The cost of equity to earnings yield differential and dividend policy

Omar Esqueda
Department of Accounting, Finance, Econ, Tarleton State University, Stephenville, Texas, USA, and
Thomas O'Connor
School of Business, Maynooth University, Maynooth, Ireland

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Abstract

Purpose – The authors measure the cost of equity to earnings yield differential for a sample of 2,035 non-financial firms. In a series of Logit and Tobit regressions, the authors examine if the cost of equity to earnings yield differential is related to dividend policy in the manner predicted by agency theory.

Design/methodology/approach – Agency theory says a firm's optimal dividend policy is partially determined by the relationship between the earnings yield and the cost of equity capital. When the cost of equity is higher (lower) than the earnings yield, firms are motivated to (not) pay dividends as this reduces the cost of capital and holding other things constant, increases corporate valuations. The authors test whether managers set dividend policies to maximize the value of the firm.

Findings – The study's findings show that when the cost of equity is higher (lower) than earnings yield, firms are more (less) likely to be dividend payers and the payouts are higher (lower). The results are robust to the inclusion of share repurchases as an alternative to cash distributions. The study's findings support the cost of equity hypothesis and are consistent with alternative dividend theories.

Originality/value – The study's findings support the cost of equity hypothesis and are consistent with alternative dividend theories. To the authors' knowledge, this is the first paper testing the cost of equity hypothesis.

Keywords Cost of capital, Dividend policy, Earnings yield, Return on equity

Paper type Research paper

1. Introduction

The agency theory predicts managers must adopt a dividend policy maximizing shareholder wealth. Accordingly, dividend policy has been examined extensively through the agency cost framework, confirming that dividend payments decrease monitoring costs and reduce overinvestment of free cash flows (Easterbrook, 1984; Esqueda, 2016; Jensen, 1986; La Porta *et al.*, 2000; Mitton, 2004; Officer, 2011; Petrasek, 2012; Tran, 2020; among others). Considering managers' duty to maximize firm value, we posit that managers can use dividend policy to maximize firm value through its association with the cost of equity capital. In the context of the discounted cash flow model, when the cost of equity is high, firms have the incentive to return costly capital to investors.

We evaluate whether firms adopt the dividend policy that maximizes firm value in the framework of the discount rate. Specifically, a lower cost of capital is consistent with higher valuations and, holding other things constant, a higher share price. Given that dividend distribution will reduce the amount of capital financed with equity, we examine the cost of equity capital directly. Yet, looking at the cost of equity in isolation may not necessarily capture its influence on dividend policy as firms can generate rates of return exceeding the

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cost of equity even when using expensive funds. Hence, we employ the differential between the cost of equity and the earnings yield (EPS/share price). According to Bulan and Subramanian (2012), when the cost of equity is higher (lower) than the return on equity capital, firms are motivated to (not) pay dividends as this reduces the cost of capital and holding other things constant, increases corporate valuations. In addition, Baker and Weigand (2015, pp. 136) state that "a firm decides upon its optimal dividend policy by the relationship between its return on equity and its cost of capital". Baker and Weigand's (2015) statement is consistent with the notion that firms pursue an equilibrium dividend policy based on the cost of equity and earnings yield differential [1].

Anecdotal evidence shows that when firms perceive that they can generate a return higher than the cost of capital, they reduce dividend payout in an attempt to create economic value, consistent with the prediction of the agency theory. For example, John Stankey, CEO of AT&T, announced that his firm will reduce its dividend payout to redirect capital to projects that will generate a higher rate of return than its cost of equity capital (Hur, 2022). Our study contributes to the payout policy literature by analyzing the dividend payment decisions in the context of the relative cost of equity. Our contribution can be described in two parts. First, we provide documented evidence that the relative cost of equity capital is part of the factors considered by firms when evaluating their dividend policies. Our results support the view that managers appear to determine payout policy in a way that maximizes firm value. Second, previous dividend policy literature has vastly considered that payout increases/initiations send unambiguous positive signals as firms portray confidence about future performance (signaling hypothesis) and as dividends contribute to lower agency costs (agency theory of free cash flow). We contribute to the literature by considering the cost of capital relative to the potential use of capital. The cost of equity to earnings yield differential addresses the potential inconsistency between growth opportunities and dividend distributions. When the earnings yield is substantially higher than the cost of equity capital, firms will benefit from holding equity capital rather than returning it to investors. For example, Fairchild (2010) posits that firms with positive NPV projects are not likely to benefit from dividend payments as distributions take away capital that could otherwise be used to fund profitable projects. To the best of our knowledge, ours is the first paper empirically testing the association between dividend policy and the cost of equity to earnings yield differential.

In addition to the agency costs explanation, researchers have offered multiple reasons why some firms pay dividends. Based on the principle that dividends are used to mitigate information asymmetry, the signaling hypothesis suggests that firms use dividends to indicate to the market positive growth prospects (Allen and Michaely, 2003; Baker *et al.*, 2002; Esqueda, 2016; Miller and Rock, 1985; Noe and Rebello, 1996; La Porta *et al.*, 2000). An alternative dividend hypothesis states that the optimal payout policy is based on the need to distribute the firms' free cash flow. The life-cycle hypothesis indicates that firms pay dividends when they reach a maturity stage as proxied by the earned-to-contributed capital ratio (DeAngelo *et al.*, 2006; Denis and Osobov, 2008). Moreover, the catering hypothesis of dividends suggests that firms are more likely to pay dividends when investors are willing to pay a premium on dividend payers and avoid paying dividends when there is a preference for non-dividend paying stocks (Baker and Wurgler, 2004; Kulchania, 2013) [2].

In this paper, we test whether managers use dividends as a way to regulate the proportion of equity capital employed, the cost of equity hypothesis. From an agency theory standpoint, managers are expected to maximize firm value. Hence, holding other things constant, they will choose to return capital to equity holders when holding the capital is more expensive relative to the return on equity capital. Since earnings yield is based on the market value of equity capital, we employ this measure as a proxy for the return on equity. Our findings are consistent with the cost of equity hypothesis of dividends. We find that when the cost of equity exceeds the earnings yield, firms are more likely to pay dividends and the payouts are higher. The opposite is also true; when earnings yields are higher than the cost of equity, firms are less likely to be dividend payers and dividend payments are lower. These findings support the expectations from the agency theory as managers appear to pursue a dividend policy that is consistent with the goal of maximizing firm value. In addition, our results are consistent with the flexibility model developed by Blau and Fuller (2008) as firms that have the potential for a higher rate of return, are more likely to reduce dividend payments to fund highly profitable projects, despite potential negative market reactions. Our findings are also in line with the life-cycle theory of dividends as more mature firms are more likely to become dividend payers (DeAngelo *et al.*, 2006) and these firms experience a reduction in their level of systematic risk (Grullon *et al.*, 2002), which commands a lower cost of equity for dividend-paying firms. Grullon *et al.* (2002) find that dividend payers subsequently experience a share price increase due to a decline in their cost of capital.

The rest of the paper is structured as follows. The next Section describes the sample and variables of interest. Section three analyses the results and Section four concludes.

2. Data

In this paper, we examine the influence of the cost of equity-earnings yield differential on dividend payout policy. In this section, we outline how each of the cost of equity capital, earnings yield and dividend and share repurchase payouts are measured.

2.1 Cost of equity capital and the earnings yield

We source estimates of the cost of equity capital for each firm in our sample from Refinitiv Eikon. Refinitiv Eikon uses the CAPM to estimate the cost of equity capital. They define their cost of equity capital estimate as "the return a firm theoretically pays its equity investors" and estimate it by "multiplying the equity risk premium of the market with the beta of the stock plus an inflation-adjusted risk-free rate. The expected risk premium is expected market return minus inflation-adjusted risk-free rate". We use the earnings yield to proxy for the return that the company yields on equity capital. We measure the earnings yield as earnings per share divided by the end-of-year share price (Eikon data code is 09,204).

2.2 Payout variables

2.2.1 Dividend payout variables. We examine whether the cost of equity to earnings yield differential influences the dividend policy. We employ the following four measures to proxy for dividend policy. These four dividend policy variables serve as the dependent variables in our main models. First, we evaluate whether the firm is a dividend payer (*Dividend payer*). This binary measure equals 1 if the firm pays dividends in year *t*, zero otherwise. Previous dividend literature has employed the approach to identify firms as dividend payers to study dividend policy (e.g. Chay and Suh, 2009; Brockman and Unlu, 2009; Esqueda, 2016). Second, we augment the dividend payer variable with a dummy variable that equals 1 in year t if the firm increases dividends per share and zero otherwise (*Dividend increase*) [3]. We follow Grullon *et al.* (2002) and focus only on economically significant increases in dividends, which they define as increases in dividends of at least 12.5% and not more than 500% (the latter serves to remove the influence of outliers) [4]. Third, we quantify the dividend amount paid to ordinary shareholders (05,376) relative to net sales (01,001) (*Dividends-to-sales*). This approach to quantifying dividends has been used by Chay and Suh (2009) and Brockman and Unlu (2009), among others. Dividends are set to missing if sales data are missing [5]. Fourth, we use dividends per share (05,101) (*Dividends per share*). Measuring dividends on a per-share basis reduces concerns about the choice of scale variable.

2.2.2 Share repurchases variables. In recent years, share repurchases have become the dominant form of shareholder payout (see Skinner, 2008; Floyd *et al.*, 2015). Hence, we extend our analysis to include share repurchases and explore whether the cost of equity to earnings yield differential influences each of the decisions to repurchase shares and the payout mix, i.e. the choice between dividends and share repurchases. To do so we create an additional four indicator variables. Each one of these four variables are used in Table 6. The first indicator variable, repurchase payer, equals 1 if the firm repurchases shares in year t. We use this variable in Model 1. The remaining three indicator variables are designed to capture the choice between dividends and share repurchases [6]. Specifically, we explore whether the cost of equity to earnings yield differential influences (1) the choice between paying dividends only (coded 0) and paying dividends and repurchasing shares simultaneously (coded 1) (*Div-only vs div and repurchase*), (2) the choice between repurchasing shares only (coded 0) and paying dividends and repurchasing shares simultaneously (coded 1) (*Rep-only vs div and repurchase*) and finally (3) the choice between using dividends only (coded 0) and repurchases only (coded 1) (*Div-only versus repurchase-only*). We source share repurchase data (04,751) from Reuters Eikon.

2.3 Independent variables

We control for a range of variables shown in previous studies to influence corporate dividend and share repurchase payouts (Fama and French, 2001; DeAngelo *et al.*, 2006; Von Eije and Megginson, 2008). The firm-specific variables we include are (1) firm size (measured as the log (book assets) in billions of US$, (02,999)), (2) firm growth (one-year growth in book assets) [7], (3) profit or cash flow volatility a la Chay and Suh (2009) (measured as the standard deviation of ROA over the previous five years), (4) leverage (financial debt (03,255) to financial capital, where financial capital is the sum of financial debt and common equity (03,501)) [8], (5) cash holdings (cash (02,003) to book assets (02,999)) and (6) firm age (log (firm age)) using firm incorporation dates from Eikon (18273) [9]. We control for outliers by winsorizing each firm-level variable at the top and bottom 1% of their respective distributions. In all regressions, we control for the influence of industry on payouts by including industry fixed effects based on Industry Classification Benchmark (ICB11) industry codes. We use ICB11 to divide our sample of firms into one of nine industry sectors, namely, technology; telecommunications; health care; consumer discretionary; consumer staples; industrials; basic materials; and energy.

2.4 Sample description

We obtain our firm-level data from Refinitiv Eikon (formerly Worldscope). In this study, we use the cost of equity capital measure provided by Refinitiv Eikon, which has been available only since 2015. Hence, we begin our data collection with a sample of all publicly-traded U.S. firms with available cost of equity data. Consistent with other studies on payout policy (Fama and French, 2001; DeAngelo *et al.*, 2006; Von Eije and Megginson, 2008), we exclude financial firms, utility sector firms and firms with negative total equity, firms with dividends greater than sales and firms with missing control variables. Our final sample of firms is comprised of 2,035 non-financial firms which we observe in the 2015–2019 period (corresponding to 6,557 firm-year observations) [10]. We choose not to include the 2020 Covid pandemic period as part of our study. Table 1 lists and summarizes each variable used in our models. Share repurchases dominate dividends both in terms of their frequency and amount. The median firm in our sample does not pay a dividend but does repurchase shares; we observe repurchases (dividends) in 53% (40%) of firm years. Share repurchase amounts average 2.7% of sales compared to just 1.4% for dividends [11]. Consistent with the smoothing theory of dividend payouts, the number of dividend increases (704 in total) largely outnumbers the

Table 1. Variable and sample description

Variable	Description	Mean	p25	p50	p95	Stdev	Coverage	Source
Dividends-to-sales	Dividends paid to common shareholders to net sales	0.014	0.00	0.00	0.068	0.028	2016–2019	Refinitiv Eikon
Dividends per share	Common dividends divided by common shares outstanding	0.45	0.00	0.00	2.29	0.85	2016–2019	Refinitiv Eikon
Dividend-payer	Equals 1 if the firm pays a dividend in year t	0.40	0.00	0.00	1.00	0.49	2016–2019	Refinitiv Eikon
Dividend increase	Equals 1 if dividends increase by at least 12.5%	0.11	0.00	0.00	1.00	0.31	2016–2019	Refinitiv Eikon
Repurchases-to-sales	Share repurchases to net sales	0.027	0.00	0.001	0.141	0.058	2016–2019	Refinitiv Eikon
Repurchase payer	Equals 1 if the firm repurchases shares in year t	0.53	0.00	1.00	1.00	0.50	2016–2019	Refinitiv Eikon
Cost of equity capital	Cost of equity capital from Refinitiv Eikon	0.09	0.07	0.07	0.16	0.04	2015–2018	Refinitiv Eikon
	Cost of equity capital from Bloomberg	0.10	0.08	0.10	0.15	0.03	2015–2018	Bloomberg
Earnings yield	Earnings per share divided by end-of-year share price	(0.07)	(0.04)	0.03	0.11	0.34	2015–2018	Refinitiv Eikon
Debt	Financial debt to the sum of financial debt and equity	0.32	0.06	0.30	0.77	0.26	2015–2018	Refinitiv Eikon
Cash holdings	Cash to assets	0.16	0.04	0.10	0.54	0.18	2015–2018	Refinitiv Eikon
Firm age	Firm age using each firm's establishment year	30.69	14.00	23.00	92.00	25.85	2015–2018	Refinitiv Eikon
RETA	Retained earnings to book assets	(0.76)	(0.42)	0.14	0.83	3.08	2015–2018	Refinitiv Eikon
Firm size	Book assets in billions of US dollars	7.39	0.17	0.89	30.62	27.92	2015–2018	Refinitiv Eikon
Profit volatility	Standard deviation of return on assets over the previous five years	0.14	0.02	0.04	0.55	0.32	2015–2018	Refinitiv Eikon

(*continued*)

Table 1.

Variable	Description	Mean	p25	p50	p95	Stdev	Coverage	Source	
Asset growth	One-year growth in book assets	0.00	0.00	0.00	0.01	0.00	2015–2018	Refinitiv Eikon	
Industry dummies	Industry dummies based on ICB	nm	nm	nm	nm	nm	2016–2019	Refinitiv Eikon	
Industry									
	Technology	Telecoms	Healthcare	Consumer Discretionary	Consumer Staples	Industrials	Basic Materials	Energy	Total
Observations	888	241	1,241	1,354	388	1,537	435	473	6,557
Firms	268	74	452	402	114	447	127	151	2,035

Note(s): The top panel lists and summarizes all variables used in this study. The bottom panel reports the number of firm-year observations and the number of individual firms in each industry. Firms in the financial, real estate, and utility sectors are excluded. Firms are assigned to an industry using the Industry Classification Benchmark (ICB)
Source(s): Created by author

number of decreases (174 in total) [12]. Over the sample period, the incidence of dividend initiations (37 in total) and omissions (59 in total) are few. For the average and median firm, the cost of equity capital is larger than the earnings yield. The bottom rows of Table 1 say that collectively, firms in industrials (447 firms), healthcare (452 firms) and consumer discretionary (402) contribute 63.9% to the total number of firms in the sample.

3. Analysis

Before we begin our analysis in earnest, in Table 2 we describe the average firm in our sample with firm years classified into one of four payout groupings; namely, (1) non-payers (firms who do not pay a dividend or repurchase shares in year t), (2) dividend-only (firms who pay a dividend but do not repurchase shares in year t), (3) repurchase-only (firms who repurchase shares but do not pay a dividend in year t) and (4) firms who simultaneously pay a dividend *and* repurchase shares in year t. Our sample is dominated by firms that do not make shareholder payouts of either type (2,391 firm-year observations or 36.46% of the total), while

	Nonpaying firms	Dividend-only firms	Repurchase-only firms	Div and repurchase
Observations	2,391	664	1,503	1,999
Cost of equity	0.095	0.085	0.087	0.085
Earnings yield	(0.224)	0.016	(0.021)	0.045
Cost of equity < earnings yield	8.20%	16.87%	15.24%	14.96%
Cost of equity > earnings yield >0	24.72%	66.27%	57.82%	79.04%
Cost of equity > earnings yield <0	67.08%	16.87%	26.95%	6.00%
Dividends-to-sales	0.00	0.035	0.00	0.034
Repurchases-to-sales	0.00	0.00	0.054	0.048
Firm size (billions of US dollars)	1.54	7.36	3.61	13.61
Tobin's q	2.11	1.68	1.88	1.87
Debt	0.22	0.33	0.31	0.37
Cash	0.22	0.10	0.15	0.10
Firm growth	0.18	0.10	0.14	0.07
RETA	(2.32)	0.31	(0.27)	0.40
Firm age	21.46 years	38.87 years	23.81 years	44.47 years
Profit volatility	0.27	0.05	0.09	0.04

Note(s): This table summarizes the average firm in each of the four groups defined by dividend and share repurchase payout behavior. Nonpaying firms are firms that do not pay a dividend or repurchase shares in year t. Dividend-only firms pay a dividend but do not repurchase shares in year t. Repurchase-only firms do not pay a dividend but repurchase shares in year t. Div and repurchase firms simultaneously pay a dividend and repurchase shares in year t. The cost of equity is from Refinitiv Eikon. Earnings yield is earnings per share (05,201) divided by the end-of-the year share price. For each payout group, we report the percentage of firms whose earnings yield is greater (less) than the cost of equity capital. Dividends-to-sales is dividends paid to common shareholders (05,376) to net sales or revenues (01,001). Repurchases-to-sales is share repurchases (04,751) to net sales (01,001). Firm size is book assets in billions of dollars (02,999). Tobin's q is the ratio of market capitalization plus debt divided by the book value of equity plus debt. Debt is financial debt to financial capital, where financial capital is the sum of financial debt (03,255) and common equity (03,501). Cash is cash (02,003) to assets (02,999). Firm growth is one-year growth in book assets. RETA is retained earnings (03,495) to book assets (02,999). Firm age is calculated using firm incorporation dates (18273). Profit volatility is the standard deviation of the annual return on assets over the most recent five years
Source(s): Created by author

Table 2. The average firm by payout status

few firms rely solely on dividends to return cash to shareholders (664 firm-year observations or 10.13% of total firm-years). Many firms in our sample are what Von Eije and Megginson (2008) describe as "switch-hitters", in that they simultaneously pay dividends *and* repurchase shares (1,999 firm-year observations or 30.49% of the total) [13].

Next, we form three additional groups to further distinguish firms by their cost of equity to earnings yield differential. We distinguish between firms whose cost of equity is less than their earnings yield (cost of equity < earnings yield, with 836 firm years, which we refer to as group 1 firms), from firms whose cost of equity exceeds their earnings yield (cost of equity > earnings yield). In this latter group of firms, we create two sub-groupings to distinguish between firms with positive (cost of equity > earnings yield >0, with 3,480 firm-years and is group 2 firms) and negative (cost of equity > earnings yield <0, with 2,241 firm-years and is group 3 firms), earnings yield. Theory asserts that value-maximizing firms should refrain from a policy of earnings retention and pay a dividend when the cost of equity capital exceeds the earnings yield, i.e. cost of equity > earnings yield. However, for group 3 firms we expect that their negative earnings will override the fact that their cost of equity exceeds their earnings yield, leading these firms to follow a policy of earnings retention.

In Table 2 we observe corporate dividend payout behavior which is largely consistent with the assertion that firms will return cash to shareholders when the cost of equity to earnings yield differential is positive. In each of the dividend-only, repurchase-only and dividend *and* repurchase groups, we observe that few firms report an earnings yield larger than their cost of equity capital. Instead, most firms have a positive earnings yield that is less than their cost of equity capital; 79.04% of firms in the dividend *and* repurchase group; 66.27% of firms in the dividend-only group of firms; and 57.82% of firms that repurchase-only. Firms who pay dividends *and* repurchase shares are the least likely of all firms to suffer losses (i.e. report a negative earnings yield), while of the firms who return cash back to their shareholders, losses are most prevalent among repurchase-only firms [14]. The decision by firms to not make payouts appears to be largely influenced by negative earnings yields; for these firms, in 67.08% of cases, the earnings yield is negative. 24.72% of these firms have positive earnings which are less than their cost of capital, yet they choose not to pay a dividend or repurchase shares [15].

In Table 3 we build on the analysis presented in Table 2, but now the focus shifts to the cost of equity to earnings yield groupings defined earlier. Between groups, there is evidence consistent with the cost of equity hypothesis; the likelihood of paying a dividend is greatest for firms whose earnings yield is positive and less than the cost of equity capital (Panel B). For these firms, we observe dividend payouts in 58% of firm-years compared to 49% for firms in Panel A, firms whose cost of equity is lower than their earnings yield. Yet, the number of firms in Panel A that pay a dividend remains high and is inconsistent with the theory. We further subdivide each of the three groups of firms into four quartiles. Doing so reveals a distinct influence of the cost of equity to earnings yield differential on payout policy within groups. Consider the firms in Panel A (i.e. with the cost of equity < earnings yield). Here we clearly see that the likelihood of paying a dividend and the dividend amount falls the greater the amount by which the earnings yield exceeds the cost of equity. To illustrate, consider quartile 1 firms whose earnings yield only marginally exceeds their cost of equity; 61% of these firms pay a dividend and their dividend payouts amount to 2% of sales. For quartile 4 firms, the likelihood of paying a dividend (28%) and the dividend amount is much lower (both in terms of dividends per share (0.198 versus 0.813 for quartile 1 firms) and dividends-to-sales (0.009 versus 0.02 for quartile 1 firms)). We observe similar patterns in Panel B (cost of equity > earnings yield >0) and Panel C (cost of equity > earnings yield <0) firms. For Panel B firms, whose cost of equity always exceeds their earnings yield, the likelihood of paying a dividend and the dividend amount decreases as the cost of equity and earnings yield differential increases; between quartile 1 and quartile 4, the likelihood of paying a dividend

Table 3. Cost of equity to earnings yield differential groups

	Cost of equity	Earnings yield	Dividends per share	Div-sales	Div payer	Div and repurchase	Tobin's q	Firm age	RETA	Firm growth	Profit volatility
Panel A: Cost of equity < earnings yield (# of observations is 836)											
Quartile 1	0.067	0.073	0.813	0.020	0.61	0.48	1.09	36.82	0.18	0.086	0.05
Quartile 2	0.063	0.080	0.676	0.020	0.56	0.39	1.31	34.70	0.12	0.103	0.08
Quartile 3	0.060	0.100	0.538	0.017	0.52	0.36	1.43	35.44	0.08	0.160	0.09
Quartile 4	0.080	0.208	0.198	0.009	0.28	0.21	1.47	28.22	(0.62)	0.200	0.20
Overall	0.068	0.116	0.555	0.017	0.49	0.36	1.33	33.77	(0.06)	0.137	0.10
Panel B: Cost of equity > earnings yield >0 (# of observations is 3,480)											
Quartile 1	0.072	0.058	0.885	0.023	0.65	0.53	1.81	39.45	0.30	0.091	0.04
Quartile 2	0.081	0.046	0.832	0.025	0.67	0.53	2.11	37.81	0.27	0.110	0.04
Quartile 3	0.091	0.037	0.649	0.021	0.61	0.49	2.22	33.42	0.25	0.123	0.04
Quartile 4	0.116	0.027	0.300	0.010	0.39	0.26	2.11	30.43	0.04	0.170	0.07
Overall	0.089	0.041	0.667	0.020	0.58	0.45	2.06	35.28	0.21	0.124	0.05
Panel C: Cost of equity > earnings yield <0 (# of observations is 2,241)											
Quartile 1	0.070	(0.026)	0.169	0.006	0.17	0.09	2.28	24.43	(0.86)	0.202	0.13
Quartile 2	0.097	(0.078)	0.107	0.004	0.13	0.07	2.23	23.18	(1.71)	0.213	0.24
Quartile 3	0.111	(0.203)	0.031	0.001	0.08	0.03	2.04	22.29	(2.85)	0.142	0.36
Quartile 4	0.107	(0.955)	0.028	0.001	0.04	0.02	1.35	20.76	(4.67)	(0.028)	0.42
Overall	0.096	(0.315)	0.083	0.003	0.10	0.05	1.98	22.67	(2.52)	0.133	0.29

Note(s): This table describes the average firm in groups defined by the relationship between the cost of equity capital and the earnings yield. In the top (middle) panel, earnings yield is greater (less) than the cost of equity capital. In the bottom panel, the earnings yield is negative. The cost of equity capital is sourced from Refinitiv Eikon. Earnings yield is earnings per share (05,201) divided by the end-of-the-year share price. The dividend payout amount is measured using Div-sales (dividends paid to common shareholders (05,376) relative to net sales or revenues (01,001)), and dividends per share (05,101). Dividend payer is an indicator variable that equals 1 if the firm pays a dividend in year t, and 0 otherwise. Div and repurchase is an indicator variable that equals 1 if the firm pays a dividend and repurchases shares in year t, 0 otherwise. Tobin's q is the ratio of market capitalization plus debt divided by the book value of equity plus debt. Firm age is calculated using firm incorporation dates (18273). RETA is retained earnings (03,495) to book assets (02,999). Firm growth is one-year growth in book assets. Profit volatility is the standard deviation of the annual return on assets over the most recent five years

Source(s): Created by author

falls from 0.65 to 0.39 and dividends per share fall from 0.885 to 0.300. We observe similar trends in the dividend payouts in Panel C: even among firms with negative earnings yield, the likelihood of paying a dividend and the dividend amount is largest when the cost of equity and earnings yield differential is at its lowest.

In Panel A, we also observe that the firm value, proxied by Tobin's q, tends to be higher when the earnings yield to the cost of equity spread is higher. The mean Tobin's q equals 1.09 (1.47) in Quartile 1(4). The findings in Panel A are consistent with the cost of equity hypothesis. In Panel B, however, there is not a clear relationship between firm value and the cost of equity to earnings yield differential. Panel C includes firms with negative earnings yield. As expected, Tobin's q declines when the earnings yield to the cost of equity decreases. This association appears more acute in Quartiles 3 and 4 given the low (negative) earning yield; as earnings yield declines, so does firm value. The last four columns of Table 3 present firm age, RETA, firm growth and profit volatility, for the average firm in each group. Dividend policies appear highly correlated with these measures and thus highlight the importance of controlling for lifecycle and profit volatility in our regression-based tests.

3.1 Regression analysis

We turn next to our formal regression-based tests and in Tables 4–7 we test for differences in the dividend and dividend versus share repurchase policies *between* the cost of equity to earnings yield groups defined in Table 3. To examine whether the cost of equity-to- earnings yield differential influences payout policy, we create an indicator variable which is coded 0 if the cost of equity < earnings yield (this is the reference group and is group 1 firms from Table 3), coded 1 if the cost of equity > earnings yield >0 (group 2 firms), and coded 2 if the cost of equity > earnings yield <0 (group 3 firms). If the cost of equity theory is correct, then relative to group 1 firms, group 2 firms should be more likely to pay a dividend, more likely to increase their dividend payouts, and pay the largest dividend amounts. Notwithstanding the fact that group 3 firms have a cost of equity > earnings yield, we expect these firms to be the least likely to pay a dividend, the least likely to increase their dividend payouts, and pay the smallest dividend amounts should they choose to pay a dividend, simply because of their negative earnings. Therefore, *a priori*, we expect the coefficient estimate for the cost of equity > earnings yield >0 dummy to be positive, and negative for the cost of equity > earnings yield <0 dummy, in regressions using each of the dependent variables in Tables 4 and 5 Our base models are presented in Table 4, where we employ two binary dependent variables, *Dividend payer*, and *Dividend increase*, as indicated. Then in Table 5, the focus shifts to the dividend amount which we measure using each of *Dividends-to-sales* and *Dividends per share*.

We begin with Table 4, which presents marginal effects from a series of pooled Logit regressions estimated over the full sample period. The dependent variables in these models are *Dividend payer* and *Dividend increase*, as indicated below. The logistic regression used in Table 4 takes the following form:

$$Log(Y_{it}) = \alpha + \sum_{j=1}^{k} \beta_j X_{it}^j + \beta_{j+1}(COE - EY) + \alpha_i + \alpha_t + v_{it} \tag{1}$$

Where, Y_{it} is a binary dependent variable indicating whether the firm is a dividend payer in year i, (*Dividend payer*) in Models 1–3. In Models 4–6, the binary dependent variable indicates whether the firm increased its dividends in year i (*Dividend increase*). X_{it} is a vector of k control variables described in Section 2.3. *COE-EY* is our variable of interest, the COEC-to-earnings yield differential. α_i and α_t represent industry and year effects, respectively. v_{it} is an idiosyncratic error term. Standard errors are calculated assuming firm-level clustering (Petersen, 2009).

Table 4. Cost of equity to earnings yield differential and the incidence of dividend payouts

	The dependent variable is Dividend payer (1)	(2)	(3)	Dividend increase (4)	(5)	(6)
Cost of equity > earnings yield >0	0.052* (1.94)	0.093** (2.25)	0.059 (1.33)	0.023** (2.42)	0.033* (1.77)	0.031* (1.68)
Cost of equity > earnings yield <0	−0.210*** (5.78)			−0.042*** (3.26)		
Cost of equity > earnings yield >0 * high cash dummy			0.077** (2.11)			0.010* (1.77)
Cost of equity	−1.609*** (3.92)	−2.225*** (3.74)	−2.260*** (3.78)	−0.305*** (3.08)	−0.739*** (3.07)	−0.742*** (3.09)
Earnings yield	0.172*** (3.03)	0.346 (0.99)	0.339 (0.97)	0.069** (2.06)	0.068 (0.40)	0.068 (0.40)
Log (firm size)	0.097*** (10.50)	0.111*** (10.75)	0.111*** (10.68)	0.013*** (6.25)	0.030*** (6.59)	0.030*** (6.58)
Firm growth	−11.227*** (4.27)	−15.167*** (3.76)	−14.757*** (3.63)	0.033*** (5.86)	0.080*** (5.40)	0.080*** (5.43)
Profit volatility	−0.444** (2.03)	−0.458 (1.53)	−0.447 (1.51)	−0.060 (1.35)	−0.093 (0.91)	−0.093 (0.91)
Debt	−0.109** (2.01)	−0.102 (1.39)	−0.087 (1.18)	−0.032** (2.28)	−0.076** (2.25)	−0.075** (2.21)
Cash	0.003 (0.04)	0.052 (0.39)	−0.122 (0.81)	0.009 (0.35)	0.041 (0.64)	0.023 (0.31)
Log (firm age)	0.192*** (9.85)	0.233*** (10.64)	0.233*** (10.66)	0.005 (1.34)	0.011 (1.23)	0.011 (1.23)
Industry and time dummies	Included	Included	Included	Included	Included	Included
Observations	6,557	4,316	4,316	6,557	4,316	4,316
	Dividend payer			Dividend increase		
Re > E. yield >0 vs Re > E. yield <0	***			***		
	Predicted dividend payouts					
Cost of equity < earnings yield	0.31	0.50		0.06	0.11	
Cost of equity > earnings yield >0	0.37	0.60		0.09	0.15	
Cost of equity > earnings yield <0	0.13			0.02		

Note(s): This table reports pooled logit marginal effects for a sample of 2,035 non-financial publicly-traded firms in the United States over the period 2015–2019. Test statistics calculated using standard errors clustered by the firm are reported in parentheses. The dependent variable is dividend payer and dividend increase, as indicated. Dividend payer is an indicator variable that equals 1 if the firm pays a dividend in year t, and 0 otherwise. Dividend increase is an indicator variable that equals 1 if the firm increases dividends in year t, 0 otherwise. Dividend increases of less than 12.5% and more than 500% are excluded. The cost of equity capital is sourced from Refinitiv Eikon. Earnings yield is earnings per share (05,201) divided by the end-of-the-year share price. Cost of equity > earnings yield >0 is an indicator variable that equals 1 if the cost of equity is greater than the earnings yield and the earnings yield >0 in year t and is 0 otherwise. Cost of equity > earnings yield <0 is an indicator variable that equals 1 if the cost of equity is greater than the earnings yield and the earnings yield <0 in year t and is 0 otherwise. High cash dummy equals 1 if the firm's cash ratio is greater than the sample median cash ratio in year t. Log (firm size) is the log of book assets (02,999) in billions of US$. Firm growth is one-year growth in book assets. Profit volatility is the standard deviation of the annual return on assets over the most recent five years. Debt is financial debt to financial capital, where financial capital is the sum of financial debt (03,255) and common equity (03,501). Cash is cash (02,003) to assets (02,999). Log (firm age) is the log of firm age, with age calculated using firm incorporation dates (18273). Industry and time dummies are included but not reported. All firm-level data is sourced from Refinitiv Eikon. ***, **, and *, denotes statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Created by author

Table 5.
Cost of equity to earnings yield differential and the dividend amount

	The dependent variable is Dividends-to-sales (1)	(2)	(3)	Dividends per share (4)	(5)	(6)
Cost of equity > earnings yield >0	0.003** (2.54)	0.004** (2.20)	0.003* (1.64)	0.054* (1.67)	0.098** (1.98)	0.078 (1.44)
Cost of equity > earnings yield <0	−0.007*** (5.42)			−0.220*** (6.02)		
Cost of equity > earnings yield >0 * high cash dummy			0.002 (1.17)			0.050 (1.13)
Cost of equity	−0.098*** (6.17)	−0.157*** (6.15)	−0.157*** (6.19)	−2.739*** (5.99)	−4.415*** (5.89)	−4.433*** (5.91)
Earnings yield	0.001*** (3.87)	−0.000 (0.01)	−0.000 (0.01)	0.003*** (3.86)	0.005 (1.16)	0.490 (1.16)
Log (firm size)	0.004*** (11.87)	0.005*** (10.19)	0.005*** (10.13)	0.138*** (15.26)	0.187*** (14.24)	0.187*** (14.18)
Firm growth	−0.005*** (3.88)	−0.008*** (3.40)	−0.007*** (3.34)	−0.134*** (4.88)	−0.193*** (4.24)	−0.193*** (4.17)
Profit volatility	−0.007 (1.02)	−0.001 (0.10)	−0.001 (0.08)	−0.274 (1.42)	−0.224 (0.81)	−0.219 (0.79)
Debt	−0.002 (1.20)	−0.001 (0.37)	−0.001 (0.25)	−0.027 (0.43)	0.000 (0.01)	0.009 (0.10)
Cash	0.007* (1.78)	0.016** (2.30)	0.012 (1.46)	0.099 (0.92)	0.223 (1.33)	0.102 (0.55)
Log (firm age)	0.006*** (10.31)	0.008*** (9.58)	0.008*** (9.59)	0.213*** (12.17)	0.280*** (11.34)	0.280*** (11.34)
Industry and time dummies	Included	Included	Included	Included	Included	Included
Observations	6,557	4,316	4,316	6,557	4,316	4,316
	Dividends-to-sales			Dividends per share		
Re > E. yield >0 vs Re > E. yield <0	***			***		
	Predicted dividend payouts					
Cost of equity < earnings yield	0.009	0.015		0.255	0.458	
Cost of equity > earnings yield >0	0.011	0.019		0.301	0.556	
Cost of equity > earnings yield <0	0.003			0.096		

Note(s): This table reports pooled logit marginal effects for a sample of 2,035 non-financial publicly-traded firms in the United States over the period 2015–2019. Test statistics calculated using standard errors clustered by the firm are reported in parentheses. The dependent variable is dividends-to-sales and dividends per share, as indicated. Dividends-to-sales is measured as dividends paid to common shareholders (05,376) divided by net sales or revenues (01,001). Dividends per share is dividends paid to common shareholders divided by common shares outstanding (05,101). The cost of equity capital is sourced from Refinitiv Eikon. Earnings yield is earnings per share (05,201) divided by the end-of-the-year share price. Cost of equity > earnings yield >0 is an indicator variable that equals 1 if the cost of equity is greater than the earnings yield and the earnings yield >0 in year t and is 0 otherwise. Cost of equity > earnings yield <0 is an indicator variable that equals 1 if the cost of equity is greater than the earnings yield and the earnings yield <0 in year t and is 0 otherwise. High cash dummy equals 1 if the firm's cash ratio is greater than the sample median cash ratio in year t. Log (firm size) is the log of book assets (02,999) in billions of US$. Firm growth is one-year growth in book assets. Profit volatility is the standard deviation of the annual return on assets over the most recent five years. Debt is financial debt to financial capital, where financial capital is the sum of financial debt (03,255) and common equity (03,501). Cash is cash (02,003) to assets (02,999). Log (firm age) is the log of firm age, with age calculated using firm incorporation dates (18273). Industry and time dummies are included but not reported. All firm-level data is sourced from Refinitiv Eikon. ***, ** and *, denotes statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Created by author

Table 6. Cost of equity to earnings yield differential, repurchases and the payout mix

	The dependent variable is			
	Repurchase payer (1)	Div-only vs div and repurchase (2)	Rep-only vs div and repurchase (3)	Div-only versus repurchase-only (4)
Cost of equity > earnings yield >0	0.052* (1.85)	0.061* (1.73)	0.092** (2.22)	0.007 (0.17)
Cost of equity > earnings yield <0	−0.225*** (6.91)	−0.111* (1.73)	−0.215*** (4.06)	0.084* (1.83)
Cost of equity	−1.483*** (4.50)	−0.135 (0.28)	−1.127* (1.68)	0.886 (1.63)
Earnings yield	0.098** (2.05)	0.316** (2.27)	0.181* (1.71)	0.011 (0.20)
Log (firm size)	0.092*** (12.80)	0.060*** (6.49)	0.117*** (9.13)	−0.039*** (3.29)
Firm growth	−0.103*** (4.61)	−0.108*** (3.62)	−0.153*** (3.64)	0.018 (0.51)
Profit volatility	−0.077 (1.32)	0.113 (0.68)	−0.382 (1.20)	0.344 (1.36)
Debt	−0.114** (2.24)	−0.091 (1.38)	−0.146* (1.72)	0.071 (0.85)
Cash	0.088 (1.15)	−0.048 (0.37)	−0.080 (0.50)	0.055 (0.40)
Log (firm age)	0.065*** (4.35)	0.038** (2.14)	0.250*** (10.23)	−0.158*** (6.41)
Industry and time dummies	Included	Included	Included	Included
Observations	6,557	2,663	3,502	2,167
Pseudo R-squared	0.239	0.092	0.291	0.154
	Repurchase payer	Div-only vs div and repurchase	Rep-only vs div and repurchase	Div-only versus repurchase-only
Re > EY > 0 vs Re > EY < 0	***	***	***	**
		Predicted likelihoods		
Cost of equity < earnings yield	0.57	0.73	0.55	0.71
Cost of equity > earnings yield >0	0.63	0.80	0.64	0.72
Cost of equity > earnings yield <0	0.35	0.62	0.34	0.79

Note(s): This table reports pooled logit marginal effects for a sample of 2,035 non-financial publicly-traded firms in the United States over the period 2015–2019. Test statistics calculated using standard errors clustered by the firm are reported in parentheses. The dependent variables are (1) repurchase payer (coded 1 if the firm pays a dividend in year t); (2) div-only (coded 0) vs div and repurchase (coded 1); (3) repurchase-only (coded 0) vs div and repurchase (coded 1); and (4) dividend-only (coded 0) versus repurchase-only (coded 1), as indicated. The cost of equity capital is sourced from Refinitiv Eikon. Earnings yield is earnings per share (05,201) divided by the end-of-the year share price. Cost of equity > earnings yield >0 is an indicator variable that equals 1 if the cost of equity is greater than the earnings yield and the earnings yield >0 in year t and is 0 otherwise. Cost of equity > earnings yield <0 is an indicator variable that equals 1 if the cost of equity is greater than the earnings yield and the earnings yield <0 in year t and is 0 otherwise. Log (firm size) is the log of book assets (02,999) in billions of US$. Firm growth is one-year growth in book assets. Profit volatility is the standard deviation of the annual return on assets over the most recent five years. Debt is financial debt to financial capital, where financial capital is the sum of financial debt (03,255) and common equity (03,501). Cash is cash (02,003) to assets (02,999). Log (firm age) is the log of firm age, with age calculated using firm incorporation dates (18273). Industry and time dummies are included but not reported. All firm level data is sourced from Refinitiv Eikon

***, ** and *, denotes statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Created by author

Table 7.
The influence of the cost of equity to earnings yield differential on corporate payouts using the cost of equity capital estimates from Bloomberg

	The dependent variable is Dividend payer (1)	Dividend increase (2)	Dividends per share (3)	Repurchase payer (4)	Div-only vs div and rep (5)	Rep-only vs div and rep (6)	Div-only vs rep-only (7)
Cost of equity > earnings yield >0	0.350** (2.40)	0.047* (1.90)	0.088*** (2.65)	−0.003 (0.10)	0.015 (0.43)	0.084** (1.97)	−0.095** (2.38)
Cost of equity > earnings yield <0	−1.037*** (5.48)	−0.135*** (4.45)	−0.210*** (5.46)	−0.285*** (8.23)	−0.144** (2.13)	0.214*** (3.52)	−0.001 (0.03)
Cost of equity	−0.979 (0.55)	−0.171 (0.73)	−0.541 (1.41)	−0.012 (0.10)	−0.308 (0.81)	−0.378 (0.76)	0.369 (0.73)
Earnings yield	0.960*** (2.79)	0.182** (2.23)	0.307*** (3.72)	0.075 (1.49)	0.344** (2.22)	0.218 (1.58)	−0.024 (0.35)
Log (firm size)	0.483*** (11.75)	0.054*** (7.67)	0.138*** (14.84)	0.095*** (12.86)	0.072*** (7.73)	0.116*** (8.92)	−0.025** (2.07)
Firm growth	−0.569*** (4.26)	−0.004 (0.24)	−0.143*** (4.84)	−0.116*** (4.91)	−0.119*** (3.87)	−0.150*** (3.43)	0.005 (0.13)
Profit volatility	−2.079 (1.60)	−0.443** (2.16)	−0.188 (0.86)	−0.063 (1.01)	0.103 (0.63)	−0.332 (1.02)	0.320 (1.29)
Debt	−0.611** (2.09)	−0.112*** (2.90)	−0.068 (1.01)	−0.156*** (2.86)	−0.146** (2.22)	−0.174** (2.00)	0.003 (0.03)
Cash	−0.296 (0.55)	−0.084 (1.15)	−0.009 (0.08)	0.078 (0.95)	−0.080 (0.58)	−0.172 (1.05)	0.102 (0.72)
Log (firm age)	0.983*** (10.90)	0.103*** (7.24)	0.214*** (11.48)	0.062*** (3.88)	0.029 (1.63)	0.241*** (9.79)	−0.161*** (6.09)
Industry and time dummies	Included	Included	Included	Included	Included	Included	Included
Observations	5,871	5,871	5,871	5,871	2,455	3,192	1,949
Pseudo R-squared	0.390	0.300	0.248	0.239	0.105	0.291	0.168
	Dividend payer	Dividend increase	DPS	Rep payer	Div-only vs div and rep	Rep-only vs div and rep	Div-only vs rep-only
Re > EY > 0 vs Re > EY < 0	***	***	***	***	***	***	***
	Predicted values						
Cost of equity < earnings yield	0.31	0.22	0.25	0.63	0.78	0.56	0.79
Cost of equity > earnings yield >0	0.39	0.27	0.32	0.63	0.79	0.65	0.70
Cost of equity > earnings yield <0	0.14	0.08	0.09	0.35	0.63	0.35	0.79

Note(s): This table reports pooled logit and pooled Tobit (using Dividends per share) marginal effects for a sample of 1,818 non-financial publicly-traded firms in the United States over the period 2015–2019. Test statistics calculated using standard errors clustered by the firm are reported in parentheses. The dependent variable is (1) dividend payer; (2) dividend increase; (3) dividends per share (05,101); (4) repurchase payer (coded 1 if the firm pays a dividend in year t); (5) div-only (coded 0) vs div and repurchase (coded 1); (6) repurchase-only (coded 0) vs div and repurchase (coded 1); and (7) dividend-only (coded 0) versus repurchase-only (coded 1), as indicated. Dividend payer is an indicator variable that equals 1 if the firm pays a dividend in year t, and 0 otherwise. Dividend increase is an indicator variable that equals 1 if the firm increases dividends in year t, 0 otherwise. Dividend increases less than 12.5% and more than 500% are excluded. Dividends per share is dividends paid to common shareholders divided by common shares outstanding. The cost of equity capital is sourced from Bloomberg. Earnings yield is earnings per share (05,201) divided by the end-of-the-year share price. Cost of equity > earnings yield >0 is an indicator variable that equals 1 if the cost of equity is greater than the earnings yield and the earnings yield >0 in year t and is 0 otherwise. Cost of equity > earnings yield <0 is an indicator variable that equals 1 if the cost of equity is greater than the earnings yield and the earnings yield <0 in year t and is 0 otherwise. Log (firm size) is the log of book assets (02,999) in billions of US$. Firm growth is one-year growth in book assets. Profit volatility is the standard deviation of the annual return on assets over the most recent five years. Debt is financial debt to financial capital, where financial capital is the sum of financial debt (03,255) and common equity (03,501). Cash is cash (02,003) to assets (02,999). Log (firm age) is the log of firm age, with age calculated using firm incorporation dates (18273). Industry and time dummies are included but not reported. Except for the cost of equity capital measure, all firm level data is sourced from Refinitiv Eikon
***, ** and *, denotes statistical significance at the 1, 5 and 10% levels, respectively

Source(s): Created by author

Our main variables of interest are the "cost of equity > earnings yield >0" and "cost of equity > earnings yield <0" indicator variables which we include in Models (1) and (4) only. In all other regressions, we exclude group 3 firms, i.e. firms with the cost of equity > earnings yield <0, and include only group 1 (i.e. firms with the cost of equity < earnings yield), and group 2 firms (i.e. firms with the cost of equity > earnings yield >0). In Models (3) and (6) we examine whether the influence of the COE-EY differential differs for firms with varying cash holdings. A priori, we would expect firms with a cost of equity > earnings yield >0 and with large cash balances to be most likely of all firms to pay and increase their dividends because the decision to retain large cash balances inside the firm for these firms is value-destroying. To test this proposition, in Models (3) and (6) we create an interaction term combining "cost of equity > earnings yield >0" with a "High-cash dummy". High-cash dummy equals 1 if the firm's cash holdings are greater than the sample median cash holdings in that year. If the cost of equity theory is correct, then we would expect that the estimated coefficient on the interaction term be positive. In all regressions, we control for the level of each of the cost of equity and the earnings yield, together with firm-level controls for firm size, firm growth, profit volatility, debt, cash and firm age. Industry and time (year) fixed effects are included but not reported.

We begin with a discussion of the results for Models (1), (2), (4) and (5). The results using dividend payer and dividend increase as dependent variables are in line with our prior expectations. Across the three costs of equity capital-to-earnings yield groupings, what we observe is that firms in the "cost of equity > earnings yield >0" group are most likely to pay a dividend and the most likely to increase their dividend payouts. In contrast, and as expected, firms in the "cost of equity > earnings yield <0" group are the least likely to pay a dividend and the least likely to increase a dividend. It appears that for the average firm with a cost of equity > earnings yield, it is their negative earnings yield, and not the cost of equity to earnings yield differential, which drives their dividend payout policy. These results hold after controlling for other know and important determinants of dividend policies, namely firm lifecycle (firm age) and profit volatility [16]. We also find that the level of both the cost of equity capital (negative) and earnings yield (positive) influence dividend payouts, as expected. Consistent with expectations, in Models (3) and (6) the coefficient estimates for the interaction terms are positive and statistically significant. Firms with the cost of equity > earnings yield >0 and with high cash balances have the greatest incentive to pay and increase dividend payouts, and that is exactly what we find.

The differences in dividend policies that we observe between the cost of equity-to- earnings yield groups are not just statistically significant, but economically significant also. For example, using regression 1, when compared to "cost of equity < earnings yield" firms, firms with "cost of equity > earnings yield >0" are 19.35% more likely to pay a dividend (compare 0.37 for the "cost of equity > earnings yield >0" to 0.31 for the "cost of equity < earnings yield group"). Relative to "cost of equity > earnings yield <0" firms, "cost of equity > earnings yield >0" firms are almost three times more likely to pay a dividend (compare 0.37 to 0.13). Firms with "cost of equity > earnings yield >0" are 50% more likely to increase dividends per share when compared to firms with "cost of equity < earnings yield", and more than four times more likely to increase dividends compared to firms with negative earnings [17].

Finally, in Table 4, we observe that several of the firm-level control variables are statistically significant determinants of dividend payout policies. Consistent with the life-cycle model of dividends, dividend payers are large, mature (using firm age) firms with profitable (earnings yield) and stable earnings (profit volatility). Compared to nonpaying firms, dividend payers are less indebted, a finding which is consistent with the assertion that leverage falls as firms mature (Kieschnick and Moussawi, 2018). Dividend increases occur in large, profitable and less indebted firms, that are growing and have a lower cost of equity capital.

We expand our tests using alternative measures of dividend policy as the dependent variables, *Dividends-to-sales and Dividends per share,* as indicated. The regression results presented in Table 5 employ the following Tobit model:

$$Y_{it} = \alpha + \sum_{j=1}^{k} \beta_j X_{it}^{j} + \beta_{j+1}(COE - EY) + \alpha_i + \alpha_t + v_{it} \tag{2}$$

Where Y_{it} is the dependent variable that takes the form of either *Dividends-to-sales* (in Models 1–3) or *Dividends per share* (in Models 4–6). X_{it} is a vector of k control variables described in Section 2.3. *COE-EY* is our variable of interest, the COEC to earnings yield differential. α_i and α_t represent industry and year effects, respectively. v_{it} is an idiosyncratic error term. Standard errors are estimated using firm-level clustering (Petersen, 2009). Like in Table 4, group 3 firms are included in Models (1) and (4), only. Models (3) and (6) include the interaction of "cost of equity > earnings yield >0" and the "High-cash dummy".

We begin with a discussion of Models (1), (2), (4) and (5). As expected, the estimated marginal effects are always positive and statistically significant for firms with "Cost of equity > earnings yield >0", and always negative and statistically significant for firms with "Cost of equity > earnings yield <0". Hence, they reveal that dividend amounts are largest for "cost of equity > earnings yield >0" firms and lowest for firms with negative earnings, which is consistent with the theory. In Model 1, the estimated coefficient for "Cost of equity > earnings yield >0" is 0.003 which implies group 2 firms pay dividends that are larger than the dividend payouts of group 1 firms in the region of 21.43% of average dividends-to-sales (i.e. 0.003/0.014). Economically significant differences in the dividend amounts between group 1, 2 and 3 firms are also present using dividends per share. For example, Model 4 says that compared to "cost of equity < earnings yield" firms, dividends per share for the average firm in the "cost of equity > earnings yield >0" group are 18.04% larger (compare 0.301 to 0.255). The difference in dividends per share between group 2 and group 1 firms is 10.22% of average dividends per share, i.e. (0.301–0.255/0.45). Dividends per share for group 3 firms with negative earnings are much lower at 0.096. Finally, Models (3) and (6) present just weak evidence in support of the value maximization theory; the estimated coefficients for the interaction term are positive, but not statistically significant.

With respect to the independent variables, the dividend amount decreases with the cost of equity capital and increases with the earnings yield. The dividend amount increases with firm size, cash and firm age and decreases in firm growth. Debt and profit volatility remain statistically insignificant determinants of the dividend amount in each regression.

3.2 The cost of equity – earnings yield differential and share repurchase payout policy

In Table 6 we examine for the first time whether the cost of equity to earnings yield differential influences the decision to repurchase shares and the payout mix (dividends versus share repurchases). The dependent variables are repurchase payer (nonpayer is the reference group); dividends-only (reference group) versus dividend and repurchase; repurchase-only (reference group) versus dividend and repurchase; and dividend-only (reference group) versus repurchase-only, as indicated. The marginal effects from pooled Logit regressions say that the cost of equity to earnings yield differential influences each of the decisions to repurchase shares and the payout mix. In Table 4 we observed that compared to firms with "cost of equity > earnings yield >0", firms with "cost of equity < earnings yield" were less likely to pay a dividend. Table 6 says that the same holds true for the decision to repurchase shares. Once more, we find that firms with negative earnings are the least likely to repurchase shares. Also, the decision to repurchase shares is increasing in the earnings yield and decreases with the cost of equity capital. The remaining columns of Table 6 focus on the payout mix. The marginal effects reveal that firms with "cost of equity > earnings yield >0" are more likely to pay dividends *and* repurchase shares rather than pay one or the other. "Cost of equity > earnings yield; earnings yield <0" firms are much less likely to pay dividends and repurchase shares and most likely to repurchase only (rather than be dividend-only payers). The decision to repurchase shares appears to be largely influenced by the same set of factors that determine the decision to pay a dividend; the decision to repurchase increases in each of the earnings yield, firm size and firm age and decreases in each of the cost of equity capital, firm growth and debt.

3.3 Robustness: using an alternative cost of equity estimate

We examine if our findings are sensitive to the cost of equity capital measure employed. To this end, we use the cost of equity capital estimate provided by Bloomberg. Like Refinitiv Eikon, Bloomberg uses the CAPM to estimate the cost of equity capital. Table 7 presents marginal effects from pooled Logit and pooled Tobit regressions with the cost of equity-to–earnings yield differential calculated using the cost of equity from Bloomberg. These estimates largely confirm our findings from earlier and suggest that our findings are not sensitive to the cost of equity capital estimate employed.

4. Concluding remarks

According to the agency theory, managers must take actions that maximize shareholder wealth. Firms have an opportunity to add economic value when the return on equity exceeds the cost of equity capital. In this scenario, the optimum payout decision is to hold equity capital rather than distribute it to shareholders. Based on the idea that managers use dividends to regulate the proportion of equity capital employed, we put forward the cost of equity hypothesis. We posit that firms prefer to distribute (retain) equity capital when holding equity capital is more (less) expensive relative to the potential return on equity.

We examine the impact of the cost of equity to earnings yield differential on the dividend policy among a sample of U.S. publicly traded firms. We find support for the cost of equity hypothesis as firms with a high cost of equity relative to the earnings yield are more likely to pay dividends and the dividend payouts are higher. The opposite also holds, firms whose relative cost of equity is low can afford to hold equity capital by not paying dividends and potentially can take advantage of investment opportunities. Our results remain robust to the inclusion of share repurchases as an alternative for distributions to shareholders.

An extension to the cost of equity hypothesis could consider the asymmetric nature of the dividend policy decision. Managers may be reluctant to decrease dividend payments even when holding the capital has the potential to add economic value as dividend cuts and omissions generate a negative short-term market reaction, as expected by signaling and agency cost dividend theories. For example, Christie (1994) finds that there is a negative market reaction, but more so following dividend decreases than omissions. Firms do not face that challenge when announcing dividend initiations or increases as markets normally perceive those events as positive news. Despite the asymmetric nature of dividend policy decisions, our results support the cost of equity hypothesis. In addition, given the different taxation on dividend payments and varying degrees of payout policy regulation, researchers can also test whether the cost of equity hypothesis holds in countries outside the U.S.

Our findings have implications for investors as they can evaluate whether managers pursue the payout policy that maximizes firm value. Managerial behavior appears consistent with the fiduciary duty to maximize shareholder wealth through a dividend policy. Our study contributes to the payout policy literature by analyzing dividend payment decisions in the context of the relative cost of equity. We improve previous models that predict the likelihood of being a dividend payer by considering the relative cost of equity. To our knowledge, this is the first paper empirically testing the association between dividend policy and the cost of equity to earnings yield differential.

Notes

1. Bulan and Subramanian (2012) use the Gordon model to link firm value and dividend payouts, $V_0 = \frac{de_1}{k-g} = \frac{de_1}{k-ROE(1-d)}$, where V is firm value, *k* is the cost of equity capital, d is the dividend payout ratio, g is the growth rate, e is earnings and ROE is return on equity capital. When ROE is greater than *k*, the value of the firm increases as the payout ratio d decreases (which applies only for $d > (1-k)/ROE$, to be consistent with assumption that $g < k$). Alternatively, when $ROE < k$, the value of the firm increases with the payout ratio. Thus, the optimal dividend policy is (1) to maintain a 0% payout ratio when $ROE > k$ and (2) a 100% payout ratio when $ROE < k$.
2. See Allen and Michaely (2003) and Baker and Weigand (2015) surveys for a detailed review of the dividend policy literature.
3. We do not examine dividend initiations or dividend omissions as the incidence of each over the sample period is low (56 dividend omissions and just 37 dividend initiations).
4. Our results do not change when we use changes in the dollar amount of dividends paid to ordinary shareholders to identify dividend increases.
5. Our findings do not materially change when we scale common dividends by the book value of total assets. We do not scale dividends using earnings because negative earnings render dividend payout ratios meaningless and reduce our sample size.
6. Skinner (2008) and Baker and De Ridder (2018) construct "payout mix" measures to examine the choice between dividends and repurchases. Skinner (2008) measures the payout mix as the ratio of dividends to the sum of dividends and share repurchases. Baker and De Ridder (2018) use ((dividends minus share repurchases)/(dividends plus share repurchases)).
7. The dividend literature has adopted many approaches to control for firm-level growth opportunities. For example, studies such as Mitton (2004), Brockman and Unlu (2009) and Chang *et al.* (2018) use one-year growth in either assets or sales to proxy for growth opportunities. Others simultaneously include growth (sales or assets) with the market-to-book of assets ratio (see Michaely and Moin, 2022, for an example), while others simultaneously include asset growth and sales growth (see Goyal *et al.*, 2020, for example). We find that our main findings do not materially change when we use each of the latter two approaches.
8. We choose to use the financial debt-to-capital ratio because we want to control for the influence of financial debt on dividend payouts. The book debt ratio uses financial debt in the numerator but problematically, non-financial (trade debt) is part of the denominator (see Welch, 2011, for a discussion).
9. We use firm age to capture the influence of lifecycle on dividend payouts. Our results do not change when we replace age with the RETE (or RETA) measure of DeAngelo *et al.* (2006).
10. The control variables are lagged by one year so for each firm we observe their control variables from 2015.
11. The average dividends-to-sales figure of 1.4% we report for U.S. firms is larger than the 0.78% reported by Brockman and Unlu (2009) but less than the 1.98% reported by Shao *et al.* (2013). Note that both Brockman and Unlu (2009) and Shao *et al.* (2013) use much larger samples of publicly-traded U.S. firms in their respective studies.
12. For industrial firms, the number of dividend increases is larger than dividend decreases, yet the incidence of both has fallen over time. The magnitude of dividend decreases tends to be larger than the magnitude of dividend increases (see Floyd *et al.*, 2015).
13. Over the period 1980–2005, Skinner (2008) shows that most US firms either occasionally or regularly repurchase shares but do not pay dividends. Between 1980–2005, dividend-only firms became largely extinct. A small group of firms pay dividends, repurchase shares and replaced dividends

with repurchases over time. In the period from 1980 to 2012, on average 61.6% of U.S. firms did not pay a dividend or repurchase shares. On average, 18.2% of firms used only dividends, and 11.7% use repurchases only. The fraction of publicly-traded U.S. firms who pay dividends and repurchase shares averaged just 8.6% in the period from 1980–2012. With the onset of the global financial crisis, industrial firms discontinued repurchases but largely maintained dividends. Michaely and Moin (2022) study the increase in dividend-paying firms since 2000. Lee and Suh (2011) examine payout policies in the 1998–2006 period and show that repurchase-only firms outnumber dividend-only and dividend and share repurchasing firms. The findings from these papers and ours point to a sizable increase in the number of "switch-hitters" in the last decade.

14. The decision by these firms to repurchase only is likely caused to their volatile earnings. Skinner (2008) notes that as the earnings of publicly held firms have become more volatile over time, new firms are likely to prefer repurchases over dividends. Earnings volatility also affects the decision to pay dividends; Michaely and Moin (2022) partly relate the rise in the number of dividend payers since 2000 to a fall in earnings volatility.

15. The non-paying group of firms typically exhibits a distinct two-tier structure. The first tier is a set of firms with little or no capacity to pay a dividend. These firms are unprofitable, young and fast-growing firms with sizable growth opportunities (Fama and French, 2001). The bottom rows of Table 2 suggest that this type of firm is the average non-paying firm in our sample of firms, i.e. young (according to age and RETA), fast-growing, unprofitable, with volatile earnings (profit volatility). The second tier includes a small group of firms with large earnings and the capacity to pay a dividend, yet they choose not to (DeAngelo *et al.*, 2004) e.g. Amazon.

16. Note that our findings do not materially change when we use RETA in place of firm age to capture the influence of firm lifecycle on dividend policies.

17. In unreported results we do not find any difference in the likelihood of decreasing dividends across the cost of equity – earnings yield groups. We observe 174 dividend decreases compared to 704 dividend increases. There is evidence which says that firms with negative earnings are most likely to omit a dividend payment.

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Corresponding author
Thomas O'Connor can be contacted at: thomas.g.oconnor@mu.ie