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Dividend Policies in an Unregulated Market: The London Stock Exchange 1895-1905*

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Abstract

We examine the effects of dividend policies on 469 British firms between 1895 and 1905. These firms operated in an environment of very low taxation and an absence of institutional constraints. We find strong support for asymmetric information/signaling theories of dividend policy, and little support for agency models. Our results suggest that dividends can signal information from managers to shareholders, even if dividend payments incur only very low taxes. However, taxes appear to be necessary to allow dividend policies to resolve agency problems between managers and investors.

Keywords: Dividend Policy, London Stock Exchange

JEL Classification Code: N23, G14, G35

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The theorem of Miller and Modigliani (1961) states that, if capital markets are perfect, a firm's decision of if, when, and how much of its cash should be disbursed to shareholders is irrelevant for the firm's value. In practice, the assumption of perfect capital markets does not hold and a firm's dividend policy is important.

Taxes are one of the main factors leading to the failure of the theorem. Taxes, for instance, increase the cost of dividend payments in many jurisdictions (including the U.S.), which tends to reduce firms' total payouts and induces managers to retain earnings and to use share repurchases (see Allen and Michaely (2002) and Chetty and Saez (2005)). Taxes also influence the importance of two competing (although not mutually exclusive) rationales for dividend payments, asymmetric information and agency issues. Signaling (asymmetric information) theories state that dividends are a costly signal available to managers to convey information about a firm's future prospects. By making dividends more expensive, taxes also make dividend payments more informative.

Agency theories suggest that managers could allocate resources to activities that benefit themselves, at the expense of shareholders. In situations where institutional investors are taxed less than individual investors, firms may pay dividends to attract more institutions, which have a relative advantage in monitoring firms, thus alleviating agency problems (see Allen et al. (2000) and Jensen (1986)).

Despite a large literature on the interaction of dividends and taxation, little is known about the relevance of taxes to determine the importance of signaling and agency based explanations. To better identify these channels we examine an extreme environment where taxes on dividends were almost absent and where each investor was taxed at the same rate: Britain before World War One. We use a data set of 469 British firms traded on the London Stock Exchange between 1895 and 1905. We document the impact of dividend announcements on security prices, we analyze which types of firms were more likely to pay dividends, and we study the role of taxes in determining the validity of the signaling versus the agency hypothesis.

Understanding the importance of taxes to each of the theories is important for two reasons. First, a better knowledge of the role of taxes will be helpful to understand if taxation only distorts firms' investment policies (for instance, by inducing managers to retain more earnings) or if taxes are a useful instrument to overcome market imperfections by mitigating agency problems (by attracting institutional shareholders with better abilities to monitor management). Second, a large number of finance studies have attempted to evaluate the validity of signaling theories versus agency theories as alternative explanations for dividend policies. If we understand the empirical relevance of taxation for each explanation that will help us to understand what the necessary conditions are to have each theory work, and under what circumstances one theory may dominate the other.

In an environment such as pre-World War One Britain, signaling theories (e.g. Bhattacharya (1979), John and Williams (1985), Bernheim (1991), and Bernheim and Wantz (1995)) predict that dividend changes contain little or no information. Agency theories (e.g. Allen et al., (2000)) would imply that companies where agency problems were more severe could not have used high dividend payments to attract institutional investors, at the expense of retail investors.

We find that dividends effectively signalled information to shareholders, which suggests that tax explanations are not needed for this channel to operate. An announcement of a dividend cut or a dividend omission was bad news for firms, it tended to generate a negative abnormal return of around 2.0% in the week of the announcement. The effects of cuts or omissions do not markedly differ between firms ranked by either age, Tobin's Q, or retained equity. Announcements of dividend increases or commencements generated positive abnormal returns of around 1.4% in the week of the announcement. These figures are similar to those reported in studies of environments with higher tax rates (e.g. Grullon et al., 2002). The effects of increases or commencements do not vary markedly between different types of firms. These results suggest that, although taxes were close to zero, dividend announcements conveyed private information held by firm insiders to shareholders, and support the asymmetric information theories of payout policy. In particular, we find that a firm's dividend policy conveyed information about the firm's future profitability and that dividend increases (decreases) were associated with increases (decreases) in earnings in the next financial year. This result is in line with the findings of Amihud and Murgia (1997), that dividend changes provide signals to investors even in environments where dividends are taxed more heavily than capital gains.

On the other hand, taxes appear to be important for agency theories: companies that faced more severe agency problems were no more likely to pay higher dividends. Higher dividends can only attract large, institutional investors, at the expense of retail investors, if those institutions are tax-advantaged. There were no tax advantages for institutions in our sample, therefore paying higher dividends would be ineffective in attracting those institutions. Although long-established firms (such as railways) paid out a higher proportion of their profits as dividends, company age and the ratio of retained earnings to nominal ordinary equity (both proxies of the maturity of the company) did not increase the likelihood that a firm would pay a dividend. We also find that the probability of paying a dividend decreased for firms with relatively few investment opportunities (measured by Tobin's Q). It is unlikely that the lack of correlation between company maturity and dividend payouts was driven by poor investor protection that led managers to act against shareholders' interests. We find that managers were concerned with agency issues, however they resolved them using alternative methods. Our results show that more mature companies had stronger restrictions on managers' discretionary borrowing powers (the power to borrow money without asking for the explicit consent of their shareholders) and they attracted institutions that would monitor their debt, not their equity, by establishing multiple bank relationships.

In other respects, the dividend policy of turn of the 20th century British firms is similar to contemporary firms. We find that British firms had similar payout ratios to contemporary firms: about 90% of earnings was disbursed to shareholders; moreover more profitable companies were more likely to pay a dividend.

In Section II we review the main theories of dividend policies. In Section III we overview the fiscal and legislative environment in Britain at the turn of the Twentieth Century. We present our main results in Section IV, examine unlisted companies in Section V, and conclude in Section VI.

I Theories of Dividend Payouts

Lintner (1956) was the first to systematically assess the dividend policies of corporations. His interviews with senior managers at 28 firms document that most managers believe stockholders prefer a stable rate of dividends, and will place a premium on firms that can deliver stable dividends. He finds behaviour of dividend-smoothing by managers (Lintner (1956, p. 99)): "most managements sought to avoid making changes in their dividend rates that might have to be reversed within a year or so."

The information signaling models of Bhattacharya (1979), Miller and Rock (1985), and John and Williams (1985) suggest that firms will use dividend changes to signal the future prospects of the firm. Managers have more information about their firm's future cash flows than individuals outside the firm, and managers may have an incentive to signal this information to their shareholders. An unanticipated rise in dividends is good news for the shareholders, and should be accompanied by a rise in the share price, whereas a fall in the dividend conveys bad news to shareholders. For these signalling models to hold in equilibrium, dividend changes should be followed by earnings changes in the same direction. Moreover, by making dividend more expensive, taxes also make dividend payments more informative - only a very profitable firm would find it beneficial to pay dividends (and the associated high taxes) to signal its high profitability. As a result, the stock price reaction to an unexpected dividend rise should be larger when taxes are higher.

Agency models recognize that a firm is comprised of at least three different stakeholders: management, shareholders, and bondholders, and the three groups' interests may diverge. Shareholders in a struggling company may like to pay themselves such large dividends that bondholders will miss out on their scheduled payments. Management may be tempted to use the firm's resources in a way that is not in the best interests of the shareholders. In the words of Allen and Michaely (2002 p. 62): "these activities can range from lavish expenses on corporate jets to unjustifiable acquisitions and expansions." Solutions to the conflict of interest problem that management face have been suggested by Grossman and Hart (1980), Easterbrook (1984), and Jensen (1986). Management should be constrained in how much readily accessible cash they have access to. The less cash available to management, the harder it is for them to spend it in wasteful pursuits. By paying out cash as dividends it reduces the cash at the disposal of management, and can increase the value of the firm. One version of the agency model, by Lang and Litzenberger (1989), is that wasteful uses of cash are likely to be more pronounced in stable, cash-rich firms in mature industries without many growth opportunities. Therefore, an increase in dividends should have a greater (positive) price impact for firms that have few investment opportunities than for firms that have many investment opportunities. Taken to the extreme, if a firm has many positive net present value projects, then increasing the cash distributed to shareholders as dividends could even decrease the value of the firm. When institutional investors are taxed less than individual investors, taxes can be an useful instrument to resolve agency problems. Companies can raise their dividend payments to attract institutional investors, who are usually better equipped than retail investors to monitor the behavior of managers. A greater number of large shareholders should provide an effective check on managerial excess, especially in mature companies where agency problems have the potential to be more severe (see Jensen (1986) and Allen et al. (2000)).

Aside from tax issues, the remaining Miller and Modigliani (1961) assumptions, complete contracting, no transaction costs, and complete markets were not satisfied in U.K. securities markets in the early twentieth century. However, it is arguable that violations of these assumptions were no worse than they are today. Managers were forced to hold stock in their own firms, and their salary was voted on at the AGM. Although managers could be voted out of office, complete contracts could not be written that would have prevented the scandals that did occur from time to time. Markets were incomplete, due to the lack of complete state-contingent contracts, but nor can such contracts be written now (although the recent development of markets for derivatives has helped). The London Stock Exchange had low brokerage fees, due to the desire to maintain world preeminence as a financial market, with thousands of competing brokers, yet transaction costs were positive, as they are today. The "recognised" brokerage fees for equities were $\frac{1}{4}\%$ per transaction under £50, $\frac{1}{2}\%$ per transaction over £50 but this could be negotiated downwards for large dealings (see

The Investor's Monthly Manual for details).

II Historical Background

Pre-1907, profits of incorporated U.K. firms were taxed at the same rate as the personal (labour) tax rate.[1] When dividends were paid, the firm would deduct the relevant tax from the dividend and send it to the government, known as taxation at the source (see Arnold (1999)). Dividends and interest income were treated identically. The relevant tax rate in the U.K. was around 5% during the period of our study, therefore there was little incentive for firms to be creative in how they returned wealth to shareholders.[2] Dividends were by far the principal means of returning wealth. Stock repurchases had been forbidden by common law, following Trevor v. Whitworth (1887), and one-off returns of capital were very infrequent, and required the sanction of a court. There was no tax levied on capital gains in this period.[3] Although charities were tax exempt we do not believe they were major investors in British firms. The almost total irrelevance of tax complications allows us to focus on alternative explanations of dividend policy. Although the Joint Stock Companies Registration and Regulation Act, 1844 and subsequent Companies Acts required that firms only paid dividends out of current or retained profits: "it was not until the Companies Act, 1980 that a definition of distributable profits was incorporated into legislation. This absence appears to have significantly constrained the British judiciary" (Ardern and Aiken (2005) p. 24). The one clear exception was that: "dividend payments could not be made to shareholders where there are no 'profits' reported" (Ardern and Aiken (2005) p. 44).

A further advantage of our data set is the absence of regulations that constrain how investors allocate their funds. "Prudent man" rules have been suggested as an explanation for why firms pay dividends. In some jurisdictions laws constrain the behaviour of certain

[1] http://www.hmrc.gov.uk/history/taxhis4.htm

[2] The tax rate was $3\frac{1}{3}\%$ (8 pence in the pound) in the late years of the 19th century. It was raised to 5% at the start of the Boer War (1899), to 5.833% in 1900 and to 6.25% in 1901. The rate was cut to 4.583% in 1902, but raised again to 5% in 1904 (see Sabine (1966) pp. 129-30).

[3] See Daunton (2001), *Trusting Leviathan*, for a discussion of the U.K. capital gains tax in this period.

types of investors (e.g. private trusts, bank trusts, and pension funds) to invest in "high quality" equities, such as those that pay dividends (see Del Guercio (1996)). In response to these laws some firms will pay dividends to cater to such investors.

The Friendly Societies Act, 1875, Section 16, as originally proposed, forbade the investment of society funds into any security: "which has not paid (a) dividend for the last two successive years prior to such purchase ... and the purchase of shares in any company ..., the liability of whose members is unlimited." However, the amended Act allowed investment of society funds into: "any ... security expressly directed by the rules of the society."[4]

Investment trusts (mutual funds) first appeared in the U.K. in 1868 and by January 1895 there were 51 trust companies listed in *The Investor's Monthly Manual*. We do not believe that trusts can be considered to be dividend clienteles, the trusts were not actively managed: "most of the early trusts were 'fixed' in the sense that the composition of the portfolio could be changed only in exceptional circumstances" (see Hutson (2005) p. 449). Although towards the end of the 19th century there was more discretion shown by managers: "investment trusts in the 19th century largely comprised foreign securities" (see Hutson p. 450). There appear to be few regulatory reasons to suspect the formation of dividend clienteles.

Most of the data we use in this analysis come from annual report and balance sheets of publicly quoted companies. The quality of information present in published accounts, and public statements of company officials during this time in the U.K. is arguably limited when compared to present day standards. Arnold (1998) claims that: "during the first quarter of the twentieth century, financial accounting practice was only lightly regulated, published accounting statements contained relatively limited amounts of information and informational asymmetry between senior managers and the suppliers of long-term corporate finance was material." However, what emerges from historical accounts is that British annual reports at the turn of the twentieth century were generally a reliable source. Sylla and Smith (1995) claim that Britain had the best quality accounting information in the Western world. Similarly, Hannah (2007(b)) reports that "the great majority of companies published more

[4] The Friendly Societies Act covered Friendly Societies, Working Men's Clubs, Benevolent Societies, Building Societies, Trade Unions, Savings Banks, and Scientific and Literary Societies.

and better information that was legally required and, in the absence of evidence to the contrary, this was treated by contemporary investors as broadly accurate" (Hannah 2007(b) p. 658). Audited accounts were required by banks from 1879 onwards and by all firms from 1900 onwards (see Hein (1963)). All the firms' accounting statements we examine have been certified by auditors. Auditors were elected at the AGM (a legal requirement from 1900 onwards). The Companies Act, 1900 required auditors to certify that the accounts reflected a "true and correct view of the state of the Company's affairs", before this auditors would usually sign off on the accounts with something similar to the auditors of Henry Briggs, Son and Company, Ltd. (1899): "examined and found correct." Annual balance sheets were required to be furnished by firms, and although usually provided, annual profit and loss statements were not required by law until 1928 (see Hein (1963)).

III Data

We obtain balance sheets and, where available, profit and loss statements for firms in our sample from the Guildhall Library in London. Accounting data for electrical, telegraph, and telephone firms comes from Garcke's Manual of Electricity Undertakings. We collect weekly data on security prices from the Stock Exchange Daily Official List (SEDOL), also available at the Guildhall Library, between 1893 and 1907. The SEDOL contains bid and ask quotes, transaction prices (if any), issued capital, last two dividend amounts, and the ex-dividend day for all securities officially listed on the London Stock Exchange.[5] We calculate the price of a security as the midpoint of the bid and ask quotes.

We find dates of annual general meetings (AGMs) from the annual reports in the Guildhall Library. The protocol for dividend paying British firms at this time was that the company's management would propose a dividend about 2 weeks before the AGM, and the proposed dividend would usually appear in the London daily newspaper, *The Times* (available electronically from *The Times Digital Archive 1785-1985*). The proposed dividend would then

[5] Although we would like to collect data on the ownership structure of the firms in our sample, most early 20th century U.K. ownership data no longer exists (see Franks, Mayer, and Rossi (2006)).

be subject to approval at the AGM. Although management "proposed" the dividend, in practice it was invariably approved by the vote at the AGM. *The Times* usually reported a company's end of year dividend amount alongside a brief summary of a company's earnings for the year. We understand that firms would mail out the financial reports to shareholders before the AGM at the same time as the dividend "proposal" was made, even if only the dividend amount was reported in *The Times*. We therefore have a potentially confounding effect of dividend and earnings announcements that we address econometrically in Section V.

The Times reported on the affairs of many British companies that were listed on the London Stock Exchange. We search each day's financial pages between 1895 and 1905 to find dividend announcements. The column "Railway and Other Companies" (changed to "Public Companies" in 1905) contains dividend announcements and reports on the proceedings of AGMs. We can not find all proposed dividends in *The Times*. Some firms would never be reported on by *The Times*, usually the smaller, infrequently traded companies, and some companies would only sporadically report their dividends. The only exception to this protocol was by British banks. Although most banks were easily large enough to justify the attention of *The Times*, we can only find seven dividend announcements by banks during this 11 year period. We therefore exclude banks from our analysis.

We find the dividend amounts, quoted as a percentage of paid up capital, from the original annual reports. We cross-check these with the SEDOL, the *Investors' Monthly Manual*, and (if announced) *The Times*. Almost all firms paid semi-annual dividends, the major exception was that many telegraph firms paid quarterly dividends. We find that announcements of dividend increases were most likely to appear in *The Times* (82% of our firms' increases were reported), followed by dividend decreases (68% of our firms' decreases were reported), and the least likely announcements to appear were dividends maintained at the same level (60%).

We construct a value-weighted market index for London that contains 163 securities. The market index is composed of seven banks, 33 railways, 7 breweries, 63 commercial and industrial firms, 19 coal and iron firms, 12 telegraph firms, 20 gas and electric firms, and two mines. By value the banks comprise around 7% of the index, railways 58%, breweries 7%, commercial and industrial firms 8%, coal and iron firms 4%, telegraph firms 3%, gas and electric firms 5%, and mines 4%. The average value of the equities included in our market index (where the average is calculated from 1895 through 1905 is £548 million. By value this is a little over 60% of the London market, so we are confident our market index is representative.[6]

Our sample consists of 469 firms that were in existence part, or all, of the time between 1895 and 1905. Of these 469 firms, 134 were officially listed on the London Stock Exchange whereas 335 companies were traded informally on a 'supplementary list' (see Franks, Mayer, and Rossi (2006)).[7] We hereafter refer to these companies as 'unlisted'. Most of our analysis concerns the subsample of listed companies, unlisted companies will provide a useful control group.

Descriptive statistics for the companies in our data set are provided in Table 1. While the profitability of the two types of companies, measured as return on equity, ROE, is similar, companies quoted in the official list were far larger and about twice as old (measured from a company's date of incorporation) as the unlisted companies. We follow De Angelo et al. (2006) and compute the earned equity to ordinary equity ratio, measured as any earnings not previously distributed to shareholders divided by nominal ordinary equity. We use this measure as a proxy of the maturity of the company, with the idea that companies at a more advanced stage of their life cycle should have accumulated a larger amount of reserves. We find that officially listed companies had a substantially higher earned to contributed capital ratio than unlisted companies.

[6]The value of the entire London equity market is given as £887 million by Hannah (2007a). He uses the figures of Dimson, Marsh, and Staunton (2002).

[7]In contrast to most modern financial data sets we include public utilities such as electricity suppliers as no regulations determined the amount of their dividend payments.

IV Results

A Payout Ratio

We reconstruct the dividend histories of all 469 firms for each year that the firm was in existence between 1895 and 1905 and when the balance sheet was found in the Guildhall Library. We compute the payout ratio for each company, i, as $\frac{1}{T}\sum\frac{Dividends_t}{Earnings_t}$, for each year, t, that the company had positive earnings. We then take an unweighted average of all firms in the same industry. The results are presented in Table 2 where we display payout ratios for all classes of equity and then payout ratios for the ordinary or residual equity.[8] Railways have the highest dividend payout ratios, paying out close to 90% of all profits. Other old, established British industries, such as breweries and textiles, paid out over 80% of all profits. Emerging industries such as electricity suppliers, cycles, and engineering retained a greater share of their earnings. This may indicate that emerging industries had a need to increase their capital stock through retained earnings. The equally weighted figure across all industries is 73%, much higher than contemporary U.S. payout figures of around 25% (see Allen and Michaely (2002)). If we calculate the payout ratio across all industries as $\frac{\sum_t\sum_i Dividends_{i,t}}{\sum_t\sum_i Earnings_{i,t}}$, which includes firms with negative earnings and gives greater weight to the larger firms, then the payout ratio rises to 92%. This is a slightly higher payout ratio than for U.S. corporations in the 1990s which was 85%, made up of 58% as dividends and 27% as repurchases. Contemporary small U.S. firms tend not to make any distributions of earnings, whereas even small young 20th century British firms tended to distribute much of their earnings to shareholders. On balance these results suggest that, although younger U.K. firms needed to retain a portion of their earnings to finance their investment projects, obtaining external finance was substantially easier than it currently is for start-up U.S. firms.

[8] The residual claimant on a company's cash flow was usually denoted as 'ordinary' equity. However, for some companies it was denoted 'deferred', 'deferred ordinary', and once 'preferred'.

B Announcement Effect

We use an event study method to assess the impact of dividend announcements on returns. For each dividend announcement we calculate the abnormal return on ordinary/residual equity as:

$$r_{j,ann} = R_{j,ann} - \widehat{a}_{j,ann} + \widehat{b}_{j,ann} R_{m,ann} \tag{1}$$

where $R_{j,ann}$ is the actual return of security j and $R_{m,ann}$ is the actual return on the market. We estimate $a_{j,ann}$ and $b_{j,ann}$ with the market model using weekly data from 18 months before to 6 months after the dividend announcement, excluding the week preceding and following the announcement:[9]

$$R_{j,ann} = a_{j,ann} + b_{j,ann} R_{m,ann} + e_{j,ann}. \tag{2}$$

We use our weekly London index to calculate the market return around each announcement date, $R_{m,ann}$.

We average the abnormal returns over all N securities (that fit certain criteria and) and that are t weeks from a dividend announcement date, ann:

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} r_{i,ann+t}. \tag{3}$$

We cumulate the average abnormal returns (AAR) from one week before to one week after the dividend announcement to calculate the cumulative average abnormal return ($CAAR$).

To discriminate between different theories of dividend policy, we examine the effect of dividend increases (or commencements), and decreases (or omissions), on security returns. We are forced to restrict our sample to the 134 companies that were officially listed on the London Stock Exchange (and therefore appear in the SEDOL) and between January 1895 and December 1905 had at least one dividend announcement that we can identify as an increase, commencement, reduction, omission or continuation at the same rate. We observe the prices and dividends of these companies from January 1893 through December 1907. Companies almost always paid two dividends per year, an interim dividend paid partway

[9] We try both shorter and longer estimation windows. Our results are not affected by the choice of the estimation window.

through the company's bookkeeping year, and a final dividend paid after the bookkeeping year was complete. A handful of firms paid annual dividends or quarterly dividends. The interim dividend was usually kept constant from year to year, when a company decided to cut or increase the dividend it would usually change the final dividend. We classify a dividend announcement as an increase (decrease) if the announced dividend less the dividend paid 12 months prior to the announcement is positive (negative).

These 134 firms made a total of 1512 final dividend announcements. We find announcements of 26 dividend omissions, 290 dividend cuts (together 20.9% of all announcements), 766 unchanged dividends (50.7% of all announcements), 396 dividend increases, and 34 dividend initiations (together 28.4%). We present the CAAR results in Table 3. Announcements of dividend increases or commencements are associated with positive CAARs of 1.4%, significant at the 1% level. Announcements of commencements or increases of more than 10% are associated with positive CAARs of 1.7%, significant at the 1% level. Announcements of dividend decreases or omissions are associated with negative CAARs of 2.0%, whereas omissions or decreases of more than 10% are associated with CAARs of 2.4%, both of which are significant at the 1% level. These results are consistent with an asymmetric information story, whereby dividend announcements are conveying information about future earnings to shareholders. Our results reject the argument that dividends only signal information because they are (in some jurisdictions) tax disadvantaged (see Bhattacharya (1979), John and Williams (1985), and Bernheim (1991). We find support for the findings of Amihud and Murgia (1997), that dividend changes can provide signals to investors, even if dividends are tax neutral.

According to Lang and Litzenberger (1989), if agency considerations are important, dividend announcements will differentially affect different types of firms. We split firms along three dimensions: Tobin's Q, earned to total equity, and age. We calculate the CAAR for each subset of firms in Table 4. Firms with a value of Tobin's Q less than one (those with fewer profitable uses for retained earnings) experience a greater drop in share prices (more negative CAAR) when announcements of dividend cuts are made than firms with Tobin's Q greater than or equal to one, although the difference in effects is not statistically significant.

We interpret this as weak evidence of agency effects. There is almost no difference in effects for announcements of dividend increases. Firms with a lower earned to ordinary equity ratio are affected more by announcements of dividend increases or decreases, but again the effect is not statistically significant. Younger firms are affected more by announcements of dividend increases or decreases, again not statistically significant (except for dividend increases at the 10% level). If agency effects were important we would expect older firms to be punished more in the stock market for cutting dividends, and rewarded more for increasing them - we find the reverse. We do not find any serious support for agency theories from examining the effect of dividend announcements on security returns. This result suggests that taxes are necessary for companies to be able to use dividends to resolve agency problems.

We next regress individual cumulative abnormal returns (CARs) for each firm-announcement on firm characteristics:

$$\begin{aligned} CAR_{i,t} &= \gamma_0 + \gamma_1 \Delta \frac{ROE_{i,t}}{P_{i,t-1}} + \gamma_2 \Delta \frac{DIV_{i,t}}{P_{i,t-1}} + \gamma_3 SIZE_{i,t} \\ &\quad + \gamma_4 DividendYield_i + \gamma_5 Controls_i + e_{i,t}. \end{aligned} \tag{4}$$

ROE is a firm's total earnings before depreciation divided by total equity; DIV is a firm's dividend paid, P_{t-1} is the market price of ordinary equity the day before the dividend announcement, and $SIZE$ is the natural logarithm of a firm's assets. We use age, the earned to total equity ratio, Tobin's Q, and following Yoon and Starks (1995), the dividend yield and firm size as controls. We report the results of the regression in Table 5. To control for contemporaneous earnings announcements we include changes in profitability, scaled by price, in addition to current dividends changes, scaled by price.

We find that announcements of increased dividends and increased earnings have separate and positive effects on a firm's cumulative abnormal return. The magnitude of the effect of dividend changes on abnormal returns is important: a one standard deviation increase in $\Delta \frac{DIV_{i,t}}{P_{i,t-1}}$ leads to a 1 percentage point CAR increase. The positive and independent effect of dividend changes on abnormal returns is consistent with the dividend signaling hypothesis. We do not find that any of the controls are statistically significant. In particular, contrary to the predictions of the agency hypothesis, measures of maturity of the company are not statistically significant. The results show that dividend changes produce a sizable reaction in stock prices, beyond the effects of the information contained in earnings changes. This test also supports the notion that taxes are not a first order element to define the information content of dividends, however taxes seem to be an important factor to resolve agency issues.

C Dividend Changes and Future Profitability

Following the methods of Bernartzi et al. (1997), Nissim and Ziv (2001), Grullon et al. (2005) and Michaely and Roberts (2007), we now assess whether investors reacted rationally to announcements of dividend increases (decreases) by driving share prices higher (lower). In particular we test whether future earnings changes could have been predicted from changes in dividends, which would lend additional support to the dividend signaling hypothesis. We run the following partial adjustment model:

$$\begin{aligned}(ROE_{i,t+n} - ROE_{i,t}) &= \gamma_0 + \gamma_1 (DNC_{i,t} * \left| \frac{DIV_{i,t} - DIV_{i,t-1}}{DIV_{i,t-1}} \right|) \\ &\quad + \gamma_2 (DPC_{i,t} * \left| \frac{DIV_{i,t} - DIV_{i,t-1}}{DIV_{i,t-1}} \right|) + Controls_{i,t} + e_{i,t}.\end{aligned} \tag{5}$$

both in its linear (e.g. Nissim and Ziv (2001)) and non-linear version (e.g. Grullon et al. (2005)). DNC is a dummy variable that takes on the value 1 if the firm has cut the dividend from period $t-1$ to period t, and 0 otherwise. DPC is a dummy variable that takes on the value 1 if the firm has increased the dividend from period $t-1$ to period t, and 0 otherwise. We include controls for past levels and changes of ROE. In particular, ROE could be a mean reverting process in which case high (low) past levels of ROE should be associated with decreases (increases) in current and future earnings (see Nissim and Ziv (2001)). In the non-linear version we also include squared adjustment terms for earnings, to capture the non-linearities of earnings reversions that Grullon et al. (2005) and Fama and French (2000) emphasize as crucial. We test if contemporaneous dividend changes can predict earnings changes one year ($n = 1$) or two years ($n = 2$) in the future. We follow the approach described in Petersen (2008) and cluster the standard errors by firm. We report the results in Table 6.

We find that we can achieve predictive power by using negative and positive dividend announcements to forecast earnings one year ahead. Dividend cuts are associated with decreases in earnings in the following year, statistically significant at the 10% level. Dividend increases are associated with increases in earnings the following year, statistically significant at the 5% level.[10] Past ROE has a negative coefficient, which gives support to the notion that earnings were mean reverting. The coefficients on the change in earnings is also negative, which provides further support for mean reversion - firms that experienced an increase (decrease) in earnings in one year are more likely to experience a decrease (increase) in earnings in the current year. We find little evidence that dividends or earnings can predict changes in earnings two years or more (unreported) in the future. These results strengthen our conclusion that asymmetric information is playing the major role in explaining the dividend policy of firms. Firms that announce a dividend increase (decrease) experience positive (negative) cumulative abnormal returns, and the increases (decreases) of dividends are associated with higher (lower) earnings one year in the future.

We also investigate Nissim and Ziv's (2001) idea that dividend changes can predict earnings levels (rather than changes in earnings) using the procedure of Grullon et al (2005). We find that dividend decreases are associated with a lower ROE one year ahead, statistically significant at the 5% level in both a linear and non-linear model. We do not find a robust correlation between dividend increases and the level of earnings one year in the future. In addition we do not find any evidence that earnings levels two or more years in the future can be predicted by dividend changes.[11]

Finally, we assess whether our inclusion of dividends in (5) increases the model's predictive power. As in Grullon et al. (2005) (pages 1675-76) we follow the technique of Giacomini and White (2006). The technique consists of forecasting ROE one or two years ahead using only the the information available at that time (ie. no 'look ahead' bias). ROE is forecast using (5) both with, and without, the dividend variables. The forecast error of each earnings level n years ahead, f_n, is calculated as $ROE_{t+n} - \widehat{ROE_{t+n}}$. Differences in squared and

[10] The results are similar, albeit slightly weaker, if we exclude outlying observations using Cook's D criterion and the method of Hadi.

[11] Results are available upon request.

absolute errors are calculated as:

$$
\begin{aligned}
d_{SE} &= f_{DIV}^2 - f_{NODIV}^2 \\
d_{AD} &= |f_{DIV}| - |f_{NODIV}| \,.
\end{aligned}
$$

We construct mean squared errors (MSE) and mean absolute deviations and we bootstrap their associated standard errors. We present our findings in Table 7. In contrast to Grullon et al. we find that forecasting models that include dividends outperform models that exclude dividends one and two years ahead. Dividends were useful information for turn of the century investors to forecast a company's future earnings.

D To pay or not to pay

We next investigate the characteristics of companies that paid dividends. If agency explanations of dividends are relevant, measures of a company's maturity should be associated with the company's propensity to pay dividends. In particular, older companies, companies with higher earned to total equity, and companies with a lower Tobin's Q should have been more likely to pay a dividend and should have had higher payout ratios. Fama and French (2001) document that in the U.S. during the period 1963-98 the firms that paid dividends were, on average, more profitable, had fewer investment opportunities (a lower market to book value, ie. Tobin's Q), and were larger than non-dividend payers. DeAngelo, DeAngelo, and Stulz (2006) find that, in addition to the variables identified by Fama and French, life cycle considerations are important. Firms that have a high ratio of earned equity to total equity are likely to be those in the mature stage of their life cycle, and are much more likely to distribute earnings as dividends.

We run a logit regression with a dummy variable equal to one if the company paid a dividend that year and equal to zero otherwise as the dependent variable:

$$
\begin{aligned}
Pay_{i,t} &= \lambda_1 ROE_{i,t} + \lambda_2 ROE_{i,t-1} + \lambda_3 SIZE_{i,t} + \lambda_4 AGE_{i,t} + \lambda_5 ETOT_{i,t} + \lambda_6 OTOT_{i,t} \quad (6) \\
&\quad + \lambda_7 CASH_{i,t} + \lambda_8 Q_{i,t} + \lambda_9 EASS_{i,t} + \lambda_7 PREV_{i,t} + Controls + e_{i,t}
\end{aligned}
$$

ROE is the return on equity, $SIZE$ is the natural logarithm of a company's total assets, AGE

is the number of years since incorporation, $ETOT$ is any earnings not previously distributed as dividends to shareholders divided by nominal ordinary equity, $CASH$ is cash divided by assets, $OTOT$ is nominal ordinary equity divided by total assets, Q is the book value of debt plus the market value of common equity divided by the book value of total assets, $EASS$ is any earnings not previously distributed to shareholders divided by total assets, and $PREV$ is a dummy variable that equals one if the company did not pay an ordinary dividend in the previous year, and zero otherwise. We also include year and industry dummies. We present our results in Table 8.

We find that the most important determinants of the propensity to pay a dividend are contemporaneous profitability and immediate past profitability. The coefficient on ROE is positive and statistically significant at the 5% level in specifications 1 through 5. In terms of economic significance the effect is quite important: a company of average size that increases its ROE from the first to the third quantile would increase its probability of paying dividends from about 76% to about 93%. We do not find a clear relation between either age or size and the probability a firm pays a dividend.

Consistent with DeAngelo et al. (2006), we find that a higher ratio of earned to total equity is associated with a higher probability of paying dividends (although this is not statistically significant). The result holds if we substitute earned equity to total assets in place of earned to contributed capital (columns 3). Firms with a higher ratio of cash to assets are more likely to pay a dividend, although the estimates have marginal statistical significance. In addition, we find that firms were dividend smoothing at this time, although markedly less than today's firms are. We run a Lintner smoothing model of dividends. We find that firms in our sample have a dividend adjustment speed of 0.82 that is substantially higher than estimates found with contemporary data, e.g. 0.21 in the U.S. between 1984 and 2002 (see Brav et al. (2005)) and 0.41 in the U.K. between 1993 and 2002 (see Michaely and Roberts (2007)). We also find that a firm's target payout ratio was about 44%, higher than the 22% found by Brav et al (2005) and the 21% reported by Michaely and Roberts (2007).

We find that a firm with a higher Tobin's Q is associated with a higher probability of being a dividend payer. This is similar to what Denis and Osobov (2008) find for France and

Germany in the 1990s and 2000s. We suspect that multicollinearity between the return on equity, Tobin's Q, and whether or not a firm paid a dividend last year is influencing these results somewhat. Firms that paid a dividend last year are more likely to be profitable firms and have a high share price (hence Tobin's Q as we measure it). When we add a dummy variable for a previous dividend payer (column 7 of Table 8) the estimated coefficients and t-stats on ROE and Tobin's Q move towards zero.

To summarize, contemporaneous profitability is very important in a firm's decision of whether or not to pay a dividend, firms are dividend smoothing from year to year, and firms with a higher proportion of earned equity to total equity are more likely to pay a dividend.

We then run Tobit models of a company's payout ratio on various explanatory variables. We present our results in Table 9. Profitability, in particular the previous year's ROE is a major determinant of companies' ordinary payout levels. An increase of one standard deviation in the previous year's ROE leads to an 11 percentage point increase in the ordinary equity payout ratio. As in the Logit analysis, this result supports the idea that companies were smoothing dividends from one year to another. Tobin's Q has a positive and statistically significant coefficient in all the specifications. However, its economic significance is not big: a one standard deviation increase of Tobin's Q leads to an increase in the ordinary payout ratio of 1 percentage point. The coefficients associated with the other measures of maturity, AGE and $ETOT$, are positive and usually statistically significant. The economic significance of these measures is moderate. A one standard deviation increase in $ETOT$ is associated with an increase of 6 percentage points in the ordinary payout ratio. Similarly, a one standard deviation increase in AGE (17 years) is associated with an increase in the ordinary payout ratio of 5 percentage points. Although we find some evidence that measures of a company's maturity are relevant, profitability has a larger impact on the payout ratio. Agency explanations do not seem to have been an important driver of dividend policies, which supports the idea that, in the absence of taxes, dividends are an unattractive method to resolve agency problems.

E Resolving the Agency Problem

Although we do not find evidence that more mature companies paid higher dividends, one method to alleviate agency problems, we find evidence of alternative strategies. More mature companies restricted their manager's borrowing powers, and dealt with more banks (potential monitors) than did less mature companies.

We collect information from the *Stock Exchange Official Intelligence* in 1896, 1897, 1901, and 1902 on the companies in our sample. We find that a one standard deviation increase in $ETOT$ reduces managers' discretionary borrowing power, measured as loans permitted by the articles of association without a vote at the AGM divided by nominal ordinary equity, by about 20%. We find this variable is statistically significant at the 5% level in a simple regression.

We also examine the existence of multiple bank relationships for our firms. A firm that has an association with more than one bank is more likely to be monitored closely, and has at least partially solved its agency problems. We run a logit model with the dependent variable equal to one if a firm a more than one bank relationship and zero otherwise. If we consider a firm that moves from the first to the third quintile of $ETOT$ we find the probability of having multiple bank relationships increases from 27% to 37%.[12]

We believe that shareholders alleviated the inherent agency problem they faced by curtailing manager's borrowing powers and using multiple banks to monitor their managers rather than by paying out higher dividends.

[12] We think it is unlikely that this result is driven by firms' desires to resolve a hold up problem as in Sharpe (1990). The Sharpe model predicts that asymmetric information problems between borrowers and a single lender are resolved over time in a relationship that creates an informational advantage for the lender. Such an informational advantage can be exploited to extract rents. As a result, young and less well-known firms may engage multiple banks to avoid later hold-ups. Our results suggest that more mature and better known companies, in principle firms that should suffer fewer hold up problems, were more likely to display multiple bank relationships.

V Officially Listed and Unlisted Companies

We now examine the behaviour of the 335 unlisted firms. These are all firms for which we observe accounting data, but not market values of equity (since they do not appear in the SEDOL). These firms were all public, limited companies; our data set does not contain any private, family-held firms. If unlisted firms were more closely held with a smaller shareholder base then we would expect little correlation between dividends and future earnings. Managers of unlisted firms would not need to raise or lower dividends to credibly convey information about future earnings to shareholders.

Table 10 examines the effect of dividend announcements on future earnings changes. We find that announcements of dividend decreases are useful to predict negative changes in earnings in the following year (columns 1 and 2).[13] Announcements of dividend increases are not robustly associated with increased earnings in the following year. We find that dividend announcements have little information content for earnings two (columns 3 and 4) or more (unreported) years in the future. The control variables indicate that earnings of unlisted firms are mean reverting, as they are for listed firms. We find little evidence of differences between listed and unlisted firms, asymmetric information problems appear to have existed in both classes of firms. Dividend announcements were a way of conveying private information from managers to shareholders.

Table 11 presents our results for the examination of the decision on whether or not to pay a dividend for unlisted firms. In most of the cases, we obtain very similar coefficient estimates for listed and unlisted firms. Contemporaneous profitability and the previous year's profitability were important determinants of the dividend payment decision for both classes of firms. Life cycle considerations were marginally more important for unlisted firms - they are more likely to pay dividends if they are larger and have more earned equity. Shareholders of unlisted firms may have been more concentrated and therefore have had more power over managers. Consequently shareholders may have found it easier to discipline managers of older, more mature companies into paying dividends.

[13] The results are weaker if we exclude outliers.

We examine the determinants of the payout ratios of unlisted firms in Table 12. We find that unlisted firms with higher profits, higher earned equity, more cash, which were older, were more likely to pay out more of their profits as dividends in a year. In addition, firms that did not pay a dividend in the previous year were likely to have had a lower payout ratio, all else equal. We test if there are statistically significant differences between the coefficient estimates of listed and unlisted companies. The coefficients on past ROE are bigger for listed firms and the difference with unlisted firms is statistically significant. However, the economic importance of this difference is small: a one standard deviation increase in past ROE for listed companies leads to a 12 percentage point increase in the ordinary payout ratio. A one standard deviation increase of past ROE for unlisted companies leads to a 11 percentage point increase in the ordinary payout ratio. Cash appears to be a more important determinant of the payout level for unlisted firms. This evidence works again agency theories of dividends: managers of listed companies should have been more careful to disburse any excess cash to shareholders than unlisted companies if they wished to show investors that resources were not being wasted. In contrast to Michaely and Roberts (2007) we do not find much difference in the dividend smoothing behaviour of these classes of firms (Tables 8 and 11) nor their payout ratio (Tables 9 and 12). We run the Lintner model (as used by Michaely and Roberts (2007)) to estimate the speed of adjustment parameter of dividends. We estimate the speed of adjustment parameter to be 0.81 for listed companies and 0.82 for unlisted companies, close to Michaely and Roberts' estimate of 0.89 for wholly owned privately traded firms, and roughly double their estimate for contemporary U.K. public firms, 0.41. In other words, our firms are smoothing dividends far less than contemporary U.K. public firms. Michaely and Roberts conclude that: "the scrutiny of public equity markets appears to induce managers to follow a policy of relatively small, consistent increases in dividends, while avoiding any decrease in dividends." However, we suggest that taxes (and possibly the associated agency effects) may be driving their results, in line with the findings of Amihud and Murgia (1997). In conclusion, we find few differences in the payout policy between firms officially listed on the London Stock Exchange and those firms not officially listed there.

VI Conclusion

We examine the dividend policy of firms in the unregulated, very low tax regime of turn of the 20th century Britain. In this environment we examine the importance of taxes for signaling and agency based models of dividend policy. We find strong support for signaling (asymmetric information) theories of dividend policy, and little support for agency models. This result suggests that taxes are unnecessary for clear signals to be sent from managers to shareholders via dividends. However, taxes appear to be necessary for dividends to resolve agency problems between managers and shareholders.

Dividend cuts appear to convey bad news to shareholders, and firms that announced dividend cuts or omissions suffered an abnormal return of around -2.0%. Firms that announced dividend raises or commencements achieved an abnormal return of around 1.4% around the time of the announcement. There do not appear to have been differences between classes of firms (grouped by age, earned to total equity, or Tobin's Q) in their responses to dividend announcements. In addition we find that changes in dividends were associated with changes in earnings in the same direction one year out. Changes in dividends did not appear to signal earnings changes two or more years in the future.

In addition we find that firms paid out around 90% of current earnings as dividends, a similar figure to contemporary American firms. An important difference is that younger U.K. firms were almost as likely to pay dividends as older firms. More profitable firms were more likely to pay a dividend and firms smoothed their dividends.

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Table I

Descriptive Statistics (1895-1905)

Return on equity is total earnings before depreciation divided by total nominal equity. Total assets is measured in '000s of pounds. Age is the number of years since a company was incorporated. Earned to Ordinary is any earnings that the company had not previously distributed as dividends divided by nominal ordinary equity. Ordinary Equity to Total Assets is nominal ordinary equity divided by total assets. Cash to assets is total cash balances (including financial investments) divided by total assets. Tobin's Q is (book value of debt + book value of preference equity + market value of common equity) / (book value of total assets).

	Officially Listed on London Stock Exchange				Not Officially Listed on London Stock Exchange			
	# Obs.	Mean	Median	Std. Deviation	# Obs.	Mean	Median	Std. Deviation
Return on Equity	134	0.089	0.078	0.06	335	0.084	0.076	0.072
Total Assets	134	7533.35	916.39	19867	335	424.9	193.27	1025.7
Age	134	20.27	13	17.39	335	10.98	6.42	10.43
Earned to Ordinary	134	0.131	0.039	0.226	335	0.082	0.007	0.171
Ordinary Equity to Total Assets	134	0.486	0.445	0.203	335	0.48	0.45	0.208
Cash over Assets	134	0.094	0.056	0.118	335	0.073	0.043	0.094
Tobin's Q	134	1.21	1.022	0.921		n.a	n.a	n.a

Table II

Average Dividend Payout Ratio by Industry (1895-1905)

We calculate the average dividends to earnings ratio over time for each company that reports positive earnings. In the first and fourth columns we report the number of observations (company-years) in an industry. In the second and fifth columns we report the unweighted average payout ratio across all companies in an industry. The dividend payout includes all classes of equity. In the third and sixth columns we report the unweighted average payout ratio, but only include the dividend payout of ordinary equity. We separate firms into those officially listed on the London Stock Exchange and those not officially listed in London.

	Listed on London Stock Exchange			Not Listed on London Stock Exchange		
Sector	# Obs.	Payout Ratio (all equity)	Payout Ratio (ordinary equity)	# Obs.	Payout Ratio (all equity)	Payout Ratio (ordinary equity)
Breweries	46	0.898		82	0.832	0.552
Cycles	52	0.734	0.475	213	0.650	0.432
Electricity	199	0.792	0.618	241	0.728	0.596
Iron and Steel	71	0.789	0.671	183	0.771	0.438
Railways	234	0.927	0.333	62	0.752	0.354
Telegraph, Telephones	100	0.716	0.620	4	0.220	0.170
Mines	79	0.730	0.589	258	0.736	0.573
Textiles	88	0.876	0.601	404	0.843	0.554
Paper Manufacturing	31	0.875	0.502	210	0.808	0.573
Engineering	57	0.732	0.680	237	0.722	0.536
Chemicals	121	0.819	0.585	306	0.772	0.443
Tobacco	27	0.918	0.622	44	0.938	0.656
All Industries (Equally Weighted with Positive Earnings)		0.826 (# obs. = 1105)	0.551 (# obs. = 1007)		0.766 (# obs. = 2244)	0.520 (# obs. = 2225)
All Industries (Sum of all Dividends / Sum of all Earnings)		0.915 (# obs. = 1155)	0.497 (# obs. = 1051)		0.819 (# obs. = 2494)	0.568 (# obs. = 2472)
All Firms (Listed & not Listed) (Equally Weighted with Positive Earnings)		0.787 (# obs. = 3349)	0.527 (# obs. = 3232)			
All Firms (Listed & not Listed) (Sum of all Dividends / Sum of all Earnings)		0.896 (# obs. = 3649)	0.500 (# obs. = 3523)			

Table III

Dividend Announcement Cumulative Average Abnormal Returns (CAAR)

We calculate cumulative abnormal returns as a security's return from 1 week before a dividend announcement to 1 week after the announcement less the security's return given by the market model over the same period. We then average the cumulative abnormal returns across securities. We split the sample along two dimensions. The first dimension is whether the dividend announcement marked an increase (or commencement), decrease (or omission), or a dividend at the same rate. The second dimension is by the size of the dividend change. The first column includes all increases and commencements (decreases and omissions), the second column only includes increases of more than 10% (and all commencements) and decreases of more than 10% (and all omissions). Standard errors are clustered by firm and appear in parentheses.

	All announcements	Omissions, Commencements and Changes > 10%
Increases and Commencements	0.014***	0.017***
	(0.002)	(0.003)
Observations	430	357
Average Size of Increases	+ 40%	+ 48%
Decreases and Omissions	-0.020***	-0.024***
	(0.004)	(0.005)
Observations	316	259
Average Size of Decreases	-33%	-39%

Table IV

Dividend Announcement CAARs by Firm Characteristics

We calculate cumulative abnormal returns as a security's return from 1 week before a dividend announcement to 1 week after the announcement less the security's expected return from the market model over the same period. We then average the cumulative abnormal returns across securities. We split securities by three characteristics - Tobin's Q, Earned to Ordinary, and Age. Tobin's Q is (book value of debt + book value of preference equity + market value of common equity) / (book value of total assets). Earned to Ordinary is any earnings that the company had not previously distributed as dividends divided by nominal ordinary equity. Age is the number of years since the firm was incorporated. t-stats of differences in mean dividend announcement effects are calculated between the groups of high and low firms as sorted by Tobin's Q, Earned to Ordinary, and Age respectively. Standard errors are clustered by firm and appear in parentheses.

	Dividend Decrease	Dividend Increase
Tobin's Q >= 1	-0.014***	0.013***
	(0.004)	(0.003)
Observations	150	225
Tobin's Q < 1	-0.027***	0.014***
	(0.007)	(0.003)
Observations	116	231
t-stat of difference in means	1.30	-0.29
Earned to Ordinary >= Median	-0.013**	0.009*
	(0.005)	(0.005)
Observations	129	124
Earned to Ordinary < Median	-0.022***	0.017***
	(0.007)	(0.003)
Observations	138	247
t-stat of difference in means	1.36	-1.23
Age >= Median	-0.013***	0.010***
	(0.004)	(0.003)
Observations	169	199
Age < Median	-0.025***	0.018***
	(0.009)	(0.004)
Observations	134	216
t-stat of difference in means	1.32	-1.67

Table V

The Influence of Firm Characteristics on announcement CARs

The dependent variable is a company's cumulative abnormal return (CAR) from one week before to one week after an announcement of a year-end dividend increase, decrease, commencement, or omission. ΔEarnings/Price is the difference in earnings between the current and the previous earnings announcement divided by the share price of one week before the current dividend announcement. ΔDiv/Price is the difference between the current and the previous dividend divided by the share price of one week before the current announcement. Dividend Yield is the total ordinary dividend payments divided by the ordinary share price at the end of the previous year. Size is the natural logarithm of a company's total assets. Age is the number of years since a company was incorporated. Earned to Ordinary is any earnings that the company had not previously distributed as dividends divided by nominal ordinary equity. Tobin's Q is (book value of debt + book value of preference equity + market value of common equity) / (book value of total assets). Standard errors are clustered by firm and appear in parentheses.

	1	2	3	4	5	6
ΔEarnings/Price$_{t-1}$	0.0004***	0.0004***	0.0004***	0.0004***	0.0004***	0.0004***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
ΔDiv/Price$_{t-1}$	0.5100**	0.4904*	0.4938*	0.4930*	0.4833*	0.4942*
	(0.2445)	(0.2657)	(0.2680)	(0.2726)	(0.2626)	(0.2678)
Dividend Yield		-0.0002	-0.0001	-0.0001	-0.0002	-0.0001
		(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Size			-0.0017	-0.0015	-0.0017	-0.0019
			(0.0012)	(0.0013)	(0.0013)	(0.0014)
Age						0.000
						(0.0001)
Earned to Ordinary					-0.0039	
					(0.0138)	
Tobin's Q				0.0055		
				(0.0103)		
Observations	502	440	425	405	408	425
R-squared	0.11	0.12	0.12	0.12	0.12	0.12

Table VI

Can Dividend Changes predict Earnings Changes?

The dependent variable is the change in a firm's return on equity (ROE) from year t to t+1 or t+2. Return on equity is total earnings before depreciation divided by total nominal equity. We control for year fixed effects. NEGINT is defined as (DNC * % Δ OrdDivs) where DNC is a dummy variable equal to 1 if the firm has cut the ordinary dividend between year t-1 and year t. % Δ OrdDivs is the percentage change in the ordinary dividend rate between year t-1 and year t. POSINT is defined as (DPC * % Δ OrdDivs) where DPC is a dummy variable equal to 1 if the firm has increased the ordinary dividend between year t-1 and year t. We only consider dividend changes of more than 10%. ROE_{t-1} is total earnings before depreciation in year t-1 divided by total nominal equity in year t-1. ΔEarnings is defined as ROE_t less ROE_{t-1}. E(ROE) is the expected return on equity defined as the predicted value from a regression of ROE on the lagged value of the natural logarithm of Tobin's Q, the natural logarithm of total assets and the lagged value of ROE. [x+] and [x-] denote the max (min) of zero and x. Standard errors are clustered by firm and appear in parentheses.

	Earnings Changes 1 year in the future		Earnings Changes 2 years in the future	
Linear Model	Yes	No	Yes	No
NEGINT	-0.018*	-0.016*	0.015	-0.002
	(0.010)	(0.008)	(0.013)	(0.007)
POSINT	0.008**	0.008**	-0.001	0.002
	(0.003)	(0.003)	(0.003)	(0.003)
Return on Equity (lagged)	-0.077*		-0.056	
	(0.042)		(0.040)	
Δ Earnings	-0.305***		-0.022	
	(0.113)		(0.100)	
[Δ $Earnings^+$]		0.364		0.314
		(0.247)		(0.260)
[Δ $Earnings^-$]		0.567**		0.356
		(0.286)		(0.301)
([Δ $Earnings^+$])^2		-2.226**		-3.143*
		(0.924)		(1.888)
([Δ $Earnings^-$])^2		4.548		0.355
		(3.585)		(1.045)
[ROE_{t-1}-E(ROE)$^+$]		-0.332		-0.176
		(0.205)		(0.270)
[ROE_{t-1}-E(ROE)$^-$]		-0.901***		-0.454
		(0.270)		(0.318)
([ROE_{t-1}-E(ROEt-1)$^+$])^2		0.296		0.210
		(0.250)		(0.332)
([ROE_{t-1}-E(ROEt-1)$^-$])^2		-1.901***		-0.942
		(0.539)		(0.673)
Observations	588	470	474	372
R^2	0.09	0.19	0.04	0.10

Table VII

Out of Sample Ability of Dividends to Predict Earnings

We use the technique of Grullon et al. (2005) to compute mean squared forecast errors (MSE) and mean absolute deviation (MAD) forecast errors for a model that includes dividend announcements (DIV) and a model that excludes dividend announcements (NODIV). Errors for each earnings observation are calculated as f_{DIV} - f_{NODIV}, where f_{DIV} is the difference between actual earnings (1 or 2 years ahead) and forecast earnings (1 or 2 years ahead). Standard errors are clustered by firm and appear in parentheses.

	1 year ahead	2 years ahead
Linear: MSE_{DIV} - MSE_{NODIV}	-0.0003* (0.00014)	-0.0003* (0.00015)
Linear: MAD_{DIV} - MAD_{NODIV}	-0.0013*** (0.00013)	-0.0015*** (0.00032)
Non Linear: MSE_{DIV} - MSE_{NODIV}	-0.0003* (0.00017)	-0.0005* (0.00025)
Non Linear: MAD_{DIV} - MAD_{NODIV}	-0.0012*** (0.00018)	-0.0012*** (0.00026)

Table VIII

Whether or not to pay a dividend

The dependent variable equals one if the company paid any dividend on its ordinary equity in the year, and zero otherwise. The estimates are obtained from a logit regression. Return on equity is total earnings before depreciation divided by total nominal equity. Size is the natural logarithm of a company's total assets. Age is the number of years since incorporation. Earned to Ordinary is any earnings not previously distributed as dividends divided by nominal ordinary equity. Ordinary Equity to Total Assets is nominal ordinary equity divided by total assets. Cash to assets is total cash balances (including financial investments) divided by total assets. Tobin's Q is (book value of debt + book value of preference equity + market value of common equity) / (book value of total assets). Earned equity to total assets is any earnings not previously distributed to shareholders divided by total assets. Previous non payer is a dummy variable that equals one if the company did not pay an ordinary dividend in the previous year, and equal to zero otherwise. Standard errors are clustered by firm and appear in parentheses.

	1	2	3	4	5	6	7
Industry Fixed Effects	No	No	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	No	Yes	Yes	Yes
Return on Equity	52.347***	32.130**	31.881**	35.457**	35.471**	29.129	22.715
	(13.397)	(15.414)	(15.570)	(16.270)	(17.794)	(20.600)	(21.845)
Return on Equity$_{t-1}$		27.513***	27.043***	26.312***	30.275***	15.518	16.716
		(9.625)	(9.606)	(9.087)	(10.096)	(10.117)	(11.867)
Size	0.015	0.035	0.072	0.116	0.129	0.105	0.066
	(0.140)	(0.142)	(0.144)	(0.166)	(0.169)	(0.132)	(0.174)
Age	0.022*	0.021	0.018	0.01	0.016	0.015	0.02
	(0.013)	(0.014)	(0.014)	(0.016)	(0.016)	(0.013)	(0.014)
Earned to Ordinary	3.346*	2.251		2.029	2.21	1.102	0.755
	(2.006)	(1.493)		(1.906)	(2.048)	(1.262)	(1.709)
Ordinary Equity to Total Assets	0.899	1.475	1.211	2.838**	2.648**	2.812**	3.327**
	(1.119)	(1.227)	(1.235)	(1.271)	(1.273)	(1.116)	(1.511)
Cash over Assets	1.802	0.253	0.313	-0.01	0.327	-2.274	-0.094
	(1.496)	(1.889)	(1.890)	(2.499)	(2.428)	(2.433)	(2.974)
Tobin's Q							2.253*
							(1.320)
Earned Eq to Total Assets			7.529				
			(5.611)				
Previous non Payer						-3.487***	-3.056***
						(0.583)	(0.630)
Wald Chi^2	32.18	35.96	34.80	94.87	144.38	161.33	199.68
Observations	1022	845	847	789	789	770	711

Table IX

Determinants of the Dividend Payout Ratio

The dependent variable is the ratio ordinary dividends to earnings. The estimates are obtained from a tobit model. Return on equity is total earnings before depreciation divided by total nominal equity. Log Size is the natural logarithm of a company's total assets. Age is the number of years since a company was incorporated. Earned to Ordinary is any earnings not previously distributed to shareholders divided by nominal ordinary equity. Ordinary Equity to Total Assets is nominal ordinary equity divided by total assets. Cash to assets is total cash balances (including financial investments) divided by total assets. Tobin's Q is (book value of debt + book value of preference equity + market value of common equity) / (book value of total assets). Earned Equity to Total Assets is any earnings not previously distributed as dividends to shareholders divided by total assets. Previous non payer is a dummy variable equal to one if the company did not pay an ordinary dividend in the previous year, and equal to zero otherwise. Standard errors are clustered by firm and appear in parentheses.

	1	2	3	4	5	6	7
Industry Fixed Effects	No	No	No	Yes	Yes	Yes	Yes
Year Fixed Effects	No	No	No	No	Yes	Yes	Yes
Return on Equity	0.721***	-0.026	-0.105	-0.003	-0.037	-0.218	-0.203
	(0.140)	(0.176)	(0.176)	(0.174)	(0.173)	(0.160)	(0.151)
Return on Equity $_{t-1}$		1.572***	1.580***	1.583***	1.570***	0.934***	1.040***
		(0.200)	(0.195)	(0.198)	(0.198)	(0.186)	(0.175)
Log Size	-0.012	-0.002	-0.002	0.012	0.011	0.008	0.003
	(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)
Age	0.001	0.001	0.000	0.003**	0.003***	0.002*	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Earned to Ordinary	0.355***	0.242***		0.196***	0.209***	0.104*	0.078
	(0.053)	(0.058)		(0.061)	(0.061)	(0.057)	(0.054)
Ordinary Equity to Total Assets	0.645***	0.698***	0.591***	0.777***	0.749***	0.626***	0.560***
	(0.076)	(0.083)	(0.079)	(0.087)	(0.087)	(0.082)	(0.080)
Cash over Assets	0.135	0.002	-0.12	-0.022	-0.003	-0.07	-0.022
	(0.110)	(0.124)	(0.128)	(0.133)	(0.134)	(0.122)	(0.115)
Tobin's Q							0.029***
							(0.011)
Earned Eq to Total Assets			0.909***				
			(0.166)				
Previous non Payer						-0.564***	-0.508***
						(0.039)	(0.038)
Likelihood Ratio Test Chi^2	201.29	228.85	246.05	289.54	300.57	508.70	510.20
Observations	1018	841	843	841	841	821	755

Table X

Can Dividend Changes predict Earnings Changes?
Unlisted Companies

The dependent variable is the change in a firm's return on equity (ROE) from year t to t+1 or t+2. Return on equity is total earnings before depreciation divided by total nominal equity. We control for year fixed effects. NEGINT is defined as (DNC * % Δ OrdDivs) where DNC is a dummy variable equal to 1 if the firm has cut the ordinary dividend between year t-1 and year t. % Δ OrdDivs is the percentage change in the ordinary dividend rate between year t-1 and year t. POSINT is defined as (DPC * % Δ OrdDivs) where DPC is a dummy variable equal to 1 if the firm has increased the ordinary dividend between year t-1 and year t. ΔEarnings is defined as ROE_t less ROE_{t-1}. E(ROE) is the expected return on equity defined as the predicted value from a regression of ROE on the lagged value of the natural logarithm of Tobin's Q, the natural logarithm of total assets and the lagged value of ROE. [x+] and [x-] denote the max (min) of zero and x. Standard errors are clustered by firm and appear in parentheses.

	Earnings Changes 1 year in the future		Earnings Changes 2 years in the future	
Linear Model	Yes	No	Yes	No
NEGINT	-0.028**	-0.012*	0.016	-0.005
	(0.012)	(0.007)	(0.015)	(0.012)
POSINT	-0.002	0.00	0.00	0.003
	(0.002)	(0.001)	(0.003)	(0.003)
Return on Equity (lagged)	-0.277**		-0.138**	
	(0.115)		(0.069)	
Δ Earnings	-0.486***		-0.104**	
	(0.115)		(0.051)	
[Δ Earnings$^+$]		0.134		-0.190
		(0.165)		(0.290)
[Δ Earnings$^-$]		0.087		0.597
		(0.091)		(0.563)
([Δ Earnings$^+$])^2		-0.462		-0.142
		(0.375)		(0.597)
([Δ Earnings$^-$])^2		-0.013		0.390
		(0.123)		(0.417)
[ROE_{t-1}-E(ROE)$^+$]		-0.311**		-0.165
		(0.130)		(0.268)
[ROE_{t-1}-E(ROE)$^-$]		-0.536***		-1.229
		(0.198)		(1.221)
([ROE_{t-1}-E(ROEt-1)$^+$])^2		-0.199		0.360
		(0.387)		(0.599)
([ROE_{t-1}-E(ROEt-1)$^-$])^2		-0.422		-1.650
		(0.592)		(1.761)
Observations	1184	1176	934	929
R^2	0.30	0.48	0.01	0.01

Table XI

Whether or not to pay a dividend
Unlisted Companies

The dependent variable equals one if the company paid any dividend on its ordinary equity in the year, and zero otherwise. The estimates are obtained from a logit regression. Return on equity (ROE) is total earnings before depreciation divided by total nominal equity. Size is the natural logarithm of a company's total assets. Age is the number of years since incorporation. Earned to Ordinary is any earnings not previously distributed as dividends to shareholders divided by nominal ordinary equity. Ordinary Equity to Total Assets is nominal ordinary equity divided by total assets. Cash to assets is total cash balances (including financial investments) divided by total assets. Tobin's Q is (book value of debt + book value of preference equity + market value of common equity) / (book value of total assets). Earned Equity to Total Assets is any earnings that the company has not previously distributed as dividends divided by total assets. Previous non payer is a dummy variable equal to one if the company did not pay an ordinary dividend in the previous year, and equal to zero otherwise. Standard errors are clustered by firm and appear in parentheses.

	1	2	3	4	5	6
Industry Fixed Effects	No	No	No	Yes	Yes	Yes
Year Fixed Effects	No	No	No	No	Yes	Yes
Return on Equity	34.016***	30.347***	30.336***	31.107***	31.516***	34.648***
	(4.955)	(5.303)	(5.232)	(5.741)	(5.936)	(5.594)
Return on Equity (lagged)	0.289***	0.347***	0.349***	0.231**	0.224*	0.248**
	(0.102)	(0.109)	(0.109)	(0.118)	(0.119)	(0.099)
Size	-0.009	-0.007	-0.007	-0.017	-0.015	-0.002
	(0.010)	(0.011)	(0.011)	(0.013)	(0.013)	(0.010)
Age	3.235***	3.208***		3.562***	3.622***	2.499***
	(0.732)	(0.747)		(0.775)	(0.799)	(0.735)
Earned to Ordinary	2.306***	2.603***	2.155***	3.120***	3.078***	2.564***
	(0.505)	(0.555)	(0.532)	(0.674)	(0.693)	(0.614)
Ordinary Equity to Total Assets	1.594	1.026	1.175	2.004	2.338*	0.729
	(1.089)	(1.332)	(1.327)	(1.269)	(1.278)	(1.133)
Cash over Assets		8.399**	8.584**	8.444**	8.156**	-0.124
		(3.744)	(3.711)	(3.911)	(4.018)	(1.409)
Earned Equity to Total Assets			7.358***			
			(2.029)			
Previous non Payer						-2.730***
						(0.242)
Wald Chi^2	86.40	81.72	75.62	112.75	117.57	397.17
Observations	2339	1868	1868	1868	1868	1833

Table XII

Determinants of the Dividend Payout Ratio
Unlisted Companies

The dependent variable is the ratio of ordinary dividends to earnings. The estimates are obtained from a tobit model. Return on equity is total earnings before depreciation divided by total nominal equity. Size is the natural logarithm of a company's total assets. Age is the number of years since a company was incorporated. Earned to Ordinary is any earnings not previously distributed as dividends divided by nominal ordinary equity. Ordinary Equity to Total Assets is nominal ordinary equity divided by total assets. Cash to assets is total cash balances (including financial investments) divided by total assets. Tobin's Q is (book value of debt + book value of preference equity + market value of common equity) / (book value of total assets). Earned Equity to Total Assets is any earnings that the company has not previously distributed as dividends divided by total assets. Previous non payer is a dummy variable equal to one if the company did not pay an ordinary dividend in the previous year, and equal to zero otherwise. Standard errors are clustered by firm and appear in parentheses.

	1	2	3	4	5	6
Industry Fixed Effects	No	No	No	Yes	Yes	Yes
Year Fixed Effects	No	No	No	No	Yes	Yes
Return on Equity	1.176***	0.829***	0.824***	0.799***	0.758***	0.313
	(0.150)	(0.207)	(0.207)	(0.207)	(0.208)	(0.217)
Return on Equity (lagged)	0.047***	0.061***	0.064***	0.048**	0.047**	0.023
	(0.015)	(0.018)	(0.018)	(0.019)	(0.019)	(0.018)
Log Size	0.002	0.002	0.002	0.002	0.003	0.006***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age	0.493***	0.399***		0.392***	0.408***	0.205**
	(0.077)	(0.093)		(0.093)	(0.093)	(0.090)
Earned to Ordinary	0.822***	0.907***	0.810***	0.969***	0.935***	0.758***
	(0.090)	(0.111)	(0.106)	(0.115)	(0.116)	(0.115)
Ordinary Equity to Total Assets	0.493***	0.378*	0.359*	0.517**	0.568***	0.296
	(0.172)	(0.206)	(0.207)	(0.206)	(0.206)	(0.200)
Cash over Assets		1.075***	1.075***	1.063***	1.003***	0.178
		(0.189)	(0.190)	(0.189)	(0.190)	(0.191)
Earned Eq to Total Assets			1.043***			
			(0.266)			
Previous non Payer						-0.871***
						(0.054)
Likelihood Ratio Test Chi^2	235.23	213.18	210.29	287.21	299.69	585.62
Observations	2334	1864	1864	1864	1864	1829