outline the industry during the second half of the 19th century. To further illustrate the industry in the time-place under consideration, I present figures 1·3a and 1·3b

below measuring the nominal market capital of railways listed on the London Stock Exchange (LSE) in decadal intervals from 1853-1913. Not all railways were listed on the LSE; in fact, a minority of them were listed. However, listing of railways on the LSE depended primarily on the size of the railway. Thus though these figures for nominal capital of listed assets come from a strict subset of the railways, they include all of the large railways. These figures thus understate the absolute nominal size of the railways. In addition they are an imperfect measure of comparison of nominal capital investment across industries because selection into listing securities on the LSE was not orthogonal to industry type. However investors, brokers, and firm directors studied the data underlying these figures actively as it came out. Caveats aside, since the LSE was (and remains) the largest exchange in the U.K., the following graphs paint an illustrative if imperfect portrait of the growth of U.K. railways and the relative size of the railway securities market from 1853-1913.

Figure 1·3a plots the nominal capital of all listed securities of U.K. railways against the same for all finance firms on the LSE. In every decadal interval from 1853-1913 railways accounted for substantially more of the value of assets traded on the LSE. Nominal capital of the listed U.K. railways in 1853 was approximately £200,000,000, while the listed securities of U.K. finance firms was negligible in that year. Financial industry securities listed grew quickly on the LSE during this period to approximately £600,000,000 in 1913. Nominal capital of listed railway securities grew at a slower rate than finance, but still increased by a factor of 6 during this 6 decade period to be approximately £1,200,000,000 in 1913. Comparisons to other industries are contained in the appendices.

Figure 1·3b takes the nominal value of all railway securities listed on the LSE, including non-U.K. railways, and divides this by the nominal capital of all securities listed on the LSE. In 1853 railways accounted for approximately 18% of nominal

(a) U.K. Railways and Finance - Nominal Capital



(b) Railway Share of Nominal Capital

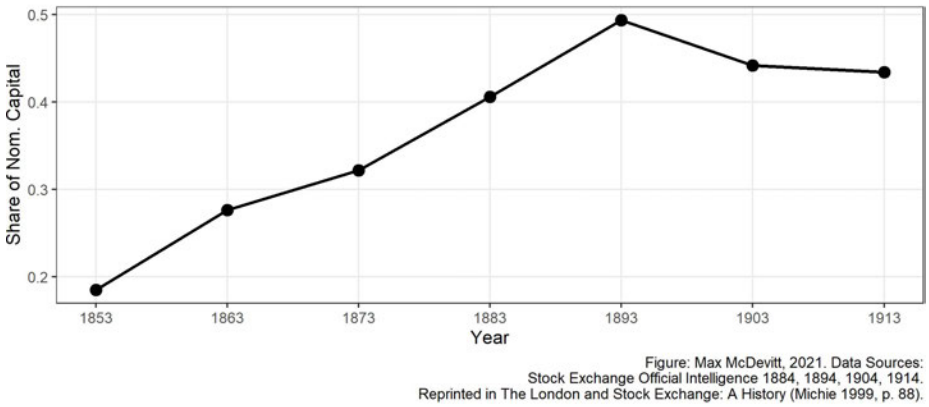


Figure 1·3: London Stock Exchange, 1853-1913

capital. The railway share grew enormously, surpassing a third of all listed capital on the LSE in the 1870s, and peaking in 1893 at nearly 50%. This means railways accounted for nearly half of the nominal capital of assets traded on the LSE in 1893. Railways dominated the LSE and capital markets broadly in the U.K. throughout the period under study. The fact that railways dominated capital markets for over half a century during a period of explosive economic growth makes them an especially appealing industry in which to study determinants of capital investment and the allocation of that investment across different firms.

1.3.2 Railway Director-M.P.s in Parliament

Far from being rare figures in the U.K. Parliament of the 19th C., directors at one time made up half of all members of Parliament ([Braggion and Moore, 2013]). For railways alone hundreds of distinct individuals were railway director-M.P.s. At any one time during the second half of the 19th century, railway director-M.P.s made up a non-trivial share of the House of Commons. Figure 1·4 plots the number of railway director-M.P.s in Parliament. The House of Commons and House of Lords are plotted separately and their sum is shown as well.

The time series begins in 1858. In that year fully 107 M.P.s were concurrently railway directors. At the time membership in the House of Commons stood at 654 M.P.s ([McCalmont, 1910]). Corporate railway directors thus made up over 16% of the membership of the House of Commons in 1858. The membership of the House of Commons, that is the number of M.P.s, increased to 658 in 1861, decreased to 652 in 1870, and was fixed at 670 by the Redistribution Act of 1885, where it remained into the 20th century ([McCalmont, 1910]). These changes in the total number of seats at this time are very small relative to the level. Thus the patterns in the time-series for the number of railway director-M.P.s are near identical to those for shares of seats

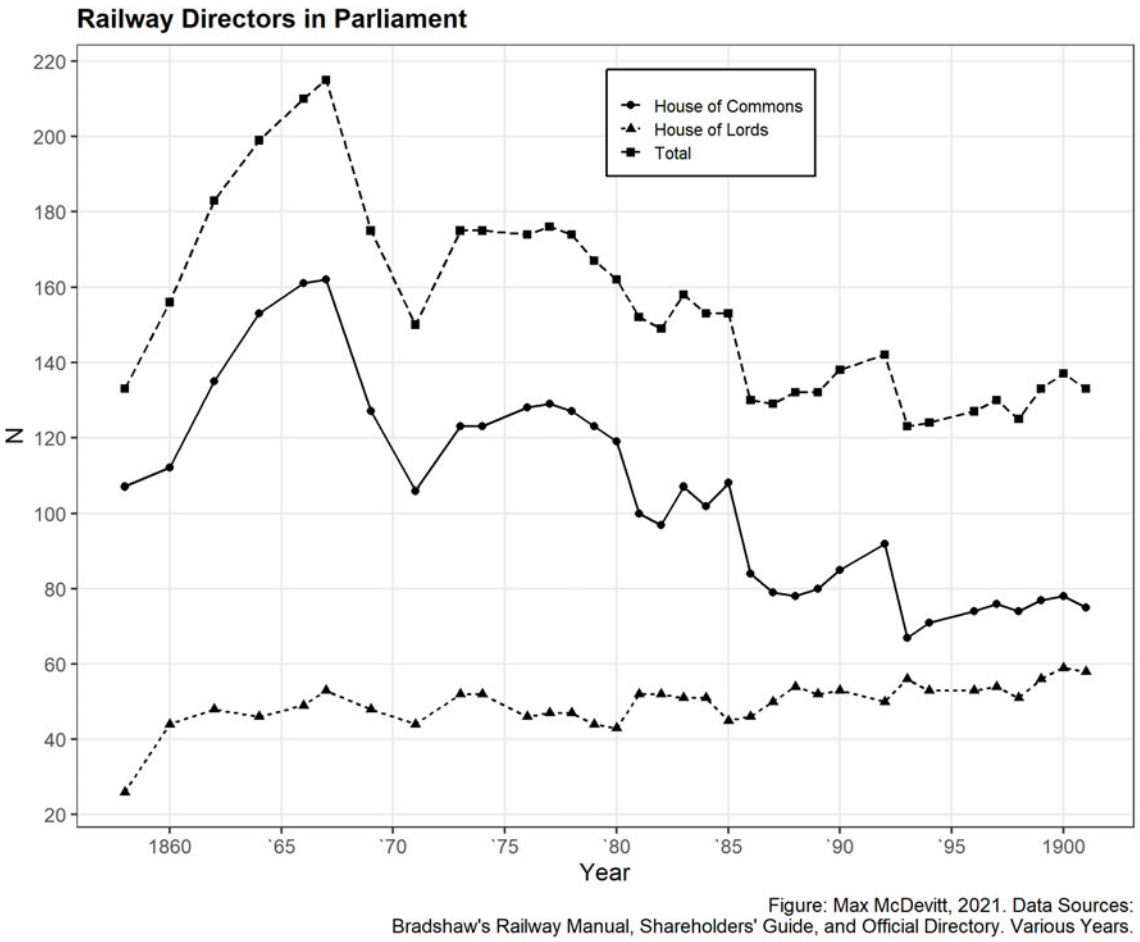


Figure 1·4: Railway Directors in Parliament, 1858-1901

in the House of Commons modulo the level of the series. The number of railway director-M.P.s grew in the late 1850s and the first half of the 1860s to a peak of 162 in 1867. At this peak in 1867, fully 24.6% of the seats in the House of Commons were occupied by railway director-M.P.s! In this year the Second Reform Act received the Royal Assent in July of 1867, discussed below, and the electorate doubled at the next general election in November and December of 1868. Notably this first election after the pro-democratic franchise expansion saw 127 railway directors returned to the House of Commons, a net decline of 35 railway director-M.P.s making a 21.6% decline in the number of railway director-M.P.s. The decline in the number of railway director-M.P.s that occurs between the zenith in 1867 to just shy of 80 at the turn of the century is a series of large declines at most general elections, in 1867, 1880, 1885, 1886, and 1892, and little year-to-year changes between these general elections.

The number of railway director-Peers in the House of Lords is plotted as well. In 1858 26 Peers concurrently sat on railway boards. A sharp increase occurs to 44 railway director-Peers in 1860. From there to the end of the century the series rises and falls mildly with a subtle positive time trend so that by 1901 58 railway directors were Peers. Unlike M.P.s in the Commons, Peers in the Lords were not elected. Thus we see very little movement in the number of director-Peers around general elections despite large movements in the number of director-M.P.s. Co-movement in the series for director-M.P.s and director-Peers is likely induced through mergers and consolidations in the number of railways post-1867 (See figure 3·1). Note that the declines in the Commons at general elections sometimes coincide with gains in the railway interest in the Lords. This occurs during the general election years of 1880 and 1892.

These individuals, whether director-M.P.s or director-Peers, actively legislated on their own firms as well as their rivals through the private bill procedure. They also

influenced the course of public railway bills, such as general worker regulation or corporate accounting laws, through the public bill process. To me this is a smoking gun disproving one claim of a famous economic historian that Parliamentarians were rarely financially interested in what they legislated on during the 19th C. W. W. Rostow claimed that,

> *More generally, the personal economic motives of a political figure appear often to have little relevance to his position on particular issues. The profession of the politician or statesman, as one who helps press forward or resolve peacefully the pressure thrust from below into the arena of politics, is, in one sense, intrinsically disinterested. The politicians who directly benefit economically from participating in politics are, for Britain in the nineteenth century, rare.* ([Rostow, 1948])

This claim is at odds with the body of quantitative evidence and institutional analysis presented in this chapter. Restricting attention to railway directors, we can see that in some years as many as 1 in 4 members of the house of commons were concurrently railway directors. Given that these M.P.s legislated on their own firms, their competitors, and their industry generally, they were intrinsically interested.

Corporate directors frequently hold directorships in multiple companies at the same time. The business directors in Parliament during the 19th C in the U.K. were no exception to this rule. Thus the graph of railway-directors in Parliament in general understates the degree of political connections measured across all railways. To the extent that there are dynamic changes in the distribution of the number of railway-directorships per director-M.P. the time-series is a biased proxy of the number of political connections of railways.

Three major expansions of democratic norms occurred between the mid 1860s and the mid 1880s that likely played a major role in the decline in the size of the railway

interest in the Commons in the latter decades of the 19th C. The most important of these were the Second and Third Reform Acts both of which increased the size of the electorate significantly immediately after they were enacted. The Third Reform Act increased the U.K. electorate by 67% ([O'Leary, 1962]) The change to voting by secret ballot makes up the the third of the major reforms. "The Ballot Act is regarded by the constitutional history textbooks as next in importance to the Reform Acts in the remodeling of the electoral system." ([O'Leary, 1962]). These three major expansions of democratic rights in the U.K. and their implications for political connections are briefly discussed below. This question regarding the implications of expanding democratic rights for political connections, is being explored more thoroughly in another work by myself.

The Ballot Act of 1872 (35 & 36 Vict. c. 33) received the royal assent on 18 July 1872 ([O'Leary, 1962]). The Ballot Act required that both parliamentary and local government elections be held by secret ballot. This was the first time in British history that voting was secret ([Ensor, 1936]). The bill that became the Ballot Act was introduced and passed with the intention of mitigating the degree to which employers and landlords could influence the votes of their employees and tenants through threats. Prior to the Ballot Act of 1872 going into effect, voting in the U.K. was done publicly and the rosters of who voted for whom were available to candidates, parties, and whoever else was interested after the election. This allowed for a fairly large amount of coercion, vote-buying, and undue influence of voters from the powerful, be they landlords, employers, or powerful politicians. A few examples of this behavior proves illustrative. One director-M.P., Sir Henry Edwards who chaired the Beverley Waggon Company, used bribery extensively to maintain his position in Parliament. Edwards made himself the political boss of the town of Beverley in the late 1850s and early 1860s. According to O'Leary, Edwards "...established a Conservative Working Men's

Association-staffed largely by officials of his company-and provided it with a constant flow of money for bribery, not only at but between elections. His nominees secured control of the corporation...even the local charities were manipulated to Edwards's advantage...Edward's supporters 'exercised an almost absolute control and mastery in the public and municipal affairs' of Beverley..." ([O'Leary, 1962]).

Examples of coercion from employers include cases of railway directors using their position as employers to exert undue influence on the votes of their employees.

> *William N. Hodgson (then Conservative member for West Cumberland) had stood for Carlisle in 1868 against Sir Wilfrid Lawson, and had canvassed the employees of the London and Northwestern Railway Company of which he was a director. The day after the election those who voted against him were dismissed. On the other hand, a Liberal mill-owner at Ashton-under-Lyne dismissed forty workers who had disobeyed 'instructions' to vote for the Liberal candidate, Milner Gibson, which were boldly posted up at their mill.* ([O'Leary, 1962])

Introduction of the secret ballot made the wide-spread practices of vote-buying and treating ([O'Leary, 1962]) blunted instruments. Introduction of the secret ballot eliminated the ability of employers, landlords, politicians, and political agents to ex-post verify compliance in voting. Because the information of how individuals voted was no longer available to candidates and parties post-election, the outcome of vote-buying and treating could not be verified. In effect this changed the principal-agent problem of coercing votes from a principal-agent problem with near perfect ex-post verification to one in which there was no ability to verify ex-post. This more or less completely destroyed the market for vote-buying, though treating continued to some extent. The same change occurred for coercion from employers and landlords in the form of threats to employees and tenants: without being able to verify how

employees and tenants voted, threats of dismissal or eviction contingent on voting were meaningless. This in effect made it harder for business elites to maintain seats in Parliament.

In addition to the introduction of the secret ballot, franchise expansions in 1867 and 1884 changed the political environment, influencing the ability of business elites to maintain seats in the Commons. The Representation of the People Act 1867 (30 & 31 Vict. c. 102), also know as the Reform Act of 1867 or the Second Reform Act, expanded the franchise to a large part of the male working class in England and Wales. In addition the franchise was extended to all male heads of households. This reform immediately increased the size of the electorate by 88.7% in England and Wales, giving an additional 938,000 men the right to vote on top of the 1,057,000 elegible immediately prior to the Act ([Woodward, 1962]). The new voters were drawn primarily from the urban working class ([O'Leary, 1962]). This change in both the size and composition of the electorate had serious implications for would-be M.P.s, especially those who sought a seat in Parliament for the sake of private benefits. The Representation of the People Act 1884 (48 &49 Vict. c. 3), also known as the Third Reform Act, extended the concessions to boroughs contained in the Second Reform Act to the countryside. This increased the electorate in the countryside of England and Wales by 162% while the increase in the Irish electorate was 200%. The overall effect of the 1884 reform was an increase in the electorate of two-thirds from approximately 3 million eligible voters to 5 million ([O'Leary, 1962]; [Ensor, 1936]). Thus the electorate increased by roughly 400% between 1867 to 1884. The number of railway director-M.P.s in the House of Commons fell from a peak of 162 in 1867 prior to the Second Reform Act to 79 in 1887, just 3 years after the passage of the Third Reform Act.

Railway director-M.P.s and director-Peers made up large portions of Parliament

throughout the second half of the 19th C. Dynamic variation in the absolute size of this railway interest in Parliament has been discussed above. In addition, the degree of political connections of individual railways varies over-time. The fact that there is considerable amounts of directly observable cross-sectional and time-variation in political connections of the railways over many decades makes this an appealing context to study political connections and how they relate to capital investment. This is done in the following section.

1.4 Political Connections and Capital Investment

The main results on political connections and capital investment are presented here. Figure 1·5 (p. 24) plots the average annual capital investment of U.K. railways by the extensive margin of political connections by year with 95% confidence intervals. This is a graphical presentation of a within-year difference-in-means test. Capital investment is lagged one year behind political connections. This reflects an institutional environment in which explicit Parliamentary approval in the form of Private Acts of Parliament, that is special legislation, were legally required for most types of railway capital investment. Given this governmental structure, both *de jure* and *de facto* it is expected that the association between political connections and capital investment is lagged rather than contemporaneous. In the figure plotting mean annual capital expenditure, the values in a given year reflect the political connections in that year and the capital expenditure in the following year. Figure 1·5 shows political connections for 1876-1899 and capital investment for 1877-1900 (p. 24).

Unconditional mean annual capital investment was £118,000 for this period. Mean annual capital investment of railways is very different for politically connected firms and those that have no political connections as strikingly presented in figure 1·5. During the period 1877-1900, the annual capital investment of politically connected

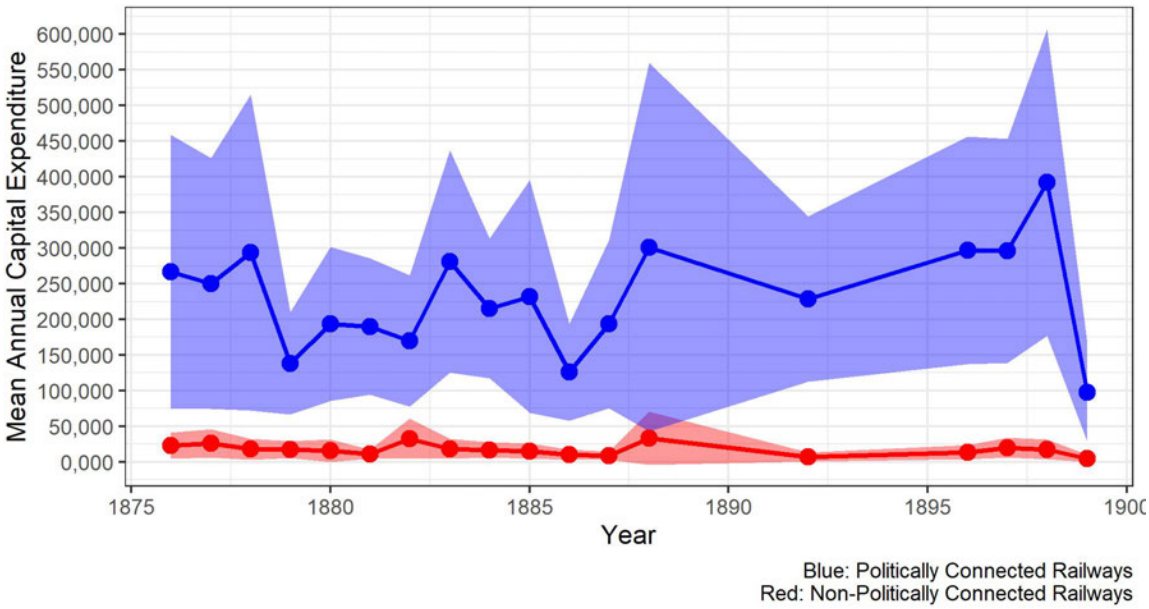


Figure 1·5: Political Connections and Capital Investment (Mean = £118,000)

railways averaged £276,000. Firms without any political connection averaged £16,000 capital expenditure. Crossing the extensive margin of political connections in the final quarter of the 19th C is thus associated with increasing annual capital investment by a factor of 17.25.

The fact that railways politically connected at the extensive margin do an order of magnitude more capital investment annually than their non-connected counterparts is not driven by exceptional years in the data. Rather this pattern is reflected in all of the individual years plotted. In only one of the eighteen years plotted, political connections in 1888 and capital expenditure in 1889, does the difference in means test fail to be statistically significant at the 95%-level. However, if a 90%-CI is used, the difference in this year is also statistically significant. The interpretation of the figure is that politically connected railways did more than an order of magnitude more investment than their non-connected counterparts.

I next explore the relationship between political connections and capital investment in a regression frame-work exploiting the panel structure of the data developed for this study. The panel structure of the data-set allows for the estimation of regression models that include company fixed effects and thus control for firm-specific time-invariant confounders. First, we consider the relationship at the intensive margin of political connections, collapsing the political connections in the House of Lords and House of Commons to a single measure of connections to government, as measured by the number of railway director-M.P.s and railway director-Peers on the board of a railway in a given year. (Regression results for the extensive margin of political connections are presented in Appendix 1.9.1, on page 56.)

1.4.1 Political Connections and Capital Investment: Intensive Margin

We now turn to investigating the intensive margin of political connections and their association with subsequent capital investment realized by the railways. The model is as follows:

$$y_{it+1} = \beta_0 + \beta_1 GOV_{it} + \psi_i + \gamma_t + \phi_{l(i),t} + \epsilon_{it} \tag{1.1}$$

In the equation above y_{it} denotes the capital expenditure of railway i in year t. GOV_{it} is a count of the number of director-M.P.s and director-Peers on the board of railway i in year t. γ_t, ψ_i, $\phi_{l(i)t}$ are year, company, and location-by-year fixed effects respectively. Year fixed effects control for annual variation in capital investment in U.K. railways. Inclusion of year fixed effects controls for variation in railway capital investment stemming from the business cycle shocks to capital investment of railways. Company fixed effects control for time-invariant un-observable characteristics of the firms studied. Location-by-year fixed effects control for place-specific

time-varying shocks to railway capital investment. An example of place-specific time-varying shocks of relevance would be increased railway capital investment in a locale resulting from an increase in the world price of coal or the discovery of a new coal field or iron vein in that locale causing the same. Since location-by-year fixed effects are a refinement of year fixed effects, in any specification in which location-by-year fixed effects are used, year fixed effects are omitted. Table 1.1 presents the results of estimating this model for the period 1876-1900. Standard errors are heteroskedastic-robust [White, 1980]. The long-panel structure of the data allows for estimating the regression model directly rather than using a first-difference or a within-estimator. As such the standard errors are centered around a firm-specific level of capital investment. Results of estimating the above model are given in table 1.1.

Table 1.1: Political Connections and Capital Investment - Intensive Margin

	Capital Investment (£)		
	(1)	(2)	(3)
Count Director-Government	156,430***	79,595***	81,575***
	(15,735)	(22,374)	(23,074)
Year Fixed Effects	No	Yes	No
Company Fixed Effects	No	Yes	Yes
Location x Year Fixed Effects	No	No	Yes
Observations	3,213	3,213	3,213
Adjusted R^2	0.209	0.504	0.497

*p<0.1; **p<0.05; ***p<0.01

Note: Mean annual capital investment is £118,000. Heteroskedastic standard errors are reported in parentheses [White, 1980]. Estimated firm fixed effects center standard errors around a firm-specific mean level of capital investment. Capital investment is lagged behind political connections by 1 year.

The results in the above table may be interpreted as follows. The results in column

(1) shows that additional board members in Parliament (either House) is associated with an increased capital expenditure of £156,430 in the following year. This associated increase is 133% of the (unconditional) mean annual capital investment done and 977% of the mean annual capital investment done by railways that have no political connections as defined in this study.

Turning to the fixed effects estimates presented in columns (2) and (3), we can see that the magnitude of the association between political connections and capital investment is cut roughly in half yet stays statistically significant at the 1%-level. The magnitude is still very large economically: the increase in capital investment associated with each additional director-M.P. or director-Peer is 69% of the unconditional mean and 510% of the mean conditional on having no political connections. The differences between the coefficients and standard errors in columns (2) and (3) are negligible and the fact that the Adjusted R-squared falls when year fixed effects are replaced with location-by-year fixed effects suggests that the simpler model using the smaller number of year fixed effects is a better fit of the data. Both columns (2) and (3) can be interpreted as saying that *within-firm* increases in political-connections were associated with large subsequent increases in capital investment. Each additional director-M.P. or director-Peer on the board is associated with an increase of roughly £80,000 capital investment done in the following year. To put this in perspective, a pound in 1885 was worth more than 130-times what a pound was worth in 2021. In today's money, that £80,000 is over £10.5 Mil.

1.4.2 Political Connections and Capital Investment: Separating the Houses of Parliament

Thus far the results presented are estimates of regression models which treat political connections in the House of Commons and the House of Lords as the same thing, in effect pooling the political connections in the elected and the elevated and hereditary

Houses of Parliament. However, the detailed data on political connections constructed for this chapter allows for the consideration of the political connections in the two houses as separate and distinct. In this section, I repeat the analysis done above for the intensive margin of the political connections of railways breaking the measure of political connections up and considering the two houses of Parliament separately. The regression specification used is a fixed effects estimator of the same flavor as equation 1.1, but this time the intensive measure of political connections is separated into an intensive measure of political connections in the House of Commons, as measured by the number of director-M.P.s, an intensive measure of political connections in the House of Lords, as measured by the number of director-Peers, and an interaction term. The regression specification is given in equation 1.2 below.

$$y_{it+1} = \beta_0 + \beta_1 MP_{it} + \beta_2 PEER_{it} + \beta_3 MP_{it} \cdot PEER_{it} + \psi_i + \gamma_t + \phi_{l(i),t} + \epsilon_{it} \quad (1.2)$$

MP_{it} denotes the number of director-M.P.s on the board of railway i in year t. $Peer_{it}$ denotes the number of director-Peers on the board of railway i in year t. All other terms in equation 1.2 are as defined for equation 1.1 on page 25.

Results of estimating the above model are shown in the table 1.2. As can be seen, political connections in either house are associated with large and statistically significant increased capital expenditure. The fact that the interaction term is null may surprise readers who expected it to be positive and significant consistent with a model of complementarity between the Houses of Parliament. The null result could be the results of higher-order polynomials in connections in either house loading onto the interactive term in the absence of inclusion in the fitted model. Inclusion of company fixed effects wipes out statistical significance in the House of Lords, but House of Commons retains statistical significance and the magnitude is large: within-

company an increase of one director-M.P. is associated with a roughly 100% increase in subsequent capital expenditure relative to the unconditional mean.

Table 1.2: Political Connections and Capital Investment - Separating Commons and Lords

	Capital Investment (£)		
	(1)	(2)	(3)
Count Director-M.P.	224,155***	116,111***	118,563***
	(26,646)	(33,187)	(33,476)
Count Director-Peer	42,397**	34,327	38,705
	(19,938)	(27,394)	(29,302)
Count Director-M.P. X Count Director-Peer	4,443	−21,024	−22,598
	(15,028)	(13,066)	(13,883)
Year Fixed Effects	No	Yes	No
Company Fixed Effects	No	Yes	Yes
Location x Year Fixed Effects	No	No	Yes
Observations	3,213	3,213	3,213
Adjusted R^2	0.243	0.507	0.501

*p<0.1; **p<0.05; ***p<0.01

Note: Mean annual capital investment is £118,000. Heteroskedastic standard errors reported in parentheses [White, 1980]. Estimated firm fixed effects center standard errors around a firm-specific mean level of capital investment. Capital investment is lagged behind political connections by 1 year.

1.4.3 Political Connections and Capital Investment: General Elections and Plausibly Exogenous Variation in Political Connections

The fixed effects estimation results in tables 1.1 and 1.2 strongly suggest a central role for political connections in explaining capital investment in U.K. railways. However, the fixed effects results do not prove that political connections caused subsequent capital investment. To conclude the relationship is causal from the estimation of equations 1.1 and 1.2 requires the strong assumption that conditional on firm and year or location-by-year fixed effects, the political connections of the railways were

as good as randomly assigned. Firm fixed effects control for selection of political connections on time-invariant characteristics, however any time-variant firm-specific unobservables that are correlated with political connections as well as subsequent capital investment potentially bias the estimated relationship between political connections and capital investment. To address this concern and push the argument in the direction of causality, I exploit general elections in the U.K. as a source of plausibly exogenous source of within-firm changes in political connections. The regression specification used is equation 1.3, discussed below on page 32. The results of estimating this equation, presented in table 1.3, are consistent with the prior results in tables 1.1 and 1.2. This suggests that the relationship between political connections and capital investment may be causal. Before turning to the empirical specification and estimation results, I discuss the plausible exogeneity of changes in political connections induced by general elections in the U.K.

On the Plausible Exogeneity of Changes in Political Connections Induced by Elections

M.P.s were (and are) elected positions in the House of Commons, unlike the analogous legislators in the House of Lords, the un-elected Peers. Popular election of M.P.s occurred both at general elections, following a dissolution of Parliament, or at special by-elections to replace deceased, un-seated, or resigning M.P.s. At general elections, all M.P. positions are open to competition before the relevant electoral divisions. When general elections occur, the political connections of railways in the House of Commons are changed by the outcomes of the elections. In fact, the largest year-on-year changes observed in the data in the number of distinct railway director-M.P.s in the House of Commons all span general elections for the period under study. Because elections determine M.P.s, given directorships they in turn determine director-M.P.s, and this in turn determines the political connections of firms in the post-period,

following the election.

This chapter follows [Braggion and Moore, 2013] in using U.K. POST-PRE general elections as a source of plausibly exogenous variation in the political connections of U.K. firms. For Braggion and Moore, who are interested in estimating the value of political connections as perceived by the market, the outcomes of interest are short-run asset price movements. For this chapter, the outcome of interest is capital investment. The assumption that within-firm changes in political connections POST-PRE general elections are as good as randomly assigned is needed in order to conclude that the results presented below have a causal interpretation.

In this context this assumption is less strong than it first appears. This assumption is not about the *level of political connections* in the House of Commons but rather about the *change in the level of political connections*. Within-firm changes in the level of political connections induced by general elections are a compound of both pre-election decisions regarding running for office, i.e. whether railway directors run for Parliament in individual electoral contests, as well as the results of electoral competition. The former decisions are to some extent under the control of railways and are endogenous to beliefs regarding the likely outcomes of the elections. The outcomes of individual election contests were largely outside the control of individual railways and hinged primarily on larger political factors of the time, such as voting rights, Home Rule for Ireland, international affairs, business cycle variations, and Worker-Management conflicts in the rapidly industrializing U.K. Firm-specific capital investment of railways is unlikely to have played much of a role in the success or failure of candidates in individual contests. In addition, dissolution of Parliament, which triggered general elections, resulted from larger political movements leading to votes of no confidence in the current government, not railway specific capital investment patterns. Taken together these details suggest that within-firm changes in

political connections stemming from general elections are largely outside the control of firms.

Elections: Empirical Specification and Estimation Results

$$\Delta y_{it+1} = \gamma_{election} + \beta_1 \Delta MP_{it} + \Delta PEER_{it} + \phi_{l(i),election} + e_{it} \tag{1.3}$$

Equation 1.3 is derived by differencing equation 1.2 over general elections. Δy_{it+1} is the change in lagged capital investment of railway i, where Δ is the difference between POST-election and PRE-election values. ΔMP_{it} is the variable of interest, it is the change in number of director-M.P.s on the board of railway i from PRE-election to POST-election. $\Delta PEER_{it}$ is analogously defined. Because elections were for the House of Commons, i.e. M.P.s and not for the House of Lords, i.e. Peers, the argument for plausible exogeneity of connections induced by the elections only applies to the director-M.P. political connections. Thus $\Delta PEER_{it}$ is viewed as a control in this specification. Whether this is included as a control (Columns (1) and (2) in table 1.3) or excluded (Columns (3) and (4)) has a negligible impact on the estimated coefficient of interest, does not impact statistical significance, and does not change the interpretation of the result. Given that the equation is differenced and thus regressing margins on margins, I abstract from the interaction term in equation 1.2 for the specification for general elections. The $\gamma_{election}$ and $\phi_{l(i),election}$ terms are motivated by the differencing of the year and location-by-year fixed effects in the panel specification, equation 1.2. Within equation 1.3 they play the role of allowing for mean changes in capital investment before and after an election, allowing for cyclical factors impacting capital investment across all railways. In the case of $\phi_{l(i),election}$, these cyclical factors are allowed to vary by location. Results of estimating equation 1.3 pooling the general elections of 1880 and the back-to-back elections of 1885/1886 are presented below in table 1.3. Discussion of the results follow.

Table 1.3: Political Connections and Capital Investment - Plausible Exogeneity (General Elections)

	Change in Capital Investment (£)			
	(1)	(2)	(3)	(4)
Change in Count Director-M.P.s	114,560*	112,510*	111,072*	109,595*
	(62,200)	(61,846)	(61,437)	(62,513)
Election Fixed Effects	Yes	No	Yes	No
Location x Election Fixed Effects	No	Yes	No	Yes
Controls for Director-Peers	No	No	Yes	Yes
Observations	337	337	337	337
Adjusted R^2	0.042	0.027	0.044	0.028

*p<0.1; **p<0.05; ***p<0.01

Note: Mean annual capital investment is £118,000. Standard errors are heteroskedastic robust [White, 1980]. Capital investment is lagged behind political connections by 1 year.

The results in table 1.3 suggest that within-firm an increase of one director-M.P. was associated with an additional £110,000 to £115,000 of capital investment in the post-election period relative to the pre-election period for that firm. This is statistically significant and very large in magnitude: the mean annual capital investment of railways was £118,000. Each additional director-M.P. is thus associated with increasing annual capital investment by 93%-97% on average. If the identifying assumption is accepted, that is if the reader accepts that within-firm *changes* in political connections to the House of Commons induced by general elections are as good as randomly assigned, then the result has a causal interpretation. Under this assumption, each additional director-M.P. on the board of a railway caused annual capital investment to increase by almost 100% of the unconditional mean.

1.5 Private Bill Legislation and Political Connections: Institutional Mechanism

In this section it is argued that firm-specific private bills, special legislation, are an important channel through which political connections influenced the allocation of investment capital and lead to larger firm-specific capital investment. Private Acts of Parliament are successful private bills. That is they are private bills passed through the private bill procedure in Parliament and voted by Parliament into law, subsequently receiving the royal assent. In this section, railway private bills are discussed. (General institutional details regarding private bill legislation are provided in the appendix in section 1.10). Novel data on railway private bill proposal and passage, as described in subsection 1.2.3, is used to relate political connections to special legislation, which is proposed in this chapter to be an important channel by which political connections lead to higher capital investment. The novel railway-year panel on special legislation is matched to the novel panel documenting the political connections of the railways and regression analysis is performed.

Three sets of results follow. These results are stated here in terms of the extensive margin of political connection. All three statements hold true for the intensive margin as well as shown in the results below. First, politically connected railways proposed legislation at higher rates than non-politically connected railways. Second, conditional on proposing legislation, politically connected railways passed legislation at higher rates than non-politically connected railways. Third, politically connected railways were more likely to receive Private Acts of Parliament, i.e. propose and successfully pass firm-specific private bills. The last result in effect combines the proposal margin, itself endogenous to beliefs about passage rates, with the conditional passage margin.

In the following subsection, 1.5.1, I discuss railway private bills. In subsection

1.5.2 I discuss the reasons railways needed private bills to be passed by Parliament. Finally, in subsection 1.5.3 I turn to the regression specifications and present results.

1.5.1 Acts of Parliament: Railway Private Bills

The appendix discusses the overall breakdown of 19th century legislation between public and private (Section 1.10). Private Acts outnumbered Public Acts by roughly two-to-one between 1801-1884. Railways took up the lion's share of private bills during the 19th C. Railways were closely tied to the legislature from their inception. A legal historian reminds us that "Among the great industrial enterprises of nineteenth-century England, the railways were unique for having been legislated into existence" ([Kostal, 1994]). In this section I show that railway private bills made up a very large portion of the total number of bills passed in the 19th C (Figure 1·6). To do this I first construct and present a time-series of the number of railway private bills passed by Parliament for the years 1846-1901 (Figure 1·7a). I also present a time-series of the number of railway private bills proposed to Parliament (Figure 1·7b). Note that attention is restricted here to looking at railway *private* bills here and throughout in this chapter. We are not considering *public* bills that concerned the railways, though the relationship between political connections and public bills regulating railways is an important topic for future work. General regulatory and corporate measures impacting railways were also being passed throughout this period, but they were classed as public bills. Private bills are the focus of this railways to raise funds for these projects. Private bills thus played a direct role in the allocation of capital investment across firms, which is the focus of this chapter.

Private railway Acts of Parliament made up a very large share of the annual Acts of Parliament passed during the 19th C. Figure 1·6 shows the share of railway Private Acts to all Acts of Parliament between 1846-1884. Railway Private Acts commonly

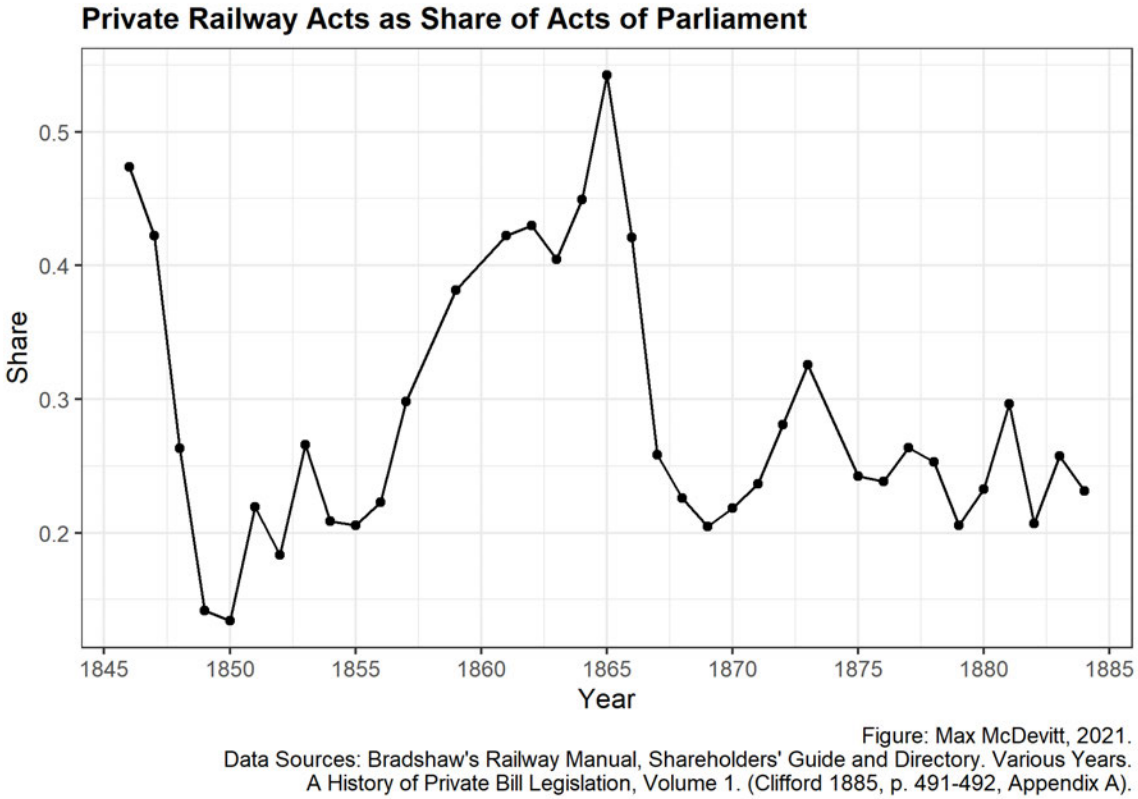


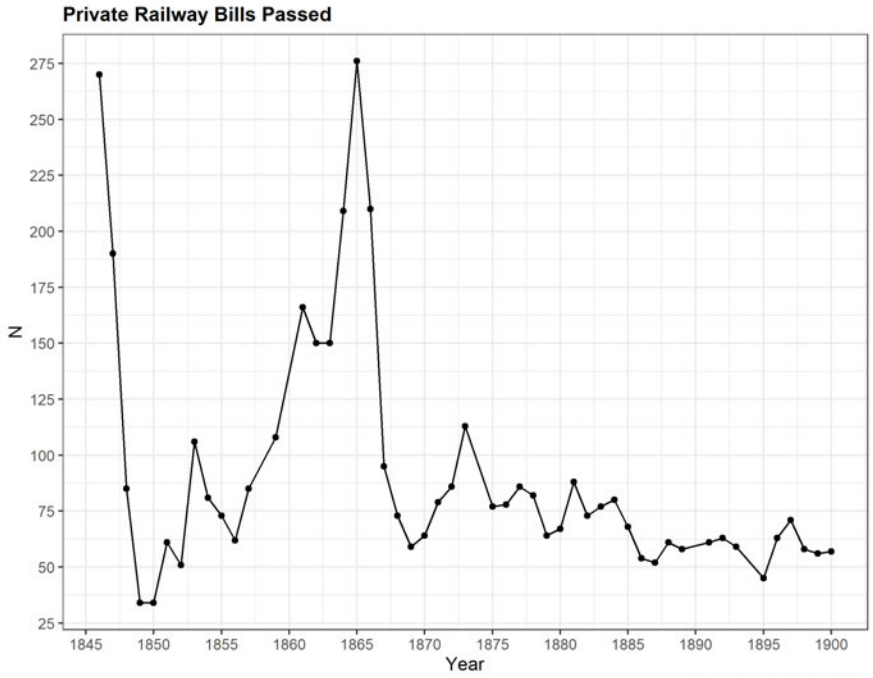
Figure 1·6: Private Railway Acts - Share of All Acts of Parliament (Public and Private)

made up 20%-30% of all Acts of Parliament passed in a year. This share falls as low as 13% in 1850, following a peak of 46% in 1846, the final year of the Railway Mania. Notably in 1865, Railway Private Acts made up more than half of all Acts of Parliament. The annual variation in the share arises dominantly from cyclical variation in the volume of railway private bills (See figure 1·7a).

The number of railway bills proposed (See figure 1·7b) in any given year is endogenous to beliefs about their likelihood of passage. Why is the proposal of a private bill endogenous to agents' priors regarding passage? Private bill proposal is endogenous to beliefs about passage rates because the proposal itself is an expensive process and the outcome is uncertain. Submitting a railway private bill to Parliament required preparing the bill well in advance of the parliamentary session and "lodging" that bill with the Railway or Harbour Department at the Board of Trade. Preparation of a bill involved the directors and executives of the railway as well as lawyers, surveyors, and engineers. After receiving a proposed bill, the Board of Trade would then review the technical aspects of the bill, especially checking that the form of the bill and its preparation including the legal notification of potentially impacted parties were in order. If the bill was not in order on technicalities, called 'standing orders,' then it would be set aside and not passed on to Parliament for consideration to pass into law. If the private bill was in order it would be passed on to Parliament at the start of the upcoming session to potentially be considered by Parliament. Placing a railway bill before Parliament and trying to get it enacted into law required large sunk costs which would either be lost permanently, if the bill failed in Parliament and the plans were not used in subsequent years, or at minimum the return on that expensive investment would be delayed by at least a year until the following Parliamentary session.

Once in Parliament, a private bill had to go through the private bill process which included multiple rounds of votes at the First, Second, and Third Readings as

(a) Successful Firm-Specific Special Legislation, 1846-1900



(b) Proposed Firm-Specific Special Legislation, 1854-1901

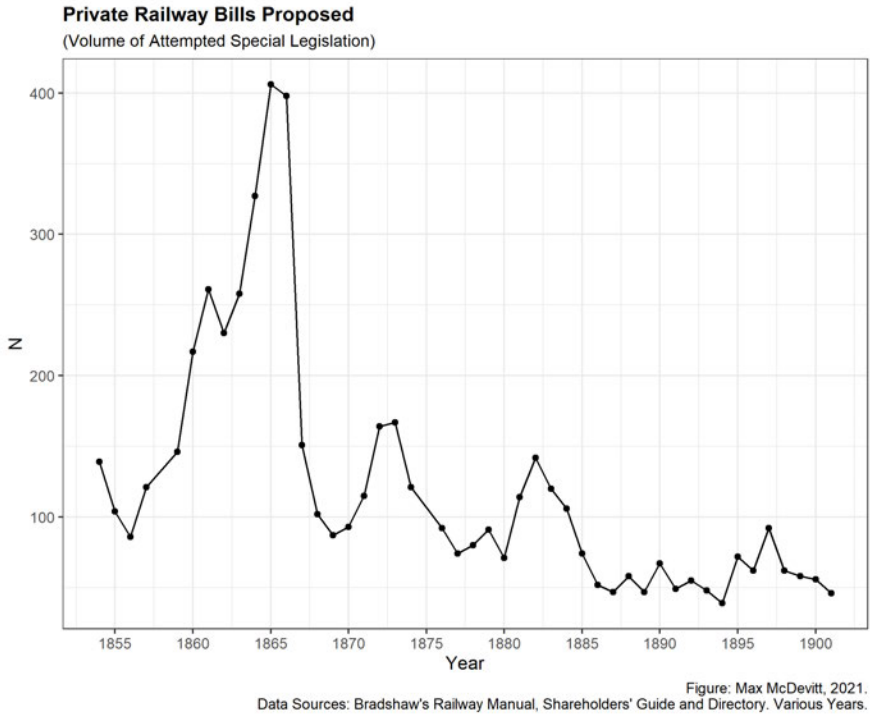


Figure 1·7: Railway Private Bills by Year

well as Committee stages in both the House of Commons and the House of Lords. Bills successfully passing through this process became Acts of Parliament and were subsequently rubber-stamped by the crown, called "receiving the royal assent." That the entire process of preparing railway special legislation and attempting to pass it involved enormous expenditure garnered comment from the popular press in London. The *Morning Post* on March 7th, 1883 agreed with the declaration made the day before in the Commons by the Scottish M.P. Craig Sellar that "...a Private Bill Committee is the most expensive tribunal that exists anywhere in the world,' the *Post* went on to editorialize that '...the preliminary expenses incurred in England in connection with the promotion of Railway Bills cost more than the whole Prussian railway system' (*quoted in* [Rydz, 1979]). That passage conditional on submission was uncertain will be demonstrated below.

Railway private bills were expensive to prepare and uncertain in their outcome ([Kostal, 1994]). Investors in "proposed private bills" be they railways or prospective railway committees required that the bills have a fair chance of success. Given the institutional context, this depended on both the expected discounted future value of the investment project delineated in the proposed private bill in the case of passage and non-passage *as well as the investors' prior on the probability of passage.* When the proposed bill was before the houses of parliament M.P.s and Peers voted on them in various stages and proposed amendments and the striking out of certain clauses. This included director-M.P.s and director-Peers of those railways. Throughout the period under study these individuals simultaneously sat on the boards of their respective railways and voted on and modified the railway private bills their own firms, competitors, and business allies proposed to Parliament. In their dual role as board members of the railways and as legislators in Parliament, these director-M.P.s and director-Peers directly legislated on their own market. Because of the institutional

centrality of the private bill legislation to railways in the nineteenth century, this meant that the political connections of railways in the houses of Parliament played a central in United Kingdom railway markets, especially as concerns capital investment, which these private bills authorized. Because Parliament voted on these bills and the votes determined which projects were authorized in law, Parliament played a large role in the allocation of capital investment in railways in the 19th C. Because many railways had strong political connections in Parliament through M.P.s or Peers on the board, they were able to influence what legislation passed Parliament. Thus Political Connections played a role in dictating the allocation of capital investment in railways during the 19th C in the U.K. through the mechanism of special legislation.

1.5.2 Institutional: Private Bills as a Necessary Condition for Capital Investments in Railways

Figure 1·7 and the related discussion highlights the large volume of railway private bill legislation enacted in the 19th century in the United Kingdom. Within the institutional context of the time the proposal to Parliament and successful passage of a private bill was *a necessary condition* for the actions delineated in the bill. In the case of large scale joint-stock corporations, corporate formation prior to general incorporation laws required a Private Act of Parliament. Virtually all major capital investments done by U.K. railways in the 19th C. required private Acts of Parliament authorizing them. The list of things railways did that required explicit legislation from Parliament is long. It includes the authorization to form a body corporate, the authorization to raise both equity and capital, building of the initial railway line and construction of station buildings to doubling of track, surveying and laying of adding additional railway lines, buying out a rival or friendly railway or a canal company or a portage firm or a port, increasing the amount of equity and debt the company can raise, and many other things. In effect, the capital investment decisions made by

railways generally required explicit authorization in the form of a private bill which was almost always railway specific in its language though it may have also impacted others in fact.

Though most commonly specific to a particular railway, some railway private bills explicitly concerned multiple railways. Multiple railways could be explicitly concerned as in the case of a proposed merger or construction of a joint-line or shared station terminal. In the more common case in which only one railway is explicitly addressed in a railway private bill, it is almost always the case that other railways are *implicitly* impacted and thus will be concerned about whether a proposed bill passes or not. For example if railway A constructs a new line, then depending on the relation of railway B to that line in the transport network, this will increase demand for railway B's services (complementary), decrease demand for railway B's services (substitutes), or have no impact on demand for railway B's services.

1.5.3 Political Connections and Private Bills: Three Main Results

Results relating political connections and private bill legislation are shown below. I present three sets of interrelated results, motivating them first graphically. The first result concerns the relationship between (endogenous) private bill proposal. As will be seen below, the likelihood of proposing a bill increases in political connections. The second result is that the likelihood of passing a bill conditional on proposal is increasing in political connections. These two margins, proposal and passage, are combined in the third result: the relationship between political connections and the likelihood a firm receives a Private Act of Parliament in any given year.

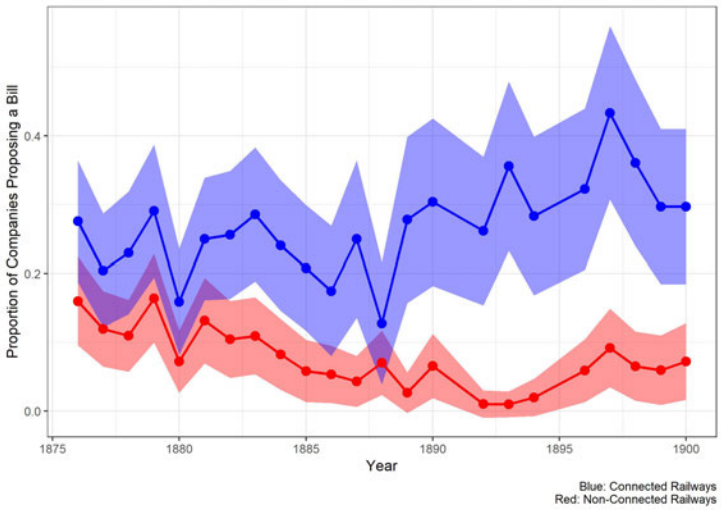
Figure 1·8 graphically motivates the above results. Figure 1·8a plots the likelihood of a railway proposing a private bill in year conditional on having at least one railway director in either the House of Commons or the House of Lords. Politically connected

railways were much more likely to propose private bill legislation than their non-connected counterparts. Figure 1·8b shows that conditional on attempting to pass legislation, politically connected firms passed legislation at higher rates then their non-connected counterparts. Figure 1·8c plots the probability of receiving a Private Act of Parliament in year conditional on political connection, combining the prior two margins. Consistent with the fact that politically connected railways both propose bills at higher rates and pass them at higher rates, the overall effect is that politically connected railways are more likely to receive Private Acts of Parliament. Below these relationships are investigated in a regression framework.

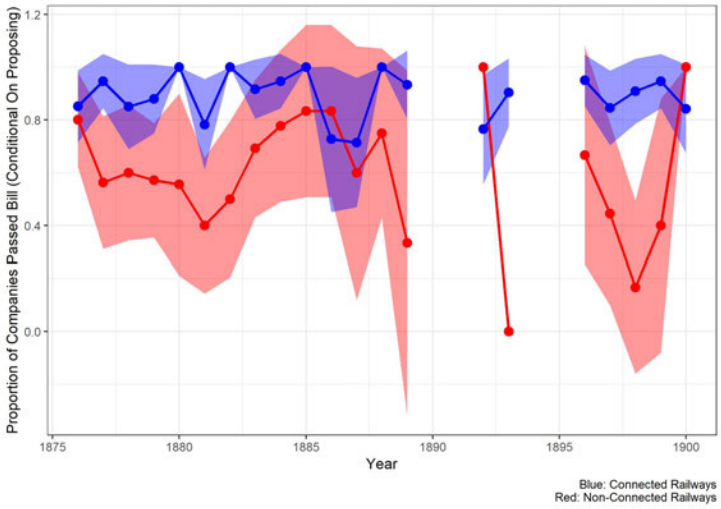
Political Connections and Private Bills: Proposal Margin

Railways commonly proposed private bills to Parliament. The mean across years is .15, i.e. 15% of railways in any given year tried to get a private railway bill passed. A fair amount of variation occurs over time and in some years more than 20% of firms proposed private bills while in other years it falls to 10% of the firms. Breaking this figure up by the extensive margin of political connections (Figure 1·8a), we can see that politically connected railways were much more likely than non-politically connected railways to propose private bills. The mean across the years shown is .26 for politically connected railways and .07 for non-politically connected railways, thus connected railways were more than 3.5x more likely to attempt to pass legislation. This is consistent with a model in which likelihood of passage is uncertain and believed to be increasing in political connections. As is shown below, this appears to be true: politically connected firms are more likely to pass bills conditional on proposal. Next we put the above into a regression framework and study this relation in more detail. The regression specification is given below.

(a) Railway Private Bills - Proposal by Political Connection



(b) Railway Private Bills - Conditional Passage by Political Connection



(c) Railway Private Bills - Unconditional Passage by Political Connection

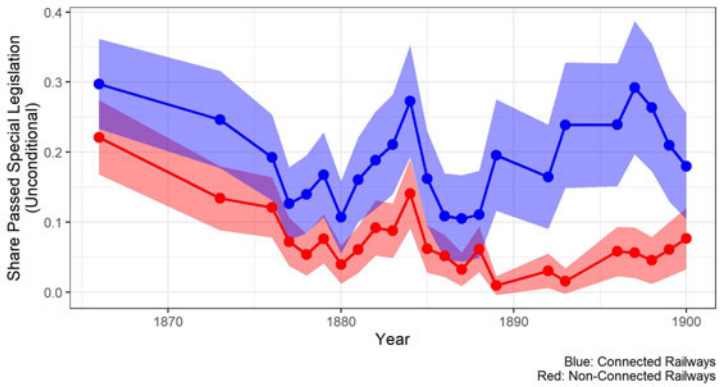


Figure 1·8: Political Connections and Private Legislation

$$z_{it} = \beta_0 + \beta_1 MP_{it} + \beta_2 PEER_{it} + \beta_3 MP_{it} \cdot PEER_{it} + X'_{it}\boldsymbol{\alpha} + \gamma_t + \psi_i + \epsilon_{it} \quad (1.4)$$

The fixed effects model is the same as that used for capital investment with the exception that controls, X_{it} are now included for capital expenditure to date and annual capital expenditure. Because the outcome variables of interest here are no longer lagged capital expenditure, the inclusion of these as controls does not run into the issues that arise from a model that includes both leads of the dependent variable and company fixed effects. z_{it} is an indicator variable denoting whether railway i proposed a private bill in year t. In the following two subsections, this same regression model is used but the dependent variable is whether i passed a private bill in year t. Results are presented below.

Table 1.4: Railway Private Bills - Proposal

	Bill Proposed in Year			
	(1)	(2)	(3)	(4)
Count Director-M.P.	0.116***	0.115***	0.011	0.013
	(0.009)	(0.009)	(0.012)	(0.013)
Count Director-Peer	0.088***	0.089***	0.056***	0.052***
	(0.013)	(0.013)	(0.019)	(0.019)
Count Director-M.P. X Count Director-Peer	−0.001	−0.001	−0.013	−0.014
	(0.008)	(0.008)	(0.010)	(0.010)
Year Fixed Effects	No	Yes	Yes	Yes
Company Fixed Effects	No	No	Yes	Yes
Controls	No	No	No	Yes
Observations	3,826	3,826	3,826	3,826
Adjusted R^2	0.164	0.169	0.500	0.500

*p<0.1; **p<0.05; ***p<0.01

Note: Heteroskedastic standard errors reported in parentheses [White, 1980]. Estimated firm fixed effects center standard errors around firm-specific means of the dependent variable.

As can be seen from Table 1.4, the probability that a railway proposed a bill in a given year increases in connections in both the House of Commons and the House of Lords. Similar to the results for capital investment, these coefficients are large in magnitude. Consider column (1). The coefficient on Count Director-M.P. says that each additional director-M.P. on a board is associated with an increased likelihood that firm proposes a bill in that year by .116. This is 166% of the mean for non-connected railways and 77% of the unconditional mean! In the House of Lords, each additional peer is associated with an increased likelihood of proposing a bill of .088.

Inclusion of company fixed effects, columns (2)-(4), wipes out the magnitude and statistical significance on political connections in the House of Commons, but the statistical significance in the House of Lords remains and magnitude is still large: within-firm increases in political connections in the House of Lords are associated with increases in the likelihood of proposal of .052. This is 35% of the unconditional mean and 74% of the mean for non-connected railways.

Political Connections and Private Bills: Conditional Passage Margin

Results for the likelihood of private bill passage conditional on proposal are presented in this section. Estimation uses equation 1.4, with z_{it} being a binary variable for whether railway i passed a private bill in year t. Estimation is done on the subset of railways that proposed a bill in year t. Thus the sample is smaller by construction and the estimates are for passage rates *conditional on proposal.* The results bear a flavor quite similar to those for private bill proposal in the prior subsection. The number of railway-year observations listed in the table is smaller than other results in this chapter because attention is restricted to firm-years in which the firm proposed a private bill, which as we saw in the above subsection, occurs in roughly 15% of firm years in the data.

Conditional bill passage is very high in the data, consistent with proposal being endogenous to beliefs about passage. The mean conditional bill passage rate across years and all firms who proposed is .8. In other words, four out of five private bills proposed were passed into Private Acts of Parliament. This high passage rate is consistent with the fact that preparing a bill to propose was a costly investment with an uncertain payoff contingent on passage. Railway private bills were unlikely to be proposed unless their originators believed they were likely to succeed. Variation across year is considerable, in 1885 for instance more than 95% of railway private bills proposed are passed into law, though this share drops below 65% in 1881.

Figure 1·8b breaks up the conditional passage margin by the extensive margin of political connections. Several very interesting things result. In most years conditional passage rates are higher for politically connected firms. Of note in 1880, 1883, 1885, and 1888, politically connected firms that had proposed bills all passed them. Railways not politically connected passed the very few bills they proposed in 1892 with certainty, but failed to pass a single bill in the following year. This accounts for the absence of confidence intervals for some political-connection-years plotted. Across all years shown, the proportion of railways passing a bill conditional on proposal was .89 for politically connected railways and .59 for non-politically connected railways.

The regression model used in the previous section for bill proposal is used here with the only differences being the sample and the outcome variable. Here the sample is restricted to railway-years in which that railway proposed a private bill in that year. The outcome variable is here a binary denoting passage of a private bill into law, that is into a Private Act of Parliament.

The results suggest that bill passage is increasing in political connections. After controlling for firm fixed effects, the association with connections in the House of Commons is shown to be null. The connection in the house of Lords is statistically

significant and in the expected direction: increased political connections in the House of Lords, within-firm, are associated with a higher likelihood of private bill passage conditional on proposal. The statistically significant coefficient on the interaction term is small in magnitude and a joint test of significance shows the net effect of political connections on bills passage is positive.

Table 1.5: Railway Private Bills - Conditional Passage

	Bill Passed in Year			
	Conditional on Bill Proposed in Year			
	(1)	(2)	(3)	(4)
Count Director-M.P.	0.091***	0.092***	0.012	0.015
	(0.012)	(0.011)	(0.016)	(0.016)
Count Director-Peer	0.116***	0.129***	0.061**	0.059**
	(0.022)	(0.023)	(0.028)	(0.028)
Count Director-M.P. X Count Director-Peer	−0.039***	−0.043***	−0.013**	−0.014**
	(0.009)	(0.009)	(0.007)	(0.007)
Year Fixed Effects	No	Yes	Yes	Yes
Company Fixed Effects	No	No	Yes	Yes
Controls	No	No	No	Yes
Observations	528	528	528	528
Adjusted R^2	0.112	0.113	0.385	0.383

*p<0.1; **p<0.05; ***p<0.01

Note: Heteroskedastic standard errors reported in parentheses [White, 1980]. Estimated firm fixed effects center standard errors around firm-specific means of the dependent variable.

Political Connections and Private Bills: Unconditional Passage Margin

This section combines the prior results on the proposal margin and the passage margin into one measure of special legislation: did a railway receive a Private Act of Parliament this year? The outcome variable is the same as in the prior subsection, but here the sample of firms is all railways in year rather than the subset that proposed a bill. Results are presented in Table 1.6 below.

Table 1.6: Railway Private Bills - Unconditional Passage

	Bill Passed in Year			
	Unconditional			
	(1)	(2)	(3)	(4)
Count Director-M.P.	0.120***	0.119***	0.011	0.012
	(0.009)	(0.009)	(0.013)	(0.013)
Count Director-Peer	0.087***	0.087***	0.054***	0.051**
	(0.014)	(0.014)	(0.020)	(0.020)
Count Director-M.P. X Count Director-Peer	−0.007	−0.007	−0.015	−0.016
	(0.008)	(0.008)	(0.010)	(0.011)
Year Fixed Effects	No	Yes	Yes	Yes
Company Fixed Effects	No	No	Yes	Yes
Controls	No	No	No	Yes
Observations	3,529	3,529	3,529	3,529
Adjusted R^2	0.179	0.183	0.470	0.470

*p<0.1; **p<0.05; ***p<0.01

Note: Heteroskedastic standard errors reported in parentheses [White, 1980]. Estimated firm fixed effects center standard errors around firm-specific means of the dependent variable.

The results in the above table suggest that the likelihood a railway received a Private Act of Parliament in a year increased in their connections in both houses in that year. Inclusion of firm fixed effects shows that within-firm increases in political connections in the House of Lords meaningfully raised the likelihood of a railway receiving special legislation in that year.

1.6 Conclusion

This chapter contributes to the literature on the economic effects of political connections in several ways. To my knowledge, this chapter is the first empirical work to provide quantitative evidence that political connections mattered for capital investment in U.K. railways, including plausibly exogenous results in the process. Going

beyond most of the literature, which to date focuses primarily on asset-prices and thus market expectations about future profitability, I establish a relationship between political connections and realized capital investment, showing that politically connected firms do more capital investment than their non-connected counterparts and that as the degree of political connection increases, the amount of capital investment grows. Dynamically this leads to a scenario whereby politically connected firms are larger and more so the more connected they are to Parliament.

This chapter contributes to the literature on political connections by providing a cleaner measure of the causal variable of interest, political connections, than previous studies provided and used. Rather than proxying for political connections of firms as has been common in the literature to date, I directly observe these political connections as measured by the number of members of the board of directors in either the House of Commons or the House of Lords. In addition, the data used in this study is richer and larger than prior studies in the literature. Rather than studying political connections in a short-time frame (i.e. [Fisman, 2001]; [Ferguson and Voth, 2008]; [Baker et al., 2018]) using variation in political connections generated by a small number of universal shocks, I study political connections over a nearly 4 decade period using over 30 years of firm-level data. This allows me to both exploit strategies using firm fixed effects as well as provide insight into the dynamics of political connections, something not possible in the shorter time frame in the current papers in the literature.

This chapter further contributes to the literature on political connections by identifying an important mechanism by which political connections translate into capital investment, firm-specific special legislation, and providing detailed quantitative support for this suggested channel. I argue the institutional importance of special legislation to capital investment in this setting. I then show that the political con-

nections of railways lead to increases in the amount of special legislation passed for that firm. I break apart this effect into two margins, a proposal margin and a passage margin, demonstrating that private bill proposal and passage increase in political connections. I argue that proposal is endogenous to political connections with firms proposing bills on the basis of beliefs about the likelihood of passage which is shown to be, unsurprisingly, increasing in political connections. By identifying and quantifying this mechanism, I go beyond prior works that suggested mechanisms by which political connections mattered for firms, such as signaling high-value firms to investors through high-profile board members, but did not provide quantitative evidence for this hypothesized mechanism.

This chapter also contributes to the recent literature on the history of capitalism by demonstrating that the largest industry in the United Kingdom during the 19th century, railways, developed not as commonly believed in a setting of largely free markets and capital investment done independently of political influence, but rather developed under a setting in which private capital investment was mediated through the a political game in the halls of Parliament. In short, political connections and Parliamentary games played a central role in the allocation of capital investment in the largest capital industry of the 19th century in the United Kingdom. This undermines viewpoints lauding industrial expansion and growth in the 19th century as a success story of free markets. As shown in this work, the political connections of railways and political games in the House of Commons and the House of Lords played a large role in determining the allocation and volume of capital investment.

1.7 Appendix: Political Connections Literature

Tables 1.7 and 1.8 summarize the most relevant papers in the empirical literature on political connections. These are discussed more fully in the Literature Review section of the chapter. The tables below summarize the major papers in the literature on political connections and compares/contrasts them with the this work. In the subsections below these papers are discussed in more detail.

Table 1.7: Literature Summary

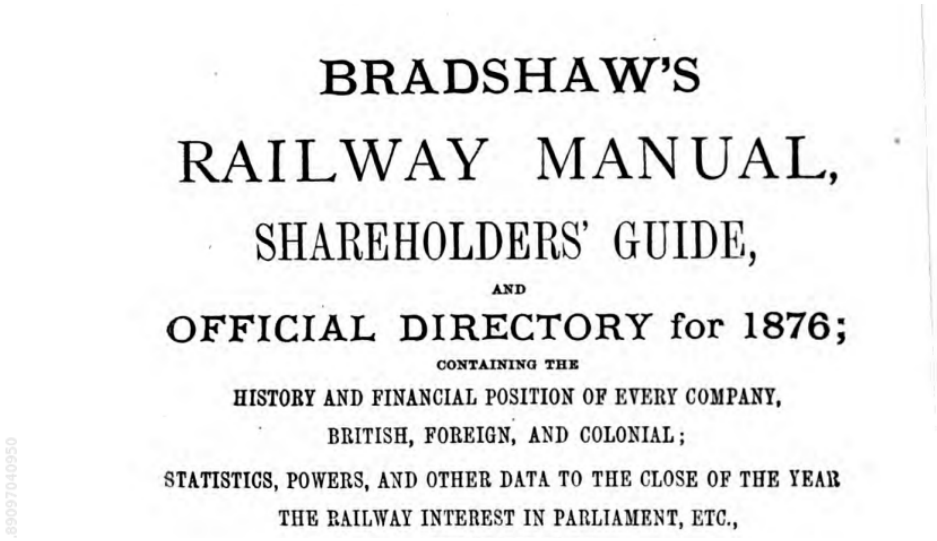
Political Connections Literature: Summary of Major Works				
Paper	Empirical Context	Measure of Political Connections	Proxy or Observed	Outcome Variable(s)
[Roberts, 1990]	U.S.A 1983; Death of Senator Henry 'Scoop' Jackson	Firms with Manufacturing Plants in WA State with 1,000+ employees; Firm had PAC contributing to Sentator Jackson or Nunn	Proxy	Returns on Shares and AR (SR Asset Price Movements))
[Fisman, 2001]	Indonesia 1995-1997; Health Shocks to Suharto	Consultants' Subjective Assessment of political connection of industries (ordinal) imputed to firms in that industry.	Proxy	Returns on Shares (SR Asset Price Movements)
[Ferguson and Voth, 2008]	Germany 1933; Rise of Hitler	Financial contributions to Hitler, NSDAP, or Göring or Political Support or Advising NSDAP or Hitler on ec. pol.	Mixed Proxy and Observed	Log Returns on Shares (SR Asset Price Movements)

Table 1.8: Literature Summary (Cont.)

Political Connections Literature: Summary of Major Works (cont.)				
Paper	Empirical Context	Measure of Political Connections	Proxy or Observed	Outcome Variable(s)
[Fan et al., 2007]	China 1993-2001; Newly Partially Privatized Firms	Count of Firm Directors currently or formerly an officer of central or local government or member of military	Observed	3-Yr Post-IPO stock returns, Corporate Financials; Returns on Stocks day of IPO (LR and SR Asset Price Movements and non-Market Measures of Corporate Performance)
[Braggion and Moore, 2013]	Britain 1895-1906; U.K. General Elections of 1895, 1900, and 1906	Count of Firm Director-M.P.s and Director-Peers	Observed	AR on shares (SR Asset Price Movements); Equity and Debt Issues; ROA, Cash Holdings, and Asset Growth

Table 1.9: Literature Summary (Cont.)

Political Connections Literature: Summary of Major Works (cont.)				
Paper	Empirical Context	Measure of Political Connections	Proxy or Observed	Outcome Variable(s)
[Baker et al., 2018]	U.S.A. 1895-1905; McKinley Assassination	Firm Owned/Managed by Donors to McKinley/Hanna; Firm has directors/officers that graduated from Harvard in same year as Roosevelt or were in same clubs at Harvard	Proxy	AR and CAR on shares (Asset Price Movements)



BRADSHAW'S

RAILWAY MANUAL,

SHAREHOLDERS' GUIDE,

AND

OFFICIAL DIRECTORY for 1876;

CONTAINING THE

HISTORY AND FINANCIAL POSITION OF EVERY COMPANY,

BRITISH, FOREIGN, AND COLONIAL;

STATISTICS, POWERS, AND OTHER DATA TO THE CLOSE OF THE YEAR

THE RAILWAY INTEREST IN PARLIAMENT, ETC.,

Figure 1·9: Bradshaw's - Title Page (1876)

1.8 Data Sources

Figure 1·9 is the title page of the 1876 Bradshaw's. This is one of the annual editions of *Bradshaw's* from which information on the political connections of railways and their capital investment were digitized for the analysis done in this chapter. Data on firm-specific legislation proposed and passed by the railways was also digitized from the appendices on private bill legislation in these same annual editions.

1.9 Appendix: Political Connections and Capital Investment

1.9.1 Political Connections and Capital Investment - Extensive Margin

$$y_{it+1} = \beta_0 + \beta_1 \mathbb{1}\{GOV_{it} > 0\} + \psi_i + \gamma_t + \phi_{l(i),t} + \epsilon_{it} \tag{1.5}$$

In the equation above y_{it} denotes the capital expenditure of railway i in year t. GOV_{it} is a count of the number of director-M.P.s and director-Peers on the board of railway i in year t. γ_t, ψ_i, $\phi_{l(i)t}$ are year, company, and location-by-year fixed effects respectively. Year fixed effects control for annual variation in capital expenditure in U.K. railways. Inclusion of year fixed effects is thus controlling for variation in railway capital investment stemming from the business cycle and other shocks to annual capital investment of railways. Company fixed effects control for time-invariant characteristics of the firms studied. Location-by-year fixed effects are also used to control for place-specific time-varying shocks to railway capital investment. An example of place-specific time-varying shocks of relevance would be increased railway capital investment in a locale resulting from an increase in the world price of coal or the discovery of a new coal field or iron vein in that locale causing the same. Since location-by-year fixed effects are a refinement of year fixed effects, in any specification in which location-by-year fixed effects are used, year fixed effects are omitted. Table 1.10 presents the results of estimating this model for the period 1876-1900. Standard errors are heteroskedastic-robust [White, 1980]. The long-panel structure of the data allows for estimating the regression model directly rather than using a first-difference or a within-estimator. As such the standard errors are centered around a firm-specific level of capital investment.

The model is fitted on 3,213 company-years. From Table 1 we can see that extensive margin of political connections is associated with an increase in annual capital investment of roughly a quarter million pounds (column (1)). Having an M.P. or Peer

Table 1.10: Political Connections and Capital Investment - Extensive Margin

	Capital Investment		
	Following Year		
	(1)	(2)	(3)
Binary Director-Government	249,655***	14,597	10,564
	(20,295)	(11,734)	(12,528)
Year Fixed Effects	No	Yes	No
Company Fixed Effects	No	Yes	Yes
Location x Year Fixed Effects	No	No	Yes
Observations	3,213	3,213	3,213
Adjusted R^2	0.065	0.495	0.488

*p<0.1; **p<0.05; ***p<0.01

Note: Mean annual capital investment is £118,000. Heteroskedastic standard errors reported in parentheses [White, 1980]. Estimated firm fixed effects center standard errors around firm-specific means of the dependent variable.

on the board of directors of a railway is associated with an additional £249,655 of capital investment in the following year, an increase of 211% relative to the unconditional mean of £118,000. Relative to the unconditional mean of £16,000, crossing the extensive margin of political connections is associated with capital investment in the following year increasing by a factor of 15.6, or equivalently an increase of 1,460%.

Inclusion of company fixed effects wipes out statistical significance at the extensive margin of political connection (Columns (2) and (3)). Why does the inclusion of company fixed effects wipe out the effect for the extensive margin? Large railways are in general connected at the extensive margin of government and this persists over time. Thus there is little variation within-firm *at the extensive margin* with which to identify the association. The fact that company fixed effects can be used to explain away the relationship between capital and political connections at the extensive margin does not imply that there is no causal relationship between those variables at that margin, it only implies that company fixed effects can explain away that pattern in the data. The fact remains that the railways doing large capital investment were almost always politically connected at the extensive margin. Company fixed effects can explain away the pattern as a by-product of selection on time-invariant characteristics. However, the acknowledgment of this fact raises the following important question: why are the large railways more or less always politically connected at the extensive margin? This apparent selection is interesting in and of itself because it denotes sorting of political connections into large firms. (For this last point, I am indebted to Ed Glaeser for a series of comments made in seminar).

1.10 Appendix: Private Bill Legislation

1.10.1 Acts of Parliament: Public and Private

Figure 1·10 shows the total number of Acts Parliament passed into law each year from 1801-1884. This is the number of parliamentary bills that succeeded and became law after receiving the Royal Assent during the Parliamentary session of that year. Due to considerable variance in the importance, scale, and scope of each Act, the large variation across years in the number of Acts passing into law does not necessarily reflect the duration of the Parliamentary session or the import of new laws.

Between 1801-1884, Parliament passed a total of 28,055 Acts, averaging 334 Acts per annum. The median number of Acts per year was 310.5, implying years in which an exceptional number of Acts pull the mean above the number of Acts passed in most years. The number of Acts ranges from a low of 238 in 1834 to a high of 570 in 1846. The large spike in the time-series in the mid-1840s is primarily due to the Railway Mania of 1844-1846. At it's height in 1846 270 railway Private Bills passed through Parliament, received the Royal Assent, and thus became railway Private Acts. During this time, "private legislation, particularly that related to railways, reached its zenith..." ([Rydz, 1979]).

Parliamentary Acts of the 19th Century can be partitioned into 2 groups: Public Acts and Private Acts. In this partitioning the set of Private Acts includes Local and Personal Acts. Throughout the 19th century railways in the United Kingdom required firm-specific, special legislation, also known as private bills, from Parliament in order to legally carry on their business, especially as concerns capital investments. These bills were primarily classed as Local and Personal Acts, a type of Private Act. In what follows I focus on this partition because it highlights the difference between Public Acts and Acts of Parliament that were firm-, person-, or locale-specific.

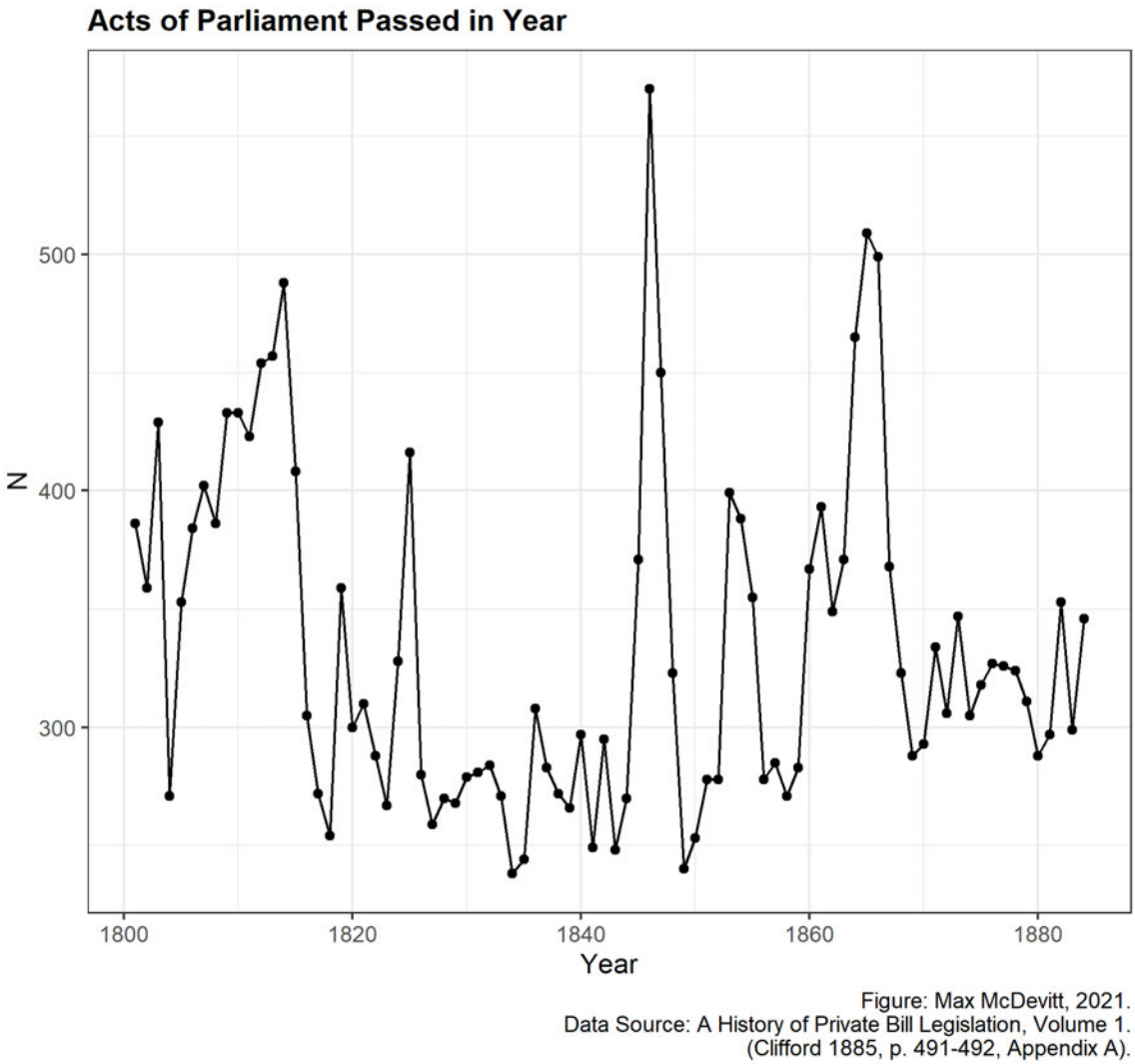


Figure 1·10: Acts of Parliament, 1880-1884

How important, or better, how common were Private Acts in 19th C U.K.? Of the 28,055 Acts of Parliament passed between 1801-1884, fully 18,497 of them are Private Acts. Almost 2 out of every 3 acts Parliament passed during this time were Private Acts and only 1 in 3 were Public Acts. The figure below shows the Acts of Parliament passed in the year broken up into these two groups. (The Appendix on Private Bill Legislation presents an alternate version of this time-series further partitioning Private Acts by whether or not they are classed as Local and Personal Acts for those interested.)

Private Acts passed by Parliament outnumber Public Acts by two-to-one between 1801-1884. Not only do Private Acts outnumber Public Acts in the aggregate across years, they also outnumber them within-year for all 84 years in the presented time series. The gap between the number of private acts passed and public acts passed per annum is smallest in the years immediately following the conclusion of the Napoleonic Wars and 1849-1850, with the lowest point being 1817 a year in which 140 Private Acts were passed and 132 Public Acts were passed. The gap is largest during the year 1846. As shown above, Parliament passed more Acts in this final year of the Railway Mania than in any other year from 1801-1884. 117 Public Acts passed into law in 1846, unexceptional relative to a mean of 114 Public Acts per year for the period under discussion. This means that the exceptional number of Parliamentary Acts passed in 1846, the high-point of 84 years, is more or less entirely due to the immense volume of Private Acts in that year. This in turn was almost entirely comprised of firm-specific railway bills passed in the final year of the Railway Mania. Not only did railways dominate U.K. capital markets in the mid-1840s., they also dominated Parliament in terms of the volume of legislation passed.

The figure 1·12 plots the total Acts of Parliament passed in each year as partitioned into three groups. This graph is the same as the figure presented in the main

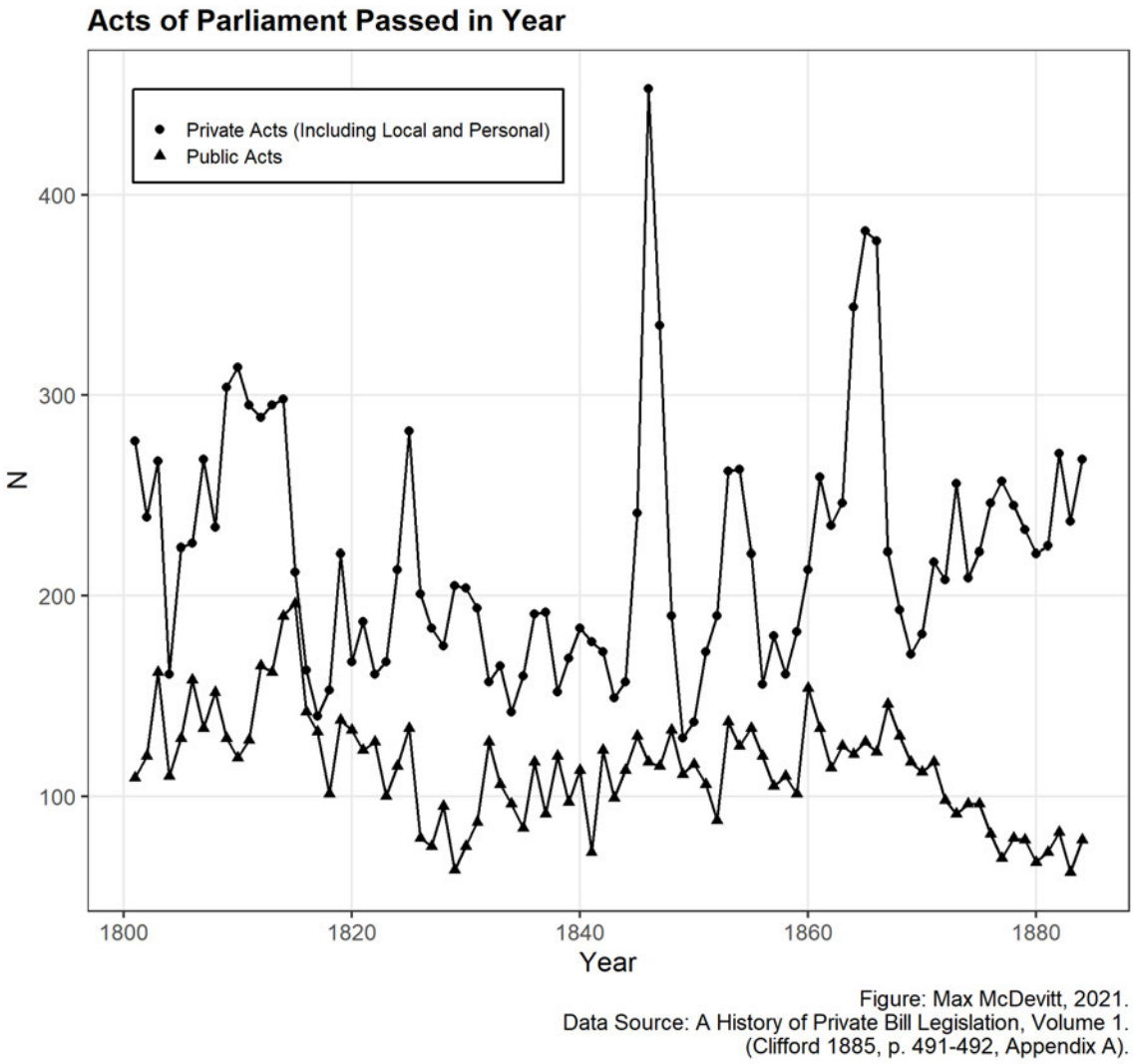


Figure 1·11: Acts of Parliament by Classification, 1880-1884

chapter but with Private Acts further partitioned into Local and Personal Private Acts, which includes nearly all firm-specific railway legislation, and non-Local and Personal Private Acts. The data underlying the figure comes from *A History of Private Bill Legislation in Two Volumes. Vol. I.* and was digitized by myself ([Clifford, 1885]). As can be seen in the figure, the high-point of 1846 in the volume of legislation passed by the U.K. Parliament is a result of a sharp increase in the number of Local and Personal bills passed during the Railway Mania of 1844-1846.

714 Local and Personal Acts were passed into law during the 3 years of the railway mania, with a high-point of 402 Acts passed into law in 1846. The number of Private Acts classed as Local and Personal shows markedly more variance than any of the other two classes in the partition. This possibly reflects variation in the demand for Local and Personal bills stemming from fluctuations in the business cycle. An downward time-trend in Private Acts classed as Local and Personal occurs during the first forty years of the series. This inverts becoming an upward time-trend from circa the early 1830s onward. Of note to the focus of this chapter: the early 1830s was the first railway boom in the U.K. following the unprecedented financial success of the Liverpool and Manchester Railway, opened on September 15th, 1830. Though this timing is suggestive of the strong role of railways time trends in Private Act legislation, many other variables relevant for the volume of this type of legislation also changed about that time. For instance in 1832 the first of the 3 major franchise reforms of the 19th C. in the U.K. passed into law and changed both the electorate and subsequently the composition of the House of Commons.

Over the period 1800-1884 the number of Public Acts passed annually varies considerably but without a time-trend between 1801-1866. A decline in the number of Public Acts passed annually appears immediately following the time of the Second Reform of the Franchise in 1867 which effectively doubled the size of the electorate

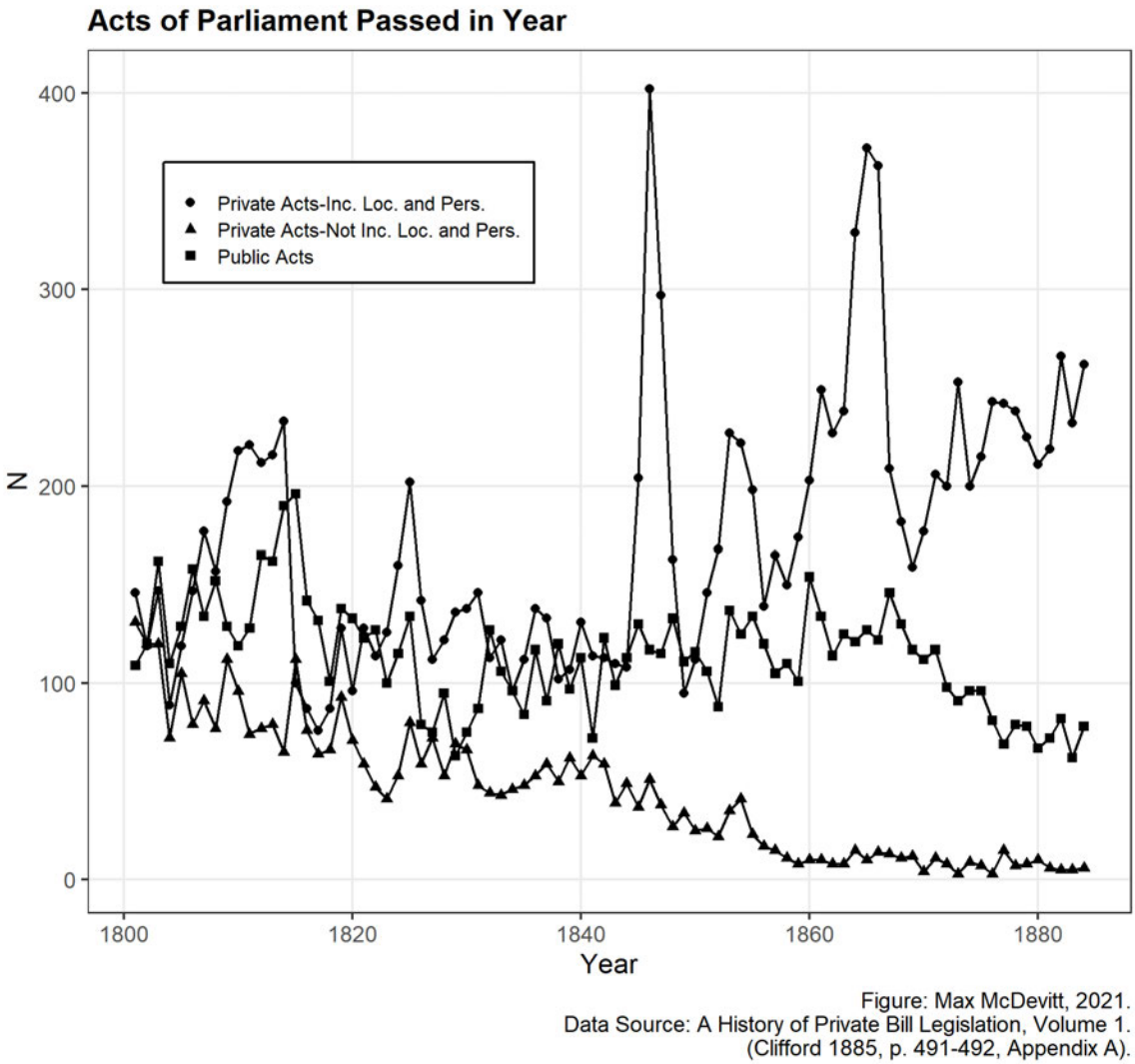


Figure 1·12: Total Acts of Parliament Passed by Type

in the U.K. This induced a compositional change in the electorate and subsequently their representation from the election of 1868 onward.

Private Acts-Not Including Local and Personal Acts decline considerably in number throughout 1801-1884. After 1856 the number stays below 15 in any given year thru the end of the time-series, falling as low as just 3 acts passed in 1876.

Figure 1·13 below shows Private Acts, both Local and Personal, and non-Local and Personal, as a fraction of the total number of Acts passed in that year. On average Private Acts broadly considered make up two-thirds of the total number of Acts passed each year. There is much variation across years, but the share never falls below a half and is never above four-fifths.

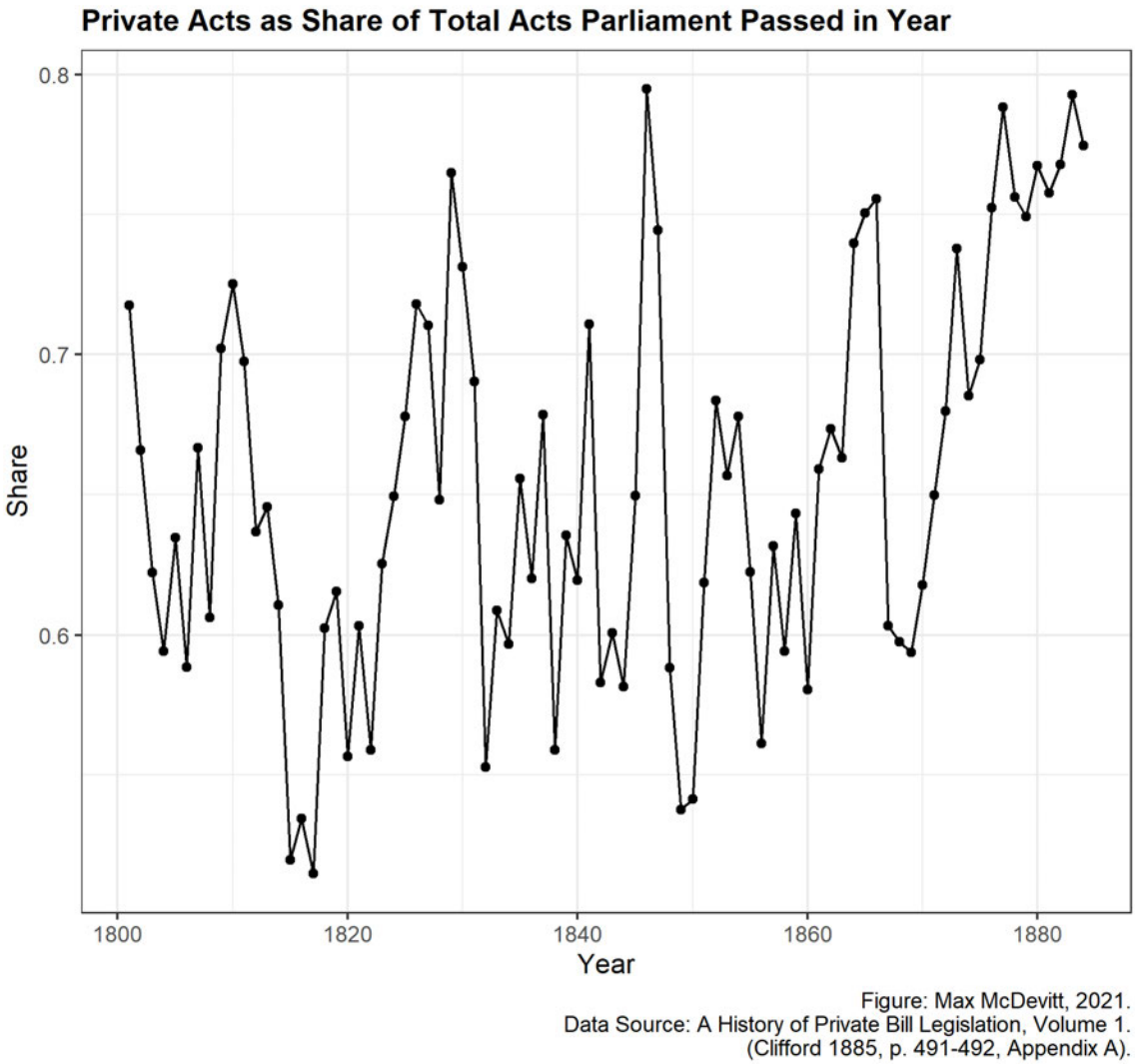
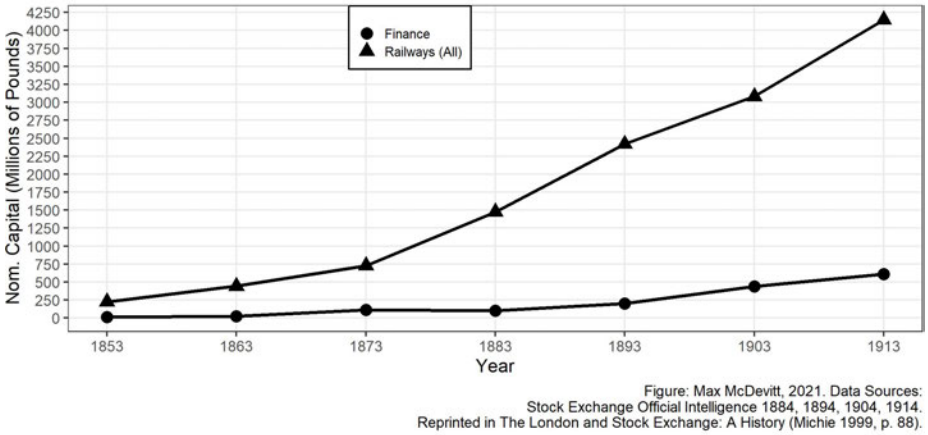


Figure 1·13: Private Acts as Share of All Acts of Parliament

1.11 Appendix: Nominal Market Capital of All Railways (U.K. and Non-U.K.) Listed on the London Stock Exchange

The London Stock Exchange during the 19th century was very international in nature. Railways as a whole made up a very large proportion of the nominal value of securities traded on the LSE. The following figures plot the nominal capital of securities listed on the LSE for railways against various industries. (Figures here include domestic, colonial, and international securities.)

(a) All Railways and Finance - Nominal Capital



(b) All Railways and Industrial/Commercial/Shipping

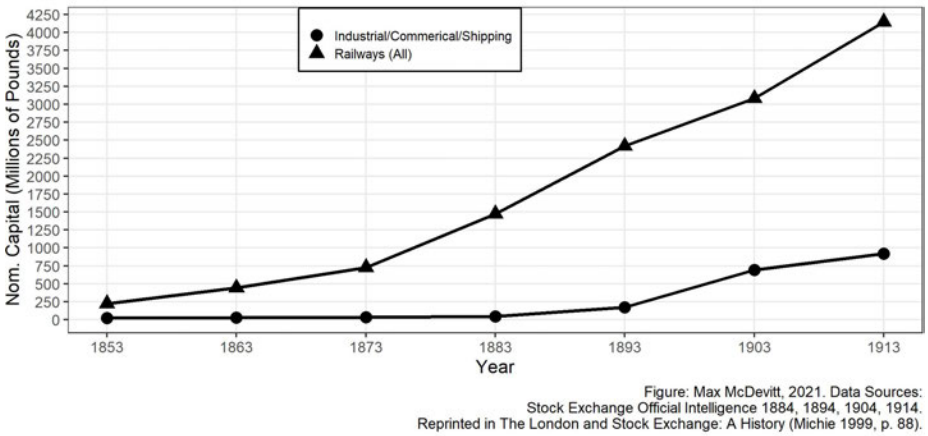
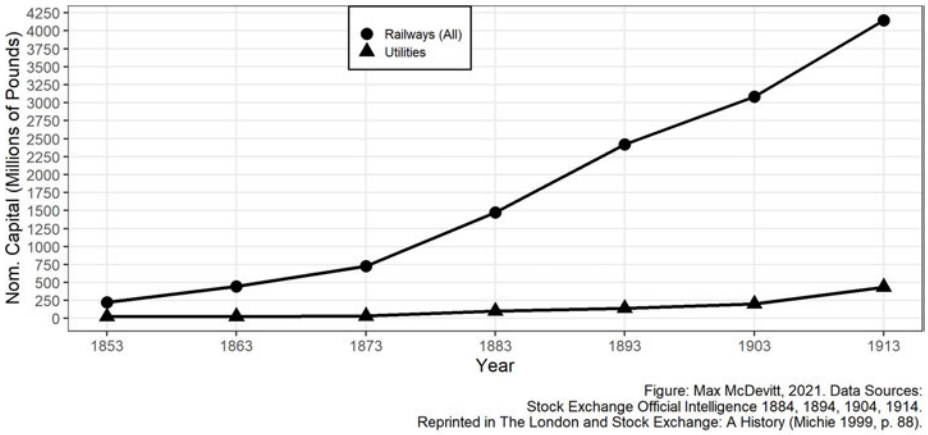


Figure 1·14: London Stock Exchange, 1853-1913

(a) All Railways and Utilities - Nominal Capital



(b) All Railways and Raw Materials

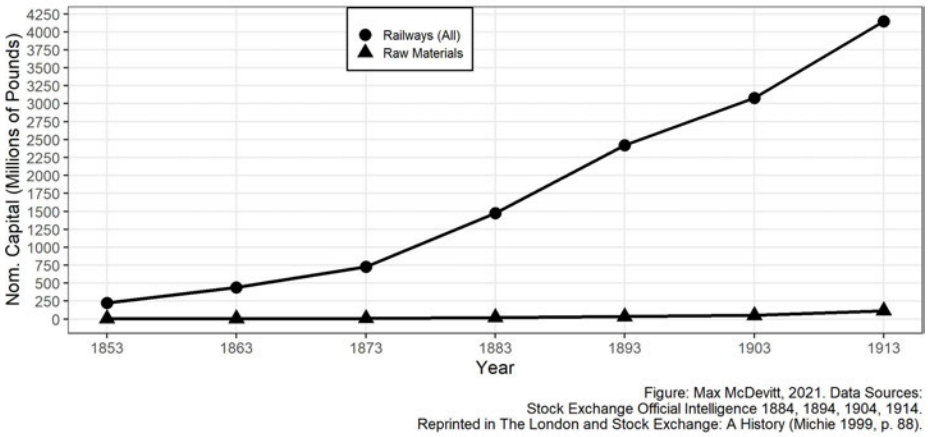


Figure 1·15: London Stock Exchange, 1853-1913

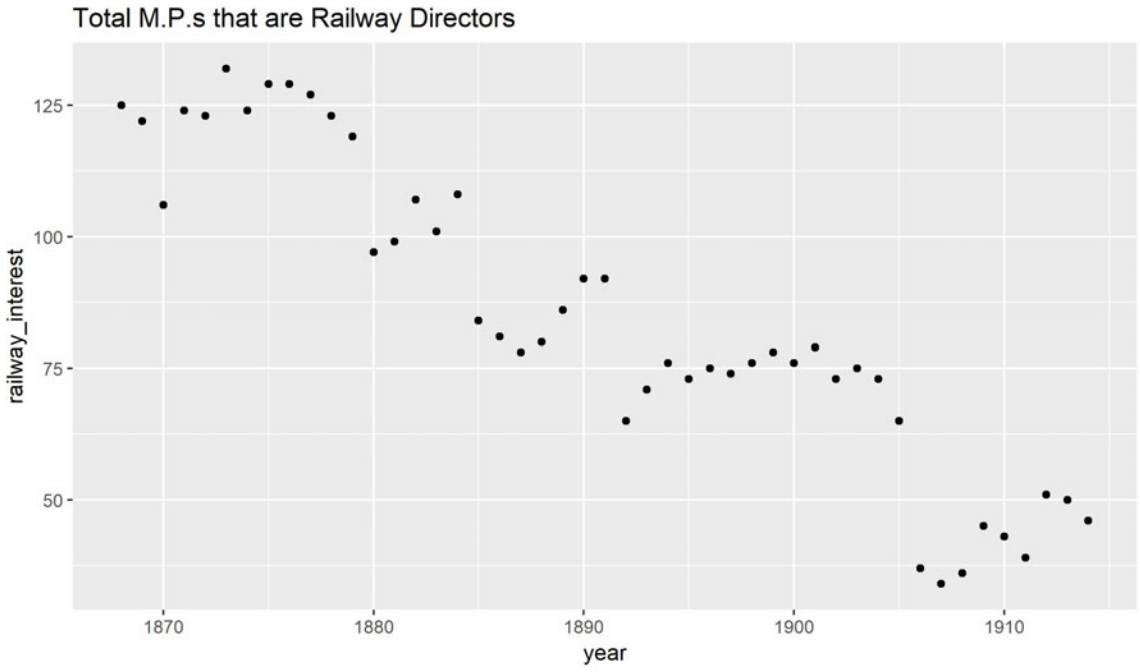


Figure 1·16: The Railway Interest in the Commons - Alderman's Tables

1.12 Appendix: Political Party Alignment of Railway Directors-M.P.s

Geoffrey Alderman in his excellent 1973 work, *The Railway Interest*, presented tables of the political connections of the railway interest in the House of Commons during a period roughly coinciding with the one under study here ([Alderman, 1973]). The following graphs, built using Alderman's tables, are a time-series of the size of the railway interest (compare to that presented by this author in the chapter using annual issues of *Bradshaw's*) and a time-series of the political party alignment of the railway interest in the House of Commons.

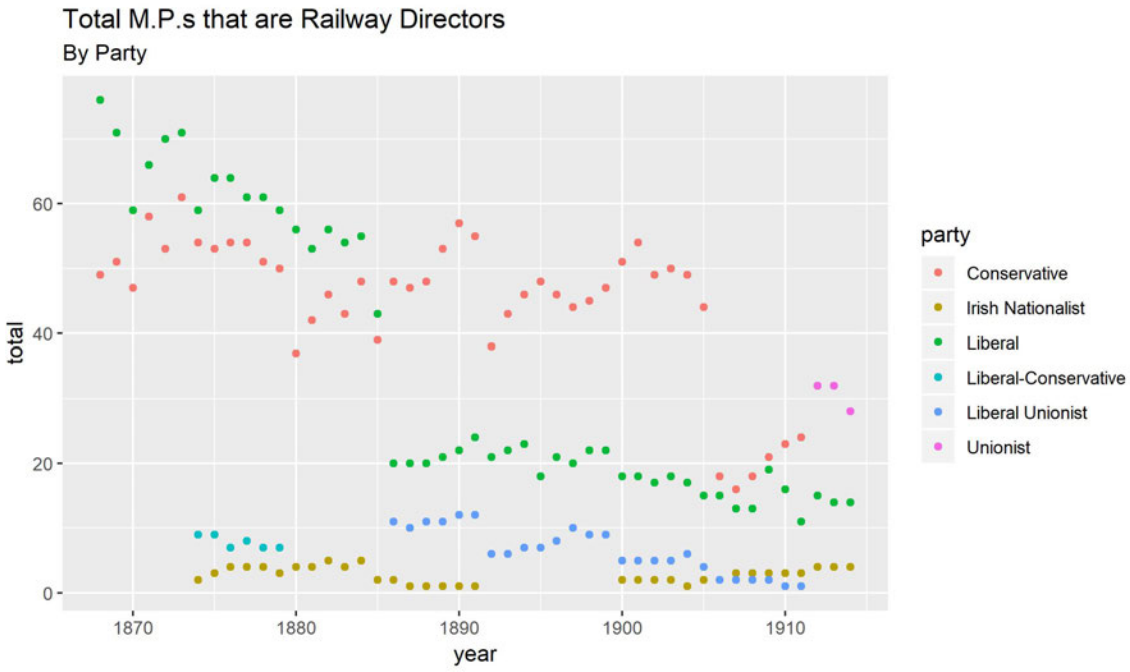


Figure 1·17: The Railway Interest in the Commons by Political Party - Alderman's Tables

Chapter 2

Political Connections, Bureaucratic Incentives, and Consumer (and Employee Safety): Fatal Railway Accidents in the U.K., 1825-1924

2.1 Introduction

Political connections matter for both consumer and employee safety. Bureaucrats who regulate industries frequently have personal career incentives that encourage laxer regulation of politically connected firms. This is true in systems in which high-ranking bureaucratic positions often require the formal approval of the legislature or executive. Relatively lax regulation of politically connected firms leads to those firms to be less safe for both consumers and workers. I test this hypothesis using the original data set used in my job market paper in collaboration with four additional novel data sets.

The first additional data set documents the universe of passenger-fatal railway accidents in the U.K. from 1825-1924. These data are employed to provide an overview of consumer safety during the first century of U.K. steam railways open for passenger traffic. The second additional data set is a four year panel (1889, 1893, 1897, 1899) of all railway accidents investigated and reported on by the Board of Trade. This data set covers more accidents in these years than the first data set as passenger-fatality is not

required for inclusion. In addition, information is separately available for passenger and bystander and employee deaths and serious injuries, allowing for both robustness checks and separate investigations of employee safety. The third additional data set used documents all deaths of U.K. M.P.s who died in office from 1832-1909. M.P.s who were also railway directors in the years of their death were identified by myself along with the companies they represented. The fourth additional data set is similar to the third, covering the deaths of railway director-Peers in the House of Lords from 1866-1900 along with their railways. These latter two data-sets are combined for the period 1871-1900 and used to look at how railway safety changes in response to plausibly exogenous changes in political connections. These four additional, novel data sets, are matched to the large panel covering political connections, capital investment, and special legislation of U.K. railways discussed in chapter 1. The latter data set also contains information on the miles of track a given railway has open in any given year. This allows for controlling for the size of the railway when considering the relationship between political connections and railway safety.

Regression analysis on the long panel of passenger-fatal railway accidents, 1825-1924, demonstrates that passenger-fatal accidents were much more likely to happen on politically connected railways. The number of people, both consumers and employees, killed annually by a railway is shown to increase significantly in the size of that railway's political connections. These results are robust to controlling for the miles of track the railway has open in that year. Event-study style results using the deaths of director-M.P.s and director-Peers provide additional evidence in support of the prior results using plausibly exogenous variation in political connections induced by deaths. Strong caveats apply to the results such that they should not be taken as causal. Regressions run on the four-year panel (1889, 1893, 1897, 1899) show that railway safety, measured (inversely) by the total number of deaths and injuries, was

markedly lower on politically connected railways (extensive margin). Railway safety also declines significantly in the degree of political connections.

Railway size is correlated with political connections. Larger railways have more accidents than smaller railways ceteris paribus, simply because they are bigger and operating more track. To address this concern, I control for miles open. Panel regression results show that within-firm changes overtime in the extensive margin of political connections are associated with large, economically important, and statistically significant changes in railway safety. Specifically for a given railway company crossing the extensive margin of political connection is associated with a four-fold change in railway safety: if a given firm goes from non-connected to connected, the number of deaths and serious injuries on that railway increases by four-times the unconditional average. Within-firm dynamic changes in the intensive margin of political connections are associated with a six-fold increase in deaths relative to the unconditional mean: for a given railway each additional political connection increases the number of deaths by an average of .56. Given that the unconditional average is 0.09, this is a drastic change in railway safety.

Additional results are presented in the appendices that separately address consumer and employee railway safety. Those results broadly tell the same story as the above: not only overall railway safety, but consumer railway safety and employee railway safety are markedly lower for politically connected firms and decrease substantially in the degree of political connections. In general those same results hold for within-firm panel estimates.

2.2 Data

2.2.1 Data: Railway Accidents Involving Passenger Fatalities, 1825-1924

For the purposes of this study I digitized a time-series of the *universe* of U.K. railway accidents involving at least one passenger fatality for the 100-years, 1825-1924, from *Railway Accidents: Legislation and Statistics, 1825-1924* ([Wilson, 1925]). The data digitized is that found in Table IX (*ibid.*, p. 36-39). There are 4 variables recorded in Wilson (1925): the date of the accident (Year-Month-Day), the location of the accident, the number of fatalities, and the cause of accident. Though Wilson does not list the company or companies involved in each accident, I was able to use the information on location and date provided to identify the company or companies involved from primary source documents. Board of Trade Railway Inspectors reports on crashes were used more than any other source to reconstruct the companies involved. I also made extensive use of the railway press of the time as well as annual editions of the Annual Register. Identification of the companies involved allows the data on railway accidents to be matched to railway-year panel data I developed in chapter 1. These data, described in the following subsection, contains information on political connections of railways. The wedding of these two datasets allows for the study of the relationship between political connections and consumer safety.

The cause of accident is given as a brief character string in Wilson (1925). The set of values this variable can be is shown in Table 1 on the following page along with the total number of accidents and fatalities, 1825-1924, by cause. The primary cause of the accident only is given. Thus a fatal railway accident in the table denoted as being caused by a Collision might also involve Derailment, but the latter will not be listed.

There are 414 observations on railway accidents involving at least one passenger

fatality, 1825-1924. This is the population of accidents in which passengers died. During this century, 4.14 railway accidents occurred per annum in which at least one passenger died. Another way to state this is for a century, railway accidents happened on average more than once per quarter. Table 1 is arranged in descending order by the primary cause of the accident, as listed in Wilson (1925). Collisions rank as the leading primary cause of passenger fatal accidents (N = 258, 62.3% of Total Accidents). Derailments rank second (N = 118, 28.5% of Total Accidents). Miscellaneous and Turned into Siding rank third in a tie (N = 9, 2.2% of Total Accidents). Taken together these 4 leading causes of accidents make up 394 of the 414 accidents, equivalently 95.2%.

These accidents caused 1,851 fatalities, an average of 18.51 fatalities per annum and an average of $\approx$ 4.47 fatalities per accident. For total fatalities, Collisions again rank first (Fatalities = 1,217, 65.7% of Total Fatalities) and Derailments second (Fatalities = 466, 25.2% of Total Fatalities). Failure of Bridge is listed as the primary cause of less than 1% of all accidents during the century, only 4 accidents out of 414, yet ranks third for total fatalities (N = 86, 4.6% of Total Fatalites). The reason for this is the Firth of Tay Bridge Disaster on December 28th, 1879, in which the Bridge owned and operated by the North British Railway collapsed killing 73 individuals. This ranks as the third deadliest railway accident in the U.K. for the century 1825-1924. This crash is discussed in detail in *Railway Detectives: The 150-year Saga of the Railway Inspectorate* ([Hall, 1990], p. 54). Maj-Gen. Huchinson, the railway inspector who had inspected the bridge in 1878 prior to giving his approval for opening, received harsh criticism from the papers and community in the wake of the disaster but was defended by Joseph Chamberlain, M.P. (ibid.).

The deadliest accident occurred at Quintinshill on the Caledonian Railway on May 22nd, 1915. 224 individuals were killed in this single accident, making it alone

Table 2.1: Railway Accidents Involving Passenger Fatalities By Cause, 1825-1924

	Primary Cause of Accident	Accidents (N)	Fatalities (N)	Fatalities (Mean)	Fatalities (Median)	Fatalities (Max)
1	Collision	258	1217	4.7	1	224
2	Derailment	118	466	3.9	2	34
3	Miscellaneous	9	14	1.6	1	3
4	Turned into Siding	9	26	2.9	1	7
5	Buffer Stops	4	19	4.8	1	16
6	Failure of Bridge	4	86	21.5	5	73
7	Obstruction	3	14	4.7	5	8
8	Boiler Explosion	2	2	1	1	1
9	Broken Coupling	1	1	1	1	1
10	Failure of Coupling	1	1	1	1	1
11	Failure of Machinery of Engine	1	1	1	1	1
12	Fire in Train	1	1	1	1	1
13	Landslip	1	1	1	1	1
14	Ran Over Obstruction	1	1	1	1	1
15	Ran through Gates	1	1	1	1	1

count for 12.1% of the total deaths under consideration. Accounts of the collision at Quintinshill can be found in Hall (1990, p. 81-83) and [Nock, 1987] (p. 88-95). The second deadliest accident took place in Ireland on the Great Northern (Ireland) Railway near Armagh on June 12th, 1889, killing 80 individuals including 22 children engaged on a Sunday school excursion. 260 additional individuals were seriously injured ([Hall, 1990], p. 55). Public and Parliamentary outcry over this horrid occurrence led to the subsequent introduction of a Public Railway Bill meant to increase oversight of railways by the Railway Inspectorate at the Board of Trade in the weeks after the Armagh crash. Less than 2 months later, on August 30th, 1889, this bill passed Parliament and received the Royal Assent as the Regulation of Railways Act 1889 (ibid.).

Figure 2·1: Railway Accidents: Total Annual Passenger-Fatal Accidents

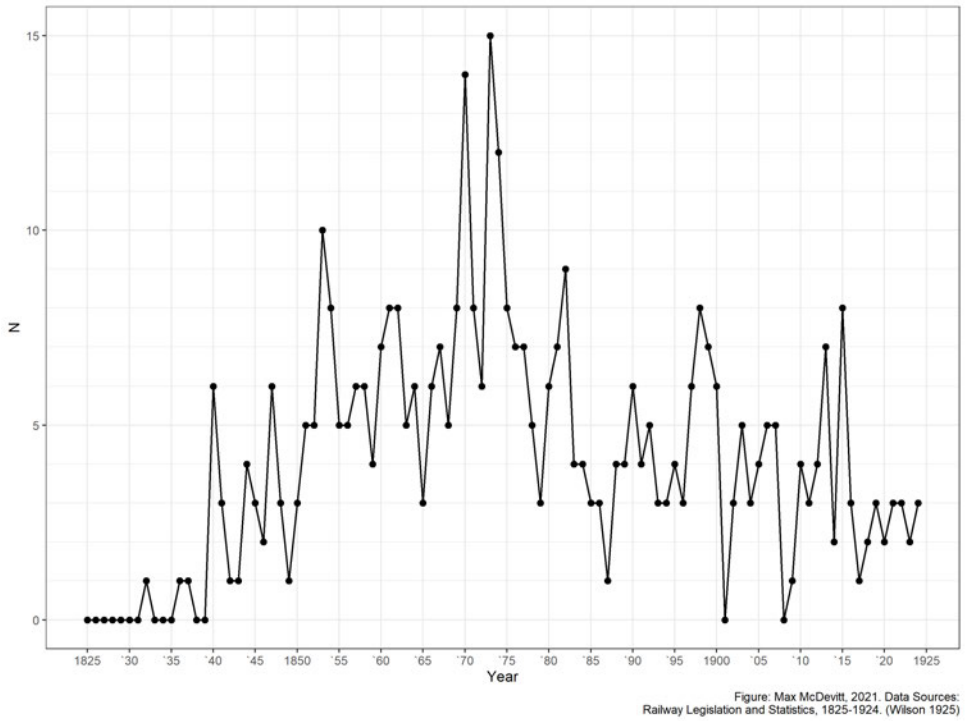


Figure 2·2: Railway Accidents: Total Annual Fatalities in Passenger-Fatal Accidents

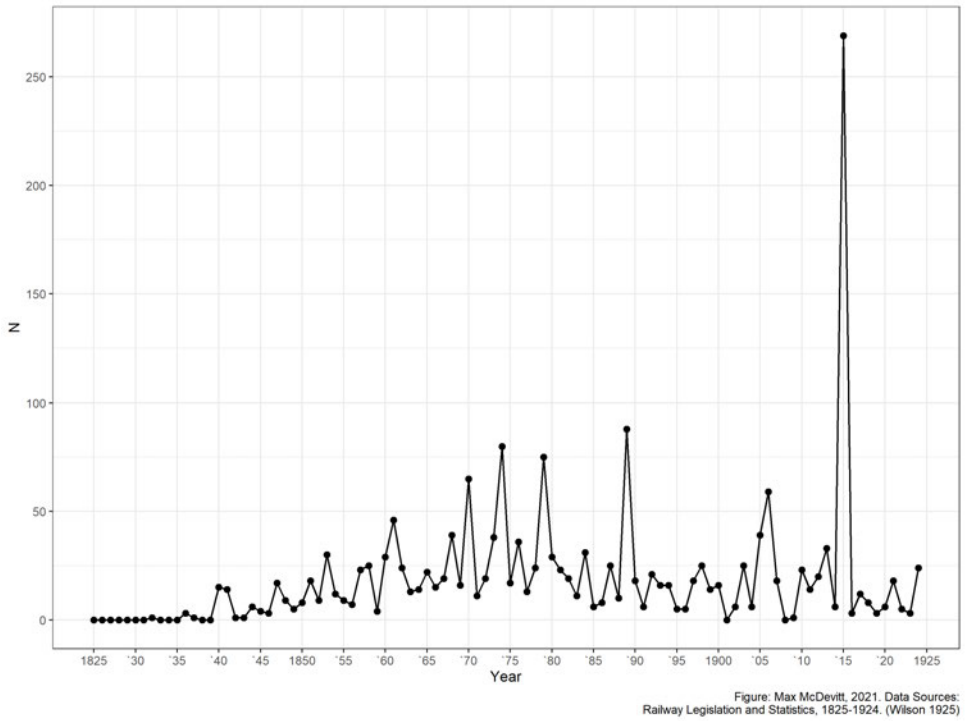


Figure 2·3: Railway Accidents: Mean Fatalities per Passenger-Fatal Accident

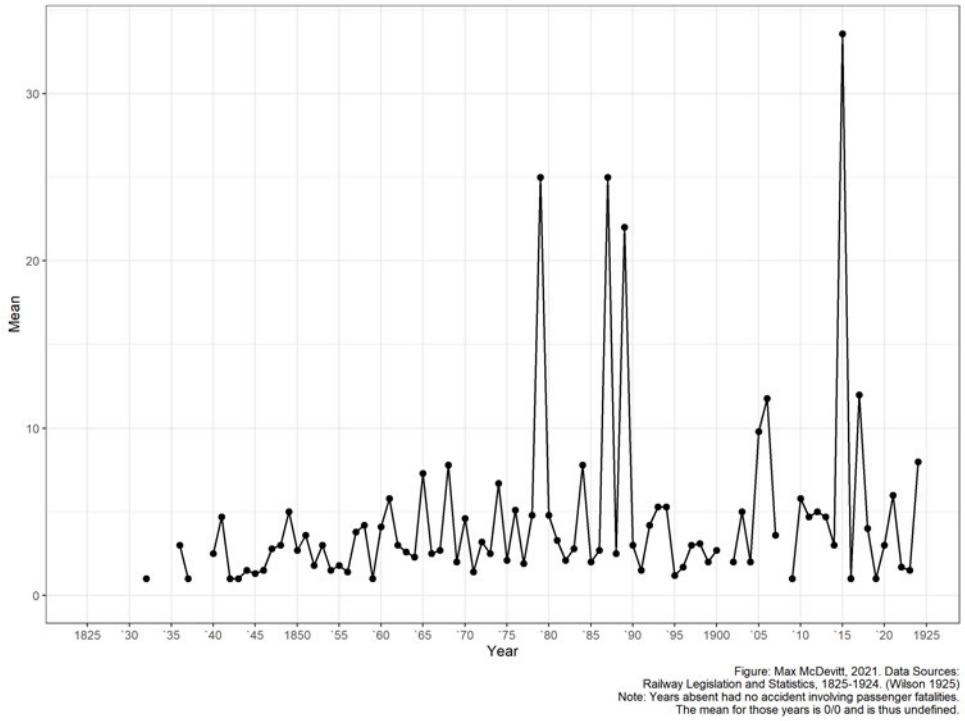


Table 2 reports the top-15 companies as ranked by the number of passenger-fatal railway accidents, 1825-1924. The London and Northwestern ranks first with 59 passenger-fatal accidents and second in fatalities, 203. The Midland railway ranks second with 38 passenger-fatal accidents. The Lancashire and Yorkshire Railway saw 35 passenger-fatal accidents, placing it in third. The Caledonian railway ranks sixth with 22 passenger-fatal accidents, but ranks first in fatalities (266), largely due to the Quintinshill Railway Disaster of 22nd May, 1915, in which 224 perished.

Figure 2·4 in the appendix of this chapter presents a list of the 37 railway companies that petitioned against "A Bill for the Better Prevention of Accidents" in 1855 as listed in *Bradshaws Railway Manual, Shareholders Guide, and Directory* of 1856. Of the 15 top-ranked railways for number of passenger-fatal crashes, only the London and South Western, Great Eastern, London, Brighton, and South Coast, South Eastern, and Cheshire Lines are missing from the list of companies that successfully petitioned against the bill. The Great Eastern, the Cheshire Lines Committee did not exist in 1855 to petition the bill. Thus out of the 13 of the 15 worst offenders from 1825-1924, 10 of them petitioned against this bill.

2.2.2 Data: Board of Trade Annual Reports to Parliament, 1889, 1893, 1897, and 1899

I digitized tables from the *General Report to the Board of Trade Upon the Accidents Which Have Occurred on the Railways of the United Kingdom* (1889, 1899) and the *Returns of Accidents and Casualties* (1893, 1897) documenting the numbers of passengers (and others) and employees killed and injured in railway accidents during the year [Railway Department, 1890, Railway Department, 1894, Railway Department, 1898, Railway Department, 1900]. These documents were prepared for Parliament annually as mandated in the Regulation of Railways Act (1871), 34 & 35 Vict. cap. 78. Convenient for the purposes of this study, the reports tabulate these variables

Table 2.2: Railway Accidents Involving Passenger Fatalities By Company, 1825-1924

	Company	Accidents (N)	Fatalities (N)	Fatalities (Mean)	Fatalities (Median)	Fatalities (Max)
1	London and North Western	59	203	3.4	1	31
2	Midland	38	128	3.4	2	16
3	Lancashire and Yorkshire	35	108	3.1	2	21
4	North Eastern	25	80	3.2	2	18
5	North British	24	158	6.6	1	73
6	Caledonian	22	266	12.1	1	224
7	Great Northern	22	85	3.9	2.5	16
8	Great Western	22	104	4.7	2	34
9	Great Central (MSLR)	18	96	5.3	1	25
10	London and South Western	15	56	3.7	1	24
11	Great Eastern	13	65	5	1	21
12	London, Brighton, and South Coast	10	48	4.8	3	23
13	Eastern Counties	8	18	2.2	2	5
14	South Eastern	8	37	4.6	3	12
15	Cheshire Lines	5	10	2	1	6

by-company.

There are several benefits to these secondary sources of data, which complements the 100-year panel of passenger fatal railway accidents presented above (2.2.1). The primary benefit is that these data sources detail employee deaths from railway accidents, which Wilson (1925) does not. Inclusion of these additional data sources allows me to investigate the relationship between political connections and employee deaths in railway accidents. A secondary benefit is that the number injured (passengers, others, and employees) is tabulated as well as the killed. This allows for a complementary analysis of injured alongside that for deaths. Finally, the railway accidents included in Wilson (1925) are only those involving passenger deaths. The railway accidents included in the *General Reports* and the *Returns of Accidents and Casualties* are a superset of those solely involving passenger deaths in the overlapping 4 years. Thus for the years included, 1889, 1893, 1897, and 1899, the data is wider" that from Wilson (1925). The data from Wilson (1925) provides the benefit of an unbroken 100-year time series.

Data for 1889 comes from Appendix No. 1 of the *General Report to the Board of Trade Upon the Accidents Which Have Occurred on the Railways of the United Kingdom* [Railway Department, 1890]. The name of the railway is listed in rows. The variables Number of Accidents." and SUFFERERS BY ACCIDENT." is broken into Passengers and others." and Servants of Company." each of which are further broken down into Killed" and Injured."

72 railway accidents are listed for 1889. These accidents took place on 26 railways companies (*Bradshaws* lists 329 U.K. railways in 1889.) These railway accidents killed 89 passengers and others" and injured 879 more. For employees, the numbers are 3 killed and 39 injured. As discussed above, 1889 was an exceptional year for U.K. passenger deaths on railways due to the Armagh crash in August of that year, which

killed 80 passengers and injured another 260.

Data for 1893 and 1897 come from the *Returns of Accidents and Casualties* [Railway Department, 1894, Railway Department, 1898]. For 1893 the table digitized is found in Table No. 4. (p. 10-13). For 1897 the table digitized is found in Table No. 4 (p. 14-15).

Accidents on the railways of 60 companies took place in 1893, a distinct increase on the 26 companies listed for 1889. This cannot be explained by an increase in the number of companies: as seen in 3·1. The number of railway accidents is not directly listed in the table and cannot be readily recovered from other variables. (Other variables in the table classifying accidents by type are non-mutually-exclusive.) 17 passengers and others" are listed as killed in 1893 along with an additional 484 injured. Coincidentally 17 employees are listed as killed in railway accidents in the same year and an additional 77 were injured.

In 1897 railway accidents listed on the lines of 36 companies accounted for the deaths of 25 passengers and the injury of 336 more passengers. The number of employees killed on railway accidents is listed as 9 with an additional 140 injured. Data for 1899 comes from the [Railway Department, 1900]. 66 accidents occurred killing 14 passengers and bystanders and 13 employees. 533 passengers and bystanders and 74 employees sustained serious injuries in these accidents.

These data are documented in 4.3 Table 2.3 provides a summary. Section 2.2.3 below describes how this data set is combined with the data from chapter 1 in order to relate railway safety to political connections. Section 2.4.1 investigates the relationship between overall (passenger, bystander, and employee) safety and political connections more formally using a panel regressions framework. Section 2.8.1 in the appendix to this chapter contains results done separately for passengers and bystanders, looking specifically at public or consumer safety. Section 2.8.2 in the

appendix does the same for employee safety.

2.2.3 Data: Political Connections of Railways, 1864-1901

Data on the political connections of railways by year uses the same data set developed for chapter 1 of this dissertation. For the years 1889, 1893, 1897, and 1899, I match the political connections data and the four-year panel on company-year. This allows me to provide the overview from table 2.3, grouping the aggregates by whether or not the firms are politically connected at the extensive margin in year. This measure is the same as in chapter 1. It is a binary variable equal to 1 if in that year there is at least one director-M.P. or director-Peer on the board of the railway. Results are presented in table 2.4.

The aggregate summaries in table 2.4 deserve some discussion. Accidents occurred much more frequently on politically connected railways, in 1889 and 1899, the two years for which the data for *distinct* railway accidents is available from the Board of Trade Reports. The differences are stark: 13 times as many railway accidents in 1889 and 11.1 times as many accidents in 1899 occurred on the lines of politically connected railways than occurred on the lines of non-politically connected railways.

Fatalities of passengers and bystanders is likewise considerably higher for the politically connected railways in 1893, 1897, and 1899. 1889 is a very stark departure from this pattern. The reason is the single deadliest railway crash in the U.K. during the 19th century. This is discussed separately below in 2.2.4. Excluding the Armagh incident for 1889, passenger and bystander deaths in railway accidents were rare on both politically connected (3) and non-politically connected firms (6). If Armagh is ignored, only 3 passengers and bystanders were injured on non-politically connected railways in 1899 while almost 600 were on the lines of politically connected firms. Injuries to employees on non-politically connected lines in 1889 were 0 if Armagh is

Table 2.3: Deaths and Injuries on U.K. Railways, By Year

Year	1889	1893	1897	1899
Accidents (N)	72*	NA	NA	66
Fatalities (Passenger and Bystander) (N)	89*	17	25	14
Fatalities (Employee) (N)	3	17	9	13
Injuries (Passenger and Bystander) (N)	879*	484	336	533
Injuries (Employee) (N)	39*	77	140	74

Deaths and Injuries as reported by the Board of Trades Railway Department to Parliament.
Data Sources: [Railway Department, 1890, Railway Department, 1894, Railway Department, 1898, Railway Department, 1900]
*Aggregates include the Armagh Incident of 1889, the single deadliest U.K. railway accident in the 19th C and an extreme outlier in this short panel. If the Armagh Incident is omitted: 1889 Accidents = 71, Fatalities (Passenger and Bystander) = 9, Injuries (Passenger and Bystander (N) = 619, and Injuries (Employee) (N) = 37.

Table 2.4: Deaths and Injuries on U.K. Railways, by Year and Political Connection

Year	1889	1889	1893	1893	1897	1897	1899	1899
Politically Connected	NO	YES	NO	YES	NO	YES	NO	YES
Accidents (N)	5*	65					5	56
Fatalities (Passenger and Bystander) (N)	86*	3	1	14	2	23	0	14
Fatalities (Employee) (N)	0	3	0	12	2	6	0	12
Injuries (Passenger and Bystander) (N)	263*	597	10	406	29	301	47	414
Injuries (Employee) (N)	2*	37	2	71	10	126	11	62

Deaths and Injuries as reported by the Board of Trades Railway Department to Parliament.
Data Sources: [Railway Department, 1890, Railway Department, 1894, Railway Department, 1898, Railway Department, 1900]
*Aggregates include the Armagh Incident of 1889, the single deadliest U.K. railway accident in the 19th C and an extreme outlier in this short panel. If the Armagh Incident is omitted: 1889 (Politically Connected = NO) Accidents = 4, Fatalities (Passenger and Bystander) = 6, Injuries (Passenger and Bystander (N) = 3, and Injuries (Employee) (N) = 0.

excluded and 2 otherwise. At the same time, 37 employees were injured.

The rest of the years presented in table 2.4 show markedly more fatalities and serious injuries on the lines of politically connected firms than non-politically connected firms. For the end of the data on director deaths sections: Note that it is matched explicitly for the years 1876-1900 of political connections with director-deaths from 1871-1900. This allows for using leads and lags of director-deaths of up to 5 years with data from 1876-1895, or 1876-1896 with 4 year leads and lags. I explored both and chose to go with the 4-year window for the leads and lags.

The politically connected railways were generally much larger than the non-politically connected railways, operating more track and running more passenger-miles and freight-miles. This very likely accounts for much of the large differentials in in the variables discussed above.

2.2.4 The Armagh Railway Collision of 1889

The reason that the fatalities of passengers and bystanders on non-politically connected railways in 1889 is so high relative to the other years is due to the single deadliest railway accident in the U.K. during the 19th century, the Armagh runaway train collision on The Great Northern (Ireland) Railways lines. The Great Northern (Ireland) Railway was not politically connected in 1889, it had been politically connected in both the House of Commons and the House of Lords continually from 1877-1885. This horrific accident occurred on June 12th, 1889 and resulted in 80 passenger fatalities. In addition to those killed, an additional $\approx$ 260 were seriously injured. Of special interest to those concerned about the relationships between extremely deadly accidents and legislation, the Regulation of Railways Act 1889 (52 & 53 Vict. c. 57) received the Royal Assent just two and a half months after the Armagh disaster. This law expanded the powers of the Board of Trade by giving bu-

reaucrats in the Railway Department the legal power to *order* ...the adoption of the space-interval block system, the provision of interlocking, and the fitting of automatic continuous brakes on all passenger-carrying lines." [Nock, 1987]. This legislation had been rushed in response to public opinion on the accident which was heightened by the fact that 22 of the fatalities were young children. Parliamentary and public opinion had been deeply stirred by the vision of all those children horribly killed and mutilated in the Armagh accident and a short Bill was hurriedly introduced, passed through Parliament and received the Royal Assent." [Hall, 1990]

2.2.5 Data: Director Deaths

In order to get at plausibly exogenous variation in the political connections of railways I constructed two additional data sets covering the deaths of railway directors in Parliament.

The first data-set is the universe of M.P.s who died while in office from 1832-1909. This data set is described in 2.2.5. From this data set I extract the subset of M.P.s between 1862 and 1900 who were also railway directors in the year they died. There are 51 director-M.P.s who died in office during these years. Restricting the data to 1871-1900 for the analysis below leaves 33 distinct deaths of railway director-M.P.s with induced 64 company-year death "treatments".

The second data-set consists of the railway director-Peers who died while serving as Peers from 1866-1900. 38 railway director-Peers died during these years. 67 company-year "treatments" were induced by these deaths. As with M.P. deaths I restrict the data to 1871-1900. This leaves 34 deaths and 61 company-year "treatments."

The two data-sets are collapsed to the company-year level from the company-year-death level and then matched on company year. No company in the data experiences more than a single director-M.P. death in a year. The same is true for director-Peers. However, two firms experienced the death of both a director-M.P. and a director-Peer in a single year. This happened to the Lancaster and Carlisle Railway in 1876 and to the Furness Railway in 1891.

The above is then matched on company-year to the political connections and railway accidents data sets described in the previous sections.

2.3 Results: Political Connections and Passenger Fatal Railway Accidents, Long Panel

2.3.1 Panel Results

2.1 is used to investigate the extensive margin of political connections in relation to railway safety.

$$Y_{it} = \alpha + \beta_0 \mathbb{1}\{GOV_{it} > 0\} + \psi MILES_{it} + \gamma_t + \phi_i + \epsilon_{it} \tag{2.1}$$

2.2 is used to investigate the intensive margin of political connections in relation to railway safety.

$$Y_{it} = \alpha + \beta_0 GOV_{it} + \psi MILES_{it} + \gamma_t + \phi_i + \epsilon_{it} \tag{2.2}$$

Y_{it} is the outcome for railway i in year t. GOV_{it} is a count of the number of director-M.P.s and director-Peers on the board of railway i in year t. $MILES_{it}$ denotes the miles of track railway i has open in year t. γ_t ϕ_i are year and company fixed effects, respectively. All standard errors reported are heteroskadasticity-robust [White, 1980].

Table 2.17 estimates equation 2.2 with the dependent variable being the number of passenger deaths.

Table 2.5 presents results of estimating equation 2.2 with a binary outcome denoting the occurrence of a passenger-fatal railway accident. The unconditional average of this variable is 0.013. i.e. on average 1.3% of railway companies had a fatal railway accident on their lines during the quarter-century, 1876-1900.

The first column uses all companies for which political connections data is available, or the unrestricted sample, while the remaining columns all use the restricted sample which is the sample for which the important control variable of miles of track open for business is available in my data. This accounts for the large difference in N

between the first column and the rest in this and all tables in this chapter. In the absence of controls, each additional director-M.P. or director-Peer on the board of a given railway is associated with an increase of 0.022 in the likelihood that railway has a passenger-fatal railway crash. Moving to the restricted sample increases the coefficient somewhat, suggesting that those firms for which I have miles data available, which tend to be larger firms, also had more fatal crashes. Column (3) adds a control for the miles of track open on the railway in that year. This control cuts the magnitude of the coefficient significantly. This is to be expected as A) the larger railways have more opportunities for passenger fatalities as they operate more track; and B) Larger railways are more politically connected (See chapter 1 of this dissertation). The addition of the miles control however does not kill statistical or economic significance of the coefficient. The magnitude is still 0.012, or more than 90% of the unconditional mean. The inclusion of year fixed effects in column (4) leaves the coefficient unchanged but unsurprisingly improves the fit of the regression model as it allows average accident likelihood to vary in a fully-flexible way across years.

The results in columns (1)-(4) are all the results of pooling observations and the coefficients estimated are coming from both within and across railway variation in political connections and railway accidents. These results can thus best be understood as saying that the more politically connected railways had more passenger-fatal railway accidents 1876-1900. Column (5) includes company fixed effects in order to control for time-invariant company fixed effects. In this specification, only within-railway dynamic variation is being used to estimate the coefficients. A null result is shown here suggesting that there is not evidence that within-firm changes in the degree political connections impacted the likelihood of railway accidents.

The extensive margin of political connections, as in equation 2.1, is estimated and results are presented in table 2.6. The results here tell a very similar story to that

Table 2.5: Railway Accidents (Binary) and Political Connections (Intensive Margin) (1876-1900*)

	Dependent variable:				
	Accident (Binary)				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	0.022***	0.030***	0.012**	0.012**	−0.005
	(0.003)	(0.005)	(0.006)	(0.006)	(0.011)
Miles Open			0.0001***	0.0001***	0.0002
			(0.00003)	(0.00002)	(0.0001)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	7,649	1,132	1,132	1,132	1,132
Adjusted R^2	0.054	0.046	0.084	0.091	0.148

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Accident): 0.013
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Values from prior years (1890 and 1894) are assigned.
No additional controls are included.

for table 2.5. Politically connected firms are much more likely to have passenger-fatal railway accidents than their non-politically connected counterparts. This result can not be explained away by miles open and/or year fixed effects. Column (5) is again a null result. The coefficients are larger than those for the intensive margin presented in table 2.5. This suggests, quite sensibly, that the extensive margin of political connections is associated with larger average marginal effects than the intensive margin. This would make sense if being politically connected matters more to firm safety behavior on average than additional political connections do. The next results switch from investigating accident probability to the amount of passenger fatalities occurring.

For tables 2.7 and 2.8, the outcome variable is the the natural log of 1 plus the number of passenger fatalities. Table 2.7 presents estimates of 2.2. Passenger deaths increase in political connections. This holds in both the full sample and the restricted sample. Inclusion of miles open and year fixed effects lowers the estimated coefficient, but the result is still statistically significant at the 5% level. Within-firm results are again a null, though notably the sign of the coefficient flips. Table 2.17 in the appendix presents a variant of this table with the outcome variable being the number of passenger deaths. The results broadly tell the same story, as in table 2.7.

Table 2.8 shows the estimates for the extensive margin, equation 2.1 with the natural log of one plus the number of passenger deaths as the outcome variable. Politically connected railways killed more consumers than their non-connected counterparts. Controlling for miles open and year fixed effects leaves a statistically significant and economically significant result. As in the other results presented thus far in the paper, restricting attention to within-company variation through the inclusion of company fixed effects leads to a null result. Although here, unlike the in the result for the intensive margin of political connection, the sign does not flip and the magnitude

Table 2.6: Railway Accidents (Binary) and Political Connections (Extensive Margin) (1876-1900*)

	Dependent variable:				
	Accident (Binary)				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	0.028^{***}	0.089^{***}	0.037^{**}	0.034^{*}	-0.005
	(0.003)	(0.017)	(0.017)	(0.017)	(0.026)
Miles Open			0.0001^{***}	0.0001^{***}	0.0002^{*}
			(0.00002)	(0.00002)	(0.0001)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	7,649	1,132	1,132	1,132	1,132
Adjusted R^2	0.014	0.023	0.083	0.089	0.148

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Accident): 0.013
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Values from prior years (1890 and 1894) are assigned.
No additional controls are included.

Table 2.7: Railway Passenger Deaths (ln) and Political Connections (Intensive Margin) (1876-1900*)

	Dependent variable:				
	ln(1 + Passenger Deaths (N))				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	0.029***	0.039***	0.016**	0.016**	−0.014
	(0.002)	(0.006)	(0.007)	(0.007)	(0.014)
Miles Open			0.0002***	0.0002***	0.0002
			(0.00003)	(0.00003)	(0.0002)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	7,649	1,132	1,132	1,132	1,132
Adjusted R^2	0.041	0.035	0.062	0.058	0.091

Note: *p<0.1; **p<0.05; ***p<0.01
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Values from prior years (1890 and 1894) are assigned.
No additional controls are included.

is much closer to zero. The results from this table suggest that politically connected firms were deadlier for passengers during 1876-1900. However, the null result for fixed effects means there is not evidence here to support a claim that for a given firm becoming politically connected (or losing political connection) over time is associated with significant changes in consumer safety.

A similar table, 2.18, is presented in the appendix with the outcome variable being the number of passenger deaths. The results are broadly similar to those in table 2.8. Notably the result in column (5) of table 2.18 yields an estimated beta of 0.065, where the mean outcome is 0.07. This estimate however, is very noisy and despite the large magnitude is unambiguously a null result.

Table 2.8: Railway Passenger Deaths (ln) and Political Connections (Extensive Margin) (1876-1900*)

	Dependent variable:				
	log(1 + Passenger Deaths (N))				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	0.037***	0.121***	0.054***	0.052**	0.005
	(0.005)	(0.021)	(0.020)	(0.020)	(0.034)
Miles Open			0.0002***	0.0002***	0.0002
			(0.00004)	(0.00004)	(0.0002)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	7,649	1,132	1,132	1,132	1,132
Adjusted R^2	0.011	0.018	0.061	0.057	0.090

Note: *p<0.1; **p<0.05; ***p<0.01
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Values from prior years (1890 and 1894) are assigned.
No additional controls are included.

2.3.2 Panel Results with Plausibly Exogenous Deaths of Director-M.P.s or Director-Peers

The results presented above show that political connections are associated with significantly higher levels of passenger fatalities. Those results generally hold for both the extensive and intensive margins of political connections. In addition, these results hold after the inclusion of controls for the number of miles open and year fixed effects. Those results do not hold generally in the full panel specifications including company fixed effects.

Company fixed effects control for time-invariant, company-specific omitted variables. However, political connections and passenger fatalities may both be correlated with time-variant company-specific variables. Political connections may be endogenous to general railway safety with railways that are operating less safely being more likely to pursue political connections to allow more permissive regulation and operating. In this section I try to address this concern by exploiting a plausibly exogenous source of variation in the political connections of firms: the deaths of railway director-M.P.s and director-Peers.

Getting an extant railway director into Parliament or convincing an M.P. or Peer to accept a directorship in a railway occurred extensively in U.K. railway history. However, these things became increasingly difficult after the hey-day of the mid-1840s railway mania. The ability to "buy" an M.P. or Peer decreased over time as fewer members were left in either house that were not already well-connected through directorships on multiple railways. In addition as the 19th century progressed elections to the House of Commons became increasingly competitive with more individuals competing for each seat. [Berlinski and Dewan, 2010] show that the Second Reform Act of 1867 considerably increased competition in elections. Chapter 3 of this dissertation shows that the expansions of the franchise in the Second (1867) and Third

(1884) Reform Acts made it considerably less likely that railway directors running for M.P. would win conditional on running. That chapter also shows that the choice to run, which is endogenous to beliefs regarding the likelihood of victory, was also impacted by the expansion of the franchise, with railway directors being less likely to run in constituencies where the franchise had expanded more. The Secret Ballot Act (1872) almost certainly also played a role by removing a tool, explicit knowledge of how their employees' voted, which historians have shown was used by railway directors to help secure their victories in Parliamentary contests as late as 1868, after the Second Reform Act (See the discussion of William Hodgson, M.P. and Railway Director exploiting open voting to secure his place in Parliament prior to passage of the Secret Ballot Act 1.3.2).

Though railways could and did actively take steps to change their political connections, by the time studied here, 1876-1900, there were significant frictions involved and a company attaining it's desired level of political connections was by no means guaranteed. Because of this, I find it highly unlikely that railways who lost a political connection through the death of a director-M.P. or director-Peer in a given year would be able to simply replace him in the years following. Deaths of director-M.P.s and director-Peers thus give rise to variation in political connections that in the short and medium term is beyond the control of the railway to undo through acquisition of a replacement director in Parliament. The data sets covering the deaths of railway director-M.P.s and director-Peers discussed in 2.2.5 and documented in 4.4 and 4.5 is matched on the company-year level to the data used above in section 2.2.

The specification 2.3 augments 2.2 through the inclusion of binary variables indicating the death of a director-M.P. or director-Peer of railway i in year t. These are firm-specific, time varying shocks to political connections. Lags and leads of these indicators are included to study how passenger fatalities relate to unexpected changes

in political connections stemming from the deaths of directors who held seats in Parliament. Note that due to many railway director-M.P.s and director-Peers holding multiple directorships some of these deaths directly impact the political connections of multiple firms. The vast majority of these deaths directly impact one or two railways. However, outliers include the death of the railway director-Peer, Edward Montagu-Stuart-Wortley-Mackenzie, 1st Earl of Wharncliffe. When Earl Wharncliffe died on May 13th, 1899, he held directorships on the Cheshire Lines, the Great Central, the North Cornwall, the Nottingham Joint Station Committee, the Sheffield and Midland Joint Lines, and the West Riding and Grimsby.

Summarizing the above, in this section, I modify 2.2 to include an event-study, where the event is the death of either a director-M.P. or a director-Peer. 2.3 is used to get at plausibly exogenous changes in the number of directors on the board of a firm concurrently in Parliament.

$$Y_{it} = \alpha + \sum_{T=-4}^{T=+4} \left(\delta_T DEATH_{it} \right) + \beta GOV_{it} + \psi MILES_{it} + \gamma_t + \phi_i + \epsilon_{it} \quad (2.3)$$

Here Y_{it} is the outcome variable for railway i in year t. GOV_{it} $DEATH_{it}$ is an indicator for if a director-M.P. or director-Peer from railway i died in year t. GOV_{it} is a count of the number of director-M.P.s and director-Peers on the board of railway i in year t. $MILES_{it}$ denotes the miles of track railway i has open in year t. γ_t ϕ_i are year and company fixed effects, respectively. All standard errors reported are heteroskadasticity-robust [White, 1980].

The outcome variable is again the natural log of one plus the number of passenger fatalities as in section 2.3 above. The reader will note that the number of observations has fallen a bit relative to the prior section. The restricted sample is now 6,404 rather than 7,649 and the unrestricted sample fell from 1,132 to 909. The reason for this

change is due to the fact that estimation of 2.3 requires information on deaths of director-M.P.s and director-Peers for 4 years prior and into the future. The data on director-Peer deaths ends in 1900, thus making 1896 the last year I can include in the estimation. The starting year, 1876, is the same as in the prior section as the data I constructed covers the universe of deaths of railway director-M.P.s and Peers for all of the 1870s. Despite the loss of some power and 4 years, this leaves 21 years of data on which the model is estimated.

Results are presented in table 2.9. These results all control for the intensive margin of political connections. The within-firm results suggest that for a given railway, the death of a director-M.P. or director-Peer increased railway safety in that year and in subsequent years, the one immediately following excepted. The coefficients are large and statistically significant for the year of death and for deaths that occurred three and four years ago. The results are large: the death of a railway director-M.P. or Peer this year is associated with a decrease of 15.7% in the number of passenger fatalities. For a death that occurred three years ago, the associated decline in passenger fatalities is 21.3% For four years ago there is a statistically significant effect of 16.5%.

There are some noticeable issues with these results that decrease confidence in them. First the coefficient for the year prior, though relatively small and statistically insignificant, is unexpectedly positive. The coefficient for two years prior is not statistically significant, though of anticipated sign. Another concern is that future deaths of director-M.P.s and Peers, which should not be predictive of railway safety are consistently negative and large, albeit not statistically significant. However, in a robustness check presented in appendix, 2.17, where the outcome variable is the number of passenger deaths, the results are broadly supported, but the negative coefficient for future death of a director-M.P. or Peer is statistically significant and large in magnitude. This indicates that the model is not adequately controlling for other

Table 2.9: Railway Passenger Deaths (ln) and Death of Director-M.P. or Director-Peer (1876-1900*)

	Dependent variable:				
	log(1 + Passenger Deaths (N))				
	(1)	(2)	(3)	(4)	(5)
Death Director Gov (t-4)	0.0001	−0.065	−0.067	−0.056	−0.165*
	(0.032)	(0.087)	(0.083)	(0.081)	(0.096)
Death Director Gov (t-3)	−0.023	−0.127**	−0.118**	−0.107*	−0.213***
	(0.019)	(0.055)	(0.053)	(0.055)	(0.077)
Death Director Gov (t-2)	−0.003	−0.028	−0.023	−0.022	−0.133
	(0.038)	(0.109)	(0.106)	(0.107)	(0.107)
Death Director Gov (t-1)	0.059	0.143	0.136	0.151	0.055
	(0.055)	(0.151)	(0.151)	(0.148)	(0.151)
Death Director Gov	−0.031	−0.097	−0.103*	−0.100	−0.157**
	(0.021)	(0.063)	(0.061)	(0.062)	(0.074)
Death Director Gov (t+1)	−0.012	−0.049	−0.058	−0.060	−0.123
	(0.033)	(0.106)	(0.107)	(0.111)	(0.118)
Death Director Gov (t+2)	−0.023	−0.068	−0.090	−0.094	−0.107
	(0.027)	(0.083)	(0.081)	(0.080)	(0.070)
Death Director Gov (t+3)	−0.037	−0.085	−0.105	−0.115	−0.128
	(0.028)	(0.088)	(0.084)	(0.086)	(0.082)
Death Director Gov (t+4)	0.003	0.005	−0.019	−0.025	−0.045
	(0.040)	(0.112)	(0.110)	(0.107)	(0.101)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	6,914	953	953	953	953
Adjusted R^2	0.034	0.024	0.050	0.045	0.078

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger Fatalities): 0.07
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Values from prior years (1890 and 1894) are assigned.
Controlling for Political Connection (N) throughout.

factors.

Results controlling for the extensive margin of political connection are presented in table 2.10. These results look very similar to those presented above in table 2.18 and the same concerns expressed there apply here as well. A robustness check is provided in the appendix with the number of passenger fatalities as the outcome variable. Results are similar.

In the literature on pricing the value of political connections using asset prices, anticipated deaths are a major concern because if the market believes an individual providing a political connection is likely to die, then that probability is priced into the asset prices of the firms potentially impacted. Measures of changes in asset prices post-pre the death of the individual providing the political connections are thus biased downward relative to what they would be if the market did not anticipate the death. This is not a concern here. However, there is a concern that bureaucrats will not be as lax in their regulation of a firm if they believe the director-M.P.s or director-Peers of that firm will not be around in the future to exert influence on their careers. Though possible, I do not believe this is likely to be large enough to significantly impact the results.

The results in this section use the deaths of director-M.P.s and director-Peers as plausibly exogenous variation in the political connections of railways. The results are mixed although they broadly suggest railway safety improves after the death of a politically connected director, consistent with the theory that political connections make firms less safe for consumers. The caveats above are important and prevent this author from calling this strong evidence in support of the hypothesis. That the effect is not present as expected for the death of a director-M.P. or Peer one year ago as well as the consistently negative, large and occasionally significant future deaths coefficients suggesting anticipatory effects suggests this model is failing to capture

Table 2.10: Railway Passenger Deaths (ln) and Death of Director-M.P. or Director-Peer (1876-1900*)

	Dependent variable:				
	log(1 + Passenger Deaths (N))				
	(1)	(2)	(3)	(4)	(5)
Death Director Gov (t-4)	0.023	−0.029	−0.054	−0.044	−0.159
	(0.031)	(0.080)	(0.078)	(0.076)	(0.097)
Death Director Gov (t-3)	0.004	−0.073	−0.098**	−0.086*	−0.216***
	(0.018)	(0.048)	(0.046)	(0.048)	(0.078)
Death Director Gov (t-2)	0.021	0.019	−0.006	−0.005	−0.132
	(0.040)	(0.114)	(0.106)	(0.108)	(0.107)
Death Director Gov (t-1)	0.084	0.194	0.154	0.169	0.054
	(0.057)	(0.155)	(0.153)	(0.150)	(0.151)
Death Director Gov	−0.001	−0.048	−0.087	−0.083	−0.169**
	(0.021)	(0.058)	(0.057)	(0.055)	(0.075)
Death Director Gov (t+1)	0.017	−0.001	−0.042	−0.044	−0.133
	(0.032)	(0.101)	(0.104)	(0.107)	(0.118)
Death Director Gov (t+2)	0.003	−0.031	−0.080	−0.083	−0.116
	(0.028)	(0.083)	(0.080)	(0.080)	(0.073)
Death Director Gov (t+3)	−0.006	−0.034	−0.090	−0.098	−0.139*
	(0.028)	(0.086)	(0.081)	(0.084)	(0.083)
Death Director Gov (t+4)	0.035	0.050	−0.006	−0.011	−0.053
	(0.037)	(0.099)	(0.103)	(0.100)	(0.102)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	6,914	953	953	953	953
Adjusted R^2	0.011	0.012	0.049	0.043	0.075

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger Fatalities): 0.07
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Values from prior years (1890 and 1894) are assigned.
All columns control for Politically Connected.

important aspects that matter for safety and may be biasing results.

2.4 Results: Board of Trade Accidents (1889, 1893, 1897, 1899)

2.4.1 Results: Political Connections and Overall Railway Safety (1889, 1893, 1897, 1899)

This section provides additional tests of the hypothesis that politically connected railways were more dangerous than non-politically connected railways using a different data set. This data set has several advantages that make it complementary to the passenger-fatal railway accidents panel used in the previous sections. First, the data has variation that is "wider" than that for passenger fatalities. I.e. there is more variation in the outcome variables across firms and fewer zeroes. This is because the condition for inclusion in the data source is not as strict as that in the passenger-fatality data source. Second, these data allow for investigation of consumer and employee safety together and separately. The long-panel used in the previous results looks only at passenger fatalities and thus cannot be used to investigate either the aggregate, as presented in the results in this section, or employee safety. The appendices contain estimates done separately on this data set for passenger and bystander safety and employee safety as well as additional results on accident probability.

This section revisits the relationship between political connections and railway accidents reported on by the Board of Trade in the years 1889, 1893, 1897, and 1899 discussed in section 2.2.2. In that section I noted that politically connected railways were larger than their non-connected counterparts. Thus the substantially higher numbers for accidents, deaths (excluding the Armagh disaster), and injuries on politically connected railways could be due to larger railway size, rather than political connections. In this section I address those concerns in a regression framework which controls for the number of railway miles open for business. Following the discussion above, I drop the Armagh disaster from the data-set as it is an extreme outlier. I

investigate the intensive margin as well as the extensive margin of political connections with respect to its relationship to accidents, deaths, and injuries. The following regression models 2.4, 2.5 used.

2.4 is used to investigate the extensive margin of political connections in relation to railway safety.

$$Y_{it} = \alpha + \beta_0 \mathbb{1}\{GOV_{it} > 0\} + \psi MILES_{it} + \gamma_t + \phi_i + \epsilon_{it} \tag{2.4}$$

2.5 is used to investigate the intensive margin of political connections in relation to railway safety.

$$Y_{it} = \alpha + \beta_0 GOV_{it} + \psi MILES_{it} + \gamma_t + \phi_i + \epsilon_{it} \tag{2.5}$$

Y_{it} is the outcome for railway i in year t. GOV_{it} is a count of the number of director-M.P.s and director-Peers on the board of railway i in year t. $MILES_{it}$ denotes the miles of track railway i has open in year t. γ_t ϕ_i are year and company fixed effects, respectively. All standard errors reported are heteroskadasticity-robust [White, 1980].

Table 2.35 shows estimates of of equation 2.4 for the outcome variable $Y_{it} = Accidents$. As discussed previously, there are only two years (1889, 1899), available for this outcome. Due to this constraint, rather than directly estimating the model with fixed effects, the final column of presents results from estimating the first-differenced version of equation 2.4. Column (1) includes all companies covered in the political connections data-set for the years 1889 and 1899. For the rest of the columns, the data is restricted to observations for which I have information on miles open.

The unconditional mean of total deaths in the 4-year panel is 0.09, or approximately 1 death for every 11 company-years. Columns (1) and (2) of table 2.11 present estimates for the intensive margin of political connections without controls or fixed

Table 2.11: Railway Deaths (All) and Political Connections (Intensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Total Deaths				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	0.107***	0.093*	0.074*	0.074*	0.560**
	(0.027)	(0.051)	(0.044)	(0.040)	(0.270)
Miles Open			0.0001	0.0001	0.010*
			(0.0002)	(0.0002)	(0.005)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.026	0.004	−0.001	−0.005	0.021

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Total Deaths): 0.09
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

effects. The estimates are approximately the same as the unconditional mean: each additional railway director-M.P. or Peer is associated with a 100% increase in fatalities relative to the unconditional mean. Controlling for miles open and year fixed effects, columns (3) and (4) slightly reduces the magnitude of the coefficient but leaves it large and statistically significant. Notably inclusion of fixed effects leads to a more than quintupling of the coefficient to 0.56. This implies that changes within-railway over time in political connections is associated with an average change in fatalities that is more than 6-times the unconditional mean. Recall that the long-panel results for passenger fatalities were null for within-firm variation. Table 2.22 in the appendix of this chapter shows results in the four-year panel when attention is restricted to passenger and bystander deaths, a better comparison to the long panel results on passenger fatalities. The results there, are similar to those in table 2.7 from the long panel.

Table 2.12 presents the results for all railway deaths for the extensive margin. The results show very large statistically significant results that hold in all specifications less the company fixed effects specification, column (5), which though large and in the expected direction, is noisy and indistinguishable from zero.

Serious injuries are considered in tables 2.14 and 2.14. The mean for total injuries is 1.98, or nearly 2 per company-year. Columns (1) and (2) of table 2.14 show large coefficients for the intensive margin of political connections. Without controls or fixed effects each additional railway director-M.P. or Peer on the board is associated with an average of 3.35 additional serious injuries. In the sample restricted to years miles open is available, this increases to 4.34, more than double the unconditional mean on average for each additional director in Parliament. Controlling for miles open (3) cuts the magnitude of the coefficient to 1.53 and the inclusion of year fixed effects (4) changes this little. Inclusion of company fixed effects in the model kills the

Table 2.12: Railway Deaths (All) and Political Connections (Extensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Total Deaths				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	0.216***	0.577***	0.526**	0.514**	2.102
	(0.068)	(0.199)	(0.249)	(0.253)	(1.315)
Miles Open			0.0001	0.0001	0.014**
			(0.0002)	(0.0002)	(0.007)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.016	0.014	0.010	0.005	0.060

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Total Deaths): 0.09
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.13: Railway Injuries (All) and Political Connections (Intensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Total Injuries				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	3.360***	4.337***	1.529*	1.549*	1.739
	(0.508)	(0.829)	(0.855)	(0.833)	(2.694)
Miles Open			0.018***	0.018***	−0.014
			(0.004)	(0.004)	(0.040)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.201	0.172	0.337	0.337	0.486

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Total Injuries): 1.98
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

statistical significance on the coefficient, but increases the magnitude to 1.74. The results for injuries of passengers and bystanders on the intensive margin (see 2.24) are remarkably similar to those presented here. The results for employee injuries (see 2.30) are all in the expected direction, but are statistically significant in all regressions including miles open controls.

The extensive margin results for total injuries are presented in table 2.14. The extensive margin coefficients are much larger than the intensive margin coefficients. Results hold in all specifications. Notably within-firm changes from being not-politically connected to being politically connected are associated with an average of 6 additional injuries, or an increase of 300% relative to the unconditional mean. This table is providing evidence that both significantly more injuries occurred on average on politically connected railways and that for a given firm, dynamic changes in being politically connected are associated with large changes in the number of injuries: becoming politically connected is associated with more injuries, or a decline in safety according to this measure. Results for passengers and bystanders are markedly similar while those for employees only are similar but the estimate loses significance when company fixed effects are included.

2.5 Conclusion

This chapter addresses the question, "What is the impact of political connections on consumer and employee safety?" In order to address this question, I gathered sources and constructed two novel data sets covering railway accidents. These data sets were matched on company-year to the political connections data developed in chapter 1. Though I cannot assert confidently that the effects are causal, the regression results are consistent with the inference that politically connected firms will be less safe than their non-connected counterparts and that the degree of danger will increase in the

Table 2.14: Railway Injuries (All) and Political Connections (Extensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Total Injuries				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	5.196***	14.317***	7.333***	7.510***	5.997*
	(0.771)	(2.075)	(1.724)	(1.795)	(3.256)
Miles Open			0.019***	0.019***	−0.003
			(0.003)	(0.003)	(0.042)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.070	0.098	0.347	0.347	0.488

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Total Injuries): 1.98
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

degree of the political connection. Regression results consistently show more accidents, fatalities, and injuries occurring on politically-connected (and more politically connected) railways, however inclusion of company fixed effects often leads to null results. In order to address concerns that time-varying firm-specific unobservables are driving the results, I constructed and combined two additional data sets that cover the deaths of railway director-M.P.s and Peers. This data set is matched to the political connections and the longer accidents panel in order to investigate how railway safety evolves in response to plausibly exogenous changes in political connections. The results of this exercise suggest that political connections may have a (negative) impact on consumer safety. However, some strong caveats apply to these results. Overall the quantitative investigation in this chapter finds moderately strong evidence consistent with the hypothesis that political connections decrease consumer and employee safety.

2.6 Appendix: Blocking Accident Prevention Bills in Parliament

Source: Bradshaw 1856, Appendix p. 1

Figure 2·4: Accident Prevention Bill Blocked by Companies

A BILL FOR THE BETTER PREVENTION OF ACCIDENTS

Passed in the House of Lords; and was on several occasions set down for second reading in the House of Commons. The measure, however, was withdrawn on the 8th of August, in consequence of the lateness of the session, and probably also on account of the opposition with which it was threatened. The following companies petitioned against the bill :—

Aberdeen
Birkenhead
Blackburn
Blackwall
Caledonian
Chester and Holyhead
Cockermouth and Workington
Eastern Counties
East Lancashire
Edinburgh and Glasgow
Edinburgh, Perth, and Dundee
Furness
Great Northern
Great Southern and Western
Great Western
Hull and Holderness
Inverness and Nairn
Lancashire and Yorkshire
Lancaster and Carlisle
London and North Western
Manchester, Sheffield, & Lincolnshire.
Manchester, South Junction, and Altrincham
Midland
Midland Great Western
Monmouthshire
Newcastle and Carlisle
Newport, Abergavenny, and Hereford
North British
North Eastern
North Staffordshire
Oxford, Worcester, and Wolverhampton
Scottish Central
Shrewsbury and Hereford
South Devon
South Staffordshire
Ulster
West Hartlepool

The general draft petition of these companies was in effect as follow :—

"Sheweth, That a Bill is pending in your honourable House, intituled 'An Act for the better Prevention of Accidents on Railways.'

"That, although this Bill was not suggested by any sudden emergency, and contains no enactment which might not have been prepared in the earliest part of the Session, yet the said Bill was not printed until the 26th of June last, and was not brought down to your honourable House until the 11th day of July instant.

"That the said Bill consists mainly of three enactments:

"First. That Companies shall provide such immediate means of communication between the guards and the drivers of trains in motion as the Board of Trade shall from time to time prescribe.

a

2.7 Appendix: Additional Results: Political Connections and Passenger Fatal Railway Accidents, Long Panel

Table 2.17 estimates equation 2.2 with the dependent variable being the number of passenger deaths.

Table 2.18 estimates equation 2.1 with the dependent variable being the number of passenger deaths.

2.7.1 Lagged Political Connections Specifications

Table **??** presents results for linear probability models of the following form 2.6.

$$\mathbb{1}\{PASSENGER\_DEATHS_{it} > 0\} = \alpha + \beta_0 GOV_{it} + \beta_1 GOV_{it-1} + \beta_2 GOV_{it-2} + \psi MILES_{it} + \delta t + \gamma_t + \epsilon_{it} \quad (2.6)$$

$PASSENGER\_DEATHS_{it}$ is the number of passengers who died in accidents on railway i in year t. GOV_{it} is a count of the number of director-M.P.s and director-Peers on the board of railway i in year t. $MILES_{it}$ denotes the miles of track railway i has open in year t. t denotes a linear time trend. γ_t are year fixed effects. Year time trend is dropped when year fixed effects are included. All standard errors are heteroskadasticity-robust.

Table 2.20 presents results for the following regression models, with the terms defined as above.

$$PASSENGER\_DEATHS_{it} = \alpha + \beta_0 GOV_{it} + \beta_1 GOV_{it-1} + \beta_2 GOV_{it-2} + \psi MILES_{it} + \delta t + \gamma_t + \epsilon_{it} \quad (2.7)$$

Table 2.15: Railway Passenger Deaths (N) and Political Connections (Intensive Margin) (1876-1900*)

	Dependent variable:				
	Passenger Deaths (N)				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	0.091***	0.131***	0.079	0.079	−0.054
	(0.021)	(0.039)	(0.053)	(0.054)	(0.091)
Miles Open			0.0004**	0.0004**	−0.0003
			(0.0002)	(0.0002)	(0.001)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	7,649	1,132	1,132	1,132	1,132
Adjusted R^2	0.024	0.022	0.029	0.018	0.030

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger Fatalities): 0.07
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Political Connection values from prior years (1890 and 1894) are assigned.
No additional controls are included.

Table 2.16: Railway Passenger Deaths (N) and Political Connections (Extensive Margin) (1876-1900*)

	Dependent variable:				
	Passenger Deaths (N)				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	0.111***	0.373***	0.197**	0.197**	0.065
	(0.021)	(0.086)	(0.089)	(0.090)	(0.129)
Miles Open			0.0005***	0.0005***	−0.0002
			(0.0001)	(0.0001)	(0.001)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	7,649	1,132	1,132	1,132	1,132
Adjusted R^2	0.006	0.009	0.026	0.015	0.029

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger Fatalities): 0.07
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Values from prior years (1890 and 1894) are assigned.
No additional controls are included.

Table 2.17: Railway Passenger Deaths (N) and Death of Director-M.P. or Director-Peer (1876-1900*)

	Dependent variable:				
	Passenger Deaths (N)				
	(1)	(2)	(3)	(4)	(5)
Death Director Gov (t-4)	−0.059	−0.356	−0.360	−0.320	−0.691*
	(0.091)	(0.276)	(0.267)	(0.262)	(0.382)
Death Director Gov (t-3)	−0.136**	−0.588***	−0.567***	−0.553**	−0.902**
	(0.054)	(0.205)	(0.207)	(0.220)	(0.361)
Death Director Gov (t-2)	0.041	0.034	0.044	0.023	−0.348
	(0.193)	(0.556)	(0.546)	(0.556)	(0.561)
Death Director Gov (t-1)	0.288	0.703	0.687	0.756	0.420
	(0.289)	(0.806)	(0.809)	(0.794)	(0.837)
Death Director Gov	−0.170***	−0.523**	−0.539**	−0.551**	−0.688**
	(0.065)	(0.218)	(0.218)	(0.230)	(0.332)
Death Director Gov (t+1)	−0.107	−0.369	−0.393	−0.456	−0.620
	(0.092)	(0.315)	(0.315)	(0.353)	(0.427)
Death Director Gov (t+2)	−0.126	−0.415	−0.468*	−0.434*	−0.395*
	(0.079)	(0.254)	(0.247)	(0.238)	(0.227)
Death Director Gov (t+3)	−0.133	−0.348	−0.398	−0.394	−0.398
	(0.096)	(0.308)	(0.293)	(0.298)	(0.315)
Death Director Gov (t+4)	−0.062	−0.219	−0.276	−0.325	−0.350
	(0.129)	(0.378)	(0.373)	(0.371)	(0.380)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	6,404	909	909	909	909
Adjusted R^2	0.021	0.017	0.024	0.013	0.023

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger Fatalities): 0.07
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Values from prior years (1890 and 1894) are assigned.
Controlling for Political Connection (N) throughout.

Table 2.18: Railway Passenger Deaths (N) and Death of Director-M.P. or Director-Peer (1876-1900*)

	Dependent variable:				
	Passenger Deaths (N)				
	(1)	(2)	(3)	(4)	(5)
Death Director Gov (t-4)	0.025	−0.191	−0.264	−0.226	−0.670*
	(0.082)	(0.231)	(0.228)	(0.227)	(0.381)
Death Director Gov (t-3)	−0.040	−0.347***	−0.418***	−0.405***	−0.914**
	(0.031)	(0.118)	(0.129)	(0.137)	(0.368)
Death Director Gov (t-2)	0.130	0.244	0.171	0.148	−0.343
	(0.202)	(0.575)	(0.542)	(0.549)	(0.562)
Death Director Gov (t-1)	0.378	0.927	0.813	0.882	0.423
	(0.300)	(0.820)	(0.823)	(0.811)	(0.836)
Death Director Gov	−0.058	−0.298**	−0.411***	−0.420***	−0.730**
	(0.041)	(0.136)	(0.150)	(0.155)	(0.338)
Death Director Gov (t+1)	0.003	−0.153	−0.273	−0.334	−0.654
	(0.076)	(0.262)	(0.275)	(0.307)	(0.433)
Death Director Gov (t+2)	−0.029	−0.240	−0.381*	−0.346	−0.432*
	(0.067)	(0.222)	(0.220)	(0.218)	(0.234)
Death Director Gov (t+3)	−0.016	−0.121	−0.280	−0.269	−0.437
	(0.086)	(0.272)	(0.261)	(0.265)	(0.316)
Death Director Gov (t+4)	0.058	−0.009	−0.170	−0.213	−0.377
	(0.111)	(0.308)	(0.328)	(0.328)	(0.385)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	6,914	953	953	953	953
Adjusted R^2	0.007	0.007	0.022	0.013	0.026

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger Fatalities): 0.07
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
1891 and 1895 are unavailable in political connections data set:
Values from prior years (1890 and 1894) are assigned.
All columns control for Politically Connected.

Table 2.19: Political Connections and the Occurrence of Passenger Fatal Accidents

	Dependent variable:				
	Passenger Deaths >0				
	(1)	(2)	(3)	(4)	(5)
Count Director Gov.	0.026***	0.026***	0.018***	0.018***	0.018***
	(0.003)	(0.003)	(0.007)	(0.006)	(0.006)
Count Director Gov., 1 Yr Lag		0.010***	0.023***	0.023***	0.023***
		(0.002)	(0.007)	(0.007)	(0.007)
Count Director Gov, 2 Yr Lag		0.002	−0.005	−0.005	−0.005
		(0.002)	(0.006)	(0.006)	(0.006)
Miles Open			0.0001***	0.0001***	0.0001***
			(0.00003)	(0.00003)	(0.00003)
Year Time Trend	N	N	N	Y	N
Year Fixed Effects	N	N	N	N	Y
Observations	7,047	7,045	1,056	1,056	1,056
R^2	0.065	0.075	0.111	0.111	0.133
Adjusted R^2	0.064	0.075	0.108	0.107	0.111

Table 2.20: Political Connections and Passenger Fatalities

	Dependent variable:				
	Passenger Deaths				
	(1)	(2)	(3)	(4)	(5)
Count Director Gov.	9.119***	8.879***	−1.704	−1.525	−1.743
	(2.149)	(2.225)	(8.724)	(8.638)	(8.871)
Count Director Gov., 1 Yr Lag		4.899	10.063	10.405	10.472
		(3.452)	(11.181)	(11.070)	(11.186)
Count Director Gov, 2 Yr Lag		0.313	−5.854	−5.694	−4.782
		(1.158)	(4.136)	(4.020)	(3.798)
Miles Open			0.072**	0.073**	0.073**
			(0.034)	(0.035)	(0.036)
Year Time Trend	N	N	N	Y	N
Year Fixed Effects	N	N	N	N	Y
Observations	7,047	7,045	1,056	1,056	1,056
R^2	0.006	0.007	0.012	0.013	0.025
Adjusted R^2	0.006	0.007	0.008	0.008	0.001

2.8 Appendix: Additional Results, Board of Trade Accidents (1889, 1893, 1897, 1899)

2.8.1 Results: Political Connections and Consumer Railway Safety (1889, 1893, 1897, 1899)

Table 2.21: Railway Deaths (Passenger and Bystander) and Political Connections (Extensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Passenger and Bystander Deaths				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	0.131***	0.365**	0.366*	0.359*	1.465
	(0.050)	(0.148)	(0.186)	(0.187)	(0.910)
Miles Open			−0.00000	−0.00000	0.009*
			(0.0001)	(0.0001)	(0.005)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.010	0.008	0.003	−0.0004	0.047

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger and Bystander Deaths): 0.06
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.22: Railway Deaths (Passenger and Bystander) and Political Connections (Intensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Passenger and Bystander Deaths				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	0.055***	0.033	0.027	0.027	0.355*
	(0.017)	(0.028)	(0.028)	(0.025)	(0.192)
Miles Open			0.00003	0.00003	0.006*
			(0.0001)	(0.0001)	(0.004)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.012	−0.004	−0.009	−0.012	0.006

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger and Bystander Deaths): 0.06
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.23: Railway Injuries (Passenger and Bystander) and Political Connections (Extensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Passenger and Bystander Injuries				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	4.441***	12.282***	6.419***	6.603***	4.896*
	(0.695)	(1.881)	(1.557)	(1.646)	(2.745)
Miles Open			0.016***	0.016***	−0.001
			(0.003)	(0.003)	(0.042)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.064	0.087	0.298	0.309	0.390

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger and Bystander Injuries): 1.68
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.24: Railway Injuries (Passenger and Bystander) and Political Connections (Intensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Passenger and Bystander Injuries				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	2.875***	3.725***	1.390*	1.409*	1.346
	(0.468)	(0.766)	(0.818)	(0.792)	(2.620)
Miles Open			0.015***	0.015***	−0.011
			(0.004)	(0.004)	(0.039)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.184	0.153	0.290	0.300	0.388

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger and Bystander Injuries): 1.68
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.25: Railway Deaths and Injuries (Passenger and Bystander) and Political Connections (Extensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Passenger and Bystander Deaths and Injuries				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	4.572***	12.647***	6.784***	6.962***	6.361**
	(0.704)	(1.897)	(1.583)	(1.667)	(3.055)
Miles Open			0.016***	0.016***	0.008
			(0.003)	(0.003)	(0.044)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.066	0.090	0.297	0.305	0.387

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger and Bystander Deaths and Injuries): 1.74
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.26: Railway Deaths and Injuries (Passenger and Bystander) and Political Connections (Intensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Passenger and Bystander Deaths and Injuries				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	2.931***	3.758***	1.418*	1.436*	1.701
	(0.470)	(0.769)	(0.821)	(0.796)	(2.646)
Miles Open			0.015***	0.015***	−0.004
			(0.004)	(0.004)	(0.040)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.185	0.152	0.287	0.294	0.383

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Passenger and Bystander Deaths and Injuries): 1.74
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

2.8.2 Results: Political Connections and Employee Railway Safety (1889, 1893, 1897, 1899)

Table 2.27: Railway Deaths (Employee) and Political Connections (Extensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Employee Deaths				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	0.085***	0.212***	0.161*	0.155*	0.637
	(0.023)	(0.077)	(0.084)	(0.087)	(0.410)
Miles Open			0.0001	0.0001	0.004**
			(0.0001)	(0.0001)	(0.002)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.021	0.016	0.023	0.019	0.063

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Employee Deaths): 0.03
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.28: Railway Deaths (Employee) and Political Connections (Intensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Employee Deaths				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	0.051***	0.061*	0.047*	0.047*	0.204**
	(0.017)	(0.032)	(0.025)	(0.024)	(0.095)
Miles Open			0.0001	0.0001	0.003*
			(0.0001)	(0.0001)	(0.002)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.052	0.027	0.025	0.022	0.048

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Employee Deaths): 0.03
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.29: Railway Injuries (Employee) and Political Connections (Extensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Employee Injuries				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	0.754***	2.035***	0.915***	0.907***	1.102
	(0.137)	(0.394)	(0.339)	(0.346)	(1.066)
Miles Open			0.003***	0.003***	−0.001
			(0.001)	(0.001)	(0.009)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.047	0.057	0.248	0.280	0.397

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Employee Injuries): 0.3
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.30: Railway Injuries (Employee) and Political Connections (Intensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Employee Injuries				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	0.485***	0.612***	0.139	0.140	0.394
	(0.095)	(0.166)	(0.119)	(0.109)	(0.446)
Miles Open			0.003***	0.003***	−0.003
			(0.001)	(0.0005)	(0.009)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.133	0.101	0.240	0.273	0.397

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Employee Injuries): 0.3
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.31: Railway Deaths and Injuries (Employee) and Political Connections (Extensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Employee Deaths and Injuries				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	0.839***	2.247***	1.076***	1.062***	1.739
	(0.148)	(0.420)	(0.377)	(0.383)	(1.451)
Miles Open			0.003***	0.003***	0.003
			(0.001)	(0.001)	(0.010)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.050	0.061	0.242	0.270	0.381

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Employee Deaths and Injuries): 0.33
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.32: Railway Deaths and Injuries (Employee) and Political Connections (Intensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Employee Deaths and Injuries				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	0.536***	0.672***	0.186	0.187	0.598
	(0.101)	(0.177)	(0.126)	(0.115)	(0.503)
Miles Open			0.003***	0.003***	−0.0001
			(0.001)	(0.0005)	(0.010)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.141	0.106	0.234	0.262	0.379

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Employee Deaths and Injuries): 0.33
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.33: Railway Deaths and Injuries (All) and Political Connections (Extensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Total Deaths and Injuries				
	(1)	(2)	(3)	(4)	(5)
Politically Connected	5.411***	14.894***	7.860***	8.024***	8.099**
	(0.792)	(2.116)	(1.786)	(1.853)	(4.031)
Miles Open			0.019***	0.019***	0.011
			(0.003)	(0.003)	(0.045)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.072	0.102	0.343	0.341	0.480

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Total Deaths and Injuries): 2.07
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.34: Railway Deaths and Injuries (All) and Political Connections (Intensive Margin) (1889, 1893, 1897, 1899)

	Dependent variable:				
	Total Deaths and Injuries				
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	3.467***	4.430***	1.603*	1.623*	2.299
	(0.517)	(0.844)	(0.863)	(0.842)	(2.765)
Miles Open			0.018***	0.018***	−0.004
			(0.004)	(0.004)	(0.041)
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	Yes	Yes
Company Fixed Effects	No	No	No	No	Yes
Observations	1,073	177	177	177	177
Adjusted R^2	0.203	0.172	0.331	0.328	0.475

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Total Deaths and Injuries): 2.07
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
No additional controls are included.

Table 2.35: Railway Accidents and Political Connections (Extensive Margin) (1889, 1899)

	Dependent variable:				
	Accidents				Accidents (First Difference)
	(1)	(2)	(3)	(4)	(5)
Politically Connected	0.589***	1.665***	0.655***	0.688***	
	(0.114)	(0.314)	(0.208)	(0.212)	
Miles Open			0.003***	0.003***	
			(0.001)	(0.001)	
Miles Open (First Difference)					−0.003
					(0.008)
Politically Connected (First Difference)					0.818
					(0.727)
First-Differenced Model	No	No	No	No	Yes
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No		Yes	No
Observations	549	87	87	87	37
Adjusted R^2	0.077	0.109	0.592	0.596	−0.016

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Railway Accidents): 0.24
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Year Fixed Effects: Accidents outcome has only 2 years. Thus there are not separate year FE for the first-differenced model.
First-Differenced Model implicitly controls for company FE
No additional controls are included.

Table 2.36: Railway Accidents and Political Connections (Intensive Margin) (1889, 1899)

	Dependent variable:				
	Accidents				Accidents (First Difference)
	(1)	(2)	(3)	(4)	(5)
Political Connections (N)	0.391***	0.515***	0.060	0.065	
	(0.078)	(0.123)	(0.094)	(0.091)	
Miles Open			0.003***	0.003***	
			(0.001)	(0.001)	
Miles Open (First Difference)					−0.005
					(0.008)
Political Connections (N) (First Difference)					−0.054
					(0.381)
First-Differenced Model	No	No	No	No	Yes
Restricted Sample	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No		Yes	No
Observations	549	87	87	87	37
Adjusted R^2	0.245	0.229	0.577	0.580	−0.039

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Railway Accidents): 0.24
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Year Fixed Effects: Accidents outcome has only 2 years. Thus there are not separate year FE for the first-differenced model.
First-Differenced Model implicitly controls for company FE
No additional controls are included.

Chapter 3

Democracy and Political Connections: Franchise Reforms and the Decline of Railway Directors in the House of Commons

3.1 Introduction

Political connections were prominent and visible in Victorian Britain. Members of Parliament, M.P.s, as well as Peers sat on the boards of directors of large firms. These business-political elites legislated on their firms as well as their competitors' firms. During the second half of the 19th C, voting rights expanded rapidly in the U.K. Both the 1867 and the 1884 Reforms doubled the size of the electorate at the time they were passed, leading to a more than 4x increase in the percentage of the population eligible to vote between the 1865 and 1885 general elections. From 1860 and 1915 the number of director-M.P.s in Parliament decreased markedly as the electorate increased. In the case of railways, the number of firm director-M.P.s declined from 162 in 1867 to 67 in 1893. Novel data covering electoral constituencies at five general election contests in the U.K., 1865, 1868, 1874, 1880, and 1885, is presented in this chapter and used to investigate the quantitative relationship between voting rights and the electoral participation and success of railway director M.P.s. Cross-sectional results show that constituencies where a larger percentage of the population was eligible to

vote were more likely to have railway directors running for M.P. and conditional on running faired poorer in places where voting rights were more extensive. Panel results suggest that within a given constituency, increases in the franchise are associated with decreases in the likelihood of railway directors running and winning seats in Parliament. Results suggest that for a given constituency a 1-percentage point increase in the percentage of the population eligible to vote is associated with a decrease of 0.9% in the likelihood that a railway director runs for M.P. in that constituency and a decrease of 1% in the likelihood a railway director wins a seat in that constituency. The declines in the size of the corporate interest in Parliament at the time when franchise reforms increased suggests that expanding voting rights might be used to mitigate the political connections of business elites.

3.1.1 Literature

Franchise extension and its impacts on economic outcomes was studied in a seminal paper [Acemoglu and Robinson, 2000]. In this paper the authors argued that political elites extended the franchise as a strategic decision to avoid social unrest and revolt. Change in the institutional structure rather than changes in redistribution occurs because current transfers don't ensure future transfers while the institutional change of the franchise extension changes subsequent political equilibria and acts as a commitment device to redistribute. This paper is foundational theory concerning *why* franchise extensions occur. In contrast this chapter focuses on the effects of the expansion of the franchise as do the papers discussed below.

[Berlinski and Dewan, 2010] use the Second Reform Act, discussed in more detail below (3.1.2), to assess the impact of the franchise reform for various electoral outcomes. As in this paper, they exploit the sharp change in the electorate caused by the Second Reform Act to get at within-constituency variation in voting rights.

They find that the franchise mattered for both electoral competition and candidate selection. More broadly, they address a question raised by [Acemoglu and Robinson, 2000], whether franchise extension occurred because of opportunistic moves by parties to gain votes or because of transitory revolutionary pressure. They strongly support both quantitatively and qualitatively the latter view. In a closely-related paper with a co-author [Berlinski et al., 2014], they used the same setting of the Second Reform Act to look directly at the impact of the expansion of voting rights on the composition of the Cabinet and M.P.s in the House of Commons. The authors frame the paper as addressing the larger questions, "Does the expansion of voting rights lead to elected assemblies that are a microcosm of the societies that they represent? Or are the background characteristics of men and women elected to office unaffected by differences in the rules governing the franchise?" (p. 531). They find no evidence for a causal effect of the Second Reform Act on the role British aristocrats played in the elected chamber. In this chapter I address the same questions in the same setting, albeit with more general elections and more reforms impacting the franchise. However, the characteristic I look at is type of business elite, railway directors, rather than aristocracy. My findings suggest that differences in voting rights matter for the characteristic of being a railway director. These results are not contradictory. The results in this chapter and the results in [Berlinski et al., 2014] suggest the answer to the questions raised above depends on which background characteristics are in question. Another difference between [Berlinski and Dewan, 2010] and [Berlinski et al., 2014] and this paper is that they exclude Ireland from the analysis throughout, while in this paper, Ireland is included.

[Aidt et al., 2010] investigate whether extensions of voting rights leads to increased or decreased public spending using a subset of municipal boroughs in England and Wales in 1868, 1871, and 1886. They find a U-shaped relationship between

spending on amenities in these urban boroughs and the extension of the local voting franchise. [Liaqat et al., 2019] investigates whether voters care about the political connections, specifically connections of local candidates to higher government officials and bureaucrats, of candidates when choosing their vote. 2015 local government elections in Pakistan were used along with information on the ties between local election candidates, higher level politicians and bureaucrats, and a field experiment to investigate this question. Political connections here are notably *within-government* connections as opposed to the private political connections studied in this chapter. Voters preferred connected candidates and providing additional information on political connections increased support. To the best of my knowledge, this chapter is the first paper to look directly at the relationship between voting rights and the political connections of private businesses.

The effects of franchise extension on education policy have been studied by different authors [Lindert, 2004] [Engerman and Sokoloff, 2005] and [Goldin, 2016]. Most recently [Falch et al., 2022] looked at this question using a national reform that extended the franchise to a specific subset of the population, poor women, between the elections of 1907 and 1910 in Norway. The empirical strategy is similar to that used in this chapter: they exploit a national-level reform and the induced heterogeneous changes in the share of the population eligible to vote from before the reform to after the reform. The authors call this an identification strategy and claim it gets at causal effects, which I will not do in this chapter despite the close similarities. They find no evidence for systematic effects on education spending but do find evidence, unsurprisingly, for increased female turnout.

Relative to the papers above, this chapter provides the first, to my knowledge, quantitative evidence regarding franchise extension and the political connections of business elites.

3.1.2 The Second Reform Act, 1867

The Representation of the People Act 1867 (30 & 31 Vict. c. 102) vastly expanded the franchise in England and Wales. This was true especially for a subset of urban, working class men. The electorate in England and Wales increased by 88.7% from 1,057,000 to 1,995,000 men with enactment ([Woodward, 1962], p. 187). This increase came mainly from the working class in urban areas and the middle class in the counties (*ibid.*). The related Reform Act for Scotland (31 & 32 Vict. c. 48) passed into law in 1868, before the 1868 election. As is done elsewhere, [Berlinski and Dewan, 2010] [Berlinski et al., 2014], it will be treated as part of the Second Reform Act. The 1867 reform involved some seat re-divisions, but very few relative to the 1884 reform as discussed below. According to my calculation, of the 397 constituencies extant in the election of 1865 (see Table 3.2), 378 of those constituencies were not divided between the General election of 1865 and that of 1868. Stated another way, less than 4.8% of the constituencies changed between these two elections.

3.1.3 The Third Reform Act, 1884

The Representation of the People Act 1884 (48 & 49 Vict. c. 3) built on the reform of 1867. The 1884 reform extended to Ireland and Scotland the franchise qualifications that England and Wales had received in the 1867 reform. The net effect of this expansion was to increase the electorate in the U.K. by about 2/3rds. "The United Kingdom electorate was raised from about 3 million to about 5 million." ([Ensor, 1936], p. 88) This increase for the U.K. as a whole masks a much larger expansion of the franchise in Ireland, where the electorate increased by more than 200%, compared with a smaller expansion, 62%, of the electorate in the much more populous England and Wales ([O'Leary, 1962], p. 182).

The Redistribution of Seats Act 1885 (48 & 49 Vict., c. 23) is commonly associated

with the reform of 1884. This bill received the royal assent on June 25th, 1885, and thus passed into law prior to the 1885 general election. Changes between 1880 and 1885 in the electoral data presented in section 3.2 below thus include changes from both the reform of 1884 and the redistribution of 1885.

The Second and Third Reform Acts greatly expanded the franchise to men in the U.K., causing the "...democratizing of parliament in 1867 and 1884..." ([Ensor, 1936], p. 31).

3.1.4 Roadmap

The rest of this chapter is arranged as follows: Section 3.2 discusses the data used in this study, first discussing sources and then providing some summary statistics. Section 3.3 provides results assessing the quantitative relationship between the percentage of the population eligible to vote and the election participation and outcomes of railway directors. Results are presented for both the full-panel of constituencies, 3.3.1, as well as for a balanced-panel of constituent constituencies not re-divided between the general elections of 1865 and 1885, 3.3.3. Section 3.4 concludes.

3.2 Data

3.2.1 Data Sources

This section briefly overviews the sources used to construct the data sets used in this paper. A more complete discussion of the data sources and construction can be found in 4.6

In order to construct the elections data, I personally digitized information from the universe of constituencies using *The Parliamentary Poll Book* ([McCalmont, 1910]). From this source I digitized this source at the candidate-constituency-election-year level. The information digitized from ([McCalmont, 1910]) included decadal popu-

lation figures and electorate counts at various dates for the constituencies. Various Annual Editions of *Bradshaw's Railway Manual, Shareholders' Guide, and Official Directory* were used to check whether those candidates running for M.P. were railway directors in that same year ([Bradshaw, 1866], [Bradshaw, 1869], [Bradshaw, 1874], [Bradshaw, 1880], [Bradshaw, 1885]). For more details, see 4.6.

3.2.2 Data Overview

Table 3.1 provides an overview of the candidates for M.P. in the House of Commons at the five consecutive general elections of 1865, 1868, 1874, 1880, and 1885. The total number of candidates running increased monotonically across these elections from 918 in 1865 to 1,339 in 1885. An increase of 45.9% despite the fact that the total number of seats in the House of Commons increased by only 1.8%, from 658 in 1865 to 670 in 1885. The largest election-on-election growth in the total number of candidates occurred between the 1880-1885 elections, 21.4%, and the 1865-1868 elections, 11.9%. These large expansions in the size of the field of candidates span the Second Reform Act of 1867 and the Third Reform Act of 1884. It is neither a foregone conclusion nor unsurprising that as the franchise expanded considerably with the passage of these Acts that the number of candidates running expanded as well. The number of candidates running per seat can be viewed as a proxy of election competitiveness. Viewed this way, the aggregate data on candidates suggests that election competitiveness increased as the franchise expanded from 1865-1885.

The remaining columns in table 3.1 provide summaries of how the composition of candidates changed as concerns railway directors. There is a marked, monotonic decline in the number of railway directors running for office across these five general elections, from 228 railway directors running for M.P. in the 1865 election to 159 in 1885, a decline of 30.3%.

Table 3.1: Summary of Candidates at General Elections, 1865-1885

Year	Total Candidates (N)	Railway Director Candidates (N)	Railway Directors as % of Candidates	Railway Directors as % of Winners
1865	918	228	24.8	26.2
1868	1027	211	20.5	20.7
1874	1077	188	17.5	20.1
1880	1103	171	15.5	16.5
1885	1339	159	11.9	13.8

Given that the choice to run for political office is endogenous to forward-looking beliefs regarding election outcomes, the fact that the number of railway directors running declined as the franchise expanded during these two decades could be suggestive that railway directors believed they were less likely to win election as M.P.s as the franchise expanded with the Second and Third Reform Acts. However, many other potentially relevant variables are changing during this time that are likely impacting the number of railway directors choosing to run for M.P. alongside changing beliefs concerning elect-ability. For instance, the total number of railway directors in the U.K. is contracting during this time as the total number of distinct railway corporations is contracting throughout most of this period. Figure 3·1, reproduced from Chapter 1 of this dissertation, is a time series of the number of railway companies in the U.K. The total number of railway corporations in aggregate declines markedly during these two decades. The decrease in the total number of railway corporations came with a decrease in the number of directorships of railways. Thus the total number of railway directors declined during this period, which could in part explain the decline in the number of railway candidates running.

The number of total number of candidates running monotonically increased across

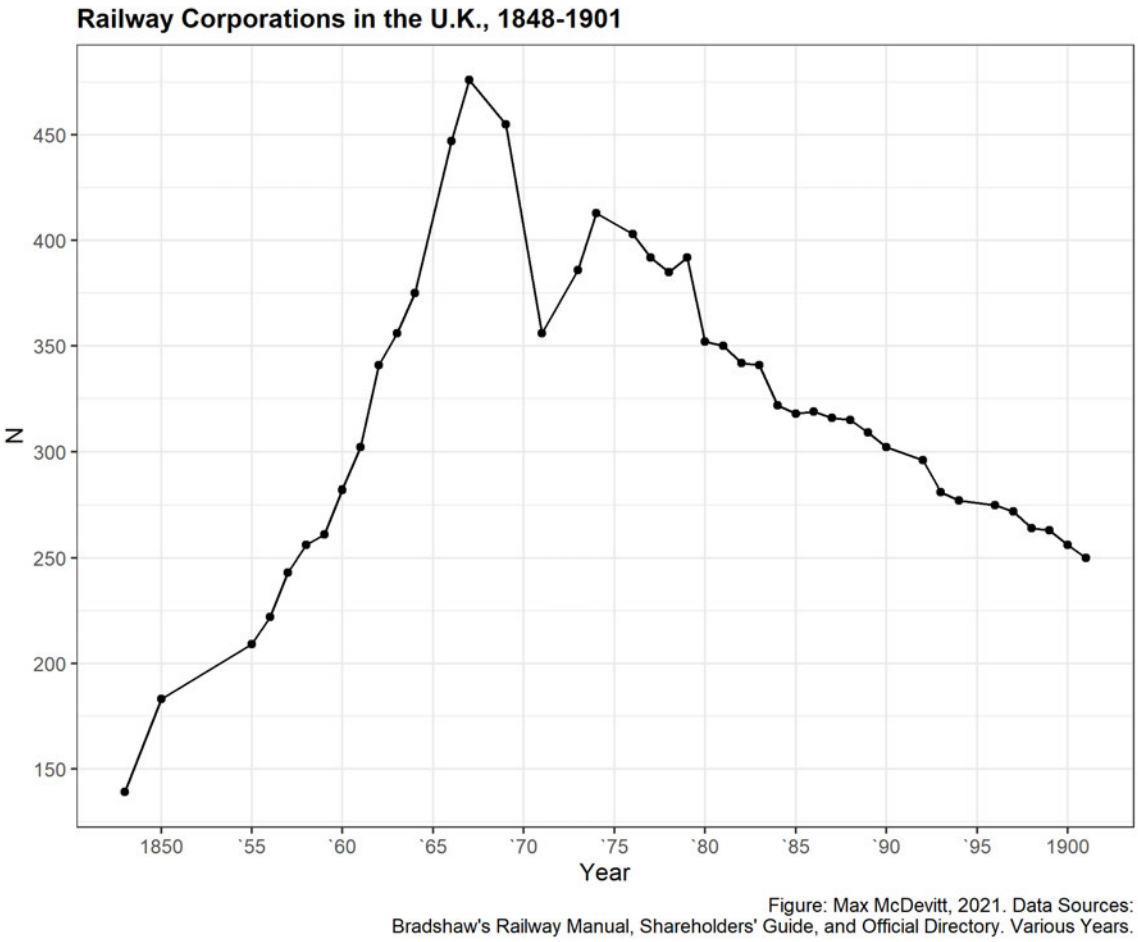


Figure 3·1: Size of U.K. Railway Industry, 1848-1901

these 5 general elections while the number of railway director candidates monotonically decreased as shown above. It necessarily follows that the percentage of candidates who were railway directors declined monotonically as is shown in column 4 of Table 3.1. In 1865 24.8% of the candidates running for the House of Commons were railway directors, nearly 1 in 4 contenders. Two decades later after the passage and implementation of the Second Reform Act (1867) and Third Reform Act (1884), 11.9% of the candidates running for the House of Commons were railway directors.

The final column in 3.1 shows the percentage of elections won by railway directors. In 1865 this was 26.2%. It fell monotonically across these 5 elections to 13.8% in 1885.

This decline in the share of railway directors winning seats in the House of Commons is intuitive given the decline in the share of railway directors in the candidates running for those seats.

Table 3.2 provides an alternative, complementary view of the same presented in table 3.1 above. Here the data has been aggregated up to the constituency-year level from the candidate-constituency-year level. The number of constituencies increases (weakly) monotonically across these five general elections. The number of constituencies grew by 62.0% between the election of 1865 and the election of 1885. This aggregate increase stemmed mainly from the change between 1880 and 1885. There was some growth in the number of distinct electoral constituencies from 1865-1880 from 397 to 416, due to the re-division of some constituencies. A very large expansion in the number of constituencies occurred between the general elections of 1880 and 1885 from 416 to 643, an increase of 54.6%. This enormous expansion in the number of distinct constituencies is due to the large number of constituencies re-divided as a part of The Redistribution of Seats Act 1885 (48 & 49 Vict., c. 23), which is commonly grouped by historians with the Third Reform Act (1884). Recall from the discussion above that the number of seats in the House of Commons only expanded by 1.8% (658 to 670) between 1865 and 1885. These together necessarily imply that the number of seats per constituency fell during this time. i.e. re-division of constituencies was associated with more and more single candidate constituencies. The majority of constituencies in any given general election 1865-1885 are one-seat constituencies. That is, there is only 1 seat in the House of Commons being disputed in the election and the candidate with the largest count of votes wins. However, at all five of these general elections there are also multiple constituencies in which the two (or more) candidates with the highest number of votes win.

The third column of is a count of the number of constituencies in which at least

Table 3.2: Constituencies at General Elections, 1865-1885

Year	Constituencies (N)	Contested by Railway Director(s) (N)	%-Contested by Railway Director(s)	Railway Director(s) Won	%-Won by Railway Director(s)
1865	397	184	46.3	153	38.5
1868	419	177	42.2	128	30.5
1874	416	157	37.7	124	29.8
1880	416	145	34.9	101	24.3
1885	643	144	22.4	92	14.3

one railway director chose to compete. The number of constituencies where railway directors ran for the House of Commons declined from 184 in 1865 to 144 in 1885. This aggregate decrease of 27.8% in the total number of constituencies where railway directors ran understates the decline in the share of constituencies in which railway directors competed given that the number of constituencies increased by 54.6% during this same time. This can be seen in column four of table 3.2: 46.3% of constituencies saw railway directors running for M.P. in 1865 and 2 decades later this percentage had fallen by more than half to 22.4%.

The fifth and sixth columns of table 3.2 give the number of constituencies in which at least one railway director won a seat in that general election year and the percentage of constituencies in which the same occurred. The number of constituencies where railway directors won election fell monotonically from 153 to 92, a decrease of 39.9%. Because the number of constituencies increased by such a large amount between 1865 and 1885 as discussed above, this decrease in the number of constituencies where a railway director won understates the decline in the percentage of constituencies where a railway director (or more) won election to the House of Commons. That declined from 38.5% in 1865 to 14.3% in 1885.

The above overview of the data suggests that the expansions of the franchise which occurred during these two decades may have played a role in the decline of the number of railway directors in the House of Commons. If it is indeed the case that franchise expansion *caused* a decline in the railway interest in the House of Commons during this period, that would be evidence strongly consistent with a theory wherein the expansion of voting rights and other democratic norms can play a "disciplinary" role on the political connections of corporations. i.e. expanding voting rights leads to a decline in elite business capture of the legislature. Though this chapter does not establish the hypothesized relationship as causal, regressions in the following sections investigate this relationship at a finer level than the above discussion in aggregate. By exploiting variation across constituencies in the percentage of the population eligible to vote, I am able to make more precise statements about how the franchise related to the running and winning of railway directors for seats as M.P.s in the House of Commons. More importantly, I am able to leverage the within-constituency changes in the percent of the population eligible to vote induced by the reform acts to assess how expansion of the franchise in a given constituency related to the electoral fortunes of railway directors.

3.2.3 Construction of Main Variable: The Percentage of the Population Enfranchised

The percentage of the population eligible to vote (i.e. enfranchised) is constructed using information on the number of electors in each constituency, taken from [McCalmont, 1910] in the numerator. To construct this variable we must also construct estimates of the population in constituency c in election year t for the denominator. This is done as follows: decadal census population estimates are reported in [McCalmont, 1910] for the constituencies. These are given for the census years 1861, 1871 and 1881. In order to construct estimates of the population in the general election

years of 1865, 1868, 1874, 1880, and 1885, I first assume that annual population growth within-constituency is constant. Letting POP_{ct} represent the population in constituency c in year t, this assumption can be written as

$$POP_{c,t} \times (1 + g_{t-(t+10)})^{10} = POP_{c,t+10} \tag{3.1}$$

$g_{t-(t+10)} \approx 0$ in general. Thus it can be approximated as follows:

$$g_{t-(t+10)} \approx \ln(1 + g_{t-(t+10)}) = \ln(\frac{POP_{c,t+10}}{POP_{c,t}}) \times (1/10) \tag{3.2}$$

After estimating obtaining these estimates of the annual rate of population growth between the Census years t and t + 10, the population in each constituency c at the election year of t + T, T ¡ 10, are proxied using equation 3.3.

$$POP_{c,t+T} = POP_{c,t} * (1 + g_{t-(t+10)})^{T} \tag{3.3}$$

The proxy for the percentage of the population eligible to vote, which I denote as $ENFRANCHISED_{ct}$, is made by dividing the number of electors in constituency c in election year t as reported in [McCalmont, 1910] by the estimated $POP_{c,t}$ from equation 3.3, and multiplying by 100.

3.3 Results

3.3.1 Full Panel

I use the following model to investigate the relationship between the expansion of the franchise and railway directors participation and performance in general elections

$$y_{ct} = \delta_t + \alpha_c + \beta ENFRANCHISED_{ct} + \mathbf{X}_{ct}\gamma + \epsilon_{ct} \tag{3.4}$$

In equation 3.4, the index c refers to the electoral constituency and t refers to the

general election year in question. The main regressor of interest is $ENFRANCHISED_{ct}$. This variable proxies the percentage of the population eligible to vote in constituency c in election year t. It is discussed above in section 3.2.3. δ_t is an election-year fixed effect, α_c is a constituency fixed effect, and ϵ_{ct} is an error term. $\mathbf{X}_{ct}$ is a vector of controls which includes the Population and the number of M.P. seats competed for in the constituency. y_{ct} is a binary indicating that a railway director ran (or won) in constituency c in the general election year t.

$\beta * 100$ is the percentage change in the outcome variable (railway director runs or railway director wins) associated with a 1-percentage point increase in the population eligible to vote . $\beta * 100$ can thus be interpreted as the quasi-franchise-elasticity of running or winning. I use the modifier "quasi-" here to distinguish the fact that the denominator here is the *percentage-point change* in the percentage of the population eligible to vote, rather than the *percentage change* in the percentage of the population eligible to vote. The latter being the standard construction of an elasticity.

We first use equation 3.4 to look at how the percentage of the population enfranchised impacts the probability that railway directors run for office. Here y_{ct} is a binary variable indicating whether at least one railway director ran in constituency c in election year t.

The decision to run in an election is endogenous to beliefs about the likelihood of winning in that election. Table 3.3 provides the results of this exercise. Table 3.10 in the appendix 3.5 presents the results when the vector of controls, $\mathbf{X}_{ct}$, is omitted. Those results are broadly consistent with the results below.

Column (1) in table 3.3 shows the result of estimating equation 3.4 without any fixed effects, i.e. pooling all observations in a simple cross-sectional regression. $\beta = 0.004$ and is statistically significant at the 10%-level. Controlling for population but ignoring fixed factors, the estimate of the quasi-franchise-elasticity of running is

Table 3.3: Voting Rights and Railway Directors Running for M.P.

	Railway Director Ran in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	0.004^{*}	0.008^{***}	-0.009^{**}
	(0.002)	(0.002)	(0.005)
Population (10,000s)	-0.000^{***}	-0.000^{***}	-0.000^{*}
	(0.000)	(0.000)	(0.000)
1868 General Election		-0.071^{*}	0.002
		(0.037)	(0.036)
1874 General Election		-0.116^{***}	-0.033
		(0.038)	(0.037)
1880 General Election		-0.141^{***}	-0.058
		(0.037)	(0.038)
1885 General Election		-0.155^{***}	-0.144^{***}
		(0.050)	(0.050)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	1,716	1,716	1,716
Adjusted R^2	0.015	0.023	0.210

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Railway Director Ran): 0.353
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
The number of M.P. seats available is controlled for as a factor variable.

$\beta * 100 = 0.4$, i.e. a 1-percentage point increase in the population eligible to vote is associated with a 0.4% *increase* in the likelihood that a railway director runs.

Column (2) of table 3.3 builds on column (1) by adding fixed effects for general election years. The inclusion of election year fixed effects in the model is important because there are likely unobserved dynamic factors influencing both the percentage enfranchised and the likelihood railway directors run for Parliament. During the period 1865 to 1885 the number of U.K. railways (and railway directors) increases initially between 1865 and 1867, and then contracts significantly (See figure 3·1). Failure to control for election year fixed effects would thus likely bias our estimates of β. Including election year fixed effects in the model (column (2)) yields an estimated $\beta * 100$ of 0.8% that is statistically significant at the 1%-level. Each additional 1-percentage point increase in the population eligible to vote is associated with a .8% increase in the likelihood that a railway director runs for Parliament.

Columns (1) and (2) show that railway directors were more likely to run in places where voting rights were more widely held. However, it is highly likely that omitted variables, for instance industrialization, population density, income, or degree urban are correlated with both the percentage enfranchised and the likelihood that railway directors run for office. The interpretation of the estimates of β in columns (1) and (2) is that railway directors were more likely to run in areas where a higher percentage of the population was eligible to vote. These estimates *do not* contradict the hypothesis that expansion of the franchise in a constituency leads to decreases in the probability that railway directors run for office *because these estimates are not restricted to within-constituency variation.*

Table 3.3, Column (3) builds on column (2) by inclusion of constituency fixed effects. By including these fixed effects, the model restricts to using within-constituency variation to estimate β. The inclusion of fixed effects controls for time-invariant

constituency-characteristics that might be impacting both the likelihood a railway director runs and the percentage enfranchised, thus biasing our estimates in columns (1) and (2). Column (3) provides the best estimate of how an increase in voting rights within a given electoral constituency relates to the likelihood that railway directors run for M.P.

The estimated β of -0.009 in column (3) can be thought of as implying a franchise-elasticity of running of -0.9, i.e. an increase within a constituency of 1-percentage point in the franchise is associated with a decline of .9% in the likelihood a railway director runs for M.P. in that constituency. This is consistent with the hypothesis that expansion of voting rights leads to declines in railway directors running for seats in the House of Commons.

The results in table 3.3 are *not* causal. Assignment of the regressor of interest, the percentage of the population eligible to vote, is not conditionally randomly assigned. The values of that variable vary across constituency-general elections as functions of observable factors, like population, time-invariant unobservable factors, like location and short-to-medium-run geographical and institutional aspects, and finally time-variant unobservable factors. The first two of these can be addressed through the inclusion of controls where available and constituency fixed effects. However, time-varying unobservables are potentially confounding the estimates presented in table 3.3. The bulk of the changes in the percentage of the population eligible to vote observed in the data resulted from changes in eligibility due to the Reform Act of 1867 and the Reform Act of 1884. These laws were passed at the national level and the specifics were thus not tailored to constituency-specific factors. This may make it tempting to assert that the *changes* between elections in the franchise in a given constituency was somewhat randomly assigned. This however is not the case as the laws expanded voting rights as functions of time-varying constituency-specific factors

that I am not able to observe.

The results presented in table 3.3 should be given the following interpretation: In the 20 years covering the five general elections of 1865, 1868, 1874, 1880, and 1885, constituencies with higher percentages of the population eligible to vote were more likely to have railway directors running for M.P. Each additional 1-percentage point of the population eligible to vote is associated with an increase of 0.4% (no election year FE) to 0.8% (election year FE) in the likelihood a railway director runs. This positive relationship depends on the cross-sectional results that do not account for time-invariant constituency-specific factors. Holding the constituency fixed, increases in the percentage of the population eligible to vote is associated with a decrease in the likelihood a railway director runs for office. This estimate is that for each additional 1-percentage point increase in the portion of the population eligible to vote the likelihood that a railway director runs falls by 0.9% Table 3.10 presents estimates without the inclusion of the controls, $\mathbf{X}_{ct}$, as a robustness check. Results are very similar, with very little change in magnitudes (only in columns (2) and (3)) and no changes in signs. This robustness check is broadly consistent with the results discussed above. Note however that the statistical significance disappears in column (3) in table 3.10.

We now investigate the likelihood that a railway director wins a seat in the constituency conditional on at least one running. Table 3.4 presents the results of this exercise which estimates equation 3.4 with y_{ct} being an indicator equal to one if a railway director won a seat in that constituency. Estimation is here restricted to the subset of constituency-election-years in which a railway director ran. Because railway directors ran in only 35.3% of our constituency-general-elections, the number of observations is necessarily much lower than in the former estimating exercise.

Column (1) of table 3.4 provides the estimated β without the inclusion of fixed

Table 3.4: Voting Rights and Railway Directors Winning M.P.

	Railway Director Won in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	-0.013^{***}	-0.011^{***}	-0.002
	(0.003)	(0.003)	(0.007)
Population (10,000s)	-0.000^{***}	-0.000^{***}	-0.000^{*}
	(0.000)	(0.000)	(0.000)
1868 General Election		-0.082^{**}	-0.031
		(0.036)	(0.033)
1874 General Election		-0.092^{**}	-0.032
		(0.036)	(0.035)
1880 General Election		-0.145^{***}	-0.086^{**}
		(0.035)	(0.035)
1885 General Election		-0.172^{***}	-0.148^{***}
		(0.044)	(0.049)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	676	676	676
Adjusted R^2	0.042	0.046	0.169

Note: *p<0.1; **p<0.05; ***p<0.01
Sample is restricted to places where railway directors ran.
Mean of Outcome Variable (Railway Director Won) (Conditional on Running): 0.741
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
The number of M.P. seats available is controlled for as a factor variable.

effects: $\beta = -0.013$. This is statistically significant at the 1%-level. The interpretation of this estimate is that after controlling for population, each additional 1-percentage point increase in the percent of the population eligible to vote is associated with a 1.3% decrease in the likelihood that a railway director wins election.

Column (2) expands on column (1) thru the inclusion of election year fixed effects to help address dynamic changes across elections that could be impacting both the likelihood railway directors win and the percentage enfranchised. Specifically we are concerned here that the secular decrease in the number of railway directors in the U.K. is taking place at the same time as the franchise is expanding. Inclusion of election year fixed effects shaves a little bit off the magnitude of the coefficient, but the estimated $\beta = -0.011$ is still statistically significant at the 1%-level and the magnitude is similar.

The takeaway from columns (1) and (2) in table 3.4 is that in constituencies where railway directors ran for office, a railway director was less likely to win if the percentage of the population enfranchised was larger. This complements what we found in columns (1) and (2) of table 3.3 above: railway directors were more likely to run in constituencies where the percentage enfranchised was larger but less likely to win conditional on running.

Table 3.4 column (3) includes constituency fixed effects as well as election fixed effects. The estimated $\beta = -0.002$ is statistically indistinguishable from 0. The inclusion of constituency fixed effects means this estimate applies to *within-constituency* changes in the percentage enfranchised. In other words, for a given constituency an increase (decrease) over time in the percent of the population enfranchised doesn't impact the likelihood a railway director wins, conditional on at least one running.

Table 3.11 in appendix 3.5 presents the same results as table 3.4 when the vector of controls, $\mathbf{X}_{ct}$, is omitted. The results there are markedly consistent with the results

presented here in terms of magnitudes, signs, and statistical significance, telling in effect the same story.

We now investigate the likelihood that a railway director wins a seat in the constituency without conditioning on where they ran. Table 3.5 presents the results of this exercise which estimates equation 3.4 with y_{ct} being an indicator equal to one if a railway director won a seat in that constituency. Estimation here *is not* restricted to the subset of constituency-election-years in which a railway director ran. This combines the two previous results into a single result relating the percentage of the population eligible to vote to the likelihood a railway director wins a seat as M.P.

Column (1) of 3.5 provides the estimated β when no fixed effects are included in the estimating equation. Column (2) provides the estimate when election year fixed effects are included. The estimates in (1) and (2) are small in magnitude and noisy. The interpretation is that the percentage of the population enfranchised does not appear related to whether a railway director wins. This apparent null result hides the fact that in constituencies where the percentage enfranchised was greater, railway directors were more likely to be seen running for M.P (table 3.3, columns (1) and (2)) and conditional on being contested by a railway M.P., the likelihood of winning was lower where the percentage enfranchised was larger (table 3.4, columns (1) and (2)).

Column (3) of table 3.5 gives the estimated β when fixed effects are included, $\beta = -0.010$. That is the quasi-franchise-elasticity of winning is -1. This can be interpreted as follows, for a given constituency a 1-percentage point increase in the percent of the population eligible to vote corresponds to a -1% change in the likelihood a railway director wins election in that constituency. Given that railway directors win election in 26.1% of the constituency-contests, this magnitude is not only statistically significant, but economically and politically significant.

A robustness check for the above results in table 3.5 is provided in table 3.12 in

Table 3.5: Voting Rights and Railway Directors Winning M.P.

	Railway Director Won in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	−0.002	0.002	−0.010**
	(0.002)	(0.002)	(0.004)
Population (10,000s)	−0.000***	−0.000***	−0.000*
	(0.000)	(0.000)	(0.000)
1868 General Election		−0.082**	−0.031
		(0.036)	(0.033)
1874 General Election		−0.092**	−0.032
		(0.036)	(0.035)
1880 General Election		−0.145***	−0.086**
		(0.035)	(0.035)
1885 General Election		−0.172***	−0.148***
		(0.044)	(0.049)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	1,716	1,716	1,716
Adjusted R^2	0.020	0.029	0.220

Note: *p<0.1; **p<0.05; ***p<0.01
Mean of Outcome Variable (Railway Director Won): 0.261
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
The number of M.P. seats available is controlled for as a factor variable in the above regressions.

the appendix (3.5). The results are nearly identical, the only difference to note is that the estimate in column (3) yields a quasi-franchise-elasticity of winning of -.9 rather than -1. I prefer the inclusion of the controls in the model, and thus included those estimates in the body of the paper. However, the fact that the results hold in both cases gives greater confidence in the interpretations presented above.

3.3.2 Balanced Panel - Summary

As mentioned in sections 3.1.2 and 3.1.3, the Reform Acts of 1867 and 1884 resulted in the division of a subset of the constituencies. This took the form of both changes in the number of seats per constituency and changes in boundaries for some constituencies. The results presented above (Tables 3.3, 3.4, 3.5) are estimated on the full set of constituencies. Due to changes in a subset of the constituencies the full panel is *not* a balanced panel of consistent constituencies followed across the five general elections of 1865, 1868, 1874, 1880, and 1885. To address concerns that changes in the number of seats or re-division of boundaries is confounding the results above, I construct a balanced panel of constituencies that do not experience either of these changes between 1865-1885 and re-estimate the above results on the balanced panel. This strategy is the same as that applied in [Berlinski et al., 2014]. A balanced panel can be constructed from the panel used above by restricting the data to constituencies that were not re-divided (that is, experienced division) at any point between the general election of 1865 and that of 1885.

Inclusion of a constituency into the balanced panel is unlikely to be non-random, given the form of the Reform Acts and associated redistribution bills. Thus the results presented below can be most accurately described as pertaining to the subset of constituencies which did not re-divided between 1865-1885. A summary of the balanced panel is presented here 3.6, paralleling Table 3.2.

Table 3.6: Constituencies at General Elections, 1865-1885 (Balanced Panel)

Year	Constituencies (N)	Contested by Railway Director(s) (N)	%-Contested by Railway Director(s)	Railway Director(s) Won	%-Won by Railway Director(s)
1865	144	75	52.1	55	38.2
1868	144	70	48.6	50	34.7
1874	144	62	43.1	48	33.3
1880	144	60	42.4	45	31.2
1885	144	48	33.3	28	19.4

The balanced panel includes 144 constituencies. These are the constituencies that are un-divided between the General Elections of 1865 and 1885. Comparing the balanced panel summary in Table 3.6 to the analogous Table 3.2 full-panel summary, we see that the consistent constituencies appearing in the balanced panel were more likely to be contested by railway directors than constituencies as a whole. For example in the 1865 general election, 46.3% of constituencies were contested by railway directors (See Column 4 of 3.2) compared to 52.1% of the consistent constituencies which appear in the balanced panel. The balanced panel shows the same monotonic decline in participation of railway directors across general elections that was seen in the full panel. The consistent constituencies also show higher rates of railway directors winning election than the full set of constituencies. Given the smaller sample size, a priori the expectation is that the estimates from the balanced panel will be less precisely estimated than those in the full panel above.

3.3.3 Balanced Panel - Results

This section parallels section 3.3.1 above. As before we first use equation 3.4 to assess the quantitative relationship between the percentage enfranchised and the likelihood

that a railway director runs in that constituency. The estimates of this exercise estimated on the balanced panel are presented in table 3.7.

Column (1) of table 3.7 yields an estimated $\beta = -0.004$. The magnitude of this coefficient is large enough to be potentially meaningful, it represents a quasi-franchise-elasticity of running of -.4, however this is statistically indistinguishable from a 0. In the absence of any fixed effects, this suggests that, for the constituencies in the balanced panel, whether a railway director ran in a constituency is orthogonal to the percentage of the population eligible to vote. Controlling for the general election years (column (2) of table 3.7) leaves this result largely unchanged other than cutting the magnitude of the estimated β by 75% while leaving the standard errors unchanged. These results should be compared to columns (1) and (2) of table 3.3. Recall that those results showed that (for the full panel) railway directors were more likely to run in constituencies with a higher portion of the population enfranchised.

Inclusion of constituency fixed effects in the model and the associated restriction to within-constituency variation (column (3) table 3.7) yields an estimated $\beta = -0.009$. Though marginally not statistically significant, possibly due to loss of power in the much smaller balanced panel, this estimate of the quasi-franchise-elasticity of running is the same as the analogous estimate in table 3.3 column (3): -0.9. Recall that the interpretation of that result in the full panel was that an 1-percentage point increase within a given constituency in the percent of the population eligible to vote was associated with a decrease in the likelihood that a railway director ran of 0.9%. Though not statistically significant in the smaller balanced panel, the similarity between these results adds confidence. Table 3.13 in appendix 3.5 replicates table 3.7 while omitting the vector of controls $\mathbf{X}_{ct}$.

We next consider estimates of the quasi-franchise-elasticity of winning. As in section 3.3.1, we first look at this by restricting attention to constituencies where railway

Table 3.7: Voting Rights and Railway Directors Running for M.P. (Balanced Panel)

	Railway Director Ran in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	−0.004	−0.001	−0.009
	(0.004)	(0.004)	(0.007)
Population (10,000s)	−0.000***	−0.000***	−0.000***
	(0.000)	(0.000)	(0.000)
1868 General Election		−0.032	0.016
		(0.063)	(0.063)
1874 General Election		−0.073	−0.002
		(0.066)	(0.065)
1880 General Election		−0.076	0.014
		(0.065)	(0.067)
1885 General Election		−0.113*	−0.069
		(0.067)	(0.070)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	696	696	696
Adjusted R^2	0.039	0.038	0.189

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Railway Director Ran): 0.439
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
The number of M.P. seats available is controlled for as a factor variable in the above regressions.

directors ran (table 3.8) before combining the running margin and the conditional win margin into a net outcome with the results in table 3.9. Table 3.8 presents the estimates of the probability a railway director runs in the subset of constituencies in the balanced panel in which a railway director ran.

Columns (1) and (2) of table 3.8 yield the same estimated $\beta = -0.012$. Both are statistically significant. These suggest an estimate of the quasi-franchise-elasticity of winning (conditional on running) of -1.2 for the balanced panel. These are both across-constituency results as constituency fixed effects aren't included in columns (1) and (2). We can interpret this as follows: within the subset of consistent constituencies in which at least one railway director ran, railway directors were less likely to win where the franchise was wider. More specifically within this set of constituencies, each additional 1-percentage point in the percent of the population eligible to vote is associated with a decrease in the probability a railway director wins M.P. of 1.2%. Note that this quasi-franchise-elasticity of winning of -1.2 is comparable to the analogous estimates in the full panel in table 3.4 column (1) (-1.3) and column (2) (-1.1). This yields additional confidence in the interpretation given to those results.

Column (3) of table 3.8 yields a statistically insignificant $\beta = 0.007$. This suggests, within a give constituency, increases in the percentage enfranchised were unrelated to whether a railway director won in that constituency. This result is consistent with the analagous result estimated on the full panel in column (3) of table 3.4.

A robustness check of the above is given in table 3.14 in appendix 3.5. The estimation is the same other than dropping the vector of controls $\mathbf{X}_{ct}$ The estimates presented there of β are very similar to those discussed above for table 3.8. Omitting the controls (which include population) biases the the estimated β's towards zero slightly, however the estimated β's in columns (1) and (2) are still statistically significant at the 5%-level and of similar size to the analogous results in table 3.8. The

Table 3.8: Voting Rights and Railway Directors Winning M.P. (Balanced Panel)

	Railway Director Won in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	-0.012^{***}	-0.012^{**}	0.007
	(0.004)	(0.005)	(0.011)
Population (10,000s)	-0.000	-0.000	0.000^{*}
	(0.000)	(0.000)	(0.000)
1868 General Election		0.024	-0.141
		(0.078)	(0.102)
1874 General Election		0.090	-0.184
		(0.081)	(0.112)
1880 General Election		0.054	-0.200^{*}
		(0.078)	(0.115)
1885 General Election		-0.089	-0.352^{**}
		(0.104)	(0.138)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	306	306	306
Adjusted R^2	0.011	0.013	0.083

Note: *p<0.1; **p<0.05; ***p<0.01
Sample is restricted to places where railway directors ran.
Mean of Outcome Variable (Railway Director Won) (Conditional on Running): 0.715
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
The number of M.P. seats available is controlled for as a factor variable in the above regressions.

interpretation is unchanged though the exact magnitudes differ a little (-0.01 and -0.009 versus -0.012).

Table 3.9 presents estimates of the net outcome of a railway director running in a constituency without conditioning on whether they ran, thus collapsing the prior two results into a single result. The analogous results estimated on the full panel (my preferred specifications) were presented above in table 3.5.

Column (1) of table 3.9 yields an estimated $\beta = -0.008$ which is statistically significant at the 1%-level. This translates to a quasi-franchise-elasticity of winning (unconditional) of -0.8. The interpretation being that each additional 1-percentage point increase in the percent of the population enfranchised is associated with a decrease in the likelihood a railway director wins election of -.8%. Inclusion of election year fixed effects (column (2)) yields an estimate of -.6 which is statistically significant at the 10% level. These magnitudes are non-trivial. The interpretation here is that for the balanced panel, railway directors were less likely to win in places where the franchise was larger. This differs from the analogous results for the full panel in columns (1) and (2) of table 3.5 which where effectively null.

Turning to the within-constituency results presented in column (3), we see that the sign (-) of the estimated β is the same as that in table 3.5. The magnitudes are comparable (-0.009 and -0.010), however the result in the balanced panel is not statistically significant, likely due to the lower power in the smaller set of observations. The interpretation given before though is supported in sign and magnitude: for a given constituency, a 1-percentage point increase in the percent of the population eligible to vote is associated with a -0.9% change in the likelihood that a railway director wins election in that constituency. This is additional evidence consistent with the hypothesis that an expanding voting rights leads to a decline in the electoral fortunes of business elites. Analogous results for the balanced panel with controls omitted is

Table 3.9: Voting Rights and Railway Directors Winning M.P. (Balanced Panel)

	Railway Director Won in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	-0.008^{***}	-0.006^{*}	-0.009
	(0.003)	(0.003)	(0.007)
Population (10,000s)	-0.000^{***}	-0.000^{***}	-0.000^{*}
	(0.000)	(0.000)	(0.000)
1868 General Election		-0.010	0.006
		(0.060)	(0.059)
1874 General Election		-0.008	0.014
		(0.062)	(0.064)
1880 General Election		-0.026	0.003
		(0.062)	(0.065)
1885 General Election		-0.105^{*}	-0.116
		(0.061)	(0.071)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	696	696	696
Adjusted R^2	0.032	0.032	0.150

Note: *p<0.1; **p<0.05; ***p<0.01
Mean of Outcome Variable (Railway Director Won): 0.314
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
The number of M.P. seats available is controlled for as a factor variable in the above regressions.

given in table 3.15 of the appendix.

3.4 Conclusion

This paper uses a novel data set to investigate the relationship between voting rights and the likelihood that business elites run and/or win seats in the legislature. Here the context is U.K. railway directors competing for seats in the House of Commons, from 1865-1885. This is an excellent framework in which to study this question due to the large number of railway directors running for M.P. and winning M.P. during this time as well as the enormous expansions of voting rights during these two decades, primarily stemming from the Reform Acts of 1867 and 1884. In aggregate during this period, voting rights expanded and constituencies were both less likely to have railway directors running and winning. The extent of the franchise varied widely across U.K. constituencies. The reforms during this era were passed at the national level and induced enormous variation in the changes in the franchise within-constituency across-elections. Cross-sectional variation in the franchise is leveraged to show that in constituencies in which the franchise had extended more, railway directors were more likely to run, less likely to win conditional on running, and that the net effect was null. Dynamic variation within-constituency over time is used to show that for a given constituency, increases in the percentage of the population eligible to vote is associated with decreases in the likelihood railway directors run in that constituency. The central finding in this paper is that within a given constituency, increases in the franchise are associated with lower likelihood that a railway director wins M.P. in that constituency. Specifically the quasi-franchise-elasticity of winning is ≈ -1 meaning that within a given constituency for each 1-percentage point of the population eligible to vote is associated with a decrease of 1% in the likelihood that a railway director is elected M.P. in that constituency. The estimates are not causal, but provide compelling

evidence consistent with a model in which the expansion of the franchise plays a disciplinary role on business elites in the legislature. The results can not be directly applied to other settings, but the methods used can be. Future work on this topic should build by studying this question in other contexts as well as in the same context, but for industries other than railways.

3.5 Appendix: Additional Results

3.5.1 Full Panel

Table 3.10: Voting Rights and Railway Directors Running for M.P. (Without Controls)

	Railway Director Ran in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	0.004*	0.009***	−0.007
	(0.002)	(0.002)	(0.005)
1868 General Election		−0.084**	−0.017
		(0.037)	(0.036)
1874 General Election		−0.131***	−0.055
		(0.038)	(0.037)
1880 General Election		−0.155***	−0.079**
		(0.037)	(0.038)
1885 General Election		−0.206***	−0.174***
		(0.049)	(0.048)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	1,716	1,716	1,716
Adjusted R^2	0.001	0.014	0.209

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Railway Director Ran): 0.353
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
No additional controls are included.

Table 3.11: Voting Rights and Railway Directors Winning M.P. (Without Controls)

	Railway Director Won in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	-0.013^{***}	-0.010^{***}	-0.004
	(0.003)	(0.003)	(0.006)
1868 General Election		-0.064	-0.094^{*}
		(0.046)	(0.048)
1874 General Election		-0.003	-0.096^{*}
		(0.047)	(0.055)
1880 General Election		-0.092^{*}	-0.126^{**}
		(0.050)	(0.057)
1885 General Election		-0.206^{**}	-0.265^{***}
		(0.080)	(0.095)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	676	676	676
Adjusted R^2	0.026	0.037	0.167

Note: *p<0.1; **p<0.05; ***p<0.01
Sample is restricted to places where railway directors ran.
Mean of Outcome Variable (Railway Director Won) (Conditional on Running): 0.741
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
No additional controls are included.

Table 3.12: Voting Rights and Railway Directors Winning M.P. (Without Controls)

	Railway Director Won in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	−0.002	0.002	−0.009**
	(0.002)	(0.002)	(0.004)
1868 General Election		−0.094***	−0.044
		(0.036)	(0.031)
1874 General Election		−0.105***	−0.046
		(0.036)	(0.033)
1880 General Election		−0.157***	−0.099***
		(0.035)	(0.034)
1885 General Election		−0.227***	−0.186***
		(0.043)	(0.047)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	1,716	1,716	1,716
Adjusted R^2	0.0002	0.016	0.220

Note: *p<0.1; **p<0.05; ***p<0.01
Mean of Outcome Variable (Railway Director Won): 0.261
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
No additional controls are included.

3.5.2 Balanced Panel

Table 3.13: Voting Rights and Railway Directors Running for M.P. (Balanced Panel, Without Controls)

	Railway Director Ran in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	0.002	0.006*	−0.005
	(0.003)	(0.004)	(0.007)
1868 General Election		−0.073	−0.013
		(0.062)	(0.064)
1874 General Election		−0.123*	−0.050
		(0.064)	(0.066)
1880 General Election		−0.131**	−0.058
		(0.064)	(0.068)
1885 General Election		−0.223***	−0.155**
		(0.062)	(0.066)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	696	696	696
Adjusted R^2	−0.001	0.012	0.175

Note: *p<0.1; **p<0.05; ***p<0.01
(Unconditional) Mean of Outcome Variable (Railway Director Ran): 0.439
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
No additional controls are included.

Table 3.14: Voting Rights and Railway Directors Winning M.P. (Balanced Panel, Without Controls)

	Railway Director Won in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	-0.010^{**}	-0.009^{**}	0.002
	(0.004)	(0.004)	(0.009)
1868 General Election		0.016	-0.102
		(0.078)	(0.092)
1874 General Election		0.075	-0.110
		(0.079)	(0.099)
1880 General Election		0.039	-0.107
		(0.077)	(0.101)
1885 General Election		-0.121	-0.302^{**}
		(0.093)	(0.118)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	306	306	306
Adjusted R^2	0.013	0.018	0.075

Note: *p<0.1; **p<0.05; ***p<0.01
Sample is restricted to places where railway directors ran.
Mean of Outcome Variable (Railway Director Won) (Conditional on Running): 0.715
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
No additional controls are included.

Table 3.15: Voting Rights and Railway Directors Winning M.P. (Balanced Panel, Without Controls)

	Railway Director Won in Constituency		
	(1)	(2)	(3)
Percentage Enfranchised	−0.004	−0.0005	−0.008
	(0.003)	(0.003)	(0.006)
1868 General Election		−0.043	−0.001
		(0.060)	(0.056)
1874 General Election		−0.050	0.001
		(0.061)	(0.059)
1880 General Election		−0.071	−0.020
		(0.062)	(0.061)
1885 General Election		−0.196***	−0.149**
		(0.058)	(0.064)
Election-Year Fixed Effects	No	Yes	Yes
Constituency Fixed Effects	No	No	Yes
Observations	696	696	696
Adjusted R^2	0.0004	0.013	0.154

Note: *p<0.1; **p<0.05; ***p<0.01
Mean of Outcome Variable (Railway Director Won): 0.314
Standard Errors reported in parentheses are heteroskedastic-robust [White, 1980].
Election-Year Fixed Effects: An intercept term is included in the model and 1865 is omitted.
No additional controls are included.

Chapter 4

Data Documentation

4.1 DATA DOCUMENTATION: Political Connections, Capital Investment, and Special Legislation of U.K. Railways

4.1.1 Introduction

This describes the file **bradshaw_polcon_capinv_specleg.csv**. This is the primary data set constructed by the author for use in his dissertation at Boston University. The data set was constructed by the author from 37 annual editions of *Bradshaw's Railway Manual, Shareholders' Guide, and Official Directory.*[1] A large number of variables detailing the political connections of the railways, their capital investment, and their activities regarding Special Legislation in Parliament are included in this data set.

4.1.2 Overview

- **Number of Observations:** N = 12,751.
- **Number of Variables:** K = 190.
- **Years:** The following 37 years are included in the data set: 1855-1858, 1860, 1864, 1864, 1866, 1867, 1869, 1871, 1873, 1874, 1876-1890, 1892-1894, 1896-1901.

[1]The 37 Editions of *Bradshaw's* used in construction: 1855-1858, 1860, 1864, 1864, 1866, 1867, 1869, 1871, 1873, 1874, 1876-1890, 1892-1894, 1896-1901.

- **Level (Rows):** Each observation (row) in the data set corresponds to a company-year pair.

4.1.3 Sources

This data set was built from the following editions of *Bradshaw's Railway Manual, Shareholders' Guide, and Official Directory.*:

- [Bradshaw, 1855, Bradshaw, 1856, Bradshaw, 1857, Bradshaw, 1858, Bradshaw, 1860, Bradshaw, 1862, Bradshaw, 1864, Bradshaw, 1866, Bradshaw, 1867, Bradshaw, 1869, Bradshaw, 1871, Bradshaw, 1873, Bradshaw, 1874, Bradshaw, 1876, Bradshaw, 1877, Bradshaw, 1878, Bradshaw, 1879, Bradshaw, 1880, Bradshaw, 1881, Bradshaw, 1882, Bradshaw, 1883, Bradshaw, 1884, Bradshaw, 1885, Bradshaw, 1886, Bradshaw, 1887, Bradshaw, 1888, Bradshaw, 1889, Bradshaw, 1890, Bradshaw, 1892, Bradshaw, 1893, Bradshaw, 1894, Bradshaw, 1896, Bradshaw, 1897, Bradshaw, 1898, Bradshaw, 1899, Bradshaw, 1900, Bradshaw, 1901]

4.1.4 Variables in Data Set

variable names are displayed in bold below as they appear in the data set. The type of variable is denoted in italics. All variables below were digitized from *Bradshaw's Railway Manual, Shareholders' Guide, and Official Directory.*

1. **company** *chr.* Railway company.
2. **year** *num.* Year.
3. **mileage_authorized_bradshaw** *num.* Number of miles of track the railway has been authorized to have as of that year.
4. **miles_open** *num.* Number of miles of railway track open for business in year.

5. **capital_expenditure_cumulative** *num.* Aggregate capital expenditure to date in British pounds.

6. **capital_receipt_cumulative** *num.* Aggregate capital paid-into the firm to date in British pounds.

7. **hol_binary_*** *bin.* There are 178 variables of this type in the data set. Each of these corresponds to a distinct member of the House of Lords who was a railway director concurrently in at least 1 year. These are binaries denoting whether the railway had this specific Peer on the corporate board in that year. Summing across these rows immediately yields the count of director-Peers at the company-year level. Construction of these binaries was done using the appendices detailing the Railway Interest in the House of Lords to ensure Peers not in the House of Lords were not accidentally counted.

8. **count_director_mp** *num.* The number of M.P.s, Members of Parliament, concurrently directors of the given company.

9. **n_bills_submitted** *num.* This is the number of bills submitted to the Railway Department or the Harbour Department of the Board of Trade by the end of the year prior. All bills referred to are private bills, a form of special legislation.

10. **n_bills_passed num.** The number of private railway bills passed in the prior year's Parliamentary session.

11. **directorate_string chr.** For a minority of the years a character-string of the entire directorate is available.

12. **location** *chr.* This variable denotes whether the railway is primarily located in Ireland, Scotland, or England/Wales.

4.1.5 Data Availability

Contact the author, Max McDevitt, at mcdevittm4@gmail.com.

4.2 DATA DOCUMENTATION: A Century of Passenger-Fatal Railway Accidents in the U.K., 1825-1924

4.2.1 Introduction

This describes the file **wilson_accidents_1925.csv**. That data set contains information on *all* passenger-fatal railway accidents recorded in the United Kingdom between 1825-1924. This information was digitized by this author from *Railway Accidents: Legislation and Statistics, 1825-1924* ([Wilson, 1925]).

4.2.2 Overview

- **Qualifications for Accidents:** The accidents digitized from [Wilson, 1925] make up the universe of railway accidents in the U.K. between 1825-1924 in which a passenger was killed. Major accidents not involving passenger fatalities are excluded.
- **Number of Observations:** N = 451.
- **Number of Variables:** K = 8.
- **Years:** 1825-1924.
- **Level (Rows):** Each observation (row) in the data set corresponds to a company-accident pair. This is done so that the data can be readily aggregated to the company-year level match to another panel data set constructed by this author at the company-year level. Any aggregate analysis of the time-series should account for this by first grouping at the accident level to avoid double-counting. The vast majority of accidents, 417, involve only one company directly, however some involve two or more companies directly. This accounts for the distinction between accident and accident-company level in the data-set.

- **Data Transformations:** The data set has been constructed in such a way that it can readily be collapsed to the accident level. Note: the accident is defined in the data set by the *vector* (**year_of_crash**, **month_of_crash**, **day_of_crash**, **location_of_crash**).

4.2.3 Sources

This data set was built from the following sources:

- Accidents data was digitized by the author from *Railway Accidents: Legislation and Statistics, 1825-1924 ([Wilson, 1925].)*
- The **company** variable was constructed using various sources. Details can be found below under the variable: **company_source**.

4.2.4 Variables in Data Set

variable names are displayed in bold below as they appear in the data set. The type of variable is denoted in italics. Unless otherwise noted, all variables below were constructed from ([Wilson, 1925].)

1. **year_of_crash** *num.* Year in which accident occurred.
2. **month_of_crash** *num.* Month in which accident occurred.
3. **day_of_crash** *num.* Day on which accident occurred.
4. **location_of_crash** *chr.* Location of accident.
5. **passenger_deaths_from_crash** *num.* Number of passenger fatalities from accident.
6. **cause_given_in_wilson_1925** *chr.* The primary cause of the accident.

7. **company** *chr.* Name of railway company implicated in accident. *Note: this information is not given in [Wilson, 1925]. The author used additional sources to determine which companies corresponded to which crashes.*

8. **company_source** *chr.* Source justifying the value of the **company** variable. The author used a variety of sources to verify the companies involved in the accidents covered. These sources include the Board of Trade's Railway Inspectorate reports on these accidents (hyperlinks provided where the report is available online), contemporary newspapers, *Railway Detectives: The 150-year Saga of the Railway Inspectorate* ([Hall, 1990]), *Historic Railway Disasters* ([Nock, 1987]), and various editions of the *Annual Register.*

4.2.5 Data Availability

Contact the author, Max McDevitt, at mcdevittm4@gmail.com.

4.3 DATA DOCUMENTATION: Railway Accidents Involving Serious Injury or Death to Passengers or Employees Reported on by the Railway Department, 4-Year Panel (1889, 1893, 1897, 1899)

4.3.1 Introduction

This describes the file

General_Report_killed_and_injured_pass_and_emp_89_93_97_99.csv. This is a 4-year panel of *all* railway accidents involving serious injury or death to passengers or employees reported on by the Railway Department at the Board of Trade. The author constructed the data set by digitizing four end of year Board of Trade Reports and stacking those data sets.

4.3.2 Overview

- **Number of Observations:** N = 153.
- **Number of Variables:** K = 7.
- **Years:** 1889, 1893, 1897, 1899.
- **Level (Rows):** Each observation (row) in the data set corresponds to a company-year pair. i.e. the level of the data has already been aggregated from the individual accidents within-year and summarized by the Board of Trade at the company-year level.

4.3.3 Sources

This data set was built from the following Board of Trade Reports Presented to Parliament:

- *General Report to the Board of Trade Upon the Accidents Which Have Occurred on the Railways of the United Kingdom During the Year 1889* ([Railway Department, 1890]).
- *Railway Accidents: Returns of Accidents and Casualties as Reported to the Board of Trade by the Several Railway Companies in the United Kingdom, During the Year ending 31st December, 1893* ([Railway Department, 1894]).
- *Railway Accidents: Returns of Accidents and Casualties as Reported to the Board of Trade by the Several Railway Companies in the United Kingdom, During the Year ending 31st December, 1897* ([Railway Department, 1898]).
- *General Report to the Board of Trade upon the Accidents That Have Occurred on the Railways of the United Kingdom During the Year 1899* ([Railway Department, 1900]).

4.3.4 Variables in Data Set

variable names are displayed in bold below as they appear in the data set. The type of variable is denoted in italics. All variables below were digitized from the Board of Trade Reports cited in the Sources section.

1. **year** *num.* Year in which accidents summarized occurred.
2. **company** *chr.* The railway company responsible for the accidents.

3. **number_of_accidents** *num.* The number of accidents reported on that occurred in company year. This variable was reported in the Board of Trade reports for 1889 and 1899, but not for the years 1893 and 1897.

4. **passengers_and_others_killed** *num.* The number of passengers and by-standers killed in the accidents reported on.

5. **passengers_and_others_injured** *num.* The number of passengers and by-standers seriously injured in the accidents reported on.

6. **servants_of_company_killed** *num.* The number of employees killed in the accidents reported on.

7. **servants_of_company_injured** *num.* The number of employees seriously injured in the accidents reported on.

4.3.5 Data Availability

Contact the author, Max McDevitt, at mcdevittm4@gmail.com.

4.4 DATA DOCUMENTATION: U.K. M.P. Deaths, 1832-1909

4.4.1 Introduction

This describes the file **mp_deaths_mccalmont_1910.csv**. The data covers every death of a sitting (i.e. currently in elected office) Member of Parliament, or M.P. Each row corresponds to a single M.P. death. All M.P.s in the data set are those that died in office and only those. Deaths are identified using *McCalmont's Parliamentary Poll Book, 7th edition* [McCalmont, 1910]. Various editions of Bradshaw's were used to check which companies director-M.P.s were on in the year of their death. Deaths for a given M.P. are repeated once for each company more than one. i.e. For summary stats of the number of railway directors dying in year, you need to first group the data by the name of the M.P. given by the variable mp_mccalmont.

4.4.2 Data Construction

McCalmont's Parliamentary Poll Book, 7th edition contains election information, such as candidates, parties, vote shares, etc, for all elections between the passage of the 1832 Reform Act to February of 1910. If a sitting M.P. dies, then a by-election is triggered to fill the dead M.P.'s former seat. By-elections triggered by deaths are always preceded by "On dec. of NAME." I use this to identify all M.P. deaths covered during this period.

This is then verified and supplemented with annual editions of the *Annual Register*, a classic source in U.K. History dating to 1758, when Edmund Burke founded the *Annual Register* as editor.

4.4.3 Overview

- **Number of Observations:** N = 681 (629 distinct deaths).
- **Number of Variables:** K = 5.
- **Years:** 1832-1909.
- **Level (Rows):** Each observation (row) in the data set corresponds to the death of a single M.P. x company.

4.4.4 Sources

This data set was built from the following sources:

- M.P. Deaths data was digitized from *McCalmont's Parliamentary Poll Book, 7th edition*, [McCalmont, 1910].
- The **company** variable was constructed using various editions of Bradshaw's Railway Manuals. Date of death was taken from various editions of the Annual Register.

4.4.5 Variables in Data Set

variable names are displayed in bold below as they appear in the data set. The type of variable is denoted in italics. Unless otherwise noted, all variables below were constructed from ([McCalmont, 1910].)

1. **date** *date (YYYY-MM-DD)* Date of the death of M.P.
2. **year** *num.* Year of death of M.P.
3. **constituency** *chr.* Constituency represented by M.P. at time of death.
4. **mp_mccalmont** *chr.* Name of the M.P. as given in *McCalmont's*.

5. **company** *chr.* company. Only available from 1862 forward. (*Bradshaw's*)

4.4.6 Data Availability

Contact the author, Max McDevitt, at mcdevittm4@gmail.com.

4.5 DATA DOCUMENTATION: U.K. Railway Director-Peer Deaths, 1866-1900

4.5.1 Introduction

This describes the file **deaths_director_lords.csv**. The data covers every death of a sitting (i.e. currently in elected office) Peer. Each row corresponds to a single Peer death x company. Unlike the M.P. dataset, this was only collected for railway director-Peers. Deaths of connected Peers are identified in the following manner: first, for every railway director-Peer in the political connections data 2.2.3, I identify the last year they appear as a railway director for a given firm. I then manually checked each of these railway director-peers against the Annual Registers to see whether they died in the prior year, or are no longer railway directors for some other reason. I keep only those railway director-peers that died.

4.5.2 Overview

- **Number of Observations:** N = 67 (34 distinct deaths).
- **Number of Variables:** K = 7.
- **Years:** 1866-1900.
- **Level (Rows):** Each observation (row) in the data set corresponds to the death of a single peer x company.

4.5.3 Sources

This data set was built from the following sources:

- Main Political Connections Data 2.2.3

- Verification of death (and thus inclusion in data set), the date of death, and the age at death were taken from the Annual Register.

4.5.4 Variables in Data Set

variable names are displayed in bold below as they appear in the data set. The type of variable is denoted in italics. Unless otherwise noted, all variables below were constructed from ([McCalmont, 1910].)

1. **date** *date (YYYY-MM-DD)* Date of the death of railway director-peer.
2. **year** *num.* Year of death of railway director-peer.
3. **hol_binary_variable** *chr.* This is a character string denoting a binary variable in the Political Connections Data 2.2.3, corresponding to that railway director-peer.
4. **company** *chr.* company name.
5. **age_at_death** *num.* Integer indicating the age at which the railway director-peer died.
6. **notes** *chr.* Additional notes.

4.5.5 Data Availability

Contact the author, Max McDevitt, at mcdevittm4@gmail.com.

4.6 DATA DOCUMENTATION: UK General Elections (1865, 1868, 1874, 1880, and 1885)

4.6.1 Introduction

This describes the file **uk_elections_mccalmont_65_to_85.csv**. That data set contains information on the United Kingdom general elections of 1865, 1868, 1874, 1880, and 1885. This information was digitized by the author from *The Parliamentary Poll Book of All Elections from the Reform Act of 1832 to February 1910*. The author improved this data set by constructing binary variables denoting whether or not a candidate for office was a railway director in that year. Construction of these binaries was done using various editions of *Bradshaw's Railway Manual, Shareholders' Guide, and Official Directory*.

4.6.2 Overview

- **Number of Observations:** N = 5,456.
- **Number of Variables:** K = 21.
- **U.K. General Elections:** 1865, 1868, 1874, 1880, and 1885.
- **Level (Rows):** Each observation (row) in the data set corresponds to an individual candidate running for the elected office of M.P. in the United Kingdom House of Commons in a specific general election in a specific constituency. That is to say, the level of the data set is election-constituency-candidate.
- **Data Transformations:** The data set has been constructed in such a way that it can readily be collapsed to the election-constituency level, the election level, the constituency level, or the candidate level. Note: the constituency is defined in the data set by the *pair* (**location**, **division**).

4.6.3 Sources

This data set was built from the following sources:

- *The Parliamentary Poll Book* ([McCalmont, 1910])
- Various Annual Editions of *Bradshaw's Railway Manual, Shareholders' Guide, and Official Directory.* ([Bradshaw, 1866], [Bradshaw, 1869], [Bradshaw, 1874], [Bradshaw, 1880], [Bradshaw, 1885]).

4.6.4 Variables in Data Set

variable names in bold below as they appear in the data set. The type of variable is denoted in italics. Unless otherwise noted, all variables below were constructed from ([McCalmont, 1910].)

1. **year** *num.* Year in which the general election took place.
2. **location** *chr.* Location of constituency.
3. **division** *chr.* Sub-location of constituency. If NA, the constituency is uniquely identified by the **location** variable.
4. **candidate** *chr.* Name of candidate running for election. Last name followed by ",", followed by the rest of the candidate's name including titles.
5. **party** *chr.* Political party of candidate.
6. **votes** *num.* The number of votes received for the candidate in the election. NA's for votes in this data set correspond to non-contested elections. Listed individuals with votes listed as NA won their seats without a contest.
7. **winner** *bin.* Denotes whether a candidate won the election.

8. **electors_1832** *num.* Number of electors Listed 1832, i.e. immediately following the First Reform Act in 1832.

9. **electors_1868** *num.* Number of electors Listed 1868, i.e. immediately following the Second Reform Act in 1867.

10. **electors_1874** *num.* Number of electors Listed 1874.

11. **electors_1884** *num.* Number of electors Listed in 1884, i.e. immediately following the Third Reform Act in 1884.

12. **pop_1831** *num.* Population in constituency in 1831 census.

13. **pop_1861** *num.* Population in constituency in 1861 census.

14. **pop_1871** *num.* Population in constituency in 1871 census.

15. **pop_1881** *num.* Population in constituency in 1881 census.

16. **pop_1891** *num.* Population in constituency in 1891 census.

17. **railway_director_bradshaw_1866** *bin.* Denotes whether the candidate was listed as a railway director in *Bradshaw's* 1866 edition ([Bradshaw, 1866]).

18. **railway_director_bradshaw_1869** *bin.* Denotes whether the candidate was listed as a railway director in *Bradshaw's* 1869 edition. ([Bradshaw, 1869]).

19. **railway_director_bradshaw_1874** *bin.* Denotes whether the candidate was listed as a railway director in *Bradshaw's* 1874 edition. ([Bradshaw, 1874]).

20. **railway_director_bradshaw_1880** *bin.* Denotes whether the candidate was listed as a railway director in *Bradshaw's* 1880 edition. ([Bradshaw, 1880]).

21. **railway_director_bradshaw_1885** *bin.* Denotes whether the candidate was listed as a railway director in *Bradshaw's* 1885 edition. ([Bradshaw, 1885]).

4.6.5 Data Availability

Contact the author, Max McDevitt, at mcdevittm4@gmail.com.

Appendix A

Appendix

A.1 Additional Relevant Literature

In addition to the works explicitly cited in the three principle chapters of this dissertation, I did extensive background reading to prepare to write this dissertation. The following are additional works I read during the course of my doctoral studies to which I am indebted for inspiration, understanding, and ideas underlying this dissertation.

A.1.1 Railways: Economic History

[Adler, 1970]; [Amini and Toms, 2020]; [Broadbridge, 1969]; [Caron, 1983]; [Eversley, 1969]; [Fishlow, 1965]; [Fenoaltea, 1983]; [Fogel, 1960]; [Fogel, 1964]; [Fremdling, 1983]; [Gomez-Mendoza, 1983]; [Gourvish, 1972]; [Gourvish, 1980]; [Hawke, 1969]; [Hawke, 1970]; [Hawke and Higgins, 1983]; [Hughes, 1960]; [Jenks, 1927]; [Kellett, 1969]; [Laffut, 1983]; [Mitchell, 1969]; [O'Brien, 1983]; [Pollins, 1969a]; [Pollins, 1969b]; [Reed, 1969]; [Reed, 1975b]; [Toniolo, 1983]; [Wray, 1969]

A.1.2 Railways: Company History

[Bassett, 1905]; [Baughan, 1980]; [Christiansen, 1991]; [Grinling, 1898]; [Lee, 1967]; [Marshall, 1963a,Marshall, 1963b]; [Thomas, 1969]; [Thomas, 1984]; [Thomas, 1990a]; [Thomas, 1990b]; [Thomas and Turnock, 1993]; [Vallance, 1985]; [Vallance, 1965]; [White, 1969];

A.1.3 Railways: General History

[Adams, 1878]; [Casserley, 1974]; [Cleveland-Stevens, 1915]; [Dunn, 1913]; [Gooch, 1892]; [Greaves, 2005]; [Hiltzik, 2020]; [Platt, 1987]; [Simmons, 1991]; [Vaughan, 1997]; [White, 2011];

A.1.4 Railways: Reference

[Simmons and Biddle, 1997]

A.1.5 19th Century U.K.: General History

[Clapham, 1926]; [Clapham, 1932]; [Clapham, 1938]; [Hobsbawm, 1962]; [Hobsbawm, 1987]; [Lyons, 1973]; [Mokyr, 2009]; [Morgan, 1988]; [Thomson, 1950]

A.1.6 19th Century U.K.: Finance and Banking History

[Braggion et al., 2015]; [Clapham, 1945a, Clapham, 1945b]; [Dillon, 1889]; [Gilbart, 1836]; [Grossman and Imai, 2016]; [Hurrell and Hyde, 1900]; [Knox, 1965]; [Michie, 1987]; [Michie, 1999]; [Ollerenshaw, 1987]; [Palmer, 1878]; [Reed, 1975a]; [Tarrang, 1867]; [Thomas, 1986]; [Tuck, 1845]; [Watson and Neuman, 1886]

A.1.7 19th Century U.K.: Parliament and Government Bureaucracy

[Bromhead, 1956]; [Clifford, 1885]; [Clifford, 1887]; [Dodd and Wilberforce, 1898] [Gardiner, 1923a, Gardiner, 1923b]; [Hammond, 1964]; [Hammond, 1964]; [Oxford and Asquith K.G., 1926a, Oxford and Asquith K.G., 1926b]; [Parris, 1965]; [Parris, 1969]

References

Acemoglu, D. and Robinson, J. A. (2000). Why did the west extend the franchise? democracy, inequality, and growth in a historical perspective. *Quarterly Journal of Economics*, 115(4):1167–1199.

Adams, C. F. J. (1878). *Railroads: Their Origin and Problems*. G. P. Putnam and Sons, Co., United States.

Adler, D. R. (1970). *British Investment in American Railways*. The University Press of Virginia, Charlottesville.

Aidt, T. S., Daunton, M., and Dutta, J. (2010). The retrenchment hypothesis and the franchise in england and wales. *The Economic Journal*, 120(547):990–1020.

Alderman, G. (1973). *The Railway Interest*. Leicester University Press.

Amini, S. and Toms, S. (2020). Elite directors, london finance, and british overseas expansion: Victorian railway networks, 1860-1900. *Economic History Review*, 74(42):496–521.

Baker, R. B., Frydman, C., and Hilt, E. (2018). Political discretion and antitrust policy: Evidence from the assassination of president mckinley. *working paper*.

Bassett, H. H. e. (1905). *Bradshaw's Railway Manual Fifty-Seventh Edition*. Henry Blacklock and Co.

Baughan, P. E. (1980). *A Regional History of the Railways of Great Britain: Volume 11: North and Mid Wales*. David and Charles.

Berlinski, S. and Dewan, T. (2010). The political consequences of franchise extension. *Working Paper*.

Berlinski, S., Dewan, T., and Coppenolle, B. V. (2014). Franchise extension and the british aristocracy. *Legislative Studies Quarterly*, 39(4):531–558.

Bradshaw (1855). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1855*. W.J. Adams & Sons.

Bradshaw (1856). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1856*. W.J. Adams & Sons.

Bradshaw (1857). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1857*. W.J. Adams & Sons.

Bradshaw (1858). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1858*. W.J. Adams & Sons.

Bradshaw (1860). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1860*. W.J. Adams & Sons.

Bradshaw (1862). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1862*. W.J. Adams & Sons.

Bradshaw (1864). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1864*. W.J. Adams & Sons.

Bradshaw (1866). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1866*. W.J. Adams & Sons.

Bradshaw (1867). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1867*. W.J. Adams & Sons.

Bradshaw (1869). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1869*. W.J. Adams & Sons.

Bradshaw (1871). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1871*. W.J. Adams & Sons.

Bradshaw (1873). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1873*. W.J. Adams & Sons.

Bradshaw (1874). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1874*. W.J. Adams & Sons.

Bradshaw (1876). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1876*. W.J. Adams & Sons.

Bradshaw (1877). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1877*. W.J. Adams & Sons.

Bradshaw (1878). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1878*. W.J. Adams & Sons.

Bradshaw (1879). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1879*. W.J. Adams & Sons.

Bradshaw (1880). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1880*. W.J. Adams & Sons.

Bradshaw (1881). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1881*. W.J. Adams & Sons.

Bradshaw (1882). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1882*. W.J. Adams & Sons.

Bradshaw (1883). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1883*. W.J. Adams & Sons.

Bradshaw (1884). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1884*. W.J. Adams & Sons.

Bradshaw (1885). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1885*. W.J. Adams & Sons.

Bradshaw (1886). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1886*. W.J. Adams & Sons.

Bradshaw (1887). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1887*. W.J. Adams & Sons.

Bradshaw (1888). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1888*. W.J. Adams & Sons.

Bradshaw (1889). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1889*. W.J. Adams & Sons.

Bradshaw (1890). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1890*. W.J. Adams & Sons.

Bradshaw (1892). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1892*. W.J. Adams & Sons.

Bradshaw (1893). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1893*. W.J. Adams & Sons.

Bradshaw (1894). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1894*. W.J. Adams & Sons.

Bradshaw (1896). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1896*. W.J. Adams & Sons.

Bradshaw (1897). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1897*. W.J. Adams & Sons.

Bradshaw (1898). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1898*. W.J. Adams & Sons.

Bradshaw (1899). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1899*. W.J. Adams & Sons.

Bradshaw (1900). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1900*. W.J. Adams & Sons.

Bradshaw (1901). *Bradshaw's Railway Manual, Shareholder's Guide, and Official Directory for 1901*. W.J. Adams & Sons.

Braggion, F., Dwarkasing, N. R. D., and Moore, L. (2015). Increasing market concentration in british banking, 1885 to 1925. In Greif, A., Kiesling, L., and Nye, J. V. C., editors, *Institutions, Innovation, and Industrialization: Essays in Economic History and Development*, chapter 7, pages 179–200. Princeton University Press, 41 William Street, Princeton, New Jersey.

Braggion, F. and Moore, L. (2013). The economic benefits of political connections in late victorian britain. *The Journal of Economic History*, 73(1).

Broadbridge, S. A. (1969). The sources of railway share capital. In Reed, M. C., editor, *Railways in the Victorian Economy: Studies in Finance and Growth*, pages 184–211. David & Charles.

Bromhead, P. A. (1956). *Private Members' Bills in the British Parliament*. Routledge & Kegan Paul, London.

Caron, F. (1983). France. In O'Brien, P., editor, *Railways and the Economic Development of Western Europe*, pages 28–48. The Macmillan Press Ltd.

Casserley, H. C. (1974). *Outline of Irish Railway History*. David & Charles Inc, North Pomfret Vermont 05053 USA.

Christiansen, R. (1991). *A Regional History of the Railways of Great Britain: Volume 7: The West Midlands*. David St. John Thomas Publisher, third edition.

Clapham, S. J. (1926). *An Economic History of Modern Britain: The Early Railway Age, 1820-1850*. Cambridge University Press, Bentley House, N. W. 1.

Clapham, S. J. (1932). *An Economic History of Modern Britain: Free Trade and Steel, 1850-1886*. Cambridge University Press, Bentley House, N. W. 1.

Clapham, S. J. (1938). *An Economic History of Modern Britain: Machines and National Rivalries (1887-1914) with an Epilogue (1914-1929)*. Cambridge University Press, Bentley House, N. W. 1.

Clapham, S. J. (1945a). *The Bank of England: A History, Volume I, 1694-1797*. Cambridge University Press, Cambridge CB2 8BS, United Kingdom.

Clapham, S. J. (1945b). *The Bank of England: A History, Volume II, 1797-1914*. Cambridge University Press, Cambridge CB2 8BS, United Kingdom.

Cleveland-Stevens, E. (1915). *English Railways: Their Development and their Relation to the State*. George Routledge and Sons, Limited, London.

Clifford, F. (1885). *A History of Private Bill Legislation in Two Volumes. Vol. I.* Butterworths, 7, Fleet Street, London.

Clifford, F. (1887). *A History of Private Bill Legislation in Two Volumes. Vol. 2.* Butterworths, 7, Fleet Street, London.

Dillon, M. (1889). *The History and Development of Banking in Ireland from the Earliest Times to the Present Day*. Alex Thom. & Co., Limited, Dublin: 87, 88, 89, Middle Abbey Street.

Dodd, C. Q. and Wilberforce, H. W. W. (1898). *Private Bill Procedure: A Guide to the Procedure Upon Private Bills*. Eyre & Spottiswoode, East Harding Street, Fleet Street, E.C.

Dunn, S. O. (1913). *Government Ownership of Railways*. D. Appleton & Company, New York and London.

Engerman, S. L. and Sokoloff, K. L. (2005). The evolution of suffrage institutions in the new world. *The Journal of Economic History*, 65(4):891–921.

Ensor, R. C. K. (1936). *England, 1870-1914*. Oxford University Press, Amen House, London, UK.

Eversley, D. E. C. (1969). The great western railway and the swindon works in the great depression. In Reed, M. C., editor, *Railways in the Victorian Economy: Studies in Finance and Growth*, pages 111–137. David & Charles.

Falch, T., Strøm, B., and Tovmo, P. (2022). The effect of voting franchise extension on education policy. *Education Economics*, 30(1):66–90.

Fan, J. P., Wong, T. J., and Zhang, T. (2007). Politically connected ceos, corporate governance, and post-ipo performance of china's newly partially privatized firms. *Journal of Financial Economics*, 84:330–357.

Fenoaltea, S. (1983). Italy. In O'Brien, P., editor, *Railways and the Economic Development of Western Europe*, pages 49–120. The Macmillan Press Ltd.

Ferguson, T. and Voth, H.-J. (2008). Betting on hitler-the value of political connections in nazi germany. *The Quarterly Journal of Economics*, 123(1):101–137.

Fishlow, A. (1965). *American Railroads and the Transformation of the Ante-Bellum Economy*. Harvard University Press, Cambridge, Massachusetts.

Fisman, R. (2001). Estimating the value of political connections. *The American Economic Review*, 91:1095–1102.

Fogel, R. W. (1960). *The Union Pacific Railroad: A Case in Premature Enterprise*. The John Hopkins Press, Baltimore, Maryland.

Fogel, R. W. (1964). *Railroads and American Economic Growth: Essays in Economic History*. The John Hopkins Press, Baltimore, Maryland.

Fremdling, R. (1983). Germany. In O'Brien, P., editor, *Railways and the Economic Development of Western Europe*, pages 121–147. The Macmillan Press Ltd.

Gardiner, A. G. (1923a). *The Life of Sir William Harcourt, Volume I (1827-1886)*. Constable & Company Ltd, London.

Gardiner, A. G. (1923b). *The Life of Sir William Harcourt, Volume II (1886-1904)*. Constable & Company Ltd, London.

Gilbart, J. W. (1836). *The History of Banking in Ireland*. Longman, Rees, Orme, Brown, Green, & Longman, London.

Goldin, C. (2016). Human capital. In Diebolt, C. and Haupert, M., editors, *Handbook of Cliometrics*, pages 55–86. Springer-Verlag Berlin Heidelberg.

Gomez-Mendoza, A. (1983). Spain. In O'Brien, P., editor, *Railways and the Economic Development of Western Europe*, pages 148–169. The Macmillan Press Ltd.

Gooch, S. D. (1892). *Diaries of Sir Daniel Gooch, Baronet*. Kegan Paul, Trench, Trubner, & Co. Ltd., London, Paternoster House, Charing Cross Road.

Gourvish, T. R. (1972). *Mark Huish and the London & Northwestern Railway: a study of management*. Leicester University Press.

Gourvish, T. R. (1980). *Railways and the British Economy, 1830-1914*. Macmillan Publishers Limited.

Greaves, J. N. (2005). *Sir Edward Watkin, 1819-1901: The Last of the Railway Kings*. The Book Guild Ltd.

Grinling, C. H. (1898). *The History of the Great Northern Railway, 1845-1895*. Methuen & Co., 36, Essex Street, W.C., London.

Grossman, R. S. and Imai, M. (2016). Taking the lord's name in vain: The impact of connected directors on 19th century british banks. *Explorations in Economic History*, 59:75–93.

Hall, S. M. (1990). *Railway Detectives: The 150-year Saga of the Railway Inspectorate*. Ian Allan Ltd, London.

Hammond, J. (1964). *Gladstone and the Irish Nation*. Frank Cass and Co. Ltd., 10 Woburn Walk, London, W.C. I.

Hawke, G. R. (1970). *Railways and Economic Growth in England and Wales*. Oxford University Press, Ely House, London W. 1.

Hawke, G. R. and Higgins, J. (1983). Britain. In O'Brien, P., editor, *Railways and the Economic Development of Western Europe*, pages 170–202. The Macmillan Press Ltd.

Hawke, S. A. (1969). Pricing policy of railways in england and wales before 1881. In Reed, M. C., editor, *Railways in the Victorian Economy: Studies in Finance and Growth*, pages 76–110. David & Charles.

Hiltzik, M. (2020). *Iron Empires: Robber Barons, Railroads, and the Making of Modern America*. Houghton Mifflin Harcourt Publishing Company, 3 Park Avenue, 19th Floor, New York 10016.

Hobsbawm, E. J. (1962). *The Age of Capital, 1848-1875*. Weidenfeld & Nicholson, London, Great Britain.

Hobsbawm, E. J. (1987). *The Age of Empire, 1875-1914*. Sphere Books Ltd, 27 Wrights Lane, London W8 5TZ, England.

Hughes, J. R. T. (1960). *Flucuations in Trade, Industry, and Finance: A Study of British Economic Development, 1850-1860*. Clarendon Press, Oxford.

Hurrell, H. and Hyde, C. G. (1900). *The Joint Stock Companies Practical Guide*. Waterlow and Sons Limited, London, London Wall.

Jenks, L. H. (1927). *The Migration of British Capital to 1875*. Alfred A. Knopf, Inc.

Kellett, J. R. (1969). *The Impact of Railways on Victorian Cities*. Routledge & Kegan Paul Ltd., Great Britain.

Knox, W. J. (1965). *Decades of the Ulster Bank*. Bell, Logan & Carswell Ltd., Queen Street, Belfast.

Kostal, R. W. (1994). *Law and English Railway Capitalism*. Clarendon Press, Oxford.

Laffut, M. (1983). Belgium. In O'Brien, P., editor, *Railways and the Economic Development of Western Europe*, pages 203–226. The Macmillan Press Ltd.

Lee, J. (1967). The construction costs of irish railways 1830-1853. *Business History*, pages 95–109.

Liaqat, A., Callen, M., Cheema, A., Khan, A., Naseer, F., and Shapiro, J. N. (2019). Political connections and vote choice: Evidence from pakistan. *Working Paper*.

Lindert, P. H. (2004). *Growing Public: Social Spending and Economic Growth Since the Eighteenth Century*. Cambridge University Press.

Lyons, F. S. L. (1973). *Ireland Since the Famine*. Fontana Paperbacks, 8 Grafton Street, London W1X 3LA.

Marshall, C. F. (1963a). *A History of the Southern Railway: Second (Enlarged) Edition in Two Volumes, Volume I*. Ian Allan, London.

Marshall, C. F. (1963b). *A History of the Southern Railway: Second (Enlarged) Edition in Two Volumes, Volume II*. Ian Allan, London.

McCalmont, F. H. (1910). *The Parliamentary Poll Book of All Elections from the Reform Act of 1832 to February, 1910*. Edward Stanford, London 12, 13, & 14, Long Acre, W.C.

Michie, R. C. (1987). *The London and New York Stock Exchanges, 1850-1914*. Allen & Unwin, Boston & Sydney & Wellington.

Michie, R. C. (1999). *The London Stock Exchange: A History*. Oxford University Press, Walton Street, Oxford OX2 6DP.

Mitchell, B. R. (1969). The coming of the railway and united kingdom economic growth. In Reed, M. C., editor, *Railways in the Victorian Economy: Studies in Finance and Growth*, pages 13–32. David & Charles.

Mokyr, J. (2009). *The Enlightened Economy: An Economic History of Britain, 1700-1850*. Yale University Press, New Haven and London.

Morgan, K. O. (1988). *The Oxford History of Britain*. Oxford University Press, Walton Street, Oxford OX2 6DP.

Nock, O. S. (1987). *Historic Railway Disasters, Fourth Edition*. Ian Allan Ltd, London.

O'Brien, P. (1983). Transport and economic development in europe, 1789-1914. In O'Brien, P., editor, *Railways and the Economic Development of Western Europe*, pages 1–29. The Macmillan Press Ltd.

O'Leary, C. (1962). *The Elimination of Corrupt Practices in British Elections, 1868-1911*. Oxford University Press, Amen House, London, UK.

Ollerenshaw, P. (1987). *Banking in nineteenth-century Ireland: The Belfast banks, 1825-1914*. Manchester University Press, Oxford Road, Manchester M13 9PL, UK.

Oxford and Asquith K.G., T. E. (1926a). *Fifty Years of British Parliament: Volume One*. Little, Brown, and Coompany, Boston.

Oxford and Asquith K.G., T. E. (1926b). *Fifty Years of British Parliament: Volume Two*. Little, Brown, and Coompany, Boston.

Palmer, F. B. (1878). *The Shareholders' and Directors' Legal Companion*. Stevens & Sons, London, 119, Chancery Lane.

Parris, H. (1965). *Government and the Railways in Nineteenth-Century Britain*. Routledge & Kegan Paul and University of Toronto Press.

Parris, H. (1969). *Constitutional Bureaucracy: The Development of British Central Administration Since the Eighteenth Century*. George Allen & Unwin Ltd., Ruskin House Museum Street, London.

Platt, A. (1987). *The Life and Times of Sir Daniel Gooch*. Alan Sutton Publishing, Brunswick Road, Gloucester.

Pollins, H. (1969a). Aspects of railway accounting before 1868. In Reed, M. C., editor, *Railways in the Victorian Economy: Studies in Finance and Growth*, pages 138–161. David & Charles.

Pollins, H. (1969b). Railway contractors and the finance of railway development in britain. In Reed, M. C., editor, *Railways in the Victorian Economy: Studies in Finance and Growth*, pages 212–228. David & Charles.

Railway Department, B. o. T. (1890). *General Report to the Board of Trade Upon the Accidents Which Have Occurred on the Railways of the United Kingdom During the Year 1889*. Eyre and Spottiswoode, East Harding Street, Fleet Street, E.C., and 32, Abingdon Street, Westminster, S.W.

Railway Department, B. o. T. (1894). *Railway Accidents: Returns of Accidents and Casualties as Reported to the Board of Trade by the Several Railway Companies in the United Kingdom, During the Year ending 31st December, 1893*. Eyre and Spottiswoode, East Harding Street, Fleet Street, E.C., and 32, Abingdon Street, Westminster, S.W.

Railway Department, B. o. T. (1898). *Railway Accidents: Returns of Accidents and Casualties as Reported to the Board of Trade by the Several Railway Companies in the United Kingdom, During the Year ending 31st December, 1897*. Eyre and Spottiswoode, East Harding Street, Fleet Street, E.C., and 32, Abingdon Street, Westminster, S.W.

Railway Department, B. o. T. (1900). *General Report to the Board of Trade upon the Accidents That Have Occurred on the Railways of the United Kingdom During the Year 1899*. Eyre and Spottiswoode, East Harding Street, Fleet Street, E.C., and 32, Abingdon Street, Westminster, S.W.

Reed, M. C. (1969). Railways and the growth of the capital market. In Reed, M. C., editor, *Railways in the Victorian Economy: Studies in Finance and Growth*, pages 162–181. David & Charles.

Reed, M. C. (1975a). *A History of James Capel & Co.* Longman Group Limited.

Reed, M. C. (1975b). *Investment in Railways in Britain, 1820-1844*. Oxford University Press, Ely House, London W. 1.

Roberts, B. E. (1990). A dead senator tells no lies: Seniority and the distribution of federal benefits. *American Journal of Political Science*, 34(1):31–58.

Rostow, W. W. (1948). *British Economy of the Nineteenth Century*. Oxford University Press, Amen House, London, UK.

Rydz, D. L. (1979). *The Parliamentary Agents: A History*. London Royal Historical Society.

Simmons, J. (1991). *The Victorian Railway*. Thames and Hudson.

Simmons, J. and Biddle, G. (1997). *The Oxford Companion to British Railway History: From 1603 to the 1990s*. Thames and Hudson.

Tarrang, H. J. (1867). *Lloyd's Bonds: Their Nature and Uses*. Stevens and Haynes, Law Publishers, 11, Bell Yard, Temple Bar, London.

Thomas, J. (1969). *The North British Railway, Volume One*. David St John Thomas.

Thomas, J. (1984). *The West Highland Railway: The History of the Railways of the Scottish Highlands-Vol. 1*. David St John Thomas.

Thomas, J. (1990a). *The Callander & Oban Railway: The History of the Railways of the Scottish Highlands-Vol. 4*. David St John Thomas.

Thomas, J. (1990b). *The Skye Railway: The History of the Railways of the Scottish Highlands-Vol. 5*. David St John Thomas.

Thomas, J. and Turnock, D. (1993). *A Regional History of the Railways of Great Britain: Volume 15: The North of Scotland*. David St. John Thomas Publisher, second edition.

Thomas, W. A. (1986). *The Stock Exchanges of Ireland*. Francis Cairns (Publications) Ltd, 27 South Main Street, Wolfeboro, New Hampshire 03894.

Thomson, D. (1950). *England in the Nineteenth Century (1815-1914)*. Penguin Books Ltd, Harmondsworth, Middlesex.

Toniolo, G. (1983). Railways and economic growth in the mediterranean countries: Some methodological remarks. In O'Brien, P., editor, *Railways and the Economic Development of Western Europe*, pages 227–236. The Macmillan Press Ltd.

Tuck, H. (1845). *The Railway Shareholder's Manual, 6th Edition*. Effingham Wilson.

Vallance, H. A. (1965). *The Great North of Scotland Railway: The History of the Railways of the Scottish Highlands-Vol. 3*. David St John Thomas.

Vallance, H. A. (1985). *The Highland Railway: The History of the Railways of the Scottish Highlands-Vol. 1*. David St John Thomas.

Vaughan, A. (1997). *Railwaymen, Politics and Money: The Great Age of Railways in Britain*. The University Press, Cambridge, Great Britain.

Watson, W. W. and Neuman, B. P. (1886). *A Practical Compendium of Equity 2nd Edition Volume I.* H. Sweet and Sons, 3 Chancery Lane.

White, H. (1969). *A Regional History of the Railways of Great Britain: Volume 2: Southern England*. David St. John Thomas Publisher, third edition.

White, H. (1980). A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica*, 48(4):817–838.

White, R. (2011). *Railroaded: The Transcontinentals and the Making of Modern America*. W. W. Norton & Company, New York and London.

Wilson, H. R. (1925). *Railway Accidents: Legislation and Statistics, 1825-1924*. The Raynar Wilson Company, 96, Hurlingham Road, S.W. 6, London, U.K.

Woodward, S. L. (1962). *The Age of Reform, 1815-1870*. Oxford University Press, Amen House, London, UK.

Wray, V. (1969). The railways and the iron industry: A study of their relationship in scotland. In Reed, M. C., editor, *Railways in the Victorian Economy: Studies in Finance and Growth*, pages 33–75. David & Charles.

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