Dividend policy in an early capital market, Britain 1825-70*

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Abstract

Using a hand-collected dataset containing the stock prices and dividends of 681 companies traded on the London stock market between 1825 and 1870, we analyze dividend policy in an early capital market. As tax was effectively zero, the market was largely unregulated, and there were no institutional shareholders, we can rule out these potential determinants of dividend policy *ex ante*. A study of *circa* 3,500 dividend announcements and the frequency of dividend changes provide support for the information communication explanation for dividends and little support for the agency or liquidity explanations for dividends. We also find little evidence that dividends were paid for behavioral reasons.

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1. Introduction

Miller and Modigliani (1961) suggested that dividend policy is irrelevant, but in a world of taxes the optimal policy is a zero dividend (Farrar and Selwyn 1967; Brennan 1970). Yet, despite high tax rates, firms pay dividends. Financial economists have consequently attempted to resolve this problem, with suggestions ranging from agency costs, clientele effects, regulatory constraints on stock repurchases, signaling, to behavioral explanations. In this paper we examine dividend policy in an early capital market – that of nineteenth-century Britain. As well as contributing to our understanding of how equity markets evolved, a study of dividend policy in this market helps us rule out some of the above explanations as to why companies pay dividends as in the pre-1870 British market, income and capital gains tax rates were effectively zero, there were no regulatory constraints on stock repurchases, and there were no institutional stockholders.

Using a new hand-collected dataset containing dividends and monthly stock prices for common equity securities traded on the London stock exchange between 1825 and 1870, we find that there is a large premium on dividend-paying stocks, even after controlling for risk, size, and growth. The rest of the paper then explores why dividends matter in this early capital market.

Using close to 3,500 dividend announcement dates garnered from newspapers, we find that investors react positively (negatively) to dividend increases (decreases). Cross-sectional regressions reveal that stock liquidity and various proxies for the severity of agency costs fail to explain the cross-sectional variation in the cumulative abnormal returns.

We also examine the stability of dividends and the frequency of dividend changes throughout our sample period as frequent dividend changes may be more consistent with the information communication explanation for dividends, whereas infrequent dividend changes may be more in line with an agency-cost explanation for dividends. We also examine the direction of dividend changes. Our results suggest that the median firm changed its dividends regularly, with a large proportion of our sample changing dividends at least once every two years, and these firms were more likely to increase rather than decrease their dividends.

Finally, we examine behavioral explanations as to why firms pay dividends by analyzing whether or not prevailing market conditions affected the risk-adjusted return on dividend-paying stocks and whether or not investors reacted more to dividend announcements in declining markets. We find no evidence that investors reacted asymmetrically. We also examine whether or not managers catered to investor sentiment regarding dividends by analyzing whether or not managers responded to the dividend premium. Our results suggest that managers did not cater to investors.

Overall, our evidence appears to offer support for the information communication explanation for dividends. Indeed, as we will argue below, there are very good reasons why dividends played such a role in early capital markets. In particular, the paucity of audited, trustworthy, and widely-distributed financial accounts in this period of capital-market development meant that dividends played an important information-communication role.

This paper fits into the literature which has examined dividends in the UK and US in the early twentieth-century, when capital markets were characterized by low or no

dividend taxation (Barclay 1987; Braggion and Moore 2009). Our contribution, however, is to extend this type of analysis back into the nineteenth century – to look at a more formative stage in the development of the capital market. This paper also contributes to the literature which suggests that dividends are used to signal private information to markets (Bhattacharya 1979; John and Williams 1985; Miller and Rock 1985; Yoon and Starks 1995; Brav *et al.* 2005; Grullon *et al.* 2005). It also fits into the literature which has suggested that dividends in early capital markets played an important information communication function (Baskin and Miranti 1997; Cheffins 2006, 2008).

The paper proceeds as follows. Section two outlines theories of dividend policy in early capital markets. Section three outlines our empirical strategy as well as our data. Section four estimates the returns on portfolios of dividend-paying and non-dividend-paying stocks. The fifth section analyzes the stability of dividends and the frequency and direction of dividend changes. Section six contains an event-study of dividend announcements. Section seven analyzes whether or not prevailing market conditions affected the risk-adjusted return on dividend-paying stocks, whether or not investors reacted more to dividend announcements in declining markets, and whether or not managers catered to investor sentiment regarding dividends.

2. Theories of dividend policy in an early capital market

Miller and Modigliani (1961) argued that in a perfect capital market free from taxes dividend policy is irrelevant. Once taxes are introduced into the model, the optimal dividend policy is to pay zero dividends (Farrar and Selwyn 1967; Brennan 1970). However, the large body of empirical work on the effect of taxes on dividend policy is by

no means definitive (Black and Scholes 1974; Litzenberger and Ramaswamy 1979, 1982; Miller and Scholes 1982; Poterba and Summers 1984; Poterba 1987; Barclay 1987; Naranjo *et al.* 1998; Bell and Jenkinson 2002; Chetty and Saez 2005). In the case of pre-1870 Britain, the income tax rate from 1817 to 1842 was zero and for most of the period up to 1870 it hovered around 2.083% (Mitchell 1988, p.645), income tax on dividends was deducted at source, and there was no capital gains tax (Daunton 2001, pp.158-9; 186). Therefore taxation cannot be a determinant of dividend policy in this early capital market.

British corporate law has never required firms to pay a dividend (Cheffins 2008, p.77). Indeed, the only common-law principle affecting dividend payments was that they could not be paid out of capital as this was prejudicial to creditors (Ardern and Aiken 2005). Corporate law can also indirectly affect dividend policy in that strong investor protection can empower minority shareholders to demand payouts (La Porta *et al.* 2000). However, British corporate and securities law provided very little protection for minority shareholders in the nineteenth century (Cottrell 1980; Cheffins 2001, 2006, 2008; Campbell and Turner 2010).

Regulatory constraints on systematic share repurchases can affect the dividend decision (Brennan 1970; Grullon and Michaely 2002), but in the case of Britain, it was only after our period that share repurchases were forbidden.[1] Although many company

[1] The House of Lords in the 1887 case of *Trevor vs. Whitworth* ruled that a limited liability company could not buy its own shares. A listing on the London Stock Exchange after the early 1870s required that articles of association restrain directors from using company funds to repurchase shares. However, this only applied to companies which listed after this time.

constitutions authorized directors to repurchase shares using company funds, share repurchases were typically not used to distribute cash to shareholders.[2]

Dividend policy can be affected by tax clientele effects (Miller and Modigliani 1961; Farrar and Selwyn 1967; Elton and Gruber 1970; Petitt 1977; Brav *et al.* 2005; Graham and Kumar 2006). However, all investors in the pre-1870 market were effectively subject to the same tax rate.[3]

Institutional investors as a clientele may have strong dividend preferences (Brav and Heaton 1998; Dhaliwal *et al.* 1999; Grinstein and Michaely 2005). However, institutional ownership of shares in pre-1870 Britain was almost non-existent as the first investment trust was only established in 1867 and the other two potential institutional investors (banks and insurance companies) typically did not invest in equity securities (Cheffins 2008, p.190).[4]

Clientele effects may have existed because of behavioral factors (Shefrin and Statman 1984; Shefrin and Thaler 1988; Graham and Kumar 2006; Baker and Wurgler 2004). In particular, investors who were older and had a need for regular income may have had a preference for dividend-paying stocks for a variety of behavioral reasons, including prospect theory and sentiment. Notably, these types of investors were common in many pre-1870 British companies (Reed 1975; Green and Owens 2003; Newton and Cottrell 2006; Rutterford and Maltby 2006, 2007; Turner 2009).

[2] Directors appear to have used these powers to help maintain the aggregate quality of the shareholder constituency or create a market in the firm's stock (Acheson and Turner 2008).
[3] There were eight years where there was a small difference in tax rates (c.0.833%) between incomes above and below £150 (Mitchell 1988, p.645).
[4] Studies of bank ownership in this period find no evidence of institutional ownership (Anderson and Cottrell 1976; Turner 2009).

Given that insiders have private information on the potential future cash flows of the firm, they may want to communicate this information to outsiders using dividend policy (Bhattacharya 1979; John and Williams 1985; Miller and Rock 1985). A large body of empirical work provides mixed results on whether dividends signal private information on future cash flows to shareholders (Baker *et al.* 2002; Brav *et al.* 2005; Grullon *et al.* 2005; Yoon and Starks 1995).[5]

In early capital markets, the dividend was in many cases the only piece of credible information which shareholders had to determine how well their firm was performing (Baskin and Miranti 1997, p.19, 255; Cheffins 2008, pp.108-15).[6] In the pre-1870 British market, timely and regular financial disclosure was not imposed by the stock market, and apart from companies incorporated under the 1844 Companies Act (which very few did) or incorporated by special Acts of Parliament (which eventually came under the purview of the 1845 Companies Clauses Consolidation Act), British companies were not required to have their accounts audited (Hunt 1936, pp.138-39).[7] Indeed, it was not until the Companies Act of 1900 that this became a requirement, and it was not until 1902 that companies listing on the London Stock Exchange had to distribute their annual balance sheet to shareholders (Cheffins 2008, p.95). Although some companies in pre-1870 Britain were required to have their accounts audited, the content of their disclosure was

[5] Dividend changes could also be signal of a change in firm maturity (Grullon *et al.* 2002) or a change in the severity of the conflict between large, controlling owners and outside shareholders (Gugler and Yurtoglu 2003).

[6] The shareholders of the Colonial Bank responding at their half-yearly shareholders' meeting to a dividend reduction reached a consensus that "the accounts presented at the meetings were not calculated to give a clear insight into its real condition" (*The Times*, 5th July 1840, p.4). Arnold and McCartney (2010) have recently suggested that dividends in some eighteenth-century canal companies would not have enabled investors to identify rates of return on capital employed although they provide no evidence that the capital markets were necessarily misled.

[7] Many companies in this early market had their books audited by directors and small groups of shareholders possibly in order to ameliorate any agency problems (Watts and Zimmerman 1983).

not mandated.[8] Indeed, formal reporting requirements were only developed for the railways in 1868, followed by gas companies in 1871 (Baskin and Miranti 1997, p.185). Overall, due to this lack of public disclosure, the potential information asymmetries faced by outside investors were substantial (Cheffins 2008, p.110).

As dividends were the most important means of communicating with shareholders in this era, it is of no surprise that the dividend paid was the principal concern of shareholders (Cheffins 2006; Jefferys 1977, p.409) and that dividends were intrinsic to the valuation of shares (Baskin and Miranti 1997, p.19).[9] Given that directors were typically required to own company stock and that these stakes were a sizeable proportion of the median director's asset portfolio, directors would have had a large incentive to ensure that their company paid high dividends (Campbell and Turner 2010).

Agency-cost explanations suggest that dividend policies can be used to resolve agency conflicts between managers and outside shareholders (Rozeff 1982; Easterbrook 1984; Jensen 1986; La Porta *et al.* 2000; Denis and Osobov 2008). Although there is some debate as to what extent a separation of ownership and control existed at the end of the nineteenth century (Hannah 2007a, b; Cheffins 2008, pp.169-70, 225-30), there is evidence to suggest that large banks and railway companies in this early capital market may have been characterized by diffuse ownership (Cheffins 2008, pp.158-9; Acheson and Turner 2008).

[8] The third report of the 1849 parliamentary committee examining the auditing of railway accounts found that railway accounts were not detailed or explanatory and were not uniform, making comparisons difficult between companies and depriving investors of the ability to assess company performance (Parliamentary Papers 1849, 3rd report, pp.v-vii).

[9] An expert witnesses before an 1849 parliamentary committee examining the auditing of railway accounts suggested that dividends were the main way of determining the value of a company (Parliamentary Papers 1849, q. 2643).

Dividends may also have played an important liquidity role in early capital markets (Baskin and Miranti 1997, p.19). As most stocks were traded infrequently in the pre-1870 market (Acheson and Turner 2008), it is possible that it was very costly for investors to create a home-made dividend by selling some of their stock. Although brokerage costs were relatively low (see *Investor's Monthly Manual* 1870, p.376 for details), there may have been a significant liquidity cost associated with a home-made dividend.

In summary, having discounted tax, tax-clientele, regulatory and institutional preferences as explanations for dividends we are left with four hypotheses to explain dividend policy in this early capital market: (1) dividends were used to communicate information to investors; (2) dividends were necessary because of illiquidity; (3) dividends were paid to ameliorate agency costs; (4) investors had a preference for dividends due to prospect theory or sentiment.

3. Empirical strategy and data

In order to analyze dividend policy in this early capital market, we hand collected dividend information, stock prices and capitalization data for 681 companies listed on the London stock market for every month from 1825 to 1870 from a stockbroker list called the *Course of the Exchange*.[10] The sectoral composition of these 681 companies is as follows: 26.4% railways; 19.5% mines; 16.3% banks; 10.6% insurance; 9.3% canals; 7.0% gas; 5.6% utilities; and 21.4% miscellaneous industrial and commercial companies.

In order to ascertain whether investors valued dividends in this early capital market, we examine the impact of whether or not a company pays a dividend on its risk-

[10] See Acheson *et al.* (2009) for further details on this dataset.

adjusted returns. As regulation, taxation and tax-based clientele considerations are non-existent in this early capital market, the impact of dividends on stock returns should be a pure measure of the extent to which investors value dividends.

The information communication hypothesis implies that dividends will be increased incrementally and only when managers know that the increase can be sustained as future cuts in dividends will be treated severely by the market (Lintner 1956). This implies that there may be a close correlation between future short-term profits and dividends. However, as little in the way of systematic profit data exists for pre-1870 Britain, we instead look at how often companies changed their dividend payments over the long run. Frequent incremental changes in dividends would be consistent with the information communication hypothesis. On the other hand, the agency explanation for dividends implies that there is not a strong correlation between short-term profits and dividends, which manifests itself as a consistent dividend policy which is not changed very often (Easterbrook 1984).

Using dividend announcement dates obtained from the *Times Digital Archive*, we examine how investors respond to dividend announcements. If the information communication hypothesis is the correct one, we would expect investors to react to changes in dividend policy. However, this could also be consistent with the illiquidity or agency-cost hypotheses. Therefore to rule these two hypotheses out or in, we perform cross-sectional regressions on abnormal returns around dividend announcements.

If the illiquidity hypothesis explains dividend policy in this early capital market, we would expect illiquid stocks to have higher absolute abnormal returns around dividend announcements. If the agency hypothesis explains dividends, we would expect

differences in levels of ownership diffuseness to have an effect on how investors react to dividend announcements. As competition can ameliorate agency problems (Jensen 1986), we also test whether investors react differently to changes in dividends in competitive versus non-competitive industries. In addition, the presence of managerial share ownership requirements, which were common in this early capital market (Campbell and Turner 2010), should result in dividends being less valuable to investors (Rozeff 1982; Easterbrook 1984, p.657). Furthermore, if the agency hypothesis explains dividend policy then we would expect to see firms which were required by law to produce audited accounts to have smaller abnormal returns to announcements of dividend changes, as audited accounts are believed to reduce agency problems (Watts and Zimmerman 1983). Finally, if the Jensen (1986) free-cash-flow version of the agency-cost explanation is the correct one, we would expect to see dividend changes for mature firms having a greater price impact than changes for firms with lots of investment opportunities (Lang and Litzenberger 1989; Yoon and Starks 1995; Braggion and Moore 2009).

In order to test the hypothesis that investors placed a premium on dividends for behavioral reasons (primarily prospect theory), we examine whether or not the prevailing market conditions, as measured by an index of stock returns for the London market, affected returns on dividend-paying stocks and investor reactions to dividend changes. If behavioral explanations hold, then we should expect to find that investors have a greater preference for dividend-paying stocks in declining markets and that dividend announcements made in declining markets have a greater impact than those made in advancing markets. For example, if prospect theory holds, investors will prefer dividend-

paying stocks more in declining markets as dividend returns are certain and probable losses on non-dividend-paying stocks are likely to increase due to an economic decline (Fuller and Goldstein 2005). Investor sentiment may also result in investors preferring dividend-paying stocks more in declining markets as investors are seeking 'safe' firms to invest in. We also directly test the sentiment explanation of why firms pay dividends by looking at the relationship between the dividend premium and the propensity to pay dividends (Baker and Wurgler 2004).

4. The returns on dividend-paying stocks

To investigate whether investors valued dividend payments, we make use of the stock information collected for the 681 firms listed in the London stock market over the sample period, and compare the returns between a portfolio that contains dividend-paying stocks and a portfolio that contains non-paying stocks. In this early capital market, dividends were paid either annually or semi-annually, and we therefore classify a stock which announced non-zero payment as dividend payer for all the subsequent 12 months (or 6 months) rather than just for the month when the dividend is actually paid. For each month, we assign firms to either the dividend-paying portfolio or the non-paying portfolio based on the dividend information at that particular month. We then calculate the equally-weighted returns at that month for both portfolios. This process is repeated every month from May 1825 to December 1870. If investors preferred to hold stocks that paid dividends and their preference resulted in some kind of premium in the prices of paying stocks, we would expect to find that the dividend-paying portfolio outperforms the non-paying portfolio.

Panel A in Table 1 reports the characteristics for the paying and non-paying stocks. On average, in any given month, less than 25% of the stocks in the market do not pay dividends. They tend to be smaller and younger firms compared with those that pay dividends. Smaller and younger firms may have chosen not to pay dividends because they were newly established and had more growth opportunities. Consistent with prior expectations, the betas in Panel A shows that the portfolio of non-paying stocks is much riskier than the portfolio of paying stocks.

The size, age, and risk features of the portfolio of non-paying stocks suggest that they should enjoy greater returns than the portfolio of paying stocks. Nevertheless, this is not what is revealed in Panels B, C and D of Table 1. Panel B shows that the paying stocks outperformed the non-paying stocks by 0.41% per month, and the difference in returns is statistically significant at the 1% level. In addition, the paying stocks also significantly outperform the non-paying stocks in both sub-periods. In order to compare the performance of paying and non-paying stocks without the influence of the dividend payment, we also calculated (but did not tabulate) the difference in capital gain between the paying stocks and non-paying stocks. One would expect that the capital gain for the non-paying stocks should be much greater than that for the paying stocks from which the investors also get various amounts of dividends. However, we find that the capital gain for the paying stocks is only 0.09% per month less than that for the non-paying stocks, and the difference is not statistically significant.

Panel C and Panel D of the Table 1 indicate that the difference in returns between paying and non-paying portfolios becomes even more substantial after controlling for the risk of the portfolios. We make use of the CAPM model and the Fama and French (1993)

three-factor model to calculate the risk-adjusted returns. The paying portfolio always has positive risk-adjusted returns and the non-paying portfolio always has negative risk-adjusted returns. The difference in risk-adjusted return between the two portfolios increases to 0.99% per month when we control for the market risk of the portfolios, and it is 0.83% per month when we also control for the SMB and HML factors.

The differential returns remain statistically significant in the two sub-periods in Table 1. The earlier period is associated with having a zero tax rate and the latter with having a very low tax rate. In addition, the earlier period is associated with two large railway manias which could potentially affect the overall findings, but our findings suggest otherwise.

To check the robustness of the above findings, we omitted the two largest industries in our sample (railways and financials) to test whether they were driving our results. As can be seen from Panel E, even when these two sectors are omitted, there is still a substantial difference in returns between paying and non-paying stocks. As partially-paid stocks were an unusual feature of this early capital market (Jefferys 1946; Acheson *et al.* 2009), we also checked the robustness of our results by looking only at fully-paid paid stocks.[11] The results in Panel E reveal that when partially-paid stocks are omitted, paying stocks still outperform non-paying stocks, and indeed do so to a greater extent.

The finding that paying stocks outperform non-paying stocks, despite the fact that the latter were (on average) smaller, younger and riskier, may be explained by investors'

[11] Partially-paid stocks had a proportion of nominal capital which remained uncalled until it was called up by a company's directors or creditors. As can be seen from Panel A of Table 1, non-paying stocks are more likely to be partially paid probably because younger firms tended to have more unpaid capital as capital was only called up as the firm developed.

preference for the dividend-paying stocks for reasons other than firm-specific characteristics. The rest of this paper attempts to analyze the possible reasons behind this preference.

5. The stability of dividend payments

In this section we look at how often companies changed their dividend payments over the long run, as well as the direction of change for frequent dividend changers. Frequent changes in dividends would be consistent with the information communication hypothesis, whereas infrequent changes would be more consistent with the agency hypothesis (Easterbrook 1984, p.657). To examine this issue, we first look at what proportion of companies changed their dividend in any given year. From Table 2, we can see that, on average over the sample period, 69% of companies in any given year do not change their dividend policy. However, the proportion of companies not changing their dividends falls over the sample period, suggesting that, as the equity market developed, companies became more flexible in their dividend policies. Indeed, companies appear to be a lot more willing to increase and decrease their dividends in the second half of the sample period. A further finding which emerges from Table 2 is that more companies change their dividends after periods of financial crisis or economic stringency. For example, in the period 1825-70, the three most substantial episodes of financial distress on the equity market were 1825-26, 1847 and 1866 (Acheson *et al.* 2009). It is notable from Table 2 that after each of these episodes, more companies changed their dividends, particularly in a downwards direction. This perhaps suggests that companies in this early

capital market may have used dividends to communicate their future prospects to the market.

The second thing we do to get at the stability of dividends is to analyze how often during our sample period the median company changed its dividend. In order to do this, we look at those companies in our dataset which listed for 10 years or more on the London market. There were 286 companies which listed continuously for at least 10 years within our sample period, with the average listing duration of these companies being 23.3 years. As can be seen from Table 3, over one third of these long-lived companies changed their dividend at least once every two years, with a further one quarter of companies changing their dividends at least once every two to four years. Overall, the median company changed its dividend every 3.02 years.

About one quarter of companies (76 in total) infrequently or never changed their dividends, and a large proportion of these were insurance companies (23). It was common for some insurance companies in this period to fix their dividend rates in their initial founding documents as a commitment to policyholders that they would not take excess risk (Pearson 2004, p.239). As can be seen from Table 3, removing insurance companies results in a fall in the time between dividend changes for the median company from 3.02 to 2.27 years. Canals and bridges were some of the earliest companies traded on the London market and some of them also had a tendency to have a fixed dividend rate. Indeed, prudent investors at the beginning of the nineteenth century may have had a preference for fixed-income securities and these companies had a fixed dividend policy to attract such investors (Baskin and Miranti 1997, p.19). As can be seen from Table 3, once we exclude bridges, canals and insurance companies, we see that 51.38% of

companies changed their dividends at least once every two years, with a further 24.31% of companies changing their dividends at least once every two to four years, and the median company changed its dividend every 1.87 years.

Table 3 also reveals that more firms changed their dividends after 1847, and dividend changes occurred more frequently as is suggested by the fall in the median time between dividend changes. This shift is mainly due to a change in the composition of companies on the market rather than any change in the dividend behavior of incumbents. Banks, mines and railways are a major part of the market after the 1840s, and it is in these three sectors where companies are most likely to change their dividends, with 75.0% of banks, 57.1% of mines and 87.7% of railways changing their dividends at least once every two years; the median number of years between changes for these three sectors is 1.76, 2.25 and 1.53 years respectively.

If the information communication hypothesis holds, we would expect managers to be reluctant to increase dividends if they have to subsequently reduce them again in the future. Indeed, there is some evidence from contemporary newspaper reports which suggests that directors were aware of the effect that reversing dividend changes had on the value of shares, and therefore they only increased dividend payments whenever circumstances permitted it.[12] Consequently, some companies appear to have had a policy of accumulating retained earnings as reserves, and only then initiating or increasing dividends.[13] From Table 4, which examines the direction of change for the companies in

[12] For example, the directors of the Great Western Railway had increased its dividend in early 1842 from 3 to 3.5%, but had to reverse it six months later; they had done so against their better judgment and at the behest of the majority of shareholders. The chairman of the board in his annual statement said that directors' course "would have been the wiser one, because by preserving a greater equality of dividends, they would preserve a greater steadiness in the value of their shares" (*The Times*, 19th August 1842, p.7).
[13] Examples include the Edinburgh and Glasgow Railway (*The Times*, 30th March 1848, p.5); St Katharine's Docks (*The Times*, 19th January 1853, p.3; *The Times*, 22nd January 1856, p.4); National

Table 3 which changed their dividend at least once every two years, we can see that frequent dividend changers were more likely to increase their dividends than decrease them. We also observe that dividend increases by frequent changers were much more likely to be at least maintained rather than reversed in the short run. Overall, the evidence in Table 4 appears to be consistent with the information communication hypothesis.

The evidence in this section suggests that companies changed dividends frequently, that frequent changers were more likely to increase their dividends rather than decrease them, and that increases in dividends were not usually followed by subsequent decreases. Taken as a whole, these findings are more in line with the information communication hypothesis rather than the agency hypothesis.

6. Investor reactions to dividend announcements

6.1 Estimating abnormal returns

We use standard event study methodology to investigate investor reactions to dividend announcements. For each dividend announcement, we calculate the abnormal return for stock i as

$$AR_{it} = R_{it} - E(R_{it}) \qquad (1)$$

Discount Company (*The Times*, 26th January 1860, p.7); Imperial Continental (*The Times*, 29th November 1867, p.8); Bank of Australasia (*The Times*, 8th June 1852, p.6); Union Bank of Australia (*The Times*, 22nd January 1850, p.6); Colonial Bank (*The Times*, 12th January 1853, p.6; *The Times*, 10th January 1855, p.5; *The Times*, 15th January 1857, p.6; *The Times*, 3rd January 1861, p.5); Lancaster and Carlisle Railway (*The Times*, 7th September 1850, p.5); Bank of London (*The Times*, 17th July 1863, p.10); London and North-Western Railway (*The Times*, 16th August 1851, p.6). Consistent with this policy, several companies dipped into their reserves to maintain dividend payments whenever earnings were insufficient to cover them - examples include London Joint Stock Bank (*The Times*, 11th January 1844, p.4 and 12th July 1844, p.6); Grand Junction Railway (*The Times*, 8th August 1842, p.3); Great Western Railway (*The Times*, 18th August 1860, p.5).

where R_{it} is a stock's realized return (excluding dividends) for time t and $E(R_{it})$ is its expected return in the absence of the event. The value-weighted returns of the market index are utilized to estimate expected returns i.e. $E(R_{it})$. The expected returns are calculated by regressing each stock's monthly return against the returns on the market index over the 48-month period before the start of the event window. The estimated parameters from the regression and the realized market returns are used to estimate a stock's monthly expected return:

$$E(R_{it}) = \hat{\alpha}_i + \hat{\beta}_i R_{mt} \qquad (2)$$

where R_{mt} is the return on the market portfolio at time t.[14] The value-weighted returns on the market portfolio are taken from Acheson *et al.* (2009), and the monthly yield on 3% Consols, which was obtained from the Course of the Exchange, is used as a proxy for the risk-free rate.

Our three event windows are [-2, +2] (i.e., two months before to two months after), [-1, +1] (i.e., one month before to one month after), and [0, +1] (i.e., one month after). We then calculate the average cumulative abnormal return (ACAR) from t = J to t =K as

$$ACAR = \frac{1}{N}\sum_{i=1}^{N}\sum_{t=J}^{K} AR_{it} \qquad (3)$$

[14] As a robustness check, the expected returns are also calculated based on the capital asset pricing model, and again this is done for value-weighted returns. As one would expect, this model gives similar results to the market model.

where N is the number of equity stocks in our sample during each event.[15]

6.2 Sample and events

As our event study methodology requires a 48-month estimation window and stock prices to be reported frequently, we initially restricted our sample to stocks which were listed for at least 10 years in the sample period. This resulted in 286 companies in our sample. However, to conduct the event study analysis, we also required that companies in the sample have at least one dividend announcement in *The Times* newspaper and that each announcement should have returns for each month in the event window. After searching *The Times Digital Archive* for dividend announcements by these companies, we found 3,457 dividend announcements (for which there were stock prices for each month in the event window) for 96 companies. Most companies in the sample announced their dividends biannually either at the company half-yearly meeting or just prior to this meeting. Dividend announcements are classified as an increase, commencement, decrease, omission or unchanged, and to account for the size of the changes in dividend, we also look at increases (decreases) greater than 20%. It is noteworthy that investors and directors at the time appear to have been aware of the impact of dividend announcements on stock prices.[16]

[15] To test the significance of the ACARs, the variance of the ACARs is estimated by using the cross-sectional variance across the cumulative abnormal returns of the various companies. This cross-sectional approach takes account of increase in event-period variance (Campbell *et al.*. 1997, p.168).

[16] For example, the dividend reduction of the West India Docks in 1833 "produced one of the most sudden and extensive depreciations in value we ever recollect to have occurred" (*The Times*, 12th January 1833, p.2). Similarly, in 1843, "Colonial Bank shares have declined to £15, £2.5 per share below the price marked yesterday, owing to the unsatisfactory result of the half-yearly meeting of the proprietors of this establishment. The meeting, which was held yesterday, was chiefly remarkable for a decline in the amount of the dividend" (*The Times*, 5th January 1844, p.4). Midland Railway stocks even declined on a rumor of a dividend reduction (*The Times*, 17th July 1868, p.3). By way of contrast, an increased dividend announced

One potential difficulty is that we may be conflating earnings and dividend announcements. This is unlikely to be an issue for us for the following reasons. First, the dividend is usually reported first in the article on the company in *The Times*, and on some occasions it is all that is reported. Second, the performance of the company over the previous six months is usually discussed in general terms, but rarely is a definitive net profit figure clearly stated; most reports talk about the augmenting of the profit and loss or reserve accounts, meaning that the investor would need access to previous financial statements to calculate profits. Third, the investor was confronted with the difficulty of interpreting profit figures when they were reported as it is unclear whether profit after tax, interest and depreciation is being reported.

6.3 Results

The results in Table 5 show that stockholders respond positively to increases in dividends, with 0.86% and 1.45% ACARs in the [-1, +1] and [-2, +2] event windows respectively. However, the ACARs are twice as large as this whenever the dividend increase is greater than 20%, with the ACARs being 1.77% and 3.11% respectively. Stockholders also respond positively to announcements of dividend commencement, with ACARs of 5.27% in the [-1, +1] event window.

Announcements of dividend decreases are accompanied by ACARs of the order of -3.12% for the [-1, +1] event window and -3.92% for the [-2, +2] event window. Dividend decreases greater than 20% were associated with ACARs of -3.96% and -4.91%

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by the Bank of Australasia, not only increased its stock price, but also the stock prices of other banks (*The Times*, 7th December 1852, p.7).

respectively. Notably, stockholders reacted strongly and negatively to dividend omissions, with -8.24% ACARs in the [-1, +1] event window.

From Table 5 we observe that announcements of unchanged dividends are accompanied by a -0.34% ACAR in the [-1, +1] event window. Whenever we look at announcements of no change in dividend which follow a previous announcement of an increase or decrease in dividends, the ACARs are not statistically different from zero. However, whenever we look at a series of announcements of unchanged dividends which follow an announcement of dividend increase, we see that this is accompanied by a -0.65% ACAR in the [-1, +1] event window. This suggests that after a company has increased its dividend, investors are disappointed whenever dividends subsequently remain the same for an extended period of time. According to *The Times*, a theme at the shareholder meetings of some railway companies was the disappointment of shareholders that the dividend was not increased despite an expectation that it would be.[17] Notably, for a series of announcements of unchanged dividends which follow an announcement of dividend increase, the mean ACAR for railways is statistically significantly lower than that for non-railways.[18]

The ACARs for the [0, +1] window suggest that for decreases and unchanged dividends, there is a significant and substantial abnormal return enjoyed in the month after the announcement, suggesting that news regarding the dividend decrease or unchanged dividend was not leaked to or signaled to the market via a potential prior earnings announcement. In contrast, the abnormal returns in the [0, +1] window for

[17] *The Times*, 28th Aug 1854, p.8; *The Times*, 27th Feb 1865, p.5; *The Times*, 8th Sept 1865, p.6.
[18] In the (-1,+1) event window, the mean ACAR on the railways is -1.26% (significant at the 1% level) whereas the mean ACAR for the non-railways is –0.44% (significant at the 10% level). The *t*-statistic on the difference means is 1.73.

dividend increases are not significant, which perhaps suggest that directors had a tendency to release good news regarding dividends to the market before announcements.

As tax can be viewed as a cost of communicating information, we compare the ACARs in the pre-1842 period (when income was zero) for the various dividend announcements with those in the post-1842 period. The untabulated results suggest that there is no statistical difference in means between the two periods for any type of dividend announcement, which is more than likely due to the fact that income tax after 1842 was at a very low level.

If the Jensen (1986) version of the agency-cost explanation is correct, we would expect to see a greater price impact of announcements of dividend changes for more mature firms; we proxy maturity using firm age and the market-to-book value of the firm's stock. From Table 6, we do not see much evidence to support this agency-cost explanation.

As ownership data does not exist for this period, we use the number of shareholders as a proxy for ownership diffuseness. Such data is available for most banks in our sample from the *Bankers' Almanac and Yearbook* from 1845 onwards and for most railways for 1855 in Parliamentary Papers (1856). As can be seen from Table 6, there is little evidence to suggest that companies with above median number of owners reacted differently to dividend changes than companies with less than median number of owners.

The illiquidity of stocks is measured by the number of times in the previous 48 months where no share price has been reported and hence no trade has taken place. As can be seen from Table 6, illiquid stocks react substantially more to dividend increases and omissions than do liquid stocks. However, in both of these cases, the difference in

means is not statistically different from zero, suggesting that there is not much support for the liquidity explanation.

The regression results in Table 7 confirm the findings of the above univariate analysis. First, the negative sign on the age coefficient suggests that investors respond more to dividend changes by younger firms. Second, the coefficient on the proxy for the market-to-book ratio [*Price(t-1) / Paidup(t-1)*] is significant and negative. Both of these findings are evidence against the agency explanation. Third, the illiquidity coefficient is not statistically significant in any of the specifications.

The coefficient on the variable which captures the size of the dividend change (ΔDiv(t)/Price(t-1)) is positive and significant in most specifications in Table 7. This is consistent with the information communication hypothesis as the larger the dividend change, the larger the message which is being communicated to the market.

As firms subject to a compulsory audit should have fewer agency conflicts, we create a binary variable which captures whether or not a company was subject to a compulsory audit.[19] The coefficient on this variable in Table 7 is positive and statistically significant, suggesting that investors in companies subject to compulsory audits reacted more to dividend changes in such companies, which is evidence against the agency explanation for dividends.

As competition can ameliorate agency problems, we create a variable which attempts to capture whether or not the firm is in a competitive industry. As information does not exist which permits us to calculate concentration ratios, we simply use whether or not a company is a utility as a rough proxy for the competitiveness of the industry.

[19] This was determined by the legislation under which a company was incorporated.

Although the coefficient on the utilities binary variable in Table 7 is positive, it is only statistically significant at the 10% level.

Using data on the amount of stock an individual had to own before they could become a company director, we test whether or not dividends were less valuable to investors in companies which had higher share managerial stock ownership qualifications, and hence less of an agency problem. We located such data for 49 companies in our sample from the second annual (1883) edition of *Burdett's Official Intelligence*. As these qualifications were included in a company's founding constitution and were rarely if ever changed, we can be confident that the qualifications in 1883 applied pre-1870. As can be seen from Table 7, the coefficient on this variable suggests that the level of stock ownership qualification for directors does not affect the value investors place upon dividends, which goes against the agency explanation.

Our first proxy for ownership diffuseness is voting rights afforded shareholders in these early companies. There was a wide spectrum of voting schemes amongst companies in this market; some had one-share-one-vote rules, others had x-shares-one-vote rules, others had graduated voting scales (e.g. 5-10 shares = 1 vote; 10-25 = 2 votes; 25-50 shares = 3 votes; etc.), and many placed an upper limit placed on the number of votes exercised by one shareholder (Campbell and Turner 2010). We located voting schemes for 48 companies in our sample from the 1883 edition of *Burdett's Official Intelligence*; these schemes were included in a company's founding constitution. As graduated voting and upper limits on the number of votes favors diffuse ownership, we created a variable to see whether this proxy for ownership diffuseness affected the price impact of dividend announcements. As can be seen from Table 9, the coefficient on this

variable suggests that this proxy has no impact on the reaction of investors to dividend announcements.

Our second proxy for diffuse ownership is the nominal value of a stock. Jefferys (1946) suggests that high share denominations in the nineteenth-century market were an indicator that ownership was limited to a select and small band of stockholders. Consequently, the lower the nominal value of a stock, the more diffuse the ownership of the company. Notably, the negative and significant coefficient on the nominal value variable suggests that the greater the diffuseness of ownership, the smaller the reaction of investors to dividend announcements.

Specification 8 in Table 7 considers how the various proxies for agency costs and diffuse ownership jointly affect investor reactions to dividend announcements. The coefficient on the director's qualification variable suggests that the higher the director's qualification, the larger the reaction to dividend announcements. The coefficient on the compulsory audit variable suggests that investors in firms subject to a compulsory audit reacted more to dividend announcements. Both of these findings are contrary to the agency-cost explanation for dividends.

We perform a robustness check on the above results by focusing on banks and railways. The reasons for focusing on these two sectors are threefold: (a) banks and railways are the two largest sectors in the market at this time, (b) they had the greatest diffusion of ownership, and (c) we have data on the number of owners of banks and railways. The results in Table 8 are similar to those in Table 7 with just two noteworthy findings. First, the coefficient on the illiquidity variable is positive and significant, suggesting that banks and railways with more illiquid stock react more to dividend

announcements. Second, the coefficient on the number of partners' variable suggests that that there is no relationship between this proxy for ownership diffusion and investor reactions to dividend announcements.

7. Market conditions and dividends

In this section we test behavioral explanations of dividends by ascertaining whether or not prevailing market conditions affected the risk-adjusted return on dividend-paying stocks and whether or not investors reacted differently to dividend announcements in declining markets. If prevailing market conditions mattered, then this may suggest a behavioral explanation for dividends. We also look at whether or not managers catered to shareholder sentiment for dividends-paying stocks.

For the sake of robustness, we have two definitions of advancing and declining markets. Using the monthly index of market-capitalization-weighted capital appreciation for all stocks on the London market developed by Acheson *et al.* (2009), we define an advancing month as a month where the average excess return on the stock index (i.e. the return over and above the proxy for the risk-free rate) over the previous 6 (or 12) months is ≥ 0 and a declining month is when the average excess return on the stock index over the previous 6 (or 12) months < 0.

Table 9 reports both the returns and the risk-adjusted returns for the dividend-paying and the non-paying portfolios in the different market conditions. In general, the results suggest that investors prefer dividend-paying stocks in both the declining and advancing markets. However, there is little evidence which suggests that the magnitude of this preference differs under different market conditions. For example, after we

control for risk, the returns between the paying and the non-paying portfolios in the declining markets are never statistically significant different from those in the advancing markets.

We also investigate whether investors react more to announcements of dividend changes in declining markets than they do in advancing markets. Using our two definitions of advancing and declining markets, we can see from Table 10 that the ACARs associated with the various dividend announcements do not appear to be affected by prevailing market conditions, no matter what definition of market conditions we use. This further suggests that investors react symmetrically to dividend increases and decreases across all market conditions.

To test the catering theory of dividends, we firstly calculate the premium due to uninformed demand for dividend-paying stocks. This premium is calculated by taking the difference in the logs of the average price/par ratios of payers and non-payers in each year. The average price/par ratio is either equally weighted or weighted by the paid-up value of the firm's stock. The price/par ratio was commonly used by investors at the time to compare the performance of stocks, and can be considered analogous to the market-to-book ratio. As can be seen from Figure 1, the dividend premium is always positive in our sample period.

To test whether managers cater to investors and respond to this dividend premium, we regress the dividend premium in year t-1 on (a) the initiation rate in year t i.e., the percentage of prior non-payers who become payers; (b) the percentage of prior payers that continue paying in year t; (c) the fraction of newly-listed stocks that pay dividends in year t. The results in Table 11 suggest that the dividend premium has little

impact on the initiation rate, although there appears to be a negative relationship between the value-weighted dividend premium and the initiation rate, which runs contrary to the catering explanation. In addition, very little of the time-series variation in the initiation rate is explained by the dividend premium. As can be seen from Table 11, the effect of the dividend premium on rate of continuation and the rate at which new lists are payers is negligible. Although the equally-weighted dividend premium is positive in specification 5, it is only significant at the 10% level. Overall, Table 11 provides little support for a catering explanation of why firms paid dividends in nineteenth-century Britain.

8. Conclusions

The main findings of this paper are fivefold. First, our evidence suggests that investors had a preference for dividend-paying stocks and placed a premium on such stocks. Second, the evidence suggests that dividends in this early capital market were not paid because of illiquidity. One possible reason for this finding is that investors in this early market invested for the long-term and liquidity considerations were very much second order. Third, we find no evidence that investors preferred dividends for behavioral reasons. Fourth, even though agency problems may have been endemic in early capital markets, we find no evidence to support the view that dividends were paid to ameliorate agency conflicts. Fifth, our evidence provides support for the view that dividends in this early capital market were valued by investors because they communicated important information in an era when financial reporting and regulation thereof was embryonic.

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Table 1. Characteristics and Returns for Dividend-Paying and Non-Paying Stocks

t-statistics are reported in parentheses. ***, ** and * indicate significance at 1%, 5% and 10% levels respectively. *Size* is measured by the market capitalization of the stocks. *Age* is calculated as the number of years from a company's formation. *Dividend/par* is the percentage of the stock's dividend relative to its paid-up value, and was the conventional way of reporting dividends at the time. *Paid-up/nominal* measures the proportion of the stock's nominal value that has been called up. *Beta* is calculated using the portfolios' excess capital gain relative to the market's excess capital gain, and the thin trading problem is corrected using the method of Dimson (1979). The returns for portfolios are total returns and are equally weighted. The CAPM risk-adjusted returns are calculated as the portfolio's return in excess of that justified by the portfolio's loading on the market excess return. The Fama and French (1993) three-factor model-adjusted returns are calculated as the portfolio's return in excess of that justified by the portfolio's loadings on the market excess return, SMB factor and HML factor. The SMB and HML factors are constructed following Fama and French (1993). Due to no information on the book-to-market ratio being available, we use the dividend yield to proxy the book-to-market ratio when constructing the HML factor (Grossman and Shore 2006). Zero dividend stocks are excluded when constructing the HML factor.

	Dividend -paying portfolio	Non-dividend-paying portfolio	Difference
PANEL A: Summary statistics			
Average number of stocks in portfolio	173	50	
Size (£)	659,118	203,009	
Age (years)	12.24	5.72	
Dividend / par (%)	9.01	0.00	
Paid-up / nominal	0.75	0.69	
Dividend yield (%)	0.50	0.00	
Proportion of partially- paid stocks	0.40	0.50	
Proportion of extended-liability stocks	0.26	0.12	
Beta	0.57	1.65	
PANEL B: Returns for paying and non-paying stocks (%)			
1825-1870 (548 months)	0.64	0.23	0.41
	(11.77)***	(1.53)	(3.29)***
1825-1847 (272 months)	0.45	0.02	0.43
	(9.09)***	(0.08)	(2.36)**
1848-1870 (276 months)	0.83	0.43	0.40
	(8.71)***	(1.99)*	(2.28)**
PANEL C: CAPM-adjusted returns for paying and non-paying stocks (%)			
1825-1870 (548 months)	0.33	-0.66	0.99
	(9.80)***	(-7.49)***	(9.86)***
1825-1847 (272 months)	0.32	-0.36	0.68
	(6.02)***	(-3.94)***	(6.09)***
1848-1870 (276 months)	0.35	-0.94	1.29
	(8.07)***	(-6.45)***	(7.88)***
PANEL D: Fama and French (1993) three-factor model-adjusted returns for paying and non-paying stocks (%)			
1825-1870 (548 months)	0.32	-0.51	0.83
	(9.81)***	(-5.52)***	(8.20)***
1825-1847 (272 months)	0.29	-0.28	0.57
	(5.79)***	(-2.89)***	(5.07)***
1848-1870 (276 months)	0.36	-0.72	1.08
	(8.23)***	(-4.73)***	(6.54)***
PANEL E: Robustness checks - 1825-1870 (%)			
Excluding railways	0.60	0.12	0.49
	(15.11)***	(0.85)	(3.82)***
Excluding financials	0.62	0.13	0.49
	(9.96)***	(0.87)	(3.67)***
Excluding partially-paid stocks	0.48	-0.07	0.55
	(10.30)***	(-0.51)	(4.41)***

Table 2. Annual Proportion of Companies Changing Their Dividend Policy, 1825-70

*** indicates significance at 1% level. An omission is where the stock paid a dividend in the previous year, but ceased paying in the present year. A commencement is where the stock paid a dividend in the previous year, but ceased paying in the present year. An increase (decrease) of dividend is classified as such if the dividend in the present year is greater (less) than the dividend paid in the previous year. Unchanged is where the dividend policy has not changed between the current and previous year.

	Omission (%)	Commencement (%)	Increase (%)	Decrease (%)	Unchanged (%)
1825	0.00	0.70	6.99	0.70	91.61
1826	1.39	4.17	5.56	4.17	84.72
1827	1.36	7.48	10.88	17.01	63.27
1828	2.07	5.52	8.28	8.97	75.17
1829	2.14	4.29	15.00	5.00	73.57
1830	0.71	2.14	10.00	10.00	77.14
1831	0.71	2.86	7.86	7.86	80.71
1832	0.00	1.42	2.13	3.55	92.91
1833	0.68	2.04	8.16	7.48	81.63
1834	2.58	1.94	10.32	6.45	78.71
1835	0.53	2.12	5.82	1.59	89.95
1836	1.93	3.86	16.91	3.86	73.43
1837	0.00	2.03	5.08	2.03	90.86
1838	0.00	1.53	10.20	1.02	87.24
1839	2.55	2.55	12.76	3.06	79.08
1840	0.52	5.76	15.18	6.28	72.25
1841	1.55	5.15	17.53	9.28	66.49
1842	0.55	11.48	15.30	10.93	61.75
1843	2.23	3.35	12.85	12.29	69.27
1844	2.14	2.67	11.23	7.49	76.47
1845	1.90	3.33	8.10	4.76	81.90
1846	2.51	3.02	9.05	2.01	83.42
1847	0.45	26.79	5.80	7.59	59.38
1848	2.54	6.78	24.58	13.14	52.97
1849	7.34	5.50	17.89	16.06	53.21
1850	7.61	2.17	8.15	30.43	51.63
1851	5.41	3.24	11.35	9.19	70.81
1852	1.48	3.94	13.79	3.94	76.85
1853	2.25	5.86	16.22	7.66	68.02
1854	0.92	5.07	17.05	5.07	71.89
1855	4.06	6.09	19.29	16.24	54.31
1856	3.00	5.50	21.00	9.00	61.50
1857	0.92	5.50	20.64	10.09	62.84
1858	4.29	2.38	13.81	14.29	65.24
1859	1.94	2.91	16.99	9.22	68.93
1860	1.94	5.83	28.16	12.14	51.94
1861	0.48	3.37	19.71	12.50	63.94
1862	0.90	5.83	18.39	10.76	64.13
1863	2.43	5.26	20.65	4.86	66.80
1864	0.37	12.82	34.80	7.33	44.69
1865	1.76	7.04	22.89	11.27	57.04
1866	2.66	1.90	17.11	12.93	65.40
1867	3.20	4.00	8.80	25.60	58.40
1868	3.98	2.39	17.93	23.90	51.79
1869	3.56	1.58	21.34	10.28	63.24
1870	2.07	3.32	23.24	11.20	60.17
Mean 1825-70	2.04	4.66	14.45	9.36	69.49
Mean 1825-47	1.24	4.62	10.04	6.23	77.87
Mean 1848-70	2.83	4.71	18.86	12.48	61.12
t-stat of diff. in means	(-3.54)***	(-0.07)	(-5.88)***	(-3.90)***	(6.44)***

Table 3. Frequency of Dividend Changes

Infrequent changes are companies that changed their dividends at least once during the sample period and the average time period between changes was at least 6 years.

	All companies	Excluding insurance companies	Excluding bridges, canals, and insurance companies
PANEL A: 1825-1870			
At least once every 2 yrs	34.61%	38.87%	51.38%
At least once every 2-4 yrs	26.22%	27.94%	24.31%
At least once every 4-6 yrs	12.62%	11.74%	8.29%
Infrequent changes	16.07%	10.53%	9.39%
Never changed	10.48%	10.92%	6.63%
N	286	247	181
Median yrs between dividend changes	3.02	2.27	1.87
Mean yrs between dividend changes	4.23	3.35	2.91
PANEL B: 1825-1847			
At least once every 2 yrs	15.96%	18.89%	20.87%
At least once every 2-4 yrs	24.88%	26.11%	26.96%
At least once every 4-6 yrs	18.78%	19.44%	16.52%
Infrequent changes	21.13%	15.56%	17.39%
Never changed	19.25%	20.00%	18.26%
N	213	180	115
Median yrs between dividend changes	3.94	3.79	3.58
Mean yrs between dividend changes	5.61	4.84	5.05
PANEL C: 1848-1870			
At least once every 2 yrs	45.10%	51.45%	60.71%
At least once every 2-4 yrs	23.04%	21.39%	22.86%
At least once every 4-6 yrs	8.82%	9.25%	7.14%
Infrequent changes	11.76%	9.83%	4.29%
Never changed	11.27%	8.09%	5.00%
N	204	173	140
Median yrs between dividend changes	1.98	1.79	1.44
Mean yrs between dividend changes	3.54	3.00	2.24

Table 4. Summary Statistics for Frequent Dividend Changers

*** indicates significance at 1% level. Frequent changers are the 99 companies which changed their dividend at least once every two years on average. Number of increases followed by an increase or unchanged includes companies which increased or maintained their dividend after a commencement. Number of increases followed by a decrease includes companies which decreased their dividend after a commencement and it also includes companies which omitted their dividend after having increased it.

	Mean	Standard deviation	Maximum	Minimum
Age (yrs)	20.03	8.29	45.83	10.00
Number of increases	7.40	4.10	20.00	0.00
Number of decreases	5.93	3.87	18.00	0.00
Number of increases followed by an increase or unchanged	5.79	3.13	14.00	0.00
Number of increases followed by a decrease	2.34	2.25	10.00	0.50
		t-stat of diff. in means		
Number of increases vs. Number of decreases		3.94***		
Number of increases followed by an increase or unchanged vs. Number of increases followed by a decrease		9.75***		

Table 5. Average Cumulative Abnormal Returns Associated With Dividend Announcements

The ACARs are calculated using the market model and value-weighted returns. ***, ** and * indicate significance at 1%, 5% and 10% levels respectively. Dividend announcements are classified as an increase, commencement, decrease, omission or unchanged. An increase (decrease) of dividend is classified as such if the announced dividend is greater (less) than the dividend paid in last announcement. To account for the size of the changes in dividend, we also look at increases (decreases) greater than 20%. A commencement announcement is when a company initiates a dividend payment and an omission announcement is when a dividend payer omits dividend payment. A dividend is unchanged whenever a dividend is maintained at the same rate. Unchanged following an increase (decrease) is whenever a dividend is maintained at the same rate having been preceded by a dividend increase (decrease). A series of unchanged announcements preceded by an increase (decrease) is where there are a series (i.e. more than one) of unchanged announcements which were preceded by a dividend increase (decrease).

Announcement	Observations	Event window (-1,+1)			Event window (-2,+2)			Event window (0,+1)		
		mean	*t*-stat	Wilcoxon Signed Rank Test	mean	*t*-stat	Wilcoxon Signed Rank Test	mean	*t*-stat	Wilcoxon Signed Rank Test
Increase	609	0.0086	2.26**	1.41	0.0145	2.94***	2.90***	-0.0012	-0.37	-1.26
Decrease	412	-0.0312	-7.48***	-7.75***	-0.0392	-7.04***	-7.33***	-0.0291	-7.54***	-7.72***
Increase(≥20%)	369	0.0177	3.24***	2.30**	0.0311	4.63***	4.25***	0.0025	0.55	-0.18
Decrease(≤-20%)	246	-0.0396	-6.60***	-6.85***	-0.0491	-6.33***	-6.49***	-0.0366	-6.66***	-6.60***
Commencement	58	0.0527	2.43**	2.05**	0.0630	2.17**	1.71*	0.0322	1.67*	1.36
Omission	39	-0.0824	-2.37**	-1.88*	-0.0914	-2.51**	-2.28**	-0.0337	-0.99	-0.88
Unchanged	2,339	-0.0034	-1.83*	-3.58***	-0.0044	-1.96*	-3.78***	-0.0062	-4.01***	-6.70***
Unchanged following an increase	309	-0.0018	-0.34	-0.91	0.0012	0.16	-0.85	-0.0040	-0.85	-1.85*
Unchanged following a decrease	195	0.0019	0.25	0.46	-0.0021	-0.24	-0.35	-0.0074	-1.25	-0.40
A series of unchanged announcements preceded by an increase	1,336	-0.0065	-3.16***	-4.66***	-0.0094	-3.52***	-5.17***	-0.0093	-5.41***	-7.37***
A series of unchanged announcements preceded by a decrease	709	-0.0012	-0.31	-0.50	0.0018	0.41	-0.18	-0.0053	-1.66*	-2.49**

Table 6. Average Cumulative Abnormal Returns by Firm Characteristics

The ACARs are calculated using the market model and value-weighted returns from the 3-month event window [-1,+1]. *t*-statistics are reported in parentheses. ***, ** and * indicate significance at 1%, 5% and 10% levels respectively. *Age* is calculated as the number of years from a company's formation. *Illiquidity* is measured by the percentage of times no share price was reported in the previous 48 months. An increase (decrease) of dividend is classified as such if the announced dividend is greater (less) than the dividend paid in last announcement. A commencement announcement is when a company initiates a dividend payment and an omission announcement is when a dividend payer omits dividend payment. The number of owners is only available for banks and railways, with the former obtained from various issues of the *Bankers' Almanac and Yearbook* and latter obtained from Parliamentary Papers (1856). The median number of owners of these two industries was 1,364. An increase (decrease) of dividend is classified as such if the announced dividend is greater (less) than the dividend paid in last announcement.

	Increase	Decrease	Commencement	Omission
PANEL A				
Age ≥ median	0.0039	-0.0311	0.0707	-0.0868
	(0.74)	(-6.40)***	(1.18)	(-1.46)
Observations	298	232	14	16
Age < median	0.0131	-0.0313	0.0470	-0.0793
	(2.40)**	(-4.34)***	(2.16)**	(-1.83)*
Observations	311	180	44	23
t-stat of diff. in means	(1.20)	(-0.03)	(-0.46)	(0.11)
PANEL B				
Illiquidity ≥ median	0.0120	-0.0323	0.0421	-0.1186
	(2.21)**	(-5.44)***	(1.35)	(2.36)**
Observations	325	211	33	23
Illiquidity < median	0.0012	-0.0304	0.0616	-0.0303
	(0.22)	(-5.06)***	(2.09)**	(-0.71)
Observations	272	196	21	16
t-stat of diff. in means	(-1.43)	(0.23)	(0.43)	(1.26)
PANEL C				
Number of owners ≥ median	0.0030	-0.0259	0.0749	-0.0357
	(0.66)	(-5.15)***	(2.15)**	(-0.74)
Observations	259	193	17	11
Number of owners < median	0.0115	-0.0408	0.0748	0.0334
	(1.30)	(-4.07)***	(1.43)	(0.51)
Observations	140	79	10	6
t-stat of diff. in means	(0.95)	(-1.47)	(-0.002)	(0.85)
PANEL D				
Price/Paid-up Ratio ≥ median	0.0036	-0.0395	-0.0052	-0.0993
	(0.62)	(-7.46)***	(-0.10)	(-2.30)**
Observations	289	183	9	5
Price/Paid-up Ratio < median	0.0132	-0.0246	0.0634	-0.0799
	(2.60)**	(-3.98)***	(2.66)***	(-2.02)**
Observations	320	229	49	34
t-stat of diff. in mean	(1.26)	(1.77)	(1.15)	(0.18)

Table 7. Cross-sectional Analysis of Market Reaction to Dividend Announcements

The dependent variable is the cumulative abnormal return (in percentage terms) from one month before to one month after an announcement of a dividend increase, decrease, commencement or omission. *t*-statistics are reported in parentheses. ***, ** and * indicate significance at 1%, 5% and 10% levels respectively. *Age* is calculated as the number of years from a company's formation. *Size* is the natural logarithm of a company's market capitalization. *Illiquidity* is measured by the percentage of times no share price was reported in the previous 48 months. *Unlimited liability* is a binary variable which equals 1 if a company has unlimited liability, 0 otherwise. *Unpaid capital* is a binary variable which equals 1 if a company has unpaid capital (i.e. the par value of the shares is less than the nominal value), 0 otherwise. *Dividend yield* is the dividend payment divided by the share price at the end of the previous year times 100. *Utilities* is a binary variable equal to 1 for companies which are in industries characterized by natural monopoly (i.e. bridges; gas light and coke industry; waterworks), 0 otherwise. *Director's qualification* is the proportion of par value which had to be owned by an individual in order to qualify as a director. *Vote diffuse* equals 2 if voting mechanisms strongly encourage diffuse ownership, 1 if voting mechanisms encourage diffuse ownership, and 0 if voting mechanisms encourage more concentrated ownership. *Nominal value* is the natural logarithm of a stock's nominal value. *Compulsory audit* is a binary variable which equals 1 if a company was subject to a compulsory audit, 0 otherwise. *Price(t-1)/Paidup(t-1)* is calculated as the price of stock in the month prior to announcement divided by paid-up capital ratio in the month prior to announcement. Δ*Div(t)/Price(t-1)* is change in dividend (in £) divided by stock price in the month prior to the announcement.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age	-0.047	-0.048	-0.056	-0.047	-0.053	-0.045	-0.028	-0.018
	(-2.05)**	(-2.10)**	(-1.93)*	(-1.76)*	(-2.30)**	(-2.00)**	(-1.20)	(-0.58)
Size	0.022	0.111	0.175	0.031	-0.346	-0.288	0.366	0.598
	(0.07)	(0.32)	(0.57)	(0.10)	(-1.01)	(-0.97)	(1.04)	(-1.30)
Illiquidity	2.569	2.119	3.573	2.014	2.146	2.211	3.273	4.54
	(1.00)	(0.82)	(1.32)	(0.69)	(0.84)	(0.88)	(1.28)	(1.55)
Unlimited liability dummy	-1.548	-1.472	-1.73	-1.785	-1.244	0.349	0.409	2.903
	(-1.99)**	(-1.88)*	(-1.86)*	(-1.68)*	(-1.55)	(0.31)	(0.41)	(1.95)*
Unpaid capital dummy	0.328	0.431	0.967	0.883	0.195	1.248	1.335	3.944
	(0.41)	(0.53)	(1.07)	(1.00)	(0.24)	(1.35)	(1.52)	(3.62)***
Dividend yield	-0.289	-0.261	-0.605	0.503	-0.128	0.036	-0.222	1.925
	(-0.23)	(-0.20)	(-0.28)	(0.23)	(-0.10)	-0.03	(-0.18)	(0.90)
ΔDiv(t)/Price(t-1)	0.252	0.253	0.084	0.086	0.261	0.264	0.261	0.11
	(2.10)**	(2.11)**	(0.40)	(0.41)	(2.24)**	(2.25)**	(2.18)**	(0.52)
Utilities		2.100						4.094
		(1.75)*						(1.08)
Director's qualification			0.010					0.016
			(1.58)					(2.32)**
Vote diffuse				-0.13				-0.062
				(-0.19)				(-0.09)
Nominal value					1.101			-0.081
					(1.89)*			(-0.11)
Compulsory audit						3.058		3.085
						(2.44)**		(2.24)**
Price(t-1)/Paidup(t-1)							-1.865	-3.049
							(-2.95)***	(-4.68)***
Constant	0.003	-1.348	-2.358	-0.464	0.737	1.638	-3.677	-10.298
	0.00	(-0.26)	(-0.50)	(-0.10)	(0.15)	(0.35)	(-0.71)	(-2.02)**
Observations	1,097	1,097	636	603	1,097	1,097	1,097	590
R^2	0.04	0.04	0.03	0.02	0.05	0.05	0.05	0.07

Table 8. Cross-sectional Analysis of Market Reaction to Dividend Announcements by Banks and Railways

The dependent variable is the cumulative abnormal return (in percentage terms) from one month before to one month after an announcement of a dividend increase or decrease. *t*-statistics are reported in parentheses. ***, ** and * indicate significance at 1%, 5% and 10% levels respectively. *Age* is calculated as the number of years from a company's formation. *Size* is the natural logarithm of a company's market capitalization. *Illiquidity* is measured by the percentage of times no share price was reported in the previous 48 months. *Unlimited liability* is a binary variable which equals 1 if a company has unlimited liability, 0 otherwise. *Unpaid capital* is a binary variable which equals 1 if a company has unpaid capital (i.e. the par value of the shares is less than the nominal value), 0 otherwise. *Dividend yield* is the dividend payment divided by the share price at the end of the previous year times 100. *Railways* is a binary variable which equals 1 if a company is a railway, 0 otherwise. *Director's qualification* is the proportion of par value which had to be owned by an individual in order to qualify as a director. *Vote diffuse* equals 2 if voting mechanisms strongly encourage diffuse ownership, 1 if voting mechanisms encourage diffuse ownership, and 0 if voting mechanisms encourage more concentrated ownership. *Nominal value* is the natural logarithm of a stock's nominal value. *Compulsory audit* is a binary variable which equals 1 if a company was subject to a compulsory audit, 0 otherwise. *Owners* is the natural logarithm of the number of bank or railway shareholders. *Price(t-1)/Paidup(t-1)* is calculated as the price of stock in the month prior to announcement divided by paid-up capital ratio in the month prior to announcement. Δ*Div(t)/Price(t-1)* is change in dividend (in £) divided by stock price in the month prior to the announcement.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Age	0.036	0.039	-0.013	-0.006	-0.004	0.043	0.045	0.050
	(0.72)	(0.68)	(-0.29)	(-0.14)	(-0.10)	-0.93	(0.69)	(0.76)
Size	-1.001	-0.794	-0.738	-0.576	-0.761	-0.126	1.278	0.561
	(-1.83)*	(-1.34)	(-2.04)**	(-1.67)*	(-1.08)	(-0.30)	(1.39)	(0.86)
Illiquidity	8.196	8.486	6.200	6.203	5.896	7.162	5.713	8.924
	(2.86)***	(2.40)**	(1.43)	(1.47)	(1.44)	(1.74)*	(2.19)**	(2.56)**
Unlimited liability dummy	-1.008	-1.047	-0.586	-1.425	-1.493	0.726	1.913	2.354
	(-0.35)	(-0.33)	(-0.28)	(-0.68)	(-0.63)	(0.33)	(0.73)	(0.62)
Unpaid capital dummy	0.475	0.472	0.097	0.654	0.536	1.719	1.696	0.973
	(0.39)	(0.38)	(0.09)	(0.64)	(0.47)	(1.50)	(0.90)	(0.54)
Dividend yield	-2.949	-2.292	-2.978	-3.545	-3.955	-3.004	-0.803	0.721
	(-0.89)	(-0.69)	(-1.26)	(-1.51)	(-1.70)*	(-1.27)	(-0.23)	(0.22)
Railways	2.236	1.855	0.480	-2.043	0.293	0.534		-5.056
	(0.64)	(0.48)	(0.22)	(-0.43)	(0.13)	(0.24)		(-0.78)
ΔDiv(t)/Price(t-1)	0.573	0.535	0.497	0.507	0.521	0.535	0.590	0.576
	(2.82)***	(2.55)**	(2.19)**	(2.25)**	(2.28)**	(2.39)**	(2.86)***	(2.87)***
Director's qualification	0.009						0.02	0.021
	(0.88)						(1.81)*	(1.97)**
Vote diffuse		0.209					0.839	0.394
		(0.28)					(0.99)	(0.48)
Nominal value			1.387				2.555	2.907
			(1.53)				(1.51)	(1.71)*
Compulsory audit				2.646				3.57
				(0.64)				(0.79)
Log(No. of partners)					0.273		-1.389	
					(0.34)		(-1.74)*	
Price(t-1)/Paidup(t-1)						-1.966	-3.220	-3.337
						(-2.39)**	(-3.80)***	(-3.95)***
Constant	13.124	9.887	5.198	8.894	9.901	2.908	-18.587	-19.892
	(1.82)*	(1.30)	(0.92)	(1.67)*	(1.67)*	(0.46)	(-1.60)	(-1.87)*
Observations	482	436	729	729	707	707	414	436
R^2	0.07	0.06	0.06	0.06	0.06	0.07	0.12	0.11

Table 9. Returns on Paying and Non-Paying Stocks by Market Condition

t-statistics are reported in parentheses. ***, ** and * indicate significance at 1%, 5% and 10% levels respectively. The returns for portfolios are equally weighted. The CAPM risk-adjusted returns are calculated as the portfolio's return in excess of that justified by the portfolio's loading on the market excess return. The Fama and French (1993) three-factor model-adjusted returns are calculated as the portfolio's return in excess of that justified by the portfolio's loadings on the market excess return, SMB factor and HML factor. The SMB and HML factors are constructed following Fama and French (1993). Due to no information on the book-to-market ratio being available, the dividend yield is used to proxy the book-to-market ratio when constructing the HML factor (Grossman and Shore 2006). Zero dividend stocks are excluded when constructing the HML factor. The excess return on the market is the monthly market-capitalization-weighted capital appreciation for the London market minus the proxy for the risk-free rate.

	Dividend-paying portfolio	Non-dividend-paying portfolio	Differential returns
PANEL A: Returns for paying and non-paying stocks (%)			
Mean excess return on market over previous 12 months< 0 (100 months)	0.47	-0.17	0.64
	(2.46)**	(-0.61)	(3.14)***
Mean excess return on market over previous 12 months ≥ 0 (437 months)	0.70	0.44	0.27
	(13.78)***	(2.62)**	(1.83)*
Difference of differences			0.37
			(1.49)
Mean excess return on market over previous 6 months< 0 (140 months)	0.21	-0.61	0.82
	(1.41)	(-2.05)	(3.32)***
Mean excess return on market over previous 6 months ≥ 0 (403 months)	0.79	0.57	0.22
	(15.64)***	(3.44)***	(1.56)
Difference of differences			0.60
			(1.86)*
PANEL B: CAPM-adjusted returns for paying and non-paying stocks (%)			
Mean excess return on market over previous 12 months< 0 (100 months)	0.26	-0.77	1.03
	(3.29)***	(-2.91)***	(3.34)***
Mean excess return on market over previous 12 months ≥ 0 (437 months)	0.35	-0.63	0.98
	(9.28)***	(-7.04)***	(9.62)***
Difference of differences			0.05
			(0.16)
Mean excess return on market over previous 6 months< 0 (140 months)	0.22	-0.68	0.80
	(3.01)***	(-7.37)***	(3.17)***
Mean excess return on market over previous 6 months ≥ 0 (403 months)	0.37	-0.58	1.05
	(9.80)***	(-2.73)***	(10.20)***
Difference of differences			-0.25
			(-0.93)
PANEL C: Fama and French (1993) three-factor model-adjusted returns for paying and non-paying stocks (%)			
Mean excess return on market over previous 12 months< 0 (100 months)	0.22	-0.61	0.84
	(3.23)***	(-2.27)**	(2.79)***
Mean excess return on market over previous 12 months ≥ 0 (437 months)	0.35	-0.48	0.83
	(9.30)***	(-5.11)***	(7.97)***
Difference of differences			0.01
			(0.03)
Mean excess return on market over previous 6 months< 0 (140 months)	0.22	-0.42	0.64
	(3.27)***	(-1.88)*	(2.53)**
Mean excess return on market over previous 6 months ≥ 0 (403 months)	0.36	-0.54	0.89
	(9.52)***	(-5.53)***	(8.54)***
Difference of differences			-0.25
			(-0.93)

Table 10. Average Cumulative Abnormal Returns by Market Condition

The ACARs are calculated using the market model and value-weighted returns from the 3-month event window [-1,+1]. *t*-statistics are reported in parentheses. ***, ** and * indicate significance at 1%, 5% and 10% levels respectively. An increase (decrease) of dividend is classified as such if the announced dividend is greater (less) than the dividend paid in last announcement. A commencement announcement is the time a company initiates a dividend payment and an omission announcement is when a dividend payer omits dividend payment. A dividend is unchanged whenever a dividend is maintained at the same rate. The excess return on the market is the monthly market-capitalization-weighted capital appreciation for all stocks on the London market (from Acheson *et al.* 2009) minus the risk-free rate, which is proxied by the yield on 3% Consols (government debt perpetuities), calculated from hand-collected data from the Course of the Exchange.

	Increase	Decrease	Commencement	Omission	Unchanged
PANEL A					
Mean excess return on market over previous 6 months ≥ 0	0.0094	-0.0324	0.0451	-0.0865	-0.0033
	(2.27)**	(-6.97)***	(1.86)*	(-2.52)**	(-1.65)*
Observations	515	320	46	28	1,857
Mean excess return over previous 6 months < 0	0.0044	-0.0269	0.0822	-0.0719	-0.0036
	(0.45)	(-2.89)***	(1.66)	(-0.80)	(-0.81)
Observations	94	92	12	11	482
t-stat of diff. in means	(-0.47)	(0.55)	(0.69)	(0.19)	(-0.06)
PANEL B					
Mean excess return on market over previous 12 months ≥ 0	0.0064	-0.0288	0.0395	-0.0932	-0.0040
	(1.58)	(-6.19)***	(1.69)*	(-2.79)***	(-2.04)**
Observations	526	340	47	30	1,961
Average excess return over previous 12 months < 0	0.0223	-0.0428	0.1095	-0.0465	-0.0001
	(2.07)**	(-4.60)***	(2.01)**	(-0.44)	(-0.02)
Observations	83	72	11	9	378
t-stat of diff. in means	(1.43)	(-1.28)	(1.27)	(0.56)	(0.78)

Table 11. The Relationship between Dividend Payment and Dividend Premium, 1826-1870

$EWDP_{t-1}$ is calculated by taking the difference in the logs of the equally-weighted average price/par ratios of payer and non-payers in each year. $VWDP_{t-1}$ is calculated by taking the difference in the logs of the value-weighted average price/par ratios of payer and non-payers in each year. These are the two dividend premium variables. $Initiate_t$, $Continue_t$, and $Listpay_t$. $Initiate_t$ is the percentage of prior non-payers that become payers in year t. $Continue_t$ is the percentage of prior payers that continue paying in year t. $Listpay_t$ is the fraction of newly-listed stocks that pay dividends in year t. As per Baker and Wurgler (2004), the independent variables are standardized to have unit variance. *t*-statistics, which are calculated using Newey-West standard errors, are reported in parentheses. ***, ** and * indicate significance at 1%, 5% and 10% levels respectively.

	$Initiate_t$		$Continue_t$		$Listpay_t$	
	(1)	(2)	(3)	(4)	(5)	(6)
$EWDP_{t-1}$	3.48		-0.34		6.62	
	(1.27)		(-1.29)		(1.75) *	
$VWDP_{t-1}$		-5.13		0.04		-0.22
		(-1.72) *		(0.12)		(-0.07)
Constant	22.17	22.09	97.46	97.45	45.39	45.54
	(6.90) ***	(6.68) ***	(267.02) ***	(259.46) ***	(13.50) ***	(11.06) ***
Observations	45	45	45	45	45	45
R^2	0.06	0.13	0.04	0.00	0.08	0.00

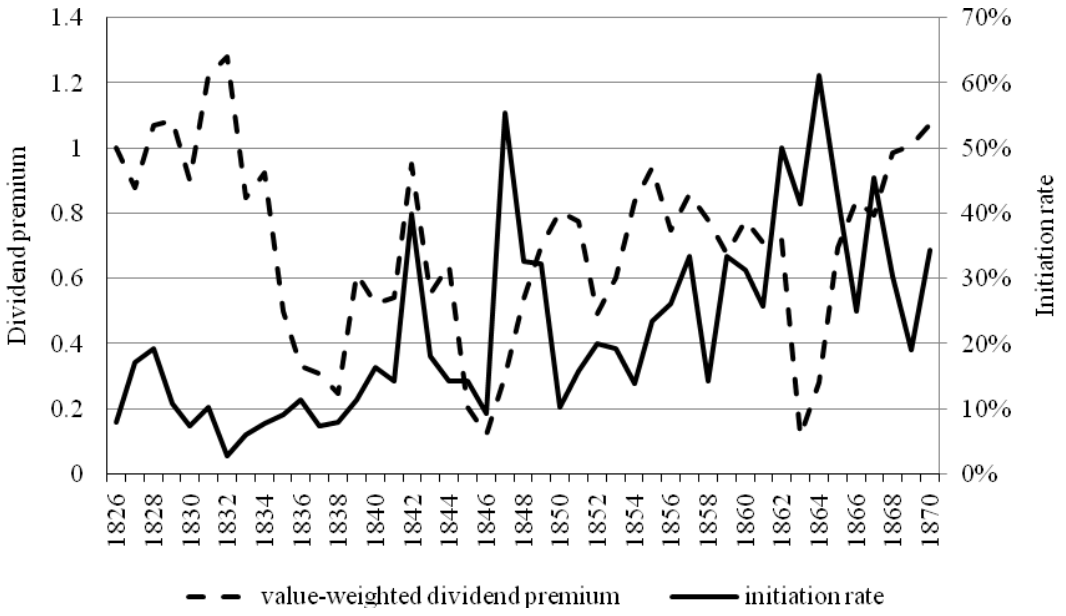

Figure 1. The Dividend Premium and the Initiation Rate, 1826-70

The value-weighted dividend premium is calculated by taking the difference in the logs of the value-weighted average price/par ratios of payer and non-payers in each year. The initiation rate is the percentage of prior non-payers that become payers in year t.