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Working Paper

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QMS Research Paper, No. 2020/02

Provided in Cooperation with:
Queen's University Belfast, Queen's Business School

Suggested Citation: Acheson, Graeme; Campbell, Gareth; Gallagher, Aine; Turner, John D. (2020) : Independent Women: Investing in British Railways, 1870-1922, QMS Research Paper, No. 2020/02, Queen's University Belfast, Queen's Management School, Belfast, https://doi.org/10.2139/ssrn.3590224

This Version is available at:
https://hdl.handle.net/10419/271233

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QMS Research Paper 2020/02

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01 May 2020

https://ssrn.com/abstract=3590224

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Independent Women:
Investing in British Railways, 1870-1922

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Abstract

The early twentieth century saw the British capital market reach a state of maturity before any of its global counterparts. This coincided with more women participating directly in the stock market. In this paper, we analyse whether these female shareholders chose to invest independently of men. Using a novel dataset of almost 500,000 shareholders in some of the largest British railways, we find that women were much more likely to be solo shareholders than men. There is also evidence that they prioritised their independence above other considerations such as where they invested or how diversified they could be.

JEL codes: G10, J16, N23

Keywords: Gender, Investment, Stock Market, Railways

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* Thanks to the British Academy for financial support. Thanks to the archivists at the National Archives at Kew and the National Archives of Scotland for all their assistance. Thanks to Les Hannah, Eric Hilt, Naomi Lamoreaux, Susie Pak, Lucy Newton, Linda Perriton, Robert Wright, and participants at the European Historical Economics Society Conference (Tubingen) and 2018 Business History Conference (Baltimore) for their comments.

I

Women have a long tradition of investing in financial instruments, and scholars have recently documented the rise of female shareholders in nineteenth-century Britain, the United States, Australia and Europe.[1] However, we know very little about how this progressed into the twentieth century, and whether women shareholders over a century ago behaved differently from their male counterparts.

To address this, we turn to the shareholder constituencies of railways, which were the largest public companies at the time. Railway companies in the UK were a popular investment choice among the middle classes and had been around as a major asset class since the first railway boom of the mid-1830s. At the start of the 1900s, British railways made up about half of the market capitalisation of all domestic equity listed in the UK, and they constituted 49 of the 100 largest companies on the British stock market in 1911.[2] The railways, therefore, make an interesting case study through which to examine women investors. Detailed railway shareholder records, comparable to those for other sectors, have generally not been preserved. However, we have found *Railway Shareholder Address Books* for six of the largest railway companies between the years 1915 and 1922. We have supplemented these with several address books for these companies back to 1870, and have also included some analysis of the *Shareholder Register* for the Great Western Railway (GWR) from 1843, to place the latter period in context.

[1] Acheson and Turner, 'Shareholder liability' and 'Investor Behaviour'; Doe, 'Waiting for her ship to come in'; Freeman et al., 'A doe in the city' and 'Between madam bubble'; Green and Owens, 'Gentlewomanly capitalism'; Johns, 'The first female shareholders'; Licini, 'Women's wealth and finance'; Lough, *Business finance*; Maltby and Rutterford, 'She possessed her own fortune'; Newton and Cottrell, 'Female investors'; Petersson, 'Women, money and the financial revolution'; Robertson and Yohn, 'Women and money'; Rutterford and Maltby, 'The widow, the clergyman and the reckless' and 'The nesting instinct'; Rutterford et al., 'Who comprised'.

[2] Calculations are based on data from the *Investor's Monthly Manual* (IMM) for 1900, so the precise result will be affected by the representativeness of the IMM. This calculation includes ordinary and preference shares, and companies were categorised as being domestic or foreign based on their name. An alternative proxy would be to use Michie's figures on the nominal capital of securities quoted on the London Stock Exchange. UK railways in 1903 represented 44% of corporate securities excluding foreign railroads (Michie, *London Stock Exchange*, p.88). Rankings in terms of size taken from Foreman-Peck and Hannah, 'Extreme divorce', online appendix.

An analysis of these shareholder address books reveals the growing importance of women shareholders from 1843, when they made up about 11 per cent of the GWR shareholder base, to 1920 when they constituted about 40 per cent of primary shareholders. By the early twentieth century, women represented 30 to 40 per cent of shareholders in each railway company in our sample, which is in line with estimates of the number of women investing in other companies at this time.[3] This implies that women were playing an important role in financial markets in the early twentieth century.

Noting the increased numbers of women shareholders, we know very little about influences on their investment behaviour during a period of increasing access to financial information and significant social change. To examine this, we focus on joint shareholdings, where people would invest together, rather than buying shares on their own. This practice was extremely common, and from our data we are able to analyse the differences between solo shareholders, lead joint shareholders (i.e., individuals who owned shares with others but held the voting rights), and secondary joint shareholders (i.e., individuals who owned shares with others but did not hold the voting rights).

We find that women were much more likely to be solo shareholders than men, with 70 to 80 per cent of women investing on their own, compared to just 30 to 40 per cent of men.[4] When women participated in joint shareholdings, there was no discernible difference as to whether they were the lead shareholder or the secondary shareholder, whereas the majority of men took up a secondary position in their joint shareholdings. When women participated as a secondary shareholder, the lead was usually not a male relative. These findings are strong evidence that women shareholders were acting independently by choosing to take on the sole

[3] Rutterford et al., 'Who comprised'.
[4] Our analysis is based on shareholders, rather than being weighted by the value of shareholdings as our source does not include this information.

risks and rewards of share ownership when making their investments as a single shareholder as opposed to sharing the risks and rewards via a joint shareholding.

We then analyse how the interaction between gender and joint shareholdings affected investment decisions. We begin by using geospatial analysis to calculate the distance between each shareholder and the nearest railway station of the company which they had invested in, to determine whether there were any preferences for local investment. We find that women were more likely than men, and solo investors more likely than joint shareholders, to invest locally. This suggests that men may have used joint investments as a way of reducing the risks of investing at a distance. In contrast, women preferred to maintain their independence even if this meant focusing more on local investments.

We then examine the extent to which women and men invested across different railways. In the modern era, it is common to adopt a value-weighted portfolio which is most heavily concentrated in larger companies.[5] As three of our sample companies were amongst the six largest companies of their era and a further two were in the top twenty-five, we would a priori expect to see some overlap of shareholders investing in different railways if they adopted this approach to diversification. From our analysis, we find that male and joint shareholders were more likely than female and solo shareholders to hold multiple railway stocks. This could imply that men were using joint shareholdings as a means of increasing diversification. In contrast, women may have been prioritising independence, even if it meant being less diversified.

We also consider whether there were differences in terms of how long each type of shareholder held onto their shares because modern studies suggest that women are much less

[5] Markowitz, 'Portfolio selection'. Although the concept of modern portfolio theory was not developed until the twentieth century, individuals during our sample period were aware of the concept of reducing risk by investing across a range of domestic and foreign securities (Lowenfeld, *Investment an exact science* and *The rudiments of sound investment*).

likely than men to trade their shares.[6] We find that only a minority of shareholders maintained a long-run buy and hold strategy, with little suggestion that this differed on the basis of gender or joint versus solo shareholders. This implies that our findings are not being driven by a cohort effect, and that the female shareholders had consciously chosen to invest independently.

This paper contributes to the growing literature on the evolution of shareholder constituencies from the Victorian era to the early twentieth century in Britain. As well as augmenting the literature on gender and investment in this era by looking at the differences when it came to women and men investing in the stock market, it adds railways, the largest and most important sector on the stock market, to studies which have focussed on the shareholders of banks and new companies.[7] The paper also contributes to the literature which has focussed on gender differences in modern financial markets, which finds that women tend to display lower risk tolerances, trade less frequently and are less prone to overconfidence than their male counterparts due to socioeconomic, environmental and psychological factors.[8] Our paper also augments the literature which has looked at investment in and the performance of British railways.[9] Our findings also suggest that investors did not invest that frequently across multiple railways, which contributes to prior work on how investors selected investments and formed portfolios in this period.[10] Finally, our paper augments the emerging literature on local

[6] Barber and Odean, 'Boys will be boys'.
[7] Acheson and Turner, 'Investor Behaviour'; Acheson et al., 'Who financed'.
[8] Bajtelsmit et al., 'Gender differences'; Barnea et al., 'Nature or nurture'; Barber and Odean, 'Boys will be boys'; Borghans et al., 'Gender differences in risk aversion'; Cesarini et al., 'Genetic variation in preferences'; Cesarini et al., 'Genetic variation in financial decision-making'; Coates and Herbert, 'Endogenous steroids and financial risk taking'; Cronqvist et al., 'The fetal origins hypothesis in finance'; Cronqvist et al., 'Value versus growth investing'; Croson and Gneezy, 'Gender differences in preferences'; Dwyer et al., 'Gender differences'; Jianakoplos and Bernasek, 'Are women more risk averse?'; Kumar, 'Who gambles in the stock market'; Sunden and Surette, 'Gender differences'.
[9] Irving, 'The profitability and performance of British Railways'; Mitchell et al., 'How good was the profitability of British railways'.
[10] Goetzmann and Ukhov, 'British investment overseas'; Mitchell et al., 'How good was the profitability of British railways'; Rutterford and Sotiropoulos, 'Financial diversification' and 'Putting all their eggs in one basket'.

investment biases in this early market by showing that women, and solo shareholders, were more likely to focus on local companies.[11]

The paper proceeds as follows. Section 2 discusses our sample of railway shareholders, and the risk and return of railway stocks. Section 3 provides context on women investors during the period. Section 4 considers whether women made independent investment decisions. Section 5 analyses the extent to which women and men investors invested in local railways. Section 6 considers whether railway investors invested in more than one railway, whilst Section 7 examines the length of investment holding periods, and Section 8 summarises our findings.

II

Our analysis of shareholding patterns of women focuses on *Railway Shareholder Address Books.* These provide consistent and reliable information on a very extensive number of investors in some of the largest companies in Britain during this time. Under the Regulation of Railways Act (1868), railways were required to maintain shareholder address books for the purposes of correspondence with their ordinary and preference shareholders and for viewing by fellow shareholders as well as mortgage or debenture holders.[12] We conducted an extensive search in the National Archives at Kew and the National Archives of Scotland for these address books and found six major railways for the period from 1915-1922, namely: London and North Western (1915); Great Western (1920); North Eastern (1921); Caledonian (1922); North British (1915); Glasgow and South Western (1921).[13]

From Table 1 we can see that these books together report almost 290,000 shareholdings. It was common for multiple shareholders to invest jointly in one shareholding, with some

[11] Rutterford et al., 'Individual investors'.
[12] 31 & 32 Vict, c.119, section 34.
[13] Caledonian (1922), BR/CAL/2/10; Glasgow and South Western (1921), BR/GSW/2/5; Great Western (1920), RAIL 251/7; London and North Western (1915), RAIL 410/769; North Eastern (1921), RAIL 527/439; North British (1915), BR/NBR/2/92.

companies reporting each individual, whilst others just reported the lead shareholder and referred to investing 'with others'. When we include the secondary investors which are reported by some firms, we have details of about 345,000 shareholders.

<< INSERT TABLE 1 >>

In addition, we have also been able to find some earlier address books for the North British (1870, 1889, 1902), the Caledonian (1897), and the Great Western (1893), and have also obtained the 1843 shareholder records for the Great Western from the National Archives at Kew.[14] When these are included, we have information on over 490,000 shareholders.

The *Railway Shareholder Address Books* gave the shareholder name, address, and whether an individual qualified to be elected as a director. Although we have an extensive sample in terms of shareholder numbers, the address books do not distinguish between ordinary and preference shareholders. A further limitation of our data is that we do not have information on the value of shares. We could attempt to exploit a marker (usually an asterisk beside a name) which indicates whether an individual held enough stock to qualify as a director. This varied somewhat between companies, but was typically between £1,000 and £2,000, in terms of the par value of the shares. This was a considerable sum, with £1,000 equating to almost six times the average annual salary for the 1920s[15], and could allow us to identify individuals who had invested large amounts in the railways. However, this marker seems to systematically exclude females, which means we cannot use it to assess the relative value of investments of men and women.

The address books also recorded information on the marital status of their female shareholders, and the occupational status of male shareholders. Women were typically referred

[14] Caledonian (1897), BR/CAL/2/1; Great Western (1843), RAIL 251/28, 29, 32, 50, 52 and 54; Great Western (1893), RAIL 251/131; North British (1870), BR/NBR/2/95; North British (1889), GD282/13/259; North British (1902), BR/NBR/2/91.
[15] The average annual salary in the 1920s was £164.10 according to Clark, 'Average Earnings'.

to as spinsters, widows or married. In cases where this detail was not provided, we have identified women based on their first name, and allocated them to the 'female other' category.[16] For males, their occupation was generally reported, but in some cases we have determined a classification from the title of the individual, e.g., Reverend, and Colonel etc. We group together employed males, who cover the full socio-economic spectrum, into one category. We also have a male rentier classification, which includes members of the nobility, and those designated as esquires and gentlemen, who may have been retired rather than members of the gentry. We also have a group for males whose occupational status was not disclosed.

From Table 1, we can see that the English railways (the Great Western, London and North Western, and North Eastern) had almost complete records on investor marital status or occupation, but the Scottish railways (the Caledonian, North British, and Glasgow and South Western) were less detailed in this regard. Overall, we have a comprehensive categorisation of females and males for all of the shareholders, and occupational or marital status classifications for 85 per cent of our sample.

How representative is our sample? In terms of the size of companies, the six railways included in this study were ranked 2nd, 5th, 6th, 22nd, 24th, and 54th at the end of 1918 in terms of the market capitalisation of their ordinary and preference equities amongst all UK public companies.[17] Our dataset of 345,000 railway shareholders, for the sub-sample focussing on 1915-22, represents circa 38 per cent of the population of railway investors in 1914.[18]

[16] To confirm that a non-return of an occupation status for female shareholders was not solely due to reporting practices, we cross-referenced the female shareholders of the North British Railway Company (in 1902) with the *Edinburgh Trade Directory* of that year. Of the 520 female shareholders who resided in Edinburgh, we found only two with a recorded occupation.

[17] Based on authors' calculations from *Investor's Monthly Manual* for 1918. Companies headquartered overseas, or traded in dollars, are excluded from the ranking.

[18] Clapham, *An Economic History of Modern Britain* estimated there were c.900,000 investors in UK and Irish Railways in 1914.

When it comes to the geographical dispersion of the railways in our sample, several of the companies had national rail networks with London as their central node, whereas others had rail and station networks located in Scotland or the north-east of England. The location of all of the stations is shown in Panel A of Figure 1, which illustrates that the railways in our sample covered the main centres of population in Great Britain.[19] Furthermore, because shareholder addresses were reported for 98 per cent of shareholders in our sample, we were able to geocode where shareholders lived using the Bing Maps API.

<< INSERT FIGURE 1 >>

It should be noted that we are only capturing individuals who chose to invest in these large, established railways, which could potentially introduce a degree of self-selection bias. Notwithstanding this limitation, our sample provides an important insight into the behaviour of a substantial number of shareholders in large companies during the period of interest, which is unprecedented in the extant literature. The maps in Figure 1 illustrate that our sample of railways, and railway shareholders, is geographically diverse. These were major companies, with stations throughout Great Britain, and investors from across the country. This suggests that our findings are based on a broad sample and are likely to be representative of investment practices within the railway industry at this time.

The railways as a sector may also be viewed as being generally representative of the 'blue chip' end of the financial market. By the end of the nineteenth century, their position and legitimacy was recognised by the Investment Trust Acts of 1889 and the Trustee Act 1893, which designated railway preference shares as suitable investments for trust funds.[20] The dominance of the railways in terms of their size diminished over time, but at the end of 1920

[19] Station locations were extracted from Butt, *The directory of railway stations*.
[20] 52 & 53 Vict., c. 32; 56 & 57 Vict., c. 53. See Mitchell et al., 'How good was the profitability of British railways'.

the British railways still constituted about 22 per cent of the market capitalisation of domestic companies quoted in the UK.[21]

Figure 2 shows the capital gains and dividend yields on the ordinary and preference shares of our six sample companies compared to the overall market. We use monthly data obtained from the *Investor's Monthly Manual* (IMM), and weight each security by its market capitalization to calculate the market indices.[22] The railways' share prices had declined considerably from the late 1890s, largely due to the profitability of the railways deteriorating because of cost inefficiencies, waste and managerial failures. Railway share prices had fallen by about 35 per cent between 1900 and the start of World War I, although falling share prices did contribute to a rising dividend yield.[23]

During the War, and for several years afterwards, the railway system was taken under government control, and the railways received an annual payment based on their 1913 receipts plus four per cent on capital expenditure. Railway share prices fell by another 40 per cent over the next eight years of state control. The railway price index reached a low point in October 1921, but then increased by 75 per cent over the next 18 months. This is likely to have been connected to the £60 million which the government agreed to in satisfaction of all claims in respect of state control. The railways were also substantially re-organised at this time, bringing together numerous independent companies to form four major regional groupings.[24]

<< INSERT FIGURE 2 >>

[21] Calculations are based on data from the *Investor's Monthly Manual* for 1920, so the precise result will be affected by the representativeness of the IMM. This calculation includes ordinary and preference shares, and companies were categorised as being domestic or foreign based on their name. An alternative proxy would be to use Michie's figures on the nominal capital of securities quoted on the London Stock Exchange. UK railways in 1920 represented 33% of corporate securities excluding foreign railroads (Michie, *London Stock Exchange*, p.88).
[22] We follow the approach of Campbell et al., 'Cult of equity' in our use of the IMM and the construction of the market indices. However, in this analysis we include ordinary and preference shares, as the railway shareholder books include anyone who invested in either of these security types.
[23] Mitchell et al., 'How good was the profitability of British railways'.
[24] *Stock Exchange Year Book*, 1930, p.294

To analyse what all of this meant for investors, Table 2 shows the evolution of risk factors for our six sample companies from 1869 through to 1929, using a methodology similar to Fama and French.[25] The monthly returns of our sample companies are regressed on the returns of a broad market index (RmRf), the returns on small companies minus big companies (SMB), the returns on high dividend yield companies minus low dividend yield companies (HML), and the returns on foreign minus domestic companies (FMD).[26]

<< INSERT TABLE 2 >>

The results suggest that during the period we focus on, from 1915-1922, the Beta of the railway companies (the coefficient of the RmRf variable) is less than one. It suggests that for every one percent increase in the overall stock market, there was only a 0.580 percent increase in railway stocks, on average. This fits with the perception of railway shares being low risk, 'blue chip' investments. The results also suggest that the railways moved like other large, domestic companies even though most of those companies were not under government control. Notably, after controlling for these factors, the constant is not significant, suggesting that the railways' returns were broadly similar to other companies after controlling for their blue-chip characteristics.

[25] Fama and French, 'Common risk factors'.

[26] RmRf is calculated as the monthly returns on the market index of all stocks, weighted by their market capitalization, minus the risk-free rate which has been obtained from Capie and Webber 'Monetary History'. For SMB, at the beginning of each year domestic companies are sorted according to their market capitalisation with the smallest 30 per cent of companies being Small and the largest 30 per cent being Big. Small and Big portfolio returns are then calculated by equally weighting the returns of each security which meet these criteria. The returns of the SMB portfolio is then calculated as the returns of Small companies minus Big companies. A similar approach is used with dividend yields, and HML is calculated as the returns of a portfolio of High dividend yield securities minus Low dividend yield securities. Companies are also classified in terms of where they operated according to their name, and Foreign Minus Domestic (FMD) returns are then calculated.

III

Recent research has suggested that women were active in the capital markets as far back as the eighteenth century,[27] and became increasingly involved towards the latter part of the nineteenth century.[28] Using our sample of address books for the Great Western Railway (1893 and 1920) supplemented with a shareholder register for 1843, we can explore these trends for a major railway. From Table 3, we can see the increasing prevalence of women investors over the 77-year period. The proportion of primary shareholders who were female increased considerably, from a relatively low base of 10.9 per cent in 1843, to 34.9 per cent in 1893, with a further increase to 40.1 per cent by 1920. Further analysis for the North British suggests the percentage of women shareholders in that company increased from 19.8 per cent in 1870 to 32.9 by 1915.

<< INSERT TABLE 3 >>

The increasing number of women investors was related to a range of demand and supply-side factors.[29] During the Victorian era, there were several demographic, social, and legal changes which influenced the composition of the shareholder base. By the latter part of the nineteenth century, there was a gender imbalance of single women, referred to as 'surplus women', who numbered 600,600 in 1871 and increased to 1,147,700 by 1911.[30]

These surplus women invested for a range of reasons. Most were happy to invest passively to generate a source of income, while some pursued capital gains and actively speculated in the markets.[31] Although many working-class women would have had jobs outside

[27] Carlos and Neal, 'Women investors in early capital markets'; Carlos et al., 'Women in the city'; Dickson, *The financial revolution in England*; Freeman et al., 'A doe in the city'; Froide, *Silent partners*; Laurence, 'Women investors' and 'Women, banks and the securities market'.
[28] Acheson and Turner, 'Investor Behaviour'; Doe, 'Waiting for her ship to come in'; Green and Owens, 'Gentlewomanly capitalism'; Maltby and Rutterford, 'She possessed her own fortune'; Newton and Cottrell, 'Female investors'; Rutterford and Maltby, 'The widow, the clergyman and the reckless'.
[29] Rutterford et al., 'Who comprised'.
[30] Hinde, *England's population*; Mitchell and Deane, *Abstract of British historical statistics*; Rutterford et al., 'Who comprised'; Wrigley et al., *English population history*.
[31] Maltby and Rutterford, 'She possessed her own fortune'; Rutterford and Maltby, 'The widow, the clergyman and the reckless'.

of the home, given the social constraints at the time, the majority of middle and upper class women did not hold paid employment.[32] This resulted in large numbers of single women who relied on investment income as a way to sustain their standard of living. As social constraints relaxed moving into the early twentieth century, more middle-class women took up paid employment, but this did not diminish their significance as a prevalent investor cohort. Also, a lack of public state pension provision meant that women without employment opportunities were more likely to engage with financial investments as a means to support themselves in retirement.[33]

A further boost to female investment came from the introduction of the Married Women's Property Acts (MWPA) in 1870 and 1882, which represented a major legal change in the restrictions around women's ownership of property and subsequent participation in the capital markets.[34] Prior to 1870, married women were prevented from owning and controlling property due to the principle of coverture (*feme covert*) established in legislation, whereas single women did not face such restrictions. Upon marriage, women were no longer recognised as a separate legal person (*feme sole*), and control of any personal property (for example money and stocks) brought into the marriage was passed to the husband. Women did retain legal ownership of any real property (housing and land), with husbands unable to dispose of it without the wife's consent, however women were not permitted to manage or control these assets including any rents, hence effectively relinquishing control to the husband.[35]

The passage of the MWPA in 1870 allowed women who were married after this date to retain ownership of any income earned through her own work or real property after the marriage, and the subsequent Act in 1882 extended married women's rights to an equal footing

[32] Kay, 'Small business, self-employment and women's work life choices'.
[33] Laurence et al., *Women and their money*.
[34] 33 & 34 Vict. c.93; 45 & 46 Vict. c.75
[35] Combs, 'Wives and household wealth'

with single women. The MWPA resulted in enhanced participation in the stock market and altered portfolio allocations away from real estate and towards personal property held in the form of savings or investments in company stock.[36] However, it is notable that by 1893 there were still very few married women shareholders in the Great Western Railway, although they had become much more prominent by 1920.

Innovation in the British capital markets in the latter part of the nineteenth century, which resulted in more company formations, lower share denominations and lower risk securities available to investors, has been proposed as one of the main supply-side factors contributing to the broader democratisation of share ownership during this period.[37] In particular, the increasing availability of lower risk securities with a steady income stream may have been attractive to women.

Table 4 outlines the breakdown of the shareholder base for the railways in our sample between 1915 and 1922. It can be seen that by the early twentieth century women comprised approximately one third of all primary shareholders.[38] In terms of number of shareholders, our results are similar to the findings of Rutterford et al. who report that women investors comprised 38.0 per cent of their sample of non-railways during the 1920s. [39]

<< INSERT TABLE 4 >>

IV

The evidence we have presented for the railways is supportive of the broader trend of increasing numbers of women shareholders, already identified in the literature throughout the latter part

, 'A measure of legal independence'; Rutterford et al., 'Who comprised'.
[37] Jefferys, 'The denomination and character of shares'; Rutterford et al., 'Who comprised'.
[38] For consistency across the companies, we do not include secondary shareholders in this analysis as their identities are only reported for three of the railways.
[39] Rutterford et al., 'Who comprised'.

of the nineteenth and early twentieth century.[40] The increasing prevalence of women shareholders in this period was accompanied by evolving social perceptions around women's involvement in the capital markets and their capabilities to act as informed independent investors.

The discourse around women investors in the eighteenth century characterised them as 'dangerously independent interlopers' and speculators, subject to various emotions and hysterias which resulted in hostility, and marginalised their participation in the capital markets.[41] By the Victorian era, social attitudes had evolved and contemporary literature reflects the notions underpinning the separate spheres ideology. Women were described as cautious, lacking in experience, and as such not being interested in or capable of investing and therefore needing protection from predatory male promoters and brokers.[42]

Some scholars have suggested that women, due to their perceived lack of knowledge, would have relied on male advisors to guide their investment choices.[43] However, more recent scholarship notes increasing numbers of women shareholders, and highlights cases of women investors taking on risk as entrepreneurs and investors, which somewhat dilutes the separate spheres narrative.[44] Indeed, by the latter part of the nineteenth century, there was a burgeoning financial literature encompassing textbooks, pamphlets and investment circulars, with some titles targeted specifically at women which could have improved their ability to invest

[40] Acheson et al., 'Who financed'; Rutterford et al., 'Who comprised'.
[41] Freeman et al., 'A doe in the city'; Maltby & Rutterford, 'Gender and finance'.
[42] Cotton, '*Everybody's guide to money matters*'; Freeman et al., 'A doe in the city'; Maltby & Rutterford, 'Gender and finance'; Preda, 'The rise of the popular investor'; Rutterford and Maltby, 'The widow, the clergyman and the reckless' and 'The nesting instinct'.
[43] Davidoff and Hall, *Family fortunes*; Hudson, 'Attitudes to investment risk''; Morris, *Men, women and property in England*.
[44] Acheson et al., 'Who financed'; Doe, 'Waiting for her ship to come in'; Newton & Cottrell, 'Female investors'; Phillips, 'Women in business'; Rutterford et al., 'Who comprised'

independently.[45] In addition, women would have had access to informal advice via their brokers, solicitors and relatives.[46]

Ultimately, the question we address is whether women with widening sources of information made independent investment choices, taking on the sole risks and rewards of share ownership. One way we can address this question is to examine solo versus joint shareholdings. Individuals who invested on their own had independent control of all of the rights to their dividends, capital gains and votes associated with their shares. In contrast, if a number of people invested jointly, this would suggest close co-operation between them in terms of their investment decision and the sharing of risk. Within the joint holding, there may have been some investors more influential than others. We can distinguish the lead and secondary shareholders by the order in which they were reported, as Section 78 of the Company Clauses Consolidation Act (1845), attributed voting power only to the first named owner.[47]

The Scottish railways (the North British 1915, Caledonian 1922, and Glasgow & South Western 1921) only report solo shareholders, or the lead shareholder from a joint holding (stating that they invested 'with others') so we group these railways together in our analysis. The results in Table 5 show that females were much more likely to invest as a single shareholder and were willing to take on the sole risks and rewards of stock ownership. For the Scottish railways 86 per cent of female primary shareholders invested on their own, compared to just 63 per cent of male primary shareholders.

<< INSERT TABLE 5 >>

[45] A Banker's Daughter, '*The guide to the unprotected*', was one of the first investment publications aimed specifically at women. Although Cotton's, '*Everybody's guide*' was written for both sexes, the preface notes, "The work has been prepared chiefly for the use of women, a vast proportion of whom are brought up in utter ignorance of money matters…".

[46] Rutterford and Maltby, 'The widow, the clergyman and the reckless'

[47] 8&9 Vict. c.16. This Act regulated the constitutions and bylaws of public utility companies such as railways. Notably, Table A of the 1862 Companies Act had a similar provision.

Two address books (the London and North Western 1915, and North Eastern 1921) disclose the name and occupation of all secondary investor(s) in a joint shareholding. This allows us to see the full range of shareholders who had invested. The results suggest that the North Eastern railway had 79 per cent of women investors investing independently compared to 40 per cent of men. Similarly, the London and North Western railway had 74 per cent of women investing independently compared to 35 per cent of men.

These results suggest a strong preference for women to take an investment position as a single independent shareholder as opposed to sharing the risks and return of share ownership with another individual.

There are some considerations that may temper our findings in terms of female independence. One aspect relates to how 'single shareholder' women came to own their shares, and whether they inherited them from a male relative rather than making an individual investment decision. If our results were driven primarily by a channel of inheritance from deceased husbands to widows, one might expect to see a much larger proportion of widows compared to spinsters. However, further analysis reveals that the number of 'single shareholder' widows was substantially less than 'single shareholder' spinsters or married women. Admittedly married women and spinsters could have inherited their shares, though this is probably less likely than for widows. Nevertheless, even if they did inherit shares, women would have been free to dispose of the shares upon taking ownership, but the majority of those in our sample chose to maintain the investment as an individual owner.

A second issue may be with regards to holders who were acting as trustees or executors. If males were more likely to act in this capacity, then this may help to explain why joint holdings were so common amongst men. To analyse this, we exploit the Scottish railway address books which systematically reported on these types of holdings, as shown in Table 5. For these railways, 17 per cent of male holdings and 11 per cent of female holdings were in

this capacity. When we exclude these types of holdings, we still find the same picture emerging, with women being much more likely to invest on their own.

A disadvantage of the Scottish railway books is that they do not include the identity of secondary investors. We therefore go on to analyse the North Eastern and the London and North Western to get estimates which include the identity of all joint holders. The North Eastern reported numerous executors but did not report on trustees. We therefore attempt to correct for this by assuming that the overall propensity to be an executor or trustee was the same as for the Scottish railways. For example, we assume about 30 per cent of male, and 40 per cent of female, joint shareholdings were led by a trustee or executor. We also assume about 17 per cent of male, and 7 per cent of female, solo holdings were in one of these roles[48]. For those holdings which we assume are led by a trustee or executor, we then say that all of the secondary shareholdings are the beneficiaries. From these calculations we predict that about 25 per cent of male shareholdings, and 13 per cent of female shareholdings, were connected with a trust or executor. We repeat the analysis for the London and North Western using the Scottish propensities and obtain similar estimates.[49]

Based on these assumptions, we then estimate the number of other shareholdings which were not in involved as a trustee, as a trust beneficiary, or as an executor. We again find that women were much more likely to invest on their own. Joint shareholdings were still very common amongst males, even though they were not in a formal trust. In contrast, solo shareholdings was the predominant approach for females. These findings suggest that although trustees and executors were an important constituency, they cannot explain why men were much more likely to invest jointly, whilst women were more likely to invest independently.

[48] For male solo shareholdings, the Scottish average was about 10 per cent, but for the North Eastern about 12 per cent were already listed as an executor so we add on another 5 per cent to account for those who may have played the role of trustee.

[49] The Great Western in 1920 does not report the secondary investor, and do not report on the identity of trustees, so we do not analyse it in detail. The Great Western in 1893 did provide detail on secondary investors, but this is outside our main period of focus.

In Table 6, we move on to examine the extent of familial ties among joint shareholdings to ascertain whether male relatives would have been a dominant influence in the cases of women choosing to invest jointly with other individuals. We determine whether secondary shareholders invested alongside someone who was related to them by virtue of sharing the same surname. Whilst this will not pick up every family connection, it should provide a good approximation. The first point of note is that in cases of joint shareholdings, on average, only a quarter of these constitute instances of investing in kinship groups. Previous research has suggested that in the eighteenth and early nineteenth centuries familial ties in investing were commonplace.[50] However, our evidence for the early twentieth century implies that familial relationships in shareholdings had weakened and were not the primary driver of joint holdings.

<< INSERT TABLE 6 >>

Considering differences between the sexes, it is apparent that men tended to invest mainly with other, unrelated, men. Given that only a small proportion of secondary male shareholders shared a surname with the primary shareholder, it could be inferred that these instances of joint shareholdings were more likely to be through professional connections or via trustee arrangements rather than kinship ties. It is possible that some men chose to invest alongside their sons-in-law, but given the prevalence of property settlements prior to the passage of the MWPA, fathers were much more likely to protect daughters in middle-class families from a 'spendthrift or unlucky son-in-law'.[51]

In cases where women were the secondary shareholders, in about half of the cases they invested with a family member, and these were slightly more likely to be a male rather than a female relative. Overall, in about 37 per cent of cases, they invested with other women. These

[50] Freeman et al, 'A doe in the city', Hudson, *Attitudes to investment risk*.
[51] Holcombe, *Wives and Property*; Rutterford and Maltby, 'The widow, the clergyman and the reckless'

results suggest that even in the minority of cases where females did decide to invest jointly, many of these holdings were alongside other women.

V

Given that women were much more likely than men to be investing individually, we now go on to establish how this may have affected their investment decisions. One dimension that may have been affected was the propensity to invest in companies which operated in the local area, rather than in distant enterprises. The preference to invest locally or 'local bias', is prevalent in modern financial markets, with two alternative explanations offered in terms of the extent of informational asymmetries favouring local investment or psychological factors influencing investor preferences.[52] There is also a small body of work examining the historic geographical distribution of shareholders, which also notes the presence of a local bias in investment decisions in the nineteenth and early part of the twentieth centuries.[53]

Given that salience with an investment is a major determinant of any local bias, the railways make a particularly good case study for this because we can proxy the extent of any familiarity by considering how close an individual was to any part of the railway network, rather than just focusing on company headquarters. To conduct our analysis, we calculated the distance as the crow flies (in miles) between each shareholder and the nearest station of the railway which they had invested in.[54] Panel A of Table 7 outlines the proximity of men and women shareholders to their investments for all of the railways in our sample in the period 1915-1922. The median shareholder lived about 16 miles away from the closest station of the

[52] Bernile et al., 'Home away from home'; Coval and Moskowitz, 'Home bias at home' and 'The geography of investment'; French and Poterba, 'Investor diversification'; Grinblatt and Keloharju, 'How distance, language and culture influence stockholdings'; Ivkovic and Weisbenner, 'Local does as local is'; Seasholes and Zhu, 'Individual investors and local bias'; Zhu, 'The local bias of individual investors'.

[53] Franks et al., 'Ownership: evolution and regulation'; Reed, *Investment in railways*; Rutterford et al., 'Individual investors'.

[54] For the sake of robustness, we also examined the distance of shareholders from the railway's head office and find similar patterns to the results reported below. We also run the analysis using various levels of precision in terms of the geocoding, and the results remain similar.

railway that they had invested in. About 41% of shareholders lived within 5 miles of the nearest station, and a further 33% lived between 5 and 100 miles away.

<< INSERT TABLE 7 >>

However, these overall results are being affected by where the railways were based, as large cities would naturally be expected to be a considerable source of capital. We therefore show results in Panel B for those companies which had a terminal in London (the Great Western and the London and North Western). For these railways, the median shareholder lived just 4 miles away, 52 per cent of shareholders lived within 5 miles, and 94 per cent lived within 100 miles of the nearest station. These high levels of local ownership reflect both a propensity by some shareholders to invest locally, coupled with the fact that these railways operated in, or close to, the major cities of London, Liverpool, and Manchester.

To disentangle these two effects somewhat, we show results for the other railways that were based in Scotland and the North-East of England, in Panel C. In these companies the median shareholder lived 92 miles away from the nearest station. About 30 per cent lived within 5 miles, and a total of about 53 per cent lived within 100 miles. For these railways we observe a much more geographically dispersed shareholder base. There was still considerable local investment, partly due to a preference to invest in the familiar and partly due to these railways operating in or near the major cities of Glasgow and Edinburgh. However, there was also a considerable amount of arms-length investment from shareholders throughout Britain.

Focussing on the gender aspect of investment preferences, it appears that women overall were more likely to invest closer to home, with the median male living 17 miles away, compared to the median female who lived 15 miles away. This pattern does not emerge when focusing on the railways with a London terminal, with women actually tending to be slightly further away, but the difference in the absolute number of miles is very small. A much starker difference is shown when considering the railways based in the North of England and Scotland.

We can see from Table 7 that about 33 per cent of women lived within 5 miles of the nearest station, while only 28 per cent of men did. This suggests that females were somewhat less likely to invest at a distance. This difference in gender preferences concurs with previous work in the area highlighting that in relative terms women may have lower risk tolerances than men when distance to investment is used as a proxy for investment risk.[55]

We then split the shareholders according to whether they were solo or joint investors. The differences between these groups are even more pronounced than those based on gender. Solo shareholders lived about 15 miles from their nearest station, whilst the lead shareholder from a joint holding lived about 24 miles away. Again, this pattern is not present for the railways with a base in London, but are very pronounced for the other railways. About 25 per cent of lead investors in joint holdings lived within 5 miles, compared to 33 per cent of solo investors.

These results imply that women and solo investors were more likely than men and joint holders to invest locally. Given that women were also more likely to be solo investors, and men were more likely to be joint holders, it is plausible that these patterns are jointly determined. Men may have used joint holdings as a way to manage the information asymmetries and risks of investing at a distance, whereas women preferred to maintain their solo investments even if it meant investing closer to home.

VI

Joint shareholdings may have been useful for investors who wanted to spread their capital around numerous companies in an attempt to diversify their holdings. To determine whether investors owned multiple railway stocks we used a matching algorithm to identify shareholders

[55] Freeman et al., 'A doe in the city', Reed, *Investment in railways*.

who held shares in more than one of the companies in our sample.[56] Each pair-wise match between the various railways was examined and the primary shareholders matched on the basis of their name and the town they lived in. This is an imperfect way to assess this issue because it only looks at several railway companies, and not the spectrum of investments available to investors. Nevertheless, it gives some insight into whether those with joint holdings were more likely to hold investments in multiple companies.

<< INSERT TABLE 8 >>

Table 8 outlines the extent of cross-holdings within the sample of shareholders. For shareholders in the Great Western, about 14 per cent also invested in the London and North Western, 12 per cent invested in the North Eastern, 10 per cent in the Caledonian, 8 per cent in the North British and 4 per cent in the Glasgow and South Western. Overall, the shareholders of the Great Western invested in 1.47 railways, meaning 0.47 apart from the Great Western. Similar rates are observed when the other railways are considered, with an average of 1.55 railway holdings across all shareholders. To place this in context, Sotiropoulos and Rutterford find that at the end of the nineteenth century the average number of holdings of all companies by investors was 4.57.[57]

There are clear gender differences, with male shareholders on average holding 1.67 of the railways in our sample, compared to female shareholders who held an average of 1.37. This gender disparity exists across each of the railways, with men consistently being more likely to invest in multiple companies. This pattern is similar to evidence on multiple railway holdings during the pre-1850 period.[58] It is also consistent with the more detailed analysis on portfolio

[56] One limitation of this approach is that we are not comparing company address books at the same point in time and so there is a possibility that we are not capturing shareholders who may have held positions in more than one company simultaneously, but subsequently divested one of their holdings within a short time frame. However, we do not expect this effect to be material given the relatively short gaps involved.
[57] Sotiropoulos and Rutterford, 'Individual investors'.
[58] Hudson, *Attitudes to investment risk*.

holdings by Rutterford and Sotiropoulos, who found that male investors held 5.6 securities on average, versus female investors who held 3.5.[59]

Similar differences emerge when multiple shareholdings are analysed according to whether they were made by solo investors or by the lead investor of a joint holding.[60] On average, the lead joint holders had invested in 1.78 companies in our sample, compared to solo investors who on average invested in 1.46. This suggests that joint holdings amongst shareholders may have facilitated diversification opportunities.

These results in terms of gender and joint holdings again are likely to be connected. Men may have used joint holdings as a way to invest small amounts in multiple companies, allowing them to diversify. In contrast, women seem to have preferred pursuing a few independent solo investments, even if it meant holding a less diversified portfolio. This is something of a puzzle because women investors would typically have been less wealthy and should therefore have had greater incentives to club together than men to gain the benefits of diversification.

VII

It is possible that the patterns we have observed, of women becoming more prevalent in the shareholder base, and of women investing more independently than men, could be spuriously linked. Perhaps joint shareholdings had been more common in previous decades, and were not being initiated any longer, so when females became more prevalent they just followed the developing trend of solo investments. The joint holdings which we observe in the 1915-1922 period may have been an artefact of history, with these joint shareholders having invested many decades ago and having never sold their shares.

[59] Rutterford and Sotiropoulos, 'Putting all their eggs in one basket'

[60] As we do not know the identity of the secondary shareholders in joint holdings for four of the companies we cannot check if the same group of joint holders invested multiple times. We restrict our analysis to whether the lead joint holder appeared in multiple address books.

To analyse this, we are able to use the shareholder address books which we have for three railways which cover sequential points in time. Again, the matching algorithm was used to match individuals across different books. Table 9 reports the percentage of investors during the 1915-1922 period which had already invested at earlier dates. The results suggest that there were considerable shifts in and out of each company. For example, only about 29 per cent of shareholders in the North British had been investing for at least 13 years, 9 per cent had been investing for 26 years, and 3 per cent had been investing for 45 years. For the Caledonian, about 12 per cent had been investing for 25 years, and for the Great Western about 6 per cent had been investing for 27 years.

<< INSERT TABLE 9 >>

This suggests that only a minority of investments were a legacy of past decades. There also seems to be little difference between groups based on gender and joint holdings, with only the Great Western showing some differences resulting from these characteristics. This would imply that most shareholdings were relatively recent, and that these new entrants, both male and female, had consciously decided that joint or solo investments were appropriate for them at this time. Men frequently chose to pursue joint shareholdings, whereas women deliberately pursued independent solo investments.

VIII

This paper has shown that by the early part of the twentieth century, women were a major constituent in the shareholder base of railway companies. Female investors, across all marital classifications, had increased in prominence over the previous decades, but the largest relative increases in shareholder participation had come from married women.

Using records on joint investments, we find clear evidence that women were choosing to invest on an individual basis, and they were more likely than their male counterparts to

exercise their independence by taking on the sole risks and rewards of ownership. Of the limited number of females who did invest as secondary shareholders on a joint basis, many of them had a lead investor who was also female, and only a minority were with related males.

We find that joint shareholders, and males, were more likely to invest further afield, whereas solo shareholders, and females, tended to invest locally. It is possible that males were using joint shareholdings as a way to expand their horizons and reduce risks. Females seem to have prioritized their independence, which may have led to more local investments.

There were also clear differences in terms of holding multiple railway stocks. Joint shareholders, and males, tended to invest across more companies than solo shareholders and females. It is possible that men were using joint shareholdings as a way to reduce transaction costs, facilitating diversification, whilst women preferred to invest alone even if it meant concentrating their investments in a smaller number of assets.

Overall, our findings suggest that women did not co-invest significantly with male relatives, and chose to preserve their independence. This limited their ability to diversify across numerous stocks, so they may have chosen to invest in these large railway companies as a means of reducing perceived risk. There was a tendency to invest in those railways which operated in the local area, and the scale of the railways meant they were often regarded as stable blue-chip companies. In contrast, men were much more likely to invest together, and managed risk by investing across multiple stocks.

Our evidence therefore indicates that, during the period 1915-1922, women were exercising independence in their own financial affairs, taking full control of the risks and rewards of share ownership. The increasing prominence and independence of female investors is reflective of the broader changes in social perceptions, demographics and legal restrictions occurring at the end of the nineteenth century which subsequently influenced women's investment behaviour moving into the early part of the twentieth century.

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Table 1. Sample of railway shareholders

Company	Year	Number of Shareholdings	Number of Shareholders Reported	% Occupations/ Marital Status Reported
Great Western	1920	69,732	69,732	97.7%
London & North Western	1915	68,878	101,970	99.2%
North Eastern	1921	56,011	78,542	94.6%
Caledonian	1922	42,924	42,924	65.1%
North British	1915	37,488	37,488	63.3%
Glasgow & South Western	1921	14,686	14,686	56.3%
Total (1915-1922)		289,719	345,342	87.9%
Prior Observations				
Great Western	1843	2,018	2,018	98.7%
Great Western	1893	38,796	62,251	94.2%
Caledonian	1897	27,767	27,767	68.6%
North British	1870	10,623	10,623	65.8%
North British	1889	17,963	17,963	65.6%
North British	1902	27,495	27,495	67.2%
Total (All periods)		414,381	493,459	85.2%

Sources: Railway company shareholder address books in the National Archives (Kew): London and North Western (1915), RAIL 410/769; Great Western (1893), RAIL 251/131; Great Western (1920), RAIL 251/7; North Eastern (1921), RAIL 527/439; Caledonian (1897), BR/CAL/2/1; Caledonian (1922), BR/CAL/2/10; North British (1870), BR/NBR/2/95; North British (1889), GD282/13/259; North British (1902), BR/NBR/2/91; North British (1915), BR/NBR/2/92; Glasgow and South Western (1921), BR/GSW/2/5. Shareholder records for the Great Western 1843 railway held at the National Archives (Kew), RAIL 251/28, 29, 32, 50, 52 and 54.

Table 2. Regressions explaining returns on sample companies by period

	(1) 1869-1884	(2) 1885-1899	(3) 1900-1914	(4) 1915-1922	(5) 1923-1929
RmRf	1.403***	1.277***	1.223***	0.580***	0.693***
	(0.055)	(0.046)	(0.086)	(0.147)	(0.204)
SMB	-0.066**	-0.133***	-0.190**	-0.496***	-0.516*
	(0.032)	(0.030)	(0.093)	(0.137)	(0.283)
HML	-0.295***	-0.090***	-0.205***	0.299**	0.137
	(0.053)	(0.023)	(0.050)	(0.115)	(0.195)
FMD	-0.460***	-0.494***	-0.639***	-0.663***	-0.559***
	(0.041)	(0.025)	(0.051)	(0.085)	(0.146)
Constant	-0.001*	-0.001***	0.000	0.001	-0.002
	(0.001)	(0.000)	(0.001)	(0.002)	(0.003)
Observations	179	179	175	96	84
R-squared	0.863	0.889	0.777	0.698	0.457

Notes: The dependent variables are the returns on portfolio of all ordinary and preference shares issued by sample railways, minus the risk-free rate. RmRf = Returns on portfolio of all ordinary and preference shares issued by all companies in *Investor's Monthly Manual*, minus risk-free rate; SMB = Returns on Small companies Minus Big companies; HML = Returns on High Yield companies Minus Low Yield companies; FMD = Returns on Foreign companies Minus Domestic companies; Constant = Excess Returns on Sample Railways after controlling for risk factors.

Table 3. Occupational classification of primary shareholders in the Great Western Railway, 1843-1920

	Great Western 1843	Great Western 1893	Great Western 1920
Spinster	8.2%	18.8%	17.9%
Widow	2.3%	11.1%	9.4%
Married	0.0%	0.6%	12.1%
Trustees & Executors	0.0%	0.0%	0.0%
Other	0.3%	4.4%	0.7%
Female shareholdings	**10.9%**	**34.9%**	**40.1%**
Employed	35.8%	23.8%	25.3%
Rentier	49.1%	36.6%	31.1%
Trustees & Executors	1.1%	0.0%	0.0%
Undisclosed	3.0%	4.5%	2.9%
Male shareholdings	**89.0%**	**65.0%**	**59.3%**
Institutional	0.1%	0.1%	0.6%
Total	100.0%	100.0%	100.0%

Notes: Calculations based on solo and lead shareholders.
Sources: Shareholder register for 1843 of £100 and £20 shares. Shareholder address books for 1893 and 1920.

Table 4. Occupational classification of primary shareholders

	Great Western	London & North Western	North Eastern	Caledonian	North British	Glasgow & South Western
	1920	1915	1921	1922	1915	1921
Spinster	17.9%	18.2%	17.7%	16.6%	0.0%	0.0%
Widow	9.4%	9.0%	7.7%	5.5%	0.0%	0.0%
Married	12.1%	10.8%	13.3%	4.1%	0.0%	0.0%
Trustees & Executors	0.0%	0.0%	1.7%	3.9%	5.1%	3.8%
Undisclosed	0.7%	0.2%	0.9%	9.2%	32.9%	34.9%
Female shareholdings	**40.1%**	**38.2%**	**41.4%**	**39.3%**	**37.9%**	**38.7%**
Employed	25.3%	26.4%	27.4%	13.4%	11.1%	8.4%
Rentier	31.1%	31.7%	19.2%	0.9%	1.2%	1.3%
Trustees & Executors	0.0%	0.1%	5.1%	10.4%	11.9%	6.7%
Undisclosed	2.9%	2.9%	6.4%	35.3%	37.1%	43.8%
Male shareholdings	**59.3%**	**61.1%**	**58.0%**	**60.0%**	**61.2%**	**60.2%**
Institutional	0.6%	0.7%	0.6%	0.6%	0.8%	1.0%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Notes: Calculations based on solo and lead shareholders.
Sources: Shareholder address books.

Table 5. Joint Holdings, Trustees and Executors

	All Shareholders		Trustees and Executors		Other Shareholders	
	% of Males	% of Females	% of Males	% of Females	% of Males	% of Females
Panel A: Data available on identity of Trustees & Executors						
Scottish Railways (1915-1922)						
Single shareholder	63.4%	86.2%	6.2%	5.8%	57.2%	80.4%
Lead shareholders	36.6%	13.8%	11.0%	5.5%	25.6%	8.3%
	100.0%	**100.0%**	**17.2%**	**11.3%**	**82.8%**	**88.7%**
Panel B: Data available on identity of Executors but not on Trustees						
	Actual All Shareholders		Predicted involvement as Trustee, Beneficiary, or Executor		Predicted Other Shareholders	
	% of Males	% of Females	% of Males	% of Females	% of Males	% of Females
North Eastern (1921)						
Single shareholder	40.4%	78.6%	6.9%	5.3%	33.6%	73.4%
Lead shareholders	22.2%	9.6%	6.7%	3.8%	15.5%	5.8%
Secondary shareholders	37.4%	11.7%	11.1%	4.2%	26.3%	7.5%
	100.0%	100.0%	24.6%	13.3%	75.4%	86.7%
Panel C: Data not available on identity of Trustees, Executors or Deceased						
	Actual All Shareholders		Predicted involvement as Trustee, Beneficiary, or Executor		Predicted Other Shareholders	
	% of Males	% of Females	% of Males	% of Females	% of Males	% of Females
London & North Western (1915)						
Single shareholder	34.9%	73.9%	3.4%	5.0%	31.5%	68.9%
Lead shareholders	24.5%	12.9%	7.4%	5.1%	17.1%	7.8%
Secondary shareholders	40.6%	13.2%	12.5%	4.6%	28.1%	8.5%
	100.0%	100.0%	23.3%	14.7%	76.7%	85.3%

Note: Shareholders were classified on the basis of whether they were entered into the address book as a single individual shareholder or whether they owned shares jointly with another individual. Joint shareholders are further classified on the basis of whether they were the lead named individual and as such retained voting rights over the shares or were classified as secondary shareholders. For a small proportion of individuals, the marker in the address book is not legible and they are excluded. Women are classified according to their marital status as recorded in the address books.

Table 6. Familial ties among joint shareholdings

	London & North Western (1915)	North Eastern (1921)
% 2nd shareholders with kinship ties to lead shareholder	24.8%	26.6%
% Female secondary shareholders with Lead:		
Related Female	20.3%	20.3%
Unrelated Female	18.0%	15.7%
Related Male	27.8%	35.9%
Unrelated Male	33.8%	28.1%
% Male secondary shareholders with Lead:		
Related Female	6.1%	5.9%
Unrelated Female	11.4%	9.5%
Related Male	15.4%	16.0%
Unrelated Male	67.1%	68.6%

Note: Secondary shareholders who shared the same surname as a primary shareholder in a joint shareholding were considered to be related and as such share a kinship tie.

Table 7. Distance from shareholders to nearest railway station, 1915-1922

Panel A: All Railways					
	Overall	Male	Female	Lead joint	Solo
Median Distance	16.3	17.3	15.2	23.6	15.0
Within: 0 – 5 miles	40.6%	40.5%	40.6%	38.4%	41.3%
Within: 5 – 100 miles	32.9%	32.7%	33.4%	31.8%	32.1%
Within: 100 – 200 miles	14.6%	15.2%	13.4%	15.5%	13.1%
Within: 200 – 300 miles	10.5%	10.3%	10.7%	13.0%	11.7%
Within: 300 + miles	1.5%	1.3%	1.9%	1.4%	1.8%
Panel B: Railways with London Terminal					
	Overall	Male	Female	Lead joint	Solo
Median Distance	4.3	4.0	5.3	4.1	4.7
Within: 0 – 5 miles	51.6%	52.7%	49.1%	52.0%	50.9%
Within: 5 – 100 miles	42.6%	41.5%	44.9%	41.5%	42.7%
Within: 100 – 200 miles	4.8%	4.8%	4.9%	5.6%	5.2%
Within: 200 – 300 miles	0.4%	0.4%	0.4%	0.5%	0.4%
Within: 300 + miles	0.6%	0.6%	0.7%	0.4%	0.7%
Panel C: Railways without London Terminal					
	Overall	Male	Female	Lead joint	Solo
Median Distance	91.7	97.3	80.2	107.9	80.9
Within: 0 – 5 miles	29.7%	27.8%	32.8%	24.5%	32.9%
Within: 5 – 100 miles	23.2%	23.5%	22.8%	21.9%	22.9%
Within: 100 – 200 miles	24.2%	26.0%	21.2%	25.6%	20.0%
Within: 200 – 300 miles	20.5%	20.6%	20.2%	25.7%	21.6%
Within: 300 + miles	2.4%	2.0%	3.0%	2.3%	2.7%

Notes: Shareholder addresses and railway stations were geocoded using the Bing Maps API. The distance between each shareholder and the closest station of the company which they had invested in is calculated. 'Lead joint' is the lead shareholder in a joint holding, i.e., the individual who exercises the voting right. 'Solo' is shareholders who owned shares by themselves.

Table 8. Shareholdings across multiple railways, 1915-1922

	Proportion of Shareholders also investing in:						Average Number of Companies Invested in by:				
	Great Western	LNW	North Eastern	Cale	North British	GSW	Overall	Males	Females	Lead Joint Shareholders	Solo Shareholders
Great Western	1.00	0.14	0.12	0.10	0.08	0.04	1.47	1.58	1.31	1.71	1.38
London & North Western	0.15	1.00	0.13	0.07	0.08	0.03	1.45	1.55	1.31	1.62	1.38
North Eastern	0.15	0.15	1.00	0.09	0.06	0.04	1.48	1.58	1.33	1.79	1.37
Caledonian	0.15	0.11	0.11	1.00	0.18	0.13	1.68	1.82	1.46	1.95	1.60
North British	0.13	0.14	0.10	0.21	1.00	0.11	1.69	1.83	1.45	1.90	1.58
Glasgow & South Western	0.16	0.12	0.13	0.33	0.24	1.00	1.96	2.12	1.71	2.23	1.88
Overall							1.55	1.67	1.37	1.78	1.46

Notes: Shareholder names and the towns they lived in were matched across companies, using a matching algorithm. LNW = London and North Western; Cale = Caledonian; GSW = Glasgow and South Western. 'Lead joint' is the lead shareholder in a joint holding, i.e., the individual who exercises the voting right. 'Solo' is shareholders who owned shares by themselves.

Table 9. Investor holding periods

North British	% of 1915 shareholders who had invested in:		
	1902	1889	1870
All	28.9%	9.4%	3.1%
Male	29.8%	10.7%	4.2%
Female	27.6%	7.5%	1.6%
Lead Joint	30.1%	11.1%	3.9%
Solo	28.3%	8.6%	2.8%

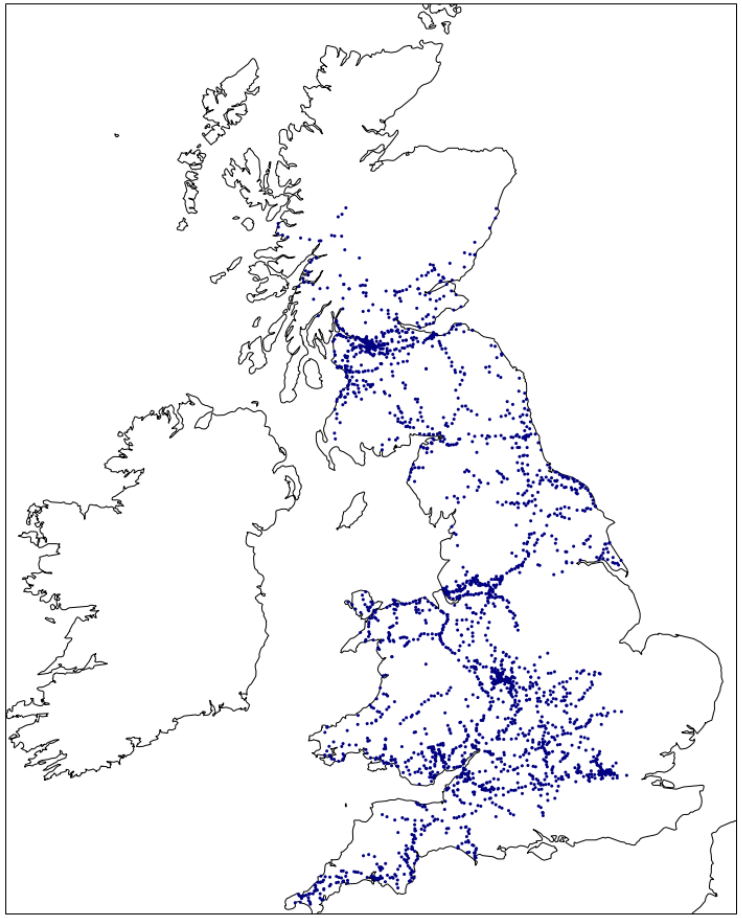
Caledonian	% of 1922 shareholders who had invested in 1897
All	12.1%
Male	12.7%
Female	11.0%
Lead Joint	13.5%
Solo	11.6%

Great Western	% of 1920 shareholders who had invested in 1893:
All	5.8%
Male	6.8%
Female	4.3%
Lead Joint	7.9%
Solo	4.9%

Notes: Shareholder names and the towns they lived in were matched across companies, using a matching algorithm. 'Lead joint' is the lead shareholder in a joint holding, i.e., the individual who exercises the voting right. 'Solo' is shareholders who owned shares by themselves.

Figure 1. Maps of railway stations and shareholders of sample companies

Panel A: Railway stations



Panel B: Railway shareholders

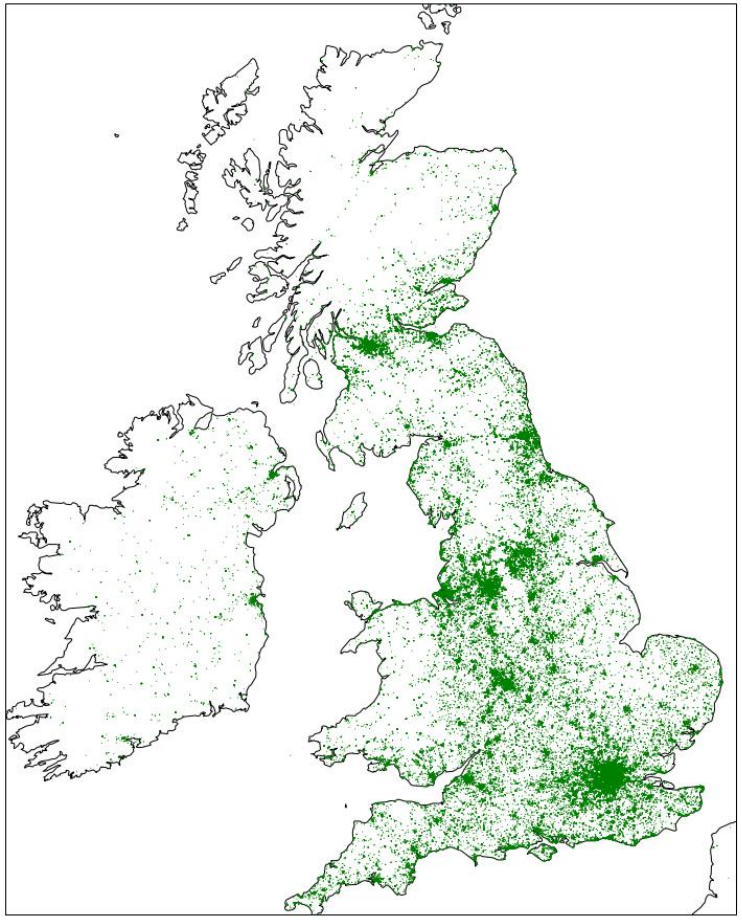
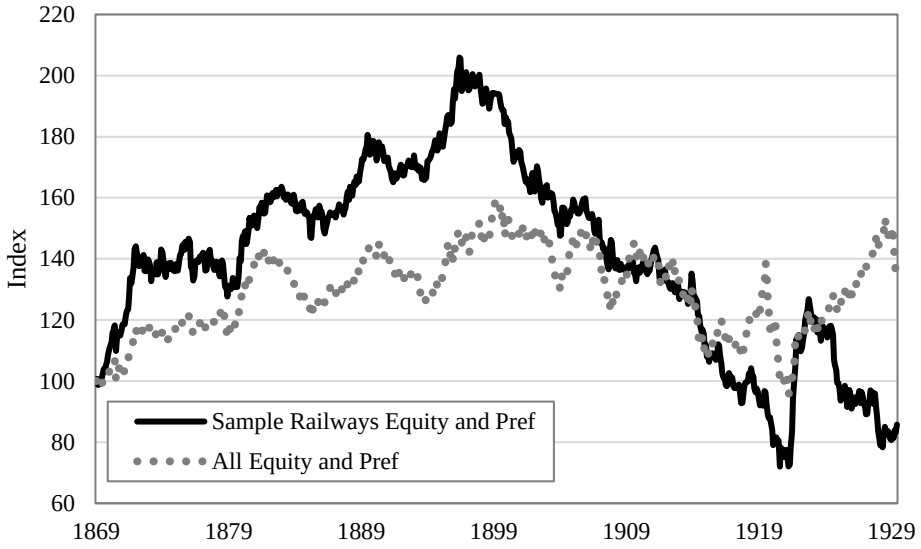
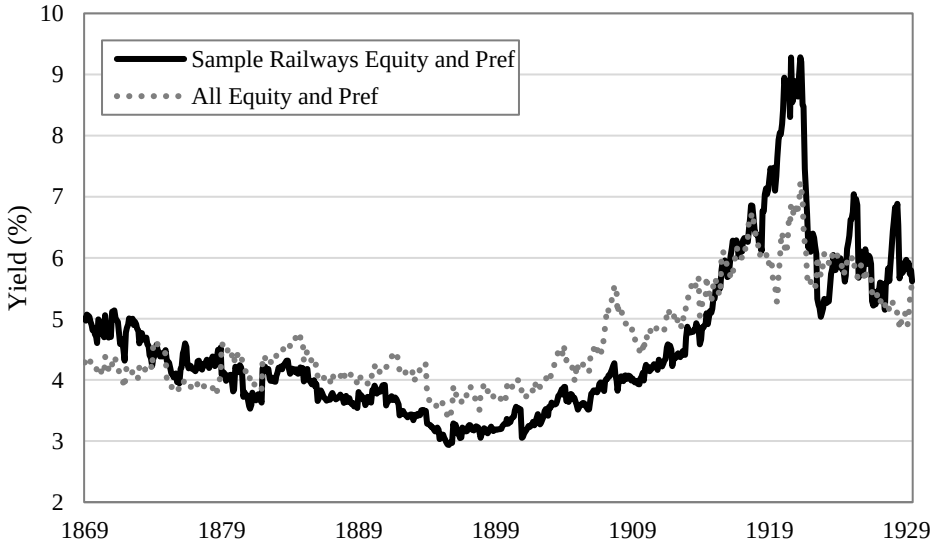


Figure 2. Capital gains and dividend yields of sample railways vs all equity and preference shares of all companies listed in *Investor's Monthly Manual*

Panel A: Capital Gains Indices



Panel B: Dividend Yield



Notes: Prices and dividends for all companies obtained from the *Investor's Monthly Manual*. Indices calculated using a market capitalisation weighting.