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Working Paper 2010:10

Taxation, Dividends, and Share Re-  
purchases: Taking Evidence Global

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September 2010

## TAXATION, DIVIDENDS, AND SHARE REPURCHASES: TAKING EVIDENCE GLOBAL

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# Taxation, Dividends, and Share Repurchases: Taking Evidence Global\*

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September 22, 2010

## Abstract

We compile a comprehensive international dividend and capital gains tax data set to study tax explanations of corporate payouts for a panel of 5,767 firms from 25 countries for 1990-2008. We find robust evidence that the tax penalty on dividends versus capital gains is statistically significant and negatively related to firms' propensity to pay dividends, initiate such payments, and the amount of dividends paid. Our analysis further reveals that an increase in the dividend tax penalty raises firms' likelihood to repurchase shares, initiate such repurchases, and the amount of shares repurchased. This is strong confirming evidence that when listed industrial firms globally design their payout policies, they take into careful consideration the relative tax implications of their payout choices.

**Keywords:** Taxation, Dividends, Stock Repurchases, Payout Policy

**JEL Classification:** G10, G15, G30, G35, H24, H25

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\*We thank Chris Allen and Baker Library Research Services for assistance with data collection. We are grateful to Bo Becker, Raj Chetty, Igor Goncharov, William Moser, James Poterba, Andrei Shleifer, Jan Södersten, and seminar participants at Harvard Business School, the 33rd Annual Congress of the European Accounting Association 2010 in Istanbul, the 2010 American Accounting Association Annual Meeting in San Francisco, and the 66th Annual Congress of the International Institute of Public Finance in Uppsala for helpful comments and recommendations on earlier versions of this paper.

# 1 Introduction

Among the solutions to the 'dividend puzzle' (Miller and Modigliani (1961)) offered in the literature, tax explanations have enjoyed revived popularity following the U.S. Jobs and Growth Tax Relief Reconciliation Act of 2003 and the subsequent research it has stimulated (Lie and Lie (1999); Chetty and Saez (2005); Brown, Liang, and Weisbenner (2007); Moser (2007)). This scholarship has also generated much interest among tax policy-makers worldwide, largely because it entails important implications for redistributive policies, economic stimulus programs, and the likely consequences of reduced tax rate reversion as envisaged in the U.S. for 2011. To the change-willing regulator's detriment, the 2003 U.S. Tax Act's effect on corporate payout strategies is debated. Controversy persists as to whether tax cuts really led to a surge in dividend payouts in the U.S. after the 2003 tax cut, or dividend increases were merely an epiphenomenon of growing corporate earnings and resurging managerial confidence after the 2001 stock market meltdown. For example, Edgerton (2010) argues that firms had unusually high levels of cash on hand prior to enactment of that tax cut, giving them the resources needed to begin paying out dividends. U.S. Bureau of Economic Analysis (BEA) data notes that firms in 2003 may have been influenced by the well-publicized corporate scandals, which created a post-Enron environment where firms were feeling pressure to reassure shareholders through dividends as a way to send a positive signal to shareholders about the financial integrity of the firms following the tax cut. Julio and Ikenberry (2004) suggest that some portion of the increase in dividend payouts by US firms is attributable to companies that first became public corporations in the 1980s and 1990s and matured at around the time of the 2003 tax act, thus moving into a life-cycle stage where they are better positioned to pay dividends.

But because their key question is to which extent tax changes rather than other factors will influence corporate payout decisions in the future, international tax regulators' learning points from individual country studies are often limited. Instead, cross-country, time-series studies covering multiple occurrences of tax reforms help alleviate concerns that factors other than taxation create an environment conducive to changes in corporate payout following enactment of the tax reform, affecting the extent to which firms respond to the tax change. That is, multi-country, multi-year evidence is one effective way to address the much criticized status quo in the literature where "the effects of dividend taxation on dividend policies [...] remain disputed, largely because of the lack of compelling tax variations and therefore of a fully convincing research design" (Chetty and Saez (2005) p. 792), thus allowing more credible out-of-sample policy implications.

Despite the quantity of scholarly research, however, the influence of dividend and capital gains taxation over time, over multiple tax regimes *and* across countries on

corporate payout remains largely unexplored in the literature. Our study addresses this shortcoming. We compile a comprehensive international dividend and capital gains tax data set to study tax explanations of corporate payout for a panel of 5,767 firms from 25 countries for 1990-2008. The countries in our sample represent around 84% of global market capitalization in 2005.<sup>1</sup> Aside from annual observations of the relative tax penalty on dividends compared to capital gains our data set contains information on 15 substantial tax reforms and 18, 42, and 22 changes in corporate, dividend, and capital gains tax rates, respectively. Scope and longitudinal characteristics of our study are unprecedented in the literature on tax explanations of corporate payout strategies.

The economic significance of the tax effects we find is substantial. Increasing the dividend tax penalty by one standard deviation (an increase by 16.5 percentage points for the sample of 25 countries in 1990-2008) decreases the probability that a firm is a dividend payer by 1.7 percentage points (or 2.4% of the sample average for 1990-2008), decreases the probability that it might initiate or substantially increase dividends over the next year by 4.5 percentage points (19.7% of the baseline effect), and decreases the dividend volume by approximately 6.7% of the sample average for 1990-2008. In turn, an increase in the dividend tax penalty by one standard deviation increases the probability that the firm is a share repurchasing firm by 5.6 percentage points (14% of the sample average for 1990-2008), and increases the probability that it initiates or more than doubles repurchases volume over the next year by 2.2 percentage points (11.8% of the baseline effect). These results obtain after controlling for firm- and country-specific characteristics, as well as year- and firm-fixed effects in payout policy. Accordingly, any variable that varies only by year or by firm is absorbed in the year- and firm-fixed effects and cannot explain any of our regression findings.

The effect of the dividend tax penalty on dividend initiations and on movements to substantially higher dividend payout tiers is particularly noteworthy given the dividend initiation or substantial ( $> 15\%$ ) increase rate is only roughly 23.1% per year over our sample – a one-standard deviation increase in the dividend tax penalty increases the likelihood of a firm initiating or substantially increasing dividend payout by 19.7% of the baseline effect. To put this into perspective, a one-standard deviation increase in the dividend tax penalty has the same effect on a firm's decision to initiate or substantially increase dividend payout as does a one-standard deviation increase in the firm's cash position. The effect of taxation is about three to four times as large as the effect of sales growth, EBITDA, leverage, and Tobin's  $q$ . Determinants of dividend initiation decisions are particularly relevant because, given the general "stickiness" of dividends (Lintner (1956) and Brav, Graham, Har-

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<sup>1</sup>Source: World Development Indicators database.

vey, and Michaely (2005)), the decision to initiate dividends is a commitment par excellence to a long stream of cash outlays.

We conduct a series of additional tests and alternative measurement and specification strategies. Some of these additional analyses simply alter the number and nature of additional control variables to the baseline model. Others seek to identify the dividend tax penalty effect by aggregating observations at the country level. The results obtained from this battery of robustness tests confirm our baseline results that the difference in individual shareholder tax rates between dividend income and capital gains is a first-order driver of corporate payout policies worldwide. Our result that investor tax positions (and thus investor preferences for dividends and share repurchases) can be an important determinant of corporate decisions complements findings from several recent studies. For example, our evidence extends prior research that the dividend tax penalty affects a firm's choice of payout channel (Lie and Lie (1999), Sarig (2004), Moser (2007)). Our findings also add to the evidence in the literature that dividend demand drives some part of the variation in payout policy, and that companies adjust payout policy in response to the preferences of their current investors (for example, Perez-Gonzales (2003), Baker and Wurgler (2004b), Baker and Wurgler (2004a), Brown, Liang, and Weisbenner (2007), Becker, Ivković, and Weisbenner (2010)).

Our results are particularly relevant for tax regulators. Our results suggests that when the tax burden on dividend payouts increases, a large fraction of firms flexibly adjust their payout policy to use share repurchases as an alternative payout channel, and vice-versa. Firms' economically significant response to tax policies is good news for tax authorities, for it underpins the potential of the tools at their disposal. Our study features an additional result. We find that share repurchase decisions are driven more by insiders' and substantial shareholders' tax positions and less by outside investors' tax preferences than are dividend payouts. This is confirming empirical evidence for the argument presented in the literature that share repurchases may benefit insiders and substantial shareholders disproportionately (Bradley and Wakeman (1983), Barclay and Smith (1988), Brennan and Thakor (1990), Dunsby (1995)). Thus, because the redistributive character of dividends and share repurchases differs, the substitution effect between dividends and share repurchases detected in this paper is particularly relevant for wealth redistribution-minded regulators. Also, the relative small weight of outside investors' tax preferences in share repurchase decisions calls for critical evaluation of existing transparency and guidelines for the repurchase process.

The remainder of this paper is in four sections. In Section 2 we briefly summarize the most important theoretical and empirical contributions to tax explanations of dividends and share repurchases to date, and develop our central conjecture. Section

3 introduces our data and sample selection. Section 4 presents our key findings and the results of our robustness tests. We conclude in Section 5 and discuss some policy implications.

## 2 Theoretical Background and Hypotheses

### 2.1 Status Quo of International Evidence

A substantial body of scholarly work, the business press, and workshop and conference contributions have been dedicated to tax motivations of dividends and share repurchases. What is striking is the geographical limitation of empirical evidence to date. In fact, heretofore conclusive research evidence is confined to only eight countries, with a strong focus on the U.S. More notably indeed, existing evidence is almost exclusively limited to single-country studies, whereas comprehensive cross-country time-series evidence on tax explanations of payout policies is fairly limited to date.

A substantial fraction of the empirical literature centers on the United States, while international evidence remains comparably scarce. The two tax reforms most widely studied are the U.S. Tax Reform Act (TRA) of 1986, whose impact on cash distributions is controversially discussed (see, for example, Bolster and Janjigian (1991), Papaioannou and Savarese (1994), and Wu (1996)), and the tax rate reductions within the context of the U.S. Jobs and Growth Tax Relief Reconciliation Act (JAGTRRA) of 2003, for which significant effects on corporate payout policies have been documented (see, for example, Blouin, Ready, and Shackelford (2004), Chetty and Saez (2005), Brown, Liang, and Weisbenner (2007), Brav, Graham, Harvey, and Michaely (2008), or Moser and Puckett (2009)).

Positive international empirical evidence for the influence of taxation on corporate payout policies is available from Finland (Kari, Karikallio, and Pirttilä (2008); Korkeamäki, Liljeblom, and Pasternack (2010)) and Australia (Pattenden and Twite (2008)), as well as from studies covering firms in the United Kingdom (Ang, Blackwell, and Megginson (1991) or Bell and Jenkinson (2002)), Canada (Christoffersen, Géczy, Musto, and Reed (2005)), Germany (Goergen, Renneboog, and Correia da Silva (2005)), Japan (Dewenter and Warther (1998)), and Taiwan (Lee, Liu, Roll, and Subrahmanyam (2006)).

Similar to the evidence on the level of cash distributions, the research on payout choices between share repurchases and dividends is predominantly single-country with a strong emphasis on evidence from the U.S. For example, Lie and Lie (1999) investigate the impact of personal taxation on corporate managers' choices between share repurchases and dividends, and find evidence consistent with the notion that

personal taxation influences the choice of disbursement method. Sarig (2004) conducts a time-series analysis of corporate payout policies and finds that an increase in the taxation of capital gains relative to dividends shifts corporate payout away from share repurchase and towards dividends. Similarly, Moser (2007) shows that the difference in individual shareholder tax rates between dividend income and capital gains affects firms' payout channel choice. Positive international evidence of taxation's consequences on firms' payout choices are provided by Rau and Vermaelen (2002) and Oswald and Young (2004) for the U.K., by Brown and Eftim (2005) for Australia, and by Lee, Liu, Roll, and Subrahmanyam (2006) for Taiwan.

The above positive results are in stark contrast to evidence from an important sub-stream of the empirical literature on corporate payout policies: dividend surveys customarily attribute at best negligible significance to tax motivations of dividends (see Lintner (1956), for the earliest such example, and Baker, Mukherjee, and Paskelian (2006), for evidence from Norway, and Brav, Graham, Harvey, and Michaely (2005), and Brav, Graham, Harvey, and Michaely (2008), for the U.S.).<sup>2</sup> However, the non-significance of tax explanations in these surveys must be taken with a pinch of salt. For example, Baker, Mukherjee, and Paskelian (2006) find that almost 70% of respondents provide a 'no opinion' answer to survey questions on the relevance of taxation for corporate payouts. From this, Baker and co-authors conclude that tax preferences are irrelevant for dividend payouts and share repurchases. We remain unconvinced that such a conclusion is accurate. In fact, dividend surveys in Norway and the U.S. were undertaken in years when there was a long dearth of significant changes in dividend and capital gains taxation. This may have made taxation temporarily less pivotal to managers. To provide supplemental confirming evidence for a first-order effect of taxation on actual corporate payout, in this paper we use hitherto unavailable, comprehensive international evidence.

## 2.2 Hypothesis Development

The theoretical literature on the potential tax impact on dividend payout policies is considerably divided – most classically into the 'traditional' view (Poterba and Summers (1984, 1985); Poterba (2004)) and the 'new' view (King (1977); Auerbach (1979); Bradford (1981)). The controversies between the two views could hardly be more consequential for the tax motivation of corporate payout. According to the traditional view of dividend taxes, investments are financed with new equity and thus returns from these investments are subject to double taxation – at the corporate and at the individual level. As a result, dividend taxes reduce the return on investments, implying that a dividend tax cut increases investments, profits and

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<sup>2</sup>Baker, Mukherjee, and Paskelian (2006) provide a useful overview of dividend surveys and their empirical findings.



dividend distributions in the long run (see, for example, Chetty and Saez (2005) p. 797). Poterba and Summers (1984) and Poterba (2004) examine the historical relationship between the relative tax burden on dividends and capital gains and the share of corporate earnings that is distributed as cash dividends in the U.K. and the U.S., respectively, and find support for the traditional view of dividend taxation.

In contrast, under the new view of dividend taxation, the marginal source of finance for new investment projects is retained earnings (Auerbach and Hassett (2002)). In this case, the tax advantage of retaining earnings precisely offsets the double taxation of subsequent dividends, implying that dividend taxes do not affect firms' decision to distribute cash unless dividend taxes are cut only temporarily. Similar doubt on the long run effect of dividend tax cuts is cast by Brav, Graham, Harvey, and Michaely (2008) who argue that increases in dividends are a permanent commitment to higher dividend yields while changes in tax rates are only temporary.

The focus of the debate between traditional and new view has one significant caveat: it largely ignores that distribution channels are at least twofold, and that not only dividend taxation *per se* but also the relative taxation of dividends compared to other payout forms (share repurchases) has been empirically shown to matter. In fact, existing evidence in the literature (Lie and Lie (1999), Sarig (2004), Moser (2007)) proved that the relation between the tax rate on capital gains and the tax rate on dividends affects not only the overall level of cash distributions but also the decision whether cash is distributed through the share repurchase or the dividend channel. Hence, in countries where capital gains are tax-exempt (such as Belgium), and in countries and years with high tax rates on dividends compared to capital gains (such as the U.S. over the 1993-2002 period), the expectation is that firms are more likely to make distributions through share repurchases as opposed to dividends to maximize shareholder wealth. This is patently different in countries with neutral (Sweden) or preferential (Finland) tax treatment of dividends versus capital gains, where firms can be expected to prefer dividends to share repurchases when they distribute cash.

To test the tax impact on corporate payout distribution channels, firms' propensity to initiate dividends and share repurchases, and the amount of dividends and share repurchases, we draw on an established measure of the relative taxation of dividends compared to capital gains – the dividend tax penalty,  $\delta^{Div}$ . The dividend tax penalty is due to Poterba and Summers (1984) and defined as follows:

$$\delta^{Div} = \frac{\frac{\tau^{Div} - \alpha}{1 - \alpha} - \tau^{CG}}{1 - \tau^{CG}} \quad (1)$$

where  $\tau^{Div}$  is the tax rate on dividends,  $\alpha$  is the imputation rate<sup>3</sup> and  $\tau^{CG}$  denotes the capital gains tax rate<sup>4</sup>. For higher values of  $\delta^{Div}$ , we expect that shareholder wealth-maximizing firms are more likely to distribute cash through share repurchases, that they are more probable to initiate share repurchases, and that they repurchase more shares. Analogously, we expect  $\delta^{Div}$  to be negatively related to firms' propensity to pay dividends, to initiate dividend payments, and to the amount of dividends paid.

### 3 Data and Sample Selection

Our sample is based on firm-level data from the July 2009 edition of the WorldScope database which provides data covering company information for 55,514 public companies in 72 countries. We restrict our analysis to those countries for which we could obtain conclusive tax data for the full sample period. To ensure a meaningful basis for the calculation of our country level statistics we also exclude from our sample firms from those countries for which we have less than 10 observations after the below sample adjustments. The start year of our analysis is 1990.<sup>5</sup> Since accounting data are often reported and collected with a delay, we use data through 2008. We complement our data with stock price information and dividend data from Datastream and carefully screen the data in accordance with Ince and Porter (2006). We collect data on active as well as dead and suspended listings that fulfill our data requirements to avoid survivorship bias. Additional country-specific data are obtained from the World Development Indicators database.

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<sup>3</sup>A value of 0.33 for  $\alpha$  indicates that corporate tax payments worth 33% of the gross dividend can be credited against the individual income tax.

<sup>4</sup>Taxation of capital gains from share repurchases is more complex in full imputation systems than it is in the U.S. (see Brown and Efthim (2005), for Australia, and Rau and Vermaelen (2002), or Oswald and Young (2004), for the U.K.). In general, if share repurchases are performed anonymously on-market individual shareholders cannot offset the corporate tax credit against the income tax liability, for shareholders are unable to identify the repurchasing corporation as the buyer. This is different for off-market buybacks, where parts of the capital gain can be treated as a dividend carrying a tax credit (see, for example, Brown and Efthim (2005), Appendix A). In Switzerland, a special withholding tax ("Verrechnungssteuer") is levied on share repurchases that can only be credited against the income (or corporate) tax liability if share repurchases are conducted on the second trading line (see among others Chung, Isakov, and Pérignon (2007)). Hence, the capital gains tax rate on share repurchases is not necessarily equal to the statutory capital gains tax rate on the disposal of share on stock exchange. We control for a possible tax wedge by adjusting the capital gains tax rate if on-market share repurchases have special tax treatment in a country, such as in Japan (until 1995), Switzerland (from 1998), and the Netherlands (until 2001).

<sup>5</sup>We start our analysis in 1990 for two reasons. First, WorldScope provides less than comprehensive coverage of individual data items for non-U.S. firms before 1990. An earlier start may thus have biased our results for earlier sub-periods away from international evidence towards evidence from North America. Second, 1990 is a historically logical year to begin. With the transformation into capitalist, democratic systems many former communist countries have not started before 1990 to cover dividends and capital gains in their tax laws.

Table 1 summarizes the construction of our sample. Prior research (Dittmar (2000); Fama and French (2001); Fenn and Liang (2001)) indicates that financial and utility firms have motives to repurchase stock that are different from non-financial firms. We therefore restrict our sample to non-financial and also non-utility firms, defined as firms with SIC code outside the intervals of 4,900-4,949 and 6,000-6,999. We also exclude firms without industry classification. We further restrict our sample to firms with non-missing values for dividends to common and preferred shareholders, net income, sales, and total assets for at least 4 consecutive years in the 1988-2008 period. From the original set of firms, we finally eliminate the following firms: firms with missing stock price information, firms with negative dividends or negative share repurchases or whose dividends exceed sales, firms with an average weekly capital gain of over 1,000% in one year and finally, firms with closely held shares exceeding 100% or falling short of 0%. To prevent extreme values and outliers from distorting our results we furthermore censor, when appropriate, observations of our dependent and independent variables that are not within the 1st and the 99th percentile of observations, and we also drop firm observations with total assets less than USD 10 million (cf. Baker, Wurgler, and Stein (2003)). This returns our basic sample of 5,767 companies from 25 countries.

**Table 1: Sample Overview**

This table shows the number of firms and firm-year observations for each country in our sample. The sample consists of 5,767 firms in 25 countries for 1990-2008.

Country	N(Firms)	N(Obs)	Country	N(Firms)	N(Obs)
Australia	181	1,229	Korea (South)	295	1,476
Austria	23	136	Mexico	19	42
Belgium	33	169	Netherlands	51	228
Canada	180	790	New Zealand	20	141
Denmark	54	408	Norway	23	109
Finland	52	446	Poland	37	158
France	194	1,806	Portugal	21	134
Germany	198	1,723	Spain	40	326
Greece	56	196	Sweden	61	581
Hungary	13	82	Switzerland	81	703
Ireland	16	159	United Kingdom	421	4,191
Italy	64	564	United States	2,093	17,544
Japan	1,541	16,385	<b>Total</b>	<b>5,767</b>	<b>49,726</b>

We collect annual corporate tax, income tax, and capital gains tax data by evaluating all available issues of *Coopers and Lybrand's* International Tax Summaries, *Price Waterhouse's* Worldwide Corporate and Individual Tax Summaries, *Ernst and Young's* Worldwide Personal Tax Guide and Worldwide Corporate Tax Guide and Directory, *Deloitte's* International Tax and Business Guide, *KPMG's* Corporate Tax Rate Survey and Individual Income Tax Rate Survey, and the OECD tax database.<sup>6</sup> This data set allows a heretofore unavailable, comprehensive analysis of tax preferences of dividends and share repurchases within a multi-country, multi-year framework.

## 4 Analyses and Results

### 4.1 Evolution of International Tax Regimes, and Dividends and Capital Gains Taxation

Tax systems and the relative taxation of dividends and share repurchases vary considerably across the countries in our sample and over the sample period studied, thus providing the identifying variation preconditional to a study of taxation's impact on corporate payout policies with least possible noise.

We count five major tax systems across the 25 countries in 1990-2008: classical corporate tax systems, shareholder relief systems, dividend tax exemption systems, and full and partial imputation systems. *Classical corporate taxation systems* (for example, in Sweden, the Netherlands, and Austria) are characterized by double taxation of corporate profits. That is, income, before it is distributed as dividends, is taxed at the corporate level, and later taxed again as dividend income at the individual shareholder level. This contrasts with *shareholder relief systems* (for example, in the U.S., Germany, and Spain) which aim to reduce the full economic burden of double taxation that applies under a pure classical system. For example, at the individual shareholder level, reduced tax rates on dividends received or exclusion of a proportion of dividend income from taxation are common forms of shareholder tax relief. Under an *imputation system*, taxes paid by a corporation are considered as paid on behalf of its shareholders. As a result, shareholders are entitled to a credit (the "imputation credit") for taxes already paid at the corporate level. That is, shareholders are liable only for the difference between their marginal income tax rate and the imputation rate. Full and partial imputation systems are distinguished by the nature of the imputation credit, which may be the full corporate tax or only a

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<sup>6</sup>Whenever sources yielded contradictory information, we relied on the source(s) that provided most details.

fraction thereof. In *dividend tax exemption systems* (for example, Greece) dividend income is generally not taxed.

Table 2 shows that the changes and trends in tax systems over time are considerable. While in the first half of our sample period the classical corporate tax system dominates, from 2005 the shareholder relief system is the most widespread tax system in our sample. The number of classical shareholder taxation systems is 9 in 1990 and falls to 7 in 2008. In contrast, there are only 3 shareholder relief systems in place in 1990, but shareholder relief systems can be found in almost half of the countries (11) in our sample at the end of the sample period. Tax exemption systems reach their highest count in 1992 when two countries, Mexico and Greece, have instituted such a tax system. The reduction in the prevalence of full and partial imputation systems from 11 in 1990 to only 6 in 2008 is largely due to the harmonization of European tax laws that necessitated an abolition of differences in the availability of imputation credits for domestic and foreign investors across member states.

**Table 2: Overview of Tax System Changes (1990-2008)**

This table summarizes tax system changes and the corresponding changes in the dividend tax penalty ( $\Delta(\delta_t^{Div})$ , in percentage points) in the 25 countries for 1990-2008. *Year* is the first effective year of the new tax system. <sup>1</sup> – Split-rate system for distributed and retained earnings. <sup>2</sup> – Individuals had the option to accumulate the dividend grossed up applying a factor of 1.82 combined with a tax credit of 35% on the grossed up dividend. This mechanism is similar to a full imputation system (Source: OECD). <sup>3</sup> – Dividends were deductible at the corporate level until 1992.

Country	Year	New System	Old System	$\Delta(\delta_t^{Div})$
Denmark	2005	Shareholder-Relief System	Classical Corporate Taxation	0pp
Finland	1993	Full Imputation System	Imputation System	31pp
Finland	2005	Shareholder-Relief System	Full Imputation System	24pp
France	2005	Shareholder-Relief System	Full Imputation System	-3pp
Germany	2002	Shareholder-Relief System	Imputation System <sup>1</sup>	0pp
Ireland	2000	Classical Corporate Taxation	Partial Imputation System	6pp
Italy	1998	Shareholder-Relief System	Full Imputation System	4pp
Japan	2004	Shareholder-Relief System	Classical Corporate Taxation	-24pp
Mexico	1992	Dividend Tax Exemption	Imputation System <sup>2</sup>	0pp
Mexico	1999	Full Imputation System	Dividend Tax Exemption	0pp
Norway	1992	Full Imputation System	Classical Corporate Taxation <sup>3</sup>	20pp
Norway	2005	Classical Corporate Taxation	Full Imputation System	0pp
Spain	1995	Partial Imputation System	Classical Corporate Taxation	11pp
Spain	2006	Shareholder-Relief System	Partial Imputation System	0pp
USA	2003	Shareholder-Relief System	Classical Corporate Taxation	-23pp

Of particular importance within the context of this study is the relative taxation of dividends to capital gains, or, the dividend tax penalty,  $\delta^{Div}$ .<sup>7</sup> The significant trend from imputation systems and classical corporate tax systems to shareholder relief systems naturally coincides with the development of the dividend tax penalty. Yet, as Table 2 illustrates, tax reforms are not necessarily accompanied by changes

<sup>7</sup>The statistics reported here apply to non-substantial shareholdings. The trends and developments for the dividend tax penalty on substantial shareholdings are very similar.

in the relative taxation of dividends compared to share repurchases. Indeed, the dynamics underlying dividend and capital gains taxation are even more impressive, and dividend tax penalty changes occur even absent major tax system reforms. As summarized in Table 3, there were 18 substantial corporate tax rate changes in the countries in our sample over the 1990-2008 period.<sup>8</sup> The tendency of these changes is particularly noteworthy: 17 resulted in a decreased corporate tax burden, while there was only one increase. We observe a similar trend for dividend taxation at the personal level, as well as for capital gains tax rates on both non-substantial and substantial shareholdings. Out of 42 major dividend tax rate changes over the sample period 26 decreased and only 16 increased the personal tax burden. Capital gains taxes for non-substantial shareholders were cut in 16 and raised in only 8 instances. Similarly, capital gains taxes for substantial shareholders were cut in 18 and increased in only 9 out of 27 capital gains tax changes over the sample period.

**Table 3: Overview of Substantial Tax Rate Changes (1990-2008)**

This table summarizes major tax rate changes ( $\geq$  five percentage points in one fiscal year) for our sample of 25 countries in 1990-2008. *Dividend tax rate* refers to the personal tax burden at the shareholder level on dividend income. *Capital gains tax rate (non-substantial)* and *Capital gains tax rate (substantial)* denote the statutory capital gains tax on non-substantial and substantial shareholdings, respectively. Personal income tax rates on dividend income and capital gains tax rates are effective rates for investors with holding periods that qualify as long-term investments, as defined by country-specific tax regulations.

	All	Decrease	Increase
Corporate tax rate	18	17	1
Dividend tax rate	42	26	16
Capital gains tax rate (non-substantial)	22	16	6
Capital gains tax rate (substantial)	27	18	9
$\delta_t^{Div}$ (non-substantial)	55	25	30
$\delta_t^{Div}$ (substantial)	61	27	34

The underlying variation in corporate, dividend and capital gains tax rates illustrated in Table 3 naturally translates into ample time-variant differences in dividend tax penalties across countries. In 1990, the dividend tax penalty ranges from 60% (implying a substantially higher tax rate on dividends relative to capital gains) in the Netherlands to minus 75% in Finland (implying a significant dividend tax advantage). At this point in time, 12 of the 25 countries in our sample taxed dividends at an unfavorable rate relative to capital gains (4 neutral, remainder favorable). In 2008, the range is from 31% in Korea to minus 13% in Hungary, implying a substantially narrower range of the dividend tax penalty internationally. In 13 of the 25 countries in our sample dividends receive unfavorable tax treatment compared to capital gains (9 neutral, only 3 favorable) in 2008.

<sup>8</sup>Defined as changes  $\geq$  five percentage points in one fiscal year.

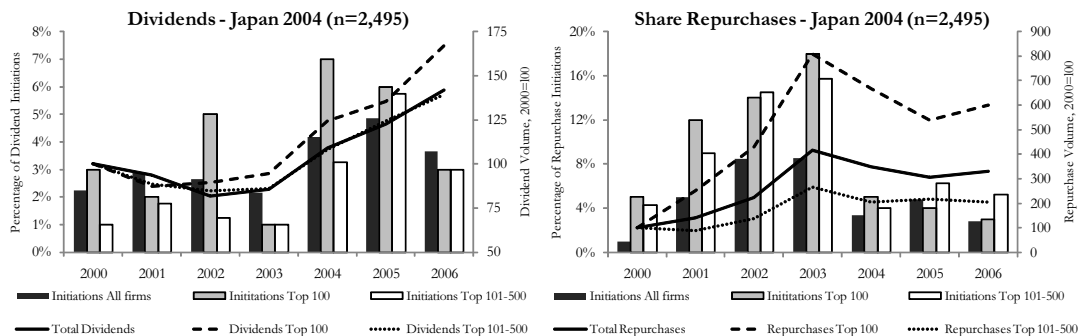
Within-country variation of the dividend tax penalty over time is no less impressive. Australia, Finland, Ireland, Japan, the Netherlands, and Poland all have standard deviation of dividend tax penalty in 1990-2008 of 16.0% to 30.0%. The range of individual year dividend tax penalties is between 38.0% and 67.6% in these countries. By contrast, we observe the most stable tax treatment of dividends relative to capital gains in Mexico, Denmark, Greece, Austria, Italy, and Portugal where the dividend tax penalty changes by only 0 to 5 percentage points over the sample period. From 1990 to 1996 the mean dividend tax penalty across our sample countries decreased from 7.1% to 4.9%. It rose sharply thereafter to reach a peak of 11.7% in 2000, and fell back to 7.4% in 2008, the end of our sample period.

## 4.2 Event Study Evidence

Prior research has documented the significant firm responses to changes in the dividend and capital gains taxation following the 2003 U.S. Tax Act (see, in particular, Chetty and Saez (2005)). Below we show that similar effects can be observed across other countries in our sample. Exemplarily, as evidence complementary to the evidence presented from the U.S., Figures 1 to 3 plot aggregate real dividends and share repurchases, as well as the percentage of dividend and repurchase initiations in Japan, Finland, and Germany in the seven years around these countries' major tax reforms. We focus on these three countries for detailed event studies because the countries are representative of the tax reforms with the greatest percentage point changes in the taxation of dividends relative to share repurchases, and because they allow meaningful inferences from a sufficient number of observations using a constant number of firms sample.

**Figure 1: Dividends and Share Repurchase Amounts and Initiations around the 2004 Tax Reform in Japan**

This figure displays the annual fraction of Japanese firms that initiate regular dividends and share repurchases in 2000-2006 on the primary y-axis. The figure plots the volume of aggregate real dividends and share repurchases in 2000-2006 on the secondary y-axis. Aggregate real dividends as well as share repurchases are indexed relative to a value of 100 in the base year (2000). The sample consists of the top 1,147 firms by total assets in each period in the Worldscope database which are non-financial and non-utility (the constant number of firms sample). Separate statistics are reported for all firms, the 100 biggest firms, and the 400 next biggest firms. We define a firm as initiating regular dividend payments and share repurchases in year  $t$  if it begins paying in that year without paying in the prior year. We define a firm as initiating share repurchases in year  $t$  if it repurchases shares in that year without repurchasing in the prior year.



Effective from January 2004, Japan's tax reform from a classical corporate tax system to a shareholder relief system was intended to boost Japan's sluggish economy. The tax reform changed both dividend and share repurchase taxation substantially. Shareholder taxation on dividends was cut from 43.6% to 10%, and the capital gains tax rate was reduced from 26% to 10% (thus resulting in a change in the dividend tax penalty from 24% to 0%). Figure 1 highlights the notable effects of the tax cut. While the dividend volume at best stagnated in the four years before the reform, the amount of dividends soared after the tax cut in 2004. The dividend volume surge can be observed consistently across all firm size categories. For example, the biggest 100 firms increased their dividends by an economically significant margin of almost 32%, and the top 501-1000 firms increased their dividend volume by 20%. The response to the tax cut is also evident from the surge in dividend initiations from 2003 to 2004/2005 across all size categories of firms in our sample. These increases are the largest increases during the sample period and cannot be explained with mere reference to the increase in GDP growth from 1.4% in 2003 to 2.7% in 2004.

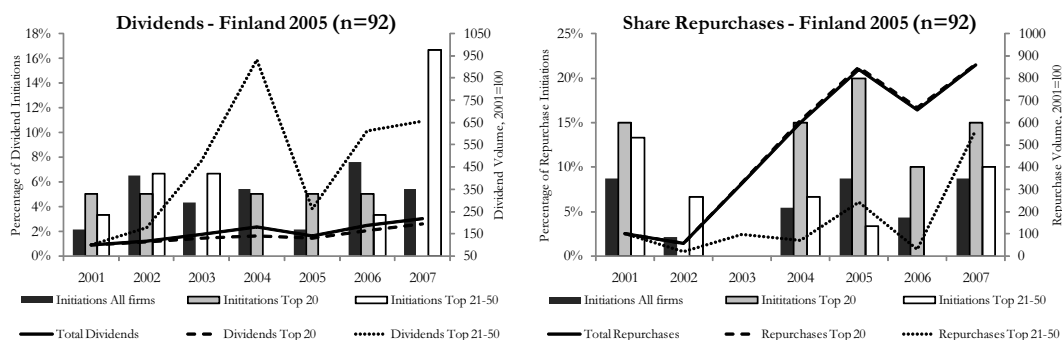
This evidence for share repurchases amounts is analogous to these dividend statistics. After years of unprecedented growth of share repurchases following the mid-1990s relaxation of restrictions on repurchases, both amount of share repurchases and the fraction of firms initiating share repurchases collapsed after the 2004 tax reform. For all firms in this constant sample the effect is an economically significant decline of almost 17% in 2004, after an increase of 88% in 2003. The effects of the tax change for both dividend payouts and share repurchases can be observed almost uniformly across all firms and is not driven by a few outliers with extraordinarily high dividends.

A similar economically significant response by firms can be detected after the increase in the relative taxation of dividends compared to share repurchases in Finland in January 2005. Finland's reform from a full imputation system to a shareholder relief system resulted in an increase in the effective shareholder taxation on dividends from 0% to 15.96% in 2005, and to 19.60% in 2006. At the same time, the capital gains tax burden eased from 29% to 28%. What is striking in Figure 2 is the unprecedented dividend volume increase of 22% in the year before the reform became effective, followed by a decline of 23% in reform year 2005. For the 21-50 largest firms the increase in 2004 was 95% and the subsequent decline in 2005 72%, at a time when the economy grew relatively constantly at 3.7% and 2.8%, respectively. The strong rise in dividend payout activity in 2004 is consistent with the observation that firms anticipated the new tax system and adjusted their payout policies accordingly (Kari, Karikallio, and Pirttilä (2008); Korkeamaki, Liljeblom, and Pasternack (2010)). As early as in June 2004 the tax bill passed parliament and



## Figure 2: Dividend and Share Repurchase Amounts and Initiations around the 2005 Tax Reform in Finland

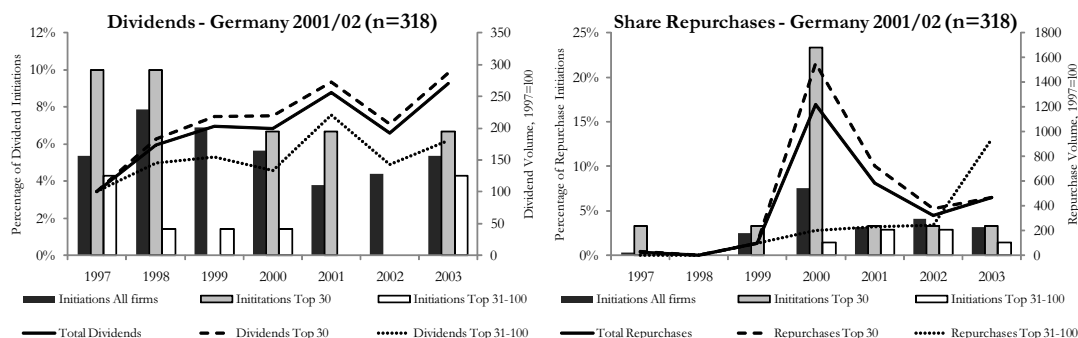
This figure displays the annual fraction of Finnish firms initiating regular dividends and share repurchases in 2001-2007 on the primary y-axis. The figure plots the volume of aggregate real dividends and share repurchases in 2001-2007 on the secondary y-axis. Aggregate real dividends and share repurchases are indexed relative to a value of 100 in the base year (2001). The sample consists of the top 90 firms by total assets in each period in the Worldscope database which are non-financial and non-utility (the constant number of firms sample). Separate statistics are reported for all firms, the 20 biggest firms, and the 30 next biggest firms. We define a firm as initiating regular dividend payments in year  $t$  if it begins paying in that year without paying in the prior year. We define a firm as initiating share repurchases in year  $t$  if it repurchases shares in that year without repurchasing in the prior year.



firms that sat on piles of cash accelerated payouts to take advantage of the imputation credit available for the last time in 2004. The fall in dividend payout activity in 2005 coincides with a surge in share repurchase initiations and repurchased amounts in 2005.

## Figure 3: Dividend and Share Repurchase Amounts and Initiations around the 2001/2002 Tax Reform in Germany

This figure displays the annual fraction of German firms initiating regular dividends and share repurchases in 1997-2003 on the primary y-axis. The figure plots the volume of aggregate real dividends and share repurchases in 1997-2003 on the secondary y-axis. Aggregate real dividends and share repurchases are indexed relative to a value of 100 in the base year (1997). The sample consists of the top 262 firms by total assets in each period in the Worldscope database which are non-financial and non-utility (the constant number of firms sample). Separate statistics are reported for all firms, the 30 biggest firms, and the 70 next biggest firms. We define a firm as initiating regular dividend payments in year  $t$  if it begins paying in that year without paying in the prior year. We define a firm as initiating share repurchases in year  $t$  if it repurchases shares in that year without repurchasing in the prior year. Aggregate dividend volume and fraction of initiations in 1998 are corrected for the high extraordinary dividend paid by Daimler AG prior to its merger with Chrysler.



The German tax reform from a full imputation system to a shareholder relief system, effective as of January 2002, was first proposed in November 1998 and passed parliament in 1999. The reform left effective personal tax burden on dividend income almost unchanged for shareholders in the highest tax bracket. For shareholders with

lower marginal income tax rate (equal to the imputation credit) the reform resulted in an increase in shareholder taxation. In turn, after the reform capital gains from non-substantial shareholdings were still taxed at 0%, resulting in a positive tax penalty. The reform also changed the relative incentives of dividend distribution vis-à-vis retained earnings. While cash distributions received favorable tax treatment relative to retained earnings before the reform, both payouts and retained earnings were taxed at the same rate after the reform.

The three-year period between enact date and effective date gave German firms sufficient time to adjust their corporate payout policies to tax law changes. Before the tax law changes passed parliament in 1999, German companies had generally taken relatively little advantage of the imputation credit but rather built substantial cash holdings. That the imputation credit was available to shareholders in Germany only until December 2001 made dividend distributions particularly attractive to shareholders in the transition period from 1999-2001, and incentivized a number of German firms to initiate dividend distributions or move to a higher payout level. As expected, firms substantially (+28%) increased their dividend payouts in 2001. The increase was even stronger among the top 31-100 biggest firms, which increased dividend payouts by 66% in 2001. This 'boom' in dividend payout activity was followed by a substantial decline in dividend amounts in 2002. Also, none of the biggest 30 firms in our constant sample initiated dividends in 2002 when the new tax regime became effective.<sup>9</sup> In interpreting the share repurchase trends, regulatory changes and an important outlier must be taken into consideration. As mentioned above, share repurchases were highly restricted until 1998. Unsurprisingly therefore, it is predominantly the biggest German firms which initiated share repurchases in 1999 and 2000. Also, the share repurchase volume in 2000 is infected by a one-off share repurchase program by Volkswagen AG which accounts for 50% of the aggregate repurchase volume in that year.

In sum, the analyses in this section have shown that tax reforms that are accompanied by significant changes in the relative taxation of dividends vis-à-vis capital gains prompt substantial changes in corporate payout. Furthermore, together with the U.S. evidence presented elsewhere, the three event studies presented here spanned countries with very different capital market characteristics and legal origins, yet they yielded very similar and economically significant evidence of tax effects.

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<sup>9</sup>To be sure, the decline in 2002 may have substantial tax effects but is most likely also driven by the September 2001 stock market collapse and the subsequent bear market of 2002.

## 4.3 Panel Regression Analyses

### 4.3.1 Baseline Specifications

To verify that the taxation of dividends relative to share repurchases helps explain corporate payout policies across countries we employ a linear-regression (OLS) framework on our panel data for the 1990-2008 period. We use four measures of dividend payout. *Dividend Payer* is an indicator variable equal to 0 for non-payers and equal to 100 for dividend payers. *Dividend Init 100* (*Dividend Init 15*) is an indicator variable equal to 100 if a non-payer at the end of year  $t$  initiates dividend payments in year  $t + 1$ , or if a dividend paying firm in year  $t$  increases dividend volume by more than 100% (15%) in year  $t + 1$ . *Dividend Yield* is the dollar amount of dividends paid out in year  $t + 1$  divided by the end-of-year  $t$  equity market value. *Repurchasing Firm* is an indicator variable equal to 0 for non-share repurchasing firms and equal to 100 if a firm repurchases shares. *Repurchase Init 100* (*Repurchase Init 15*) is an indicator variable equal to 100 if a non-repurchasing-firm in year  $t$  initiates share repurchases in year  $t + 1$ , or if a repurchasing firm in year  $t$  increases the share repurchase volume by more than 100% (15%) in the next year. *Repurchase Yield* is the dollar amount of shares repurchased in year  $t + 1$  divided by the end-of-year  $t$  equity market value.

Summary statistics for corporate payout are presented in Panel A of Table 4. The average value of 71.1 for the variable *Dividend Payer* indicates that 71.1% of companies paid dividends in the following year. 5.4% of companies in our sample initiated (if they did not pay any dividends in a given year) or more than doubled dividend payments in the next year (*Dividend Increase 100*). 23.1% of companies in our sample initiated dividends or increased dividend payments by more than 15% in the next year (*Dividend Increase 15*). The average value of 39.9 for the variable *Share Repurchaser* indicates that almost 40% of firms repurchased shares in the following year. 18.3% of companies in our sample more than doubled their share repurchase volume in the next year or, if they did not repurchase shares in a given year, initiated share repurchases the next year (*ShareRe Increase 100*). 23.4% of firms in our sample initiated share repurchases or increased repurchase volume by more than 15% (*ShareRe Increase 15*). The average dividend yield across all firms (non-payers as well as payers) is 1.4% of market value, and the repurchase yield is 0.7%.

We estimate our payout policy variables by the following equation:

$$Payout_{i,j,t+1} = \alpha_0 + \beta \cdot DivTaxPen_{j,t} + \gamma F_{i,j,t} + \chi C_{j,t} + \alpha_t + \alpha_i + \epsilon_{i,j,t} \quad (2)$$

**Table 4: Summary Statistics**

This table reports summary statistics for corporate payout variables (Panel A), and it presents the basic distribution parameters for tax variables and firm and country controls (Panel B). *Dividend Payer (Repurchasing Firm)* is an indicator variable equal to 0 for non-payers (not-share-repurchasing firms) and equal to 100 for dividend payers (share repurchasing firms). *Dividend Init 100 (Dividend Init 15)* is an indicator variable equal to 100 if a non-payer initiates dividend payments or if a dividend-paying firm increases the dividend volume by more than 100% (15%), and zero otherwise. *Repurchase Init 100 (Repurchase Init 15)* is an indicator variable equal to 100 if a firm initiates share repurchases or if a firm that repurchased shares in the prior period increases the share repurchase volume by more than 100% (15%), and zero otherwise. *Dividend Yield (Repurchase Yield)* is the dollar amount of dividends paid out (shares repurchased) in year  $t + 1$  divided by the end-of-year  $t$  equity market value. *DivTaxPen* is the country-year-specific dividend tax penalty. *PriceApp* is the prior year average weekly stock price appreciation. *SalesGrowth* is the real sales growth rate from  $t - 1$  to  $t$ . *Leverage* is the ratio of total debt to total assets. *EBITDA* is earnings before interest, taxes, and depreciation relative to total assets. *RelSize* is the percentage of firms smaller than the company. *EarnRepFreq* is the earnings reporting frequency, which takes the values between 1 (yearly) and 4 (quarterly). *Closely* is the percentage of shares held by substantial shareholders. *Q* is the ratio between the market value and replacement value of the physical assets of a firm (Tobin's  $q$ ). *CashRatio* is the firm's cash flow divided by prior year assets. *RE\_TE* is the ratio of retained earnings to total shareholder equity. *GDPGrowth* is the annual GDP growth in a firm's country. *MarketCap* is a country's market capitalization of listed companies as % of GDP. *RuleLaw* is rule of law index.

Panel A: Payout Variables						
Variable	N	Mean	Standard Deviation	10th Percentile	Median	90th Percentile
Dividend Payer	49,726	71.1177	45.3220	0.0000	100.0000	100.0000
Dividend Init 100	49,610	5.4263	22.6539	0.0000	0.0000	100.0000
Dividend Init 15	49,610	23.1345	42.1696	0.0000	0.0000	100.0000
Dividend Yield	49,681	1.3690	1.8153	0.0000	0.8452	3.4362
Repurchasing Firm	40,679	39.8682	48.9633	0.0000	0.0000	100.0000
Repurchase Init 100	39,333	18.3002	38.6673	0.0000	0.0000	100.0000
Repurchase Init 15	39,333	23.4027	42.3395	0.0000	0.0000	100.0000
Repurchase Yield	40,489	0.7185	1.8998	0.0000	0.0000	2.3928

Panel B: Tax Variables, and Firm and Country Controls						
Variable	N	Mean	Std. Dev.	P10	Median	P90
DivTaxPen	49,726	0.0822	0.1645	-0.1111	0.1216	0.2450
PriceApp	49,726	0.0678	0.2335	-0.1708	0.0422	0.3090
SalesGrowth	49,726	0.0959	0.3313	-0.2578	0.0833	0.4512
Leverage	49,726	0.2746	0.1936	0.0449	0.2484	0.5253
EBITDA	49,726	0.1033	0.0904	0.0188	0.1011	0.2073
RelSize	49,726	0.6778	0.2321	0.3214	0.7254	0.9504
EarnRepFreq	49,726	2.7821	1.2617	1.0000	2.0000	4.0000
Closely	49,726	36.4820	22.5818	4.7404	35.6620	66.9999
Q	49,726	2.0306	2.4546	0.8224	1.2708	3.7506
CashRatio	49,726	0.0753	0.0808	0.0029	0.0709	0.1685
RE_TE	49,726	0.3100	0.9230	-0.1922	0.4423	0.8818
GDPGrowth	49,726	2.3067	1.6789	0.1844	2.5226	4.2197
MarketCap	49,726	100.9636	43.8224	52.0526	101.5789	154.6784
RuleLaw	49,726	1.5227	0.2486	1.2700	1.5300	1.7700

where the left hand side variable is the respective payout policy measure of firm  $i$  in country  $j$  in year  $t + 1$ ;  $DivTaxPen_{i,j,t}$  is the dividend tax penalty as defined in equation (1).<sup>10</sup>;  $F_{i,j,t}$  is a vector of firm-level controls; and  $C_{j,t}$  is a vector of

<sup>10</sup>By applying the definition of the dividend tax penalty from equation (1), we implicitly opt for the tax rates applicable to domestic investors. Because foreign ownership in domestic companies is

country-level controls. In all regression specifications we employ year-fixed effects ( $\alpha_t$ ) and fixed effects at the firm level ( $\alpha_i$ ). Controlling for year-specific effects and all other firm- and country-specific factors that may vary cross-sectionally and over time, we ensure that identification of the effect of taxation on corporate payout policies comes only from changes in the dividend tax penalty. Note that firm-fixed effects soak up country characteristics such as common versus civil law legal origin and mandatory dividend requirements<sup>11</sup>.

The key parameter that we are interested in is  $\beta$ , the impact of relative taxation on dividends and capital gains on payout policies. In our dividend regressions the coefficient on DivTaxPen should be negative if, as hypothesized, a firm is less likely to be a dividend-payer, has lower dividend payout, and is less likely to initiate or increase regular dividends where shareholders face a higher dividend tax penalty. In our share repurchase regressions, we expect the coefficient on DivTaxPen to be positive if a firm is more likely to repurchase shares, has higher amount of shares repurchased, and is more likely to initiate or increase share repurchases where shareholders face a higher taxation of dividends relative to capital gains, that is, a higher dividend tax penalty.

In all stages of the analysis, we subject our regressions to an extensive set of firm- and country-level controls, integrating cross-national 'law and finance' variables with the more traditional public and corporate finance variables that in the literature feature as alternative determinants of payout policies. The vector  $F_{i,j,t}$  of firm level controls consists of ten variables: i) prior-year stock price appreciation (*PriceApp*) (Lie and Lie (1999) and Moser (2007)), ii) ownership structure, measured by the percentage of shares held by corporate insiders (*Closely*) (Jensen (1986)), iii) leverage, defined as the ratio of total debt to total assets (*Leverage*) (Jensen (1986)), iv) growth in sales from year  $t - 2$  to  $t$  (*SalesGrowth*), v) relative firm size (*RelSize*) measured as the fraction of sample firms smaller than the firm, vi) the fraction of earned (retained) versus contributed capital in a firm's equity capitalization (*Re.TE*) (DeAngelo, DeAngelo, and Stulz (2006), Denis and Osobov (2008)), vii) the earnings reporting frequency (*EarnRepFreq*), which takes the values between 1 and 4, representing the number of times per year earnings are reported

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often subject to different tax rates than domestic ownership (as codified in bilateral tax treaties), our tax variables are imperfect proxies of the true tax burden of the median investor in the firms in our sample. However, there is overwhelming evidence in the literature of a substantial home bias in national investment portfolios; that is, most investors hold nearly all of their wealth in domestic assets (see, for example, French and Poterba (1991); Tesar and Werner (1995); Mondria and Wu (2010)). This makes us confident that the tax rates applicable to domestic investors is the most plausible approximation for the median investor's tax burden. Our data do not allow for identification of the fraction of foreign ownership in a company.

<sup>11</sup>For example, in Greece all firms are subject to mandatory dividends payments as a percentage of firm earnings. Prior studies have often overlooked mandatory dividend requirements (von Eije and Megginson (2008)), or outrightly excluded mandatory dividend countries from investigation (La Porta, Lopez-De-Silanes, Shleifer, and Vishny (2000)).

(Wood (2001), von Eije and Megginson (2008)), viii) a proxy for stock undervaluation ( $Q$ ), defined as the market value of equity plus the book value of liabilities divided by the book value of assets, or, Tobin's  $q$  (for example, Ross (1977), Bhattacharya (1979), Miller and Rock (1985), and Allen, Bernardo, and Welch (2000)), ix) a firm's relative availability of cash ( $CashRatio$ ), defined as a firm's prior year cash flow divided by prior year assets (for example, Dittmar (2000), Moser (2007), Skinner (2008), and Stephens and Weisbach (1998)), and x) we include  $EBITDA$  relative to total assets, as a further proxy for the firm's profitability and its availability of funds for potential distribution.

At the country-level ( $C_{j,t}$ ), we control for indicators of country and stock market development. Those are annual percentage GDP growth ( $GDPGrowth$ ) and the market capitalization of listed companies in a country as percentage of GDP ( $MarketCap$ ). We include these variables to control for the possibility that the relative development of a country or the maturity of its financial market biases our results towards finding greater prevalence of dividends or share repurchases in this country. We further test whether the quality of shareholder protection influences corporate payout choices. We do so by including the rule of law index ( $RuleLaw$ ). As defined above, our corporate payout dependent variables are measured one year after our dividend tax penalty variable and our firm- and country-level controls. Table 4, Panel B presents summary statistics for the dividend tax penalty and firm- and country-level control variables.

One common source of correlated error terms is right-hand-side variables that vary only within groups in the data, rather than with every observation in the data. For our key right-hand side variable – the dividend tax penalty – is the same for all firms in the same country in any given year, this problem occurs in our data. If the assumption of independently and identically distributed error terms across observations in the data does not hold and error terms are positively correlated, then reported standard errors will be too low and we will overstate the precision of our estimates. As a result, in all regression specifications we cluster standard errors by country-year, as this is the level at which identifying variation in the dividend tax penalty occurs.

### 4.3.2 Baseline results

The results of our baseline tests are presented in Table 5. In Table 6, we provide the economic magnitude of the effects of the dividend tax penalty on company payout policy by analyzing the predicted effect on dividends and share repurchases resulting

from a one-standard deviation change in DivTaxPen (using the estimated coefficients from Table 5).<sup>12</sup>

Column (1) reports the results for the Dividend Payer dependent variable. The coefficient associated with the dividend tax penalty is -10.2 and is highly statistically significant ( $p\text{-value} \leq 0.01$ ). The interpretation of the coefficient is that increasing the dividend tax penalty by one standard deviation (an increase by 16.5 percentage points for the 1990-2008 period, from approximately 8.2% to 24.7%) reduces the likelihood that the company pays dividends in the following year by 1.7 percentage points, or 2.6% of the sample average for 1990-2008 (Table 6). Columns (2) and (3) in Table 5 examine dividend initiations and substantial increases in dividend payout. The coefficients associated with the dividend tax penalty are large and significant, implying that the probability of initiating or substantially increasing dividends is much higher for corporations when the dividend tax penalty is lower. Specifically, a one standard deviation increase in the dividend tax penalty reduces the likelihood that a company initiates dividends or increases dividend payouts in year  $t+1$  by more than 100% (15%) by 0.8 (4.5) percentage points, or 13.9% (19.7%) of the sample average for 1990-2008 (Table 6). This is a substantial economic effect. Also note that determinants of dividend initiation decision, and decisions to move to a higher dividend payout tier, are particularly relevant because, against the background of the general “stickiness” of dividends (Lintner (1956) and Brav, Graham, Harvey, and Michaely (2005)), the decision to initiate or substantially increase dividends, is a commitment par excellence to a long stream of cash outlays (as opposed to a simple one-year commitment that can be easily reversed). Column (4) reports results for dividend payout volume. Once again the coefficient for DivTaxPen is negative and significant. Its interpretation is that increasing the taxation of dividends relative to capital gains by one standard deviation decreases the next-year dividend yield relative to market value by approximately 6.7% of the sample average (Table 6). Thus, we find both statistically and economically significant effects of dividend and capital gains taxation on various facets of corporate dividend policy.

Columns (5) through (8) show results for share repurchase dependent variables. The coefficients for the dividend tax penalty all have the ‘correct’ positive sign. The coefficient associated with the dividend tax penalty in column (5), the regressions with the share repurchasing firm dependent variable, is 31.6 and is highly statistically significant ( $p\text{-value} \leq 0.01$ ). The interpretation of the coefficient is that increasing the dividend tax penalty by one standard deviation increases the likelihood that the company repurchases shares in the next year by 5.6 percentage points – 14% of the sample average for 1990-2008 (Table 6). Column (6) examines share

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<sup>12</sup>We obtain very similar results using logit/probit regression specifications. The results are not reported but available from the authors upon request.

**Table 5: Dividend Tax Penalty and Corporate Payout Across 25 Countries (1990-2008)**

This table reports fixed effects panel regression results for corporate payout behavior, estimated over the panel of 5,767 companies in 25 countries for 1990-2008. Dependent and independent variables are defined as in Table 4. Corporate payout is measured one year after firm- and country-level controls. Firm- and year-fixed effects are included in all regressions. Standard errors (shown in brackets) allow for heteroskedasticity and are clustered by country-years. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	Dividend Payer	Dividend Initiation 100	Dividend Initiation 15	Dividend Yield	Repurchasing Firm	Repurchase Initiation 100	Repurchase Initiation 15	Repurchase Yield
Constant	73.1970*** [7.1293]	9.2397 [6.6682]	10.9180 [22.9497]	-0.8780 [0.5921]	78.2770*** [23.0150]	57.3550*** [22.6079]	66.1879*** [25.4860]	2.2331*** [0.7205]
DivTaxPen	-10.2191*** [2.8650]	-4.5760** [2.1501]	-27.6364*** [7.6468]	-0.5592** [0.2549]	31.5873*** [7.6157]	12.1233* [6.7177]	12.1858* [7.2276]	0.1726 [0.2490]
PriceApp	-1.1341 [1.0261]	5.9328*** [1.0304]	13.1921*** [2.2200]	-0.4876*** [0.0702]	-0.4199 [1.3233]	3.7239*** [1.2653]	4.9516*** [1.5193]	-0.1815*** [0.0622]
SalesGrowth	2.9379*** [0.6411]	-0.5693 [0.4952]	5.5446*** [1.3451]	-0.0795** [0.0362]	-0.7801 [1.0740]	0.6672 [1.1965]	0.1551 [1.2638]	-0.1165*** [0.0373]
Leverage	-19.2590*** [1.9855]	-0.5328 [1.4654]	-5.1378** [2.1239]	-0.5654*** [0.0944]	-19.6006*** [2.8761]	-14.9555*** [2.5409]	-20.0876*** [2.9735]	-0.8348*** [0.1155]
EBITDA	18.2943*** [5.8559]	6.4949* [3.7229]	19.4233*** [9.6274]	0.4453 [0.2875]	32.3758*** [7.1952]	-21.5238*** [7.9418]	-12.8935* [7.5630]	1.9221*** [0.4405]
RelSize	30.2796*** [2.4628]	-11.5295*** [2.3727]	-12.5469** [5.2078]	0.5899*** [0.2096]	-0.1043 [7.0726]	10.4738* [5.6813]	9.7820 [6.3638]	-0.1896 [0.2718]
EarnRepFreq	-0.0583 [0.3505]	0.0544 [0.2794]	2.9688 [2.3167]	0.0700** [0.0337]	5.1109*** [0.8057]	-0.3930 [0.7390]	0.9264 [0.9191]	-0.1814*** [0.0385]
Closely	-0.0649*** [0.0148]	0.0239** [0.0110]	-0.0016 [0.0194]	-0.0022*** [0.0007]	-0.1108*** [0.0219]	-0.0947*** [0.0204]	-0.1135*** [0.0213]	-0.0017 [0.0011]
Q	-0.1897** [0.0963]	-0.1237* [0.0699]	0.5582*** [0.1982]	-0.0985*** [0.0095]	-0.7889*** [0.1795]	-0.2001 [0.1838]	-0.2579 [0.1740]	-0.0845*** [0.0127]
CashRatio	49.9546*** [8.3865]	13.4093** [5.6690]	53.8085*** [11.0973]	1.7315*** [0.3663]	19.6028** [8.7311]	46.0175*** [9.7385]	44.8926*** [9.3995]	0.0038 [0.3840]
RE-TE	3.2002*** [0.4877]	0.1241 [0.1779]	-0.0585 [0.2709]	0.0907*** [0.0139]	0.2105 [0.3345]	-1.4477*** [0.3483]	-1.2531*** [0.3707]	0.0246 [0.0197]
GDPGrowth	0.6287*** [0.1668]	0.2018 [0.3210]	-0.5055 [0.6531]	0.0198 [0.0201]	0.9287 [0.6531]	0.4339 [0.4374]	0.5929 [0.4885]	0.0487*** [0.0165]
MarketCap	0.0198 [0.0124]	-0.0255** [0.0123]	0.1121** [0.0554]	-0.0043*** [0.0012]	-0.0222 [0.0383]	-0.0516 [0.0327]	-0.0437 [0.0353]	-0.0004 [0.0012]
RuleLaw	-9.0884** [4.3231]	-0.2897 [4.1166]	-1.7852 [13.4877]	1.2992*** [0.3617]	-38.6679*** [13.6488]	-24.7969* [13.1738]	-30.5775** [14.7174]	-0.7437* [0.4046]
Observations	49,726	49,610	49,610	49,681	40,679	39,333	39,333	40,489
Adjusted R <sup>2</sup>	0.7224	0.0618	0.1842	0.5725	0.4574	0.0529	0.1189	0.2199
F-statistic	23.5141	9.3666	9.7383	12.4406	41.1285	14.3129	19.1117	15.8900
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000



repurchases and substantial increases in repurchase volume. The coefficient associated with the dividend tax penalty is positive and significant. It implies that the probability of initiating or substantially increasing share repurchases is much higher for corporations when the taxation of share repurchases is more favorable compared to dividends. The coefficient 12.1 suggests that a one standard deviation increase in the dividend tax penalty increases the likelihood that a company initiates or more than doubles share repurchases in the following year by 2.2 percentage points, or 11.8% of the baseline effect (Table 6). The coefficient for the dividend tax penalty (12.2) in column (7) suggests that a one standard deviation increase in the dividend tax penalty increases the likelihood that a company initiates share repurchases or increases repurchase volume by more than 15% in year  $t + 1$  by 2.2 percentage points (9.2% of the sample average, Table 6). The economic magnitude of the tax effect on a company's decision to repurchase shares, initiate or significantly increase repurchases is substantial. It suggests that when the tax burden on dividend payouts increases, a large fraction of firms flexibly adjust their payout policy to use share repurchases as an alternative payout channel. Column (8) reports results for share repurchase volume. The coefficient for DivTaxPen is again positive as predicted but not statistically significant (in Section 4.4.4 we present an explanation for why this is the case).

**Table 6: Economic Significance of the Tax Effect on Corporate Payout**

This table is based upon the regression coefficients reported in Table 5. It presents the effects of a one-standard deviation increase in the dividend tax penalty upon firm's payout choices. The first column of this table presents the dependent variable (see Table 4 for a description of the dependent variables). The second column replicates the coefficient estimates and significance levels. The third column features the effects of a one standard-deviation increase of the independent variable upon dividend policy (expressed in percentage points). The fourth column summarizes the sample averages of the dependent variables. Finally, the fifth column presents the ratio of the effect in column three relative to the sample average of the respective payout variable.

Dependent Variable	Regression Coefficient	1-Std. Dev Effect	Sample Average	Economic Magnitude
Dividend Payer	-10.219***	-1.681	71.1177	-2.36%
Dividend Init 100	-4.576**	-0.753	5.4263	-13.87%
Dividend Init 15	-27.636***	-4.546	23.1345	-19.65%
Dividend Yield	-0.559**	-0.091	1.3690	-6.67%
Repurchasing Firm	31.587***	5.563	39.8682	13.95%
Repurchase Init 100	12.123*	2.151	18.3002	11.75%
Repurchase Init 15	12.186*	2.162	23.4027	9.24%
Repurchase Yield	0.173	0.030	0.7185	4.23%

Most of the estimated coefficients pertaining to traditional firm- and country specific variables are in accordance with expectations and previous studies. For example, relative size of the firm increases the likelihood that a firm is a dividend payer and reduces the probability that a firm initiates or substantially increases dividends. Cash ratio, the fraction of retained earnings relative to total earnings, and

EBITDA all increase the probability of paying, initiating or substantially increasing dividends, while leverage and the quality of investor protection reduce the likelihood of paying dividends or repurchasing shares. This adds validity to our regression results and also allows us to put our results for taxation into perspective.

In Table 7, we provide the economic magnitude of taxation and various firm-specific controls on company payout policy by analyzing the predicted effect on dividends and share repurchases resulting from a one-standard deviation change in a particular variable (using the estimated coefficients from Table 5). For ease of comparison, the first row replicates the economic magnitudes of the effects of taxation obtained in Table 6. For the Dividend Payer dependent variable, the effect of taxation is larger than those of six of the ten firm characteristics commonly presented in the literature as driving dividend payouts, but it is smaller than those of cash ratio, leverage, and the fraction of earned (retained) versus contributed capital in a firm's equity capitalization. As alluded to above, particularly striking is the economic magnitude of the effect of taxation for firms' decision to initiate or substantially increase dividends. The magnitude of the tax effect (which is associated with an increase of 19.7% of the sample average likelihood of a firm initiating or more than 15% increasing dividends) is about three to four times as large as the effect of sales growth, EBITDA, leverage, and Tobin's  $q$ . The effect of taxation is about level with the magnitude of the effect of cash ratio (which is associated with an increase in the likelihood of a firm starting to pay dividends or substantially increasing dividend volume of about 19%) and share price appreciation (average effect of approximately 13.3%). Finally, the economic magnitude of the effect of DivTaxPen on Dividend Yield is comparable to the effects of leverage, share price appreciation, earnings reporting frequency, and the fraction of earned versus contributed capital.

The strength of the effect of taxation on share repurchases is equally impressive. A one standard deviation increase in the dividend tax penalty increases the likelihood that a firm repurchases shares by 5.6 percentage points, or 14% of the sample average likelihood of repurchasing shares – an effect larger than that of any of the firm controls but earnings reporting frequency. In general, for all dependent variables the economic magnitude of the effects of firm size and earnings reporting frequency seem considerably large. Note, however, that one standard deviation increases in firm size (which is equivalent to a firm moving up 23 percentiles in relative firm size) and earnings reporting frequency (which is associated with a firm increasing reporting frequency by more than one report per year) are unlikely to be observed in reality. To put the taxation effect into perspective, a one standard deviation reduction in leverage increases the likelihood that a firm is a share repurchasing firm by 9.6% of the sample average – a 31% smaller effect than that of taxation. A one standard deviation increase in cash ratio increases the likelihood that a firm is a

**Table 7: Comparison of Economic Significance of Effects – Dividend Tax Penalty versus Firm-Level Controls**

This table is based upon the regression coefficients reported in Table 5. It presents the effects of a one-standard deviation increase in the dividend tax penalty and our firm-level controls upon corporate payout. The first column of this table presents the independent variables (see Table 4 for a description of the variables). Columns 2 through 7 show the effect of a one standard-deviation increase of the independent variable upon the firm dividend policy relative to the sample average of the respective payout-policy dependent variable. For ease of comparison, the first row features the economic magnitude of the tax effects obtained in Table 6. Percentages in italics denote statistical insignificance at a conventional level.

	Dependent Variable						
	Dividend Payer	Dividend Init 100	Dividend Init 15	Dividend Yield	Repurch. Firm	Repurch. Init 100	Repurch. Init 15
DivTaxPen	-2.36%	-13.87%	-19.65%	-6.67%	13.95%	11.75%	9.24%
PriceApp	<i>-0.37%</i>	25.50%	13.30%	-8.41%	<i>-0.25%</i>	4.72%	4.91%
SalesGrowth	1.37%	<i>-3.47%</i>	7.94%	-1.93%	<i>-0.66%</i>	<i>1.24%</i>	<i>0.23%</i>
Leverage	-5.24%	<i>-1.90%</i>	-4.30%	-8.01%	-9.59%	-15.92%	-16.72%
EBITDA	2.32%	10.82%	7.59%	<i>2.96%</i>	7.61%	-11.07%	-5.18%
RelSize	9.88%	-49.32%	-12.59%	10.00%	<i>-0.06%</i>	13.52%	<i>9.87%</i>
EarnRepFreq	<i>-0.10%</i>	<i>1.26%</i>	<i>16.19%</i>	6.46%	14.89%	<i>-2.45%</i>	<i>4.51%</i>
Closely	-2.06%	9.94%	<i>-0.16%</i>	-3.63%	-6.32%	-11.78%	-11.04%
Q	-0.65%	-5.60%	5.92%	-18.00%	-5.10%	<i>-2.81%</i>	<i>-2.83%</i>
CashRatio	5.68%	19.98%	18.81%	10.36%	4.12%	21.15%	16.13%
RE.TE	4.15%	<i>2.11%</i>	<i>-0.23%</i>	6.13%	<i>0.51%</i>	-7.72%	-5.23%

share repurchasing firm by 4.1% of the sample average – only 29.5% of the economic magnitude of the effect of taxation. Similarly, a one standard deviation increase in the dividend tax penalty increase the likelihood that a firm initiates or substantially increases share repurchases by 2.2 percentage points, or 11.8% of the sample average. This effect is larger than the effects for stock price appreciation, EBITDA, and the fraction of earned (retained) versus contributed capital. It is smaller than the effect of leverage (which is associated with a reduction in share repurchase initiations or substantial increases in repurchase volume of 15.9% of the sample average likelihood of a firm initiating or substantially increasing repurchases) and availability of cash (21.2%).

The result that corporate payout responds to changes in the tax burden on dividends relative to capital gains is consistent with the traditional view of dividend taxation. The implications of our empirical evidence for the new view, which predicts no response to permanent changes in dividend taxation, are less favorable.

## 4.4 Robustness

### 4.4.1 Ensuring robustness to alternative specification strategies

Having established the baseline result – the presence of a statistically significant and economically strong correlation between the dividend tax penalty and dividend and share repurchase behavior, we next establish the robustness of our results to alternative specification strategies.

One concern about our regression specifications in Table 5 is, as any experienced researcher is aware, that by experimenting with many different combinations of control variables in a rich micro dataset like the one used in this study, nearly any desired result can be obtained. Hence, to make the results more convincing to the skeptical reader, in Table 8 we show robustness of our results to different specification strategies. These are sixfold. In Model (1), we regress the dependent payout variables on the dividend tax penalty alone. In Model (2), we add our firm-level controls to the regression specification. Regression coefficients for DivTaxPen are based on OLS only with country level controls in Model (3). In Model (4), regression specifications combine both firm- and country-level controls. Model (5) employs firm- and country-level controls but uses cash holdings, defined as cash and equivalents over total assets, instead of cash flow to control for the availability of internal resources for distribution to shareholders. Firm- and year-fixed effects are included in all regressions, and we cluster standard errors by country-year.

Table 8 reports coefficient estimates for the dividend tax penalty across our dependent payout variables and the five regression specifications set out above. Across all specifications sign, significance, and economic magnitude of the tax effect are strikingly similar, thus confirming the robustness of the significant tax effects obtained in Table 5.

#### **4.4.2 Ruling out distortions from tax evasion**

In Model (6) of Table 8 we address a central concern pertaining to the dividend tax penalty. It could be that our statutory dividend and capital gains tax rates that are used to compute DivTaxPen are an inaccurate representation of the 'effective' tax rates faced by shareholders. If, for example, state capacity to collect taxes in a country is low, and tax evasion abounds, the divergence between the statutory and the 'effective' tax rate on dividends and capital gains is large. The larger this divergence is the more inaccurate is the measurement of our tax variables, and the more spurious is the significance of the coefficients we obtain. Consequently, we opt for robustness checks in which we weight the dividend tax penalty with a measure of the state's capacity to collect taxes. Two popular measures of state capacity in the literature are the fraction of total tax revenues relative to GDP (Cheibub (1998)) and the Polity index (Polity IV Project (2003)). For both measures, our robustness checks yield results very similar to those obtained in Models (1) to (5) in Table 5.

**Table 8: Dividend Tax Penalty and Corporate Payout Across 25 Countries (1990-2008) – Alternative Specifications**

This table reports coefficient estimates of the dividend tax penalty variable for various model specifications. The first column presents the dependent variables which are defined as in Table 4. Model (1) shows coefficients from OLS regressions without firm- and country-level controls. In Model (2) we present estimates from OLS regressions with firm-level controls as defined in Table 5. In Model (3), regression coefficients for *DivTaxPen* are based on OLS with country-level controls. Model (4) includes firm- and country-level controls. The regression coefficient for *DivTaxPen* in Model (5) is presented in the sixth column where we use cash holdings (cash and equivalents over total assets) instead of cash flow in the firm-level controls. Model (6) features OLS regression coefficients of the interaction of the state capacity to collect taxes and the dividend tax penalty. Firm- and year-fixed effects are used throughout. Standard errors (shown in brackets) allow for heteroskedasticity and are clustered by country-years. \*\*\*, \*\*, \* and \* denote significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
Dividend Payer	-10.1560*** [2.7634]	-10.7018*** [2.6050]	-9.6070*** [3.0605]	-10.2191*** [2.8650]	-9.4285*** [2.8106]	-10.1417*** [2.8841]
Dividend Init 100	-2.9415 [2.3763]	-3.7638* [2.2502]	-3.8461* [2.2547]	-4.5760** [2.1501]	-3.9363* [2.1410]	-4.0689* [2.1901]
Dividend Init 15	-27.8136*** [8.9065]	-31.0627*** [8.7184]	-24.5185*** [7.8356]	-27.6364*** [7.6468]	-25.9062*** [7.5734]	-27.2314*** [7.6938]
Dividend Yield	-0.4964* [0.2538]	-0.6970*** [0.2614]	-0.3624 [0.2397]	-0.5592** [0.2549]	-0.5628** [0.2578]	-0.4993* [0.2542]
Repurchasing Firm	25.2330*** [9.0533]	29.2676*** [8.6589]	27.8487*** [7.7843]	31.5873*** [7.6157]	32.6828*** [7.7565]	32.4369*** [7.5586]
Repurchase Init 100	10.9760* [5.8972]	10.6866* [5.7570]	12.2608* [6.7887]	12.1233* [6.7177]	13.8032** [6.7314]	12.6137* [6.7839]
Repurchase Init 15	9.2558 [6.3502]	10.1514 [6.1922]	11.2179 [7.3419]	12.1858* [7.2276]	13.9955* [7.2870]	12.7589* [7.2977]
Repurchase Yield	0.0722 [0.2831]	0.1107 [0.2720]	0.1293 [0.2601]	0.1726 [0.2490]	0.2635 [0.2526]	0.1968 [0.2477]
Firm-level controls	No	Yes	No	Yes	No	Yes
Firm-level controls (cash holdings)	No	No	No	No	Yes	No
Country-level controls	No	No	Yes	Yes	Yes	Yes
State capacity interactions	No	No	No	No	No	Yes

### 4.4.3 Ruling out biases from unequal country weights and ensuring robustness over time

Another concern is that our results might be driven by unequal representation of individual countries. So far we have assigned equal weight to all firm-year observations. Yet, it may be that our conjectured relationship between the dividend tax penalty and corporate payout policies holds only in some countries that are over-represent in our sample, but not in others that weight less in our regressions. To address this concern we run linear (OLS) regressions for dividend payout behavior estimated over 25 countries, but now we aggregate the data at the country level. As in the preceding analyses we use dependent variables Dividend Payer, Dividend Initiation 100, Dividend Initiation 15, Repurchasing Firm, Repurchase Initiation 100, Repurchase Initiation 15, and we also include the ShareRe / Div Ratio, defined as the aggregate share repurchase volume over aggregate dividend payout in a country in year  $t + 1$ . The ShareRe / Div Ratio is a powerful measure of the aggregate importance of share repurchases relative to dividends that is unavailable at the firm-level. Because only a fraction of firms actively distributes cash through both dividends and share repurchases, thus having non-zero values for both payout channels, calculation of the ratio at the firm-level overly censors observations and introduces severe biases. At the country-level, it proves a powerful indicator of the relative importance of alternative payout channels.

In the country-level regressions, we control for indicators of country and stock market development and the quality of shareholder protection that may affect the prevalence of dividends and share repurchases in a country. We include annual percentage GDP growth (*GDPGrowth*), the urban population as a percentage of the total population (*UrbanPop*), the market capitalization of listed companies as a percentage of GDP (*MarketCap*), and the growth rate (in %) of the number of listed domestic companies (*NumListGrowth*) to control for the possibility that the relative development of a country or its financial market biases our results towards finding greater prevalence of dividends or share repurchases in this country. We further test whether the quality of shareholder protection influences corporate payout choices. We do so by including an indicator (*CommonLaw*) whether the country is a common law versus a civil law country, and we also obtain the rule of law index (*RuleLaw*). Following the outcome model of dividends due to La Porta, Lopez-De-Silanes, Shleifer, and Vishny (2000) we expect dividends to be more prevalent, and dividend payouts to be higher, in common law countries and in countries where legal protection is higher.

**Table 9: Dividend Tax Penalty and Country-Level Aggregate Corporate Payout Across 25 Countries (1990-2008)**

This table reports OLS regression results for corporate payout aggregated at the country level, estimated over 25 countries for 1990-2008. Dependent variables are measured the year after controls. *Dividend Payer* is the percentage of dividend paying firms in a country. *Dividend Initiation 100* (*Dividend Initiation 15*) represents the fraction of firms initiating dividends or increasing dividend payout by 100% (15%) in the country. *Repurchasing Firm* is percentage of firms repurchasing shares in a country. *Repurchase Initiation 100* (*Repurchase Initiation 15*) is the fraction of firms initiating share repurchases or increasing repurchase volume by 100% (15%) in the country. *ShareRe / Div Ratio* is the aggregate share repurchase amount over aggregate dividend volume in a country. *DivTaxPen* is the country-year-specific dividend tax penalty. *RuleLaw* abbreviates rule of law index. *Common* is an indicator whether the country's legal origin is common law. *GDPGrowth* is the annual GDP growth. *MarketCap* is a country's market capitalization of listed companies as % of GDP. *NumListGrowth* is the growth of the number of listed companies in the country from  $t-1$  to  $t$ . *UrbanPop* is the percentage of the urban population. Standard errors (shown in brackets) allow for heteroskedasticity and are clustered at the country-level. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	Dividend Payer	Dividend Initiation 100	Dividend Initiation 15	Repurchasing Firm	Repurchase Initiation 100	Repurchase Initiation 15	ShareRe / Div Ratio
Constant	64.2347*** [18.9858]	9.6483** [4.3779]	19.0484 [11.2421]	31.3832** [13.9466]	8.8375* [4.5322]	12.5978* [6.6889]	60.9473** [26.5328]
DivTaxPen	-17.4041** [8.4180]	-6.3428*** [1.5300]	-14.0664** [5.2613]	13.3694* [7.8254]	3.9017* [2.0148]	5.8604* [3.0411]	33.5919** [15.8507]
RuleLaw	12.0830** [5.2376]	-0.1555 [0.7868]	8.7995*** [2.5536]	-8.1663** [3.7531]	-2.7152* [1.3714]	-3.4890* [1.9144]	-14.4363 [10.7838]
CommonLaw	-8.0394 [6.0865]	-1.7167* [0.9766]	-5.5184 [4.2616]	4.5514 [5.1197]	1.0225 [1.5841]	1.8998 [2.3831]	-4.6966 [7.2748]
GDPGrowth	1.4095** [0.6570]	0.3043* [0.1534]	1.6078*** [0.4984]	-0.3851 [0.7057]	-0.3024 [0.2053]	-0.3264 [0.2902]	-0.8484 [1.5363]
MarketCap	-0.0057 [0.0348]	-0.0043 [0.0063]	-0.0131 [0.0203]	0.1466*** [0.0276]	0.0433*** [0.0071]	0.0617*** [0.0109]	0.2962*** [0.0583]
NumListGrowth	-0.7567 [4.5250]	-0.1356 [1.2025]	2.5568 [4.5705]	2.5185 [5.3969]	-0.2361 [1.8483]	0.3901 [2.3757]	-17.6569 [15.9425]
UrbanPop	-0.1221 [0.1748]	-0.0484 [0.0475]	-0.1004 [0.1034]	-0.1747 [0.1544]	-0.0422 [0.0468]	-0.0790 [0.0731]	-0.0113 [0.2999]
Observations	378	377	377	363	352	352	350
R-squared	0.1793	0.0670	0.0986	0.1878	0.1261	0.1449	0.0392
F-statistic	5.3106	4.7626	8.1769	7.1939	8.2321	6.7042	13.8065
Prob > F	0.0009	0.0018	0.0000	0.0001	0.0000	0.0002	0.0000

Table 9 features the results of the country-level regressions. The effects of taxation are even stronger than those obtained before. Column (1) shows the results for the Dividend Payer dependent variable. The coefficients for the dividend tax penalty is 17.4, implying that a one standard deviation increase in the dividend tax penalty (the standard deviation of country-mean dividend tax penalties is 20.7%) is associated with a 3.5 percentage points reduction in the fraction of dividend paying firms in the next year – or 4.9% of the mean of country means of 73% in 1990-2008. Columns (2) and (3) show that the effect of taxation on a firm’s decision to initiate or substantially increase dividend payout is negative and significant. The coefficient of 6.3 in Column (2) implies that a one standard deviation increase in the dividend tax penalty reduces the fraction of firms initiating or more than doubling dividends in the next year by 1.3 percentage points, or 24% of the country-year averages of 5.4%. The coefficient 14.1 for DivTaxPen in Column (3) suggests that an increase in the taxation of dividends relative to capital gains reduces the percentage of firms initiating or, if they paid dividends in the current year, increasing payout by more than 15% in the next year by 2.9 percentage points (or 10% of the mean of country means of 28.7%).

Columns (4) to (6) report estimates for the effect of taxation on companies’ share repurchase activity. Column (4) features the results for regressions with dependent variable Repurchasing Firm. The interpretation of the coefficient 13.4 is that a one standard deviation increase in the dividend tax penalty increases the fraction of repurchasing firms in the next year by 2.8 percentage points, or 13.5% of the 20.4% average fraction of share repurchasing firms across countries. Columns (5) and (6) report country-level estimates of taxation’s effect on a firm’s decision to initiate share repurchases or to substantially increase repurchase volume. Coefficient estimates show that a one standard deviation increase in the dividend tax penalty increase the share of firms initiating share repurchases or increasing repurchase volume by more than 100% (15%) in the next year by 0.8 (1.2) percentage points – 19.32% (19.27%) of the mean of country means in 1990-2008.

Column (7) reports the tax effect on the share repurchase volume relative to the dividend payout volume. The expectation is that a higher tax penalty on dividends relative to share repurchases correlates with a higher share-repurchase-to-dividends ratio, as firms opt for the payout channel for which investors are tax advantaged. The coefficient 33.6 for DivTaxPen in Column (7) shows that this is the case. It implies that a one standard deviation increase in the dividend tax penalty is associated with a 7.0 percentage point increase in the amount of share repurchases relative to the amount of dividends, or 16.9% of the 39.8% baseline repurchase-to-dividend-volume ratio.



Valid country-level results would suggest that one should see a clear relationship between aggregate corporate payout and the dividend tax penalty over time. Figures 4 and 5 illustrate that this is the case: our tax effects are valid not only in individual sub-periods of our sample but hold remarkably well over the entire sample period. The figures are simple scatter plots of our aggregate payout measures against the tax rate on dividends for each year in 1990-2008. For both the percentage of dividend payers and the dividend yield individual year-specific observations cluster remarkably tightly around the negative trend line between the percentage of dividend paying firms (Figure 4) and the dividend volume (Figure 5) against the dividend tax penalty over the 1990-2008 period. Similarly, with the exception of the years 2004 to 2008, the percentage of share repurchasing firms (Figure 4) and the share repurchase volume (Figure 5) in individual year-specific observations are increasing in the dividend tax penalty over the 1990-2008 period.

**Figure 4: Dividend Tax Penalty and Aggregate Corporate Payout Across 25 Countries (1990-2008)**

This figure features scatter plots of the global percentage of dividend payers (y-axis, left plot) and share repurchasing firms (y-axis right plot) against the year-specific global average dividend tax penalty (x-axis; 25 countries, see Table 1) for 1990-2008.



The seeming inconsistency of the year 2004-2008 observations with the otherwise positive trend line between dividend tax penalty and share repurchases reflects the vastly growing international importance of share repurchases, particularly during the boom market in second half of the last decade – a time when dividend tax penalties around the world were generally decreasing. Most notably in the countries in continental Europe, but also in Japan and New Zealand, share repurchase volumes and the propensity to repurchase shares reach, if at all, negligible levels until the turn of the millennium for various regulatory reasons. First, in some European countries share repurchases were either difficult to implement (for example, France) or illegal (for example, Sweden and Germany) until the turn of the millennium (Rau and Vermaelen (2002), De Ridder (2009)). Second, in countries with high taxes on dividends and low capital gains taxes (such as the Netherlands before 2001), specific tax provisions existed to discourage share repurchases. Third, in many European countries,

companies did not have to disclose repurchase authorizations. And, finally, because most continental European companies traditionally have emphasized maximizing 'stakeholder value' rather than 'shareholder value', share repurchases did not fit the European corporate culture. In Japan, restrictions on corporate share repurchases thwarted corporations from buying back their own shares until gradual removal of restrictions on share repurchases since the mid-1990s (Hashimoto (1998)).

**Figure 5: Dividend Tax Penalty and Aggregate Payout Volume Across 25 Countries (1990-2008)**

This figure features scatter plots of average dividend and share repurchase yield against global average dividend tax penalty (x-axis; 25 countries, see Table 1) for 1990-2008. The average dividend yield on the y-axis of the left plot is the average global dividend-to-market-capitalization ratio in a year. The average share repurchase yield on the y-axis of the right plot is the average global share-repurchase-to-market-capitalization ratio in the year.



#### 4.4.4 Ensuring robustness to more fine-grained analysis of ownership structures

In many countries and years the corporate payout tax burden for different shareholder classes is identical. However, in some jurisdictions the capital gains of substantial shareholders are taxed at different, often higher rates than capital gains accrued by non-substantial shareholders.<sup>13</sup> For example – in stark contrast to the U.K. and the U.S. – some countries such as Germany, Austria, Italy (from 1998), South Korea (from 1999), and the Netherlands tax capital gains from substantial shareholdings at a higher rate than capital gains from non-substantial shareholdings. In many cases, the dividend tax penalty for firms with a higher fraction of highly concentrated ownership is thus lower than for companies with more widely held stock. As a result, substantial shareholders in such countries may be more likely to persuade firms to pay higher dividends.

Prior research shows that the companies mostly likely to respond to the tax cut by initiating or increasing dividends are those in which top executives hold substantial shares in the company and thus stand to benefit personally from the

<sup>13</sup>A substantial shareholder is defined as a shareholder whose shares total a threshold fraction or more of a company's issued capital. The participation quota of share capital or voting rights above which a shareholding is considered substantial varies over time and across countries. For example, the threshold is 1% in Germany and 5% in Italy.

change in dividend policy (Brown, Liang, and Weisbenner (2007), Chetty and Saez (2005)). For policy-makers, this aspect is relevant insofar as policy-makers' interest is in what is most productive for the firm and the economy overall. By contrast, when managers act out of self-interest, there is no guarantee that their actions line up with the broader interests of the company or the shareholders.

Our available data allows us to distinguish between shares held by non-substantial shareholders (*Float*) and shares held by insiders and substantial shareholders (*Closely*)<sup>14</sup>. Accordingly, we collect the dividend tax penalty for both non-substantial (*DivTaxPen*) and substantial shareholdings (*DivTPSubs*), and interact each shareholder group's dividend tax penalty with the fraction of shares held by this shareholder class.

The interaction term  $DivTaxPen * Float$  has the advantage that the dividend tax penalty for minority shareholders is weighted by the fraction of shares that is actually held by this investor class. This creates a more realistic measure of the likely relevance of outside shareholders' interests for corporate decision makers. The interaction  $DivTPSubs * Closely$  is useful because critics may be concerned that the dividend tax penalty measure we use in Table 5 may be a more or less accurate measure of shareholders' true tax burden depending on differences in ownership structures across countries. Including both interactions also allows us to check whether the results obtained so far are evidence of corporate managers changing dividend policies in line with the best interest of the company's shareholders or whether response to tax changes are driven by strong principals who had stronger incentives to respond (high share ownership and changes in tax incentives).

We opt for the same specification strategy as in Table 5. As in the previous analyses, we cluster standard errors by country-year – the level at which identifying variation in the dividend tax penalty occurs – to rule out distorting effects on the p-values of our coefficient estimates. The results in Table 10 line up with those obtained in Table 5 very closely. Sign, significance and magnitude of the tax effects using interaction  $DivTaxPen*Float$  closely resemble those of the coefficients obtained for  $DivTaxPen$ .  $DivTaxPen*Float$  is significant and has the 'correct' negative sign in Columns (1) through (4). This shows that an increase in the dividend tax penalty is associated with a lower likelihood that a firm pays dividends, initiates or substantially increases dividends, and it reduces the dividend volume.

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<sup>14</sup>Shares held by officers, directors and their immediate families, shares held in trust, shares of the company held by any other corporation (except shares held in a fiduciary capacity by banks or other financial institutions), shares held by pension/benefit plans, shares held by individuals who hold 5% or more of the outstanding shares. For Japanese companies it represents the holdings of the ten largest shareholders.

**Table 10: Dividend Tax Penalty and Corporate Payout Across 25 Countries (1990-2008) – Ownership Specificities**

This table reports fixed effects panel regression results for dividend payout behavior, estimated over the panel of 5,767 companies in 25 countries for 1990-2008. Dependent and independent variables are defined as in Table 4. Corporate payout is measured one year after firm- and country-level controls. *DivTPSubs* is the dividend tax penalty for substantial shareholdings. *CloseLy* is the percentage of shares held by insiders and substantial shareholders. *Float* is defined as  $1 - \text{CloseLy}$ . Firm- and year-fixed effects are included in all regressions. Standard errors (shown in brackets) allow for heteroskedasticity and are clustered by country-years. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% level, respectively.

Dependent Variable	Dividend Payer	Dividend Initiation 100	Dividend Initiation 15	Dividend Yield	Repurchasing Firm	Repurchase Initiation 100	Repurchase Initiation 15	Repurchase Yield
Constant	73.5785*** [6.7929]	9.3470 [6.6376]	12.3347 [23.2672]	-0.7932 [0.5862]	55.2430** [21.8703]	55.2430** [21.8703]	63.1545** [24.5324]	2.0932*** [0.6962]
DivTaxPen*Float	-12.1123*** [2.7467]	-4.7220** [2.2994]	-32.1457*** [8.7415]	-0.5889** [0.2748]	11.4136 [9.4913]	11.4136 [9.4913]	6.5415 [9.7319]	-0.0001 [0.0039]
DivTPSubs*CloseLy	-6.5132 [4.2370]	-5.4796* [3.2618]	-13.4571 [12.2432]	0.5156* [0.2994]	16.3800** [7.9246]	16.3800** [7.9246]	18.5240** [9.2260]	0.0099*** [0.0034]
PriceApp	-1.0422 [1.0187]	5.9825*** [1.0375]	13.4189*** [2.1961]	-0.4863*** [0.0711]	3.6623*** [1.2671]	3.6623*** [1.2671]	4.9295*** [1.5099]	-0.1842*** [0.0623]
SalesGrowth	2.8865*** [0.6389]	-0.6025 [0.4962]	5.4257*** [1.3588]	-0.0786** [0.0364]	0.7733 [1.1465]	0.7733 [1.1465]	0.2479 [1.2233]	-0.1131*** [0.0370]
Leverage	-19.2153*** [1.9770]	-0.4850 [1.4599]	-5.0901** [2.0845]	-0.5772*** [0.0947]	-15.1216*** [2.5660]	-15.1216*** [2.5660]	-20.2016*** [3.0054]	-0.8455*** [0.1161]
EBITDA	18.0087*** [5.8496]	6.3633* [3.7137]	18.7276** [9.5147]	0.4440 [0.2842]	-21.2601*** [7.9018]	-21.2601*** [7.9018]	-12.8881* [7.5054]	1.9287*** [0.4331]
RelSize	30.8374*** [2.4890]	-11.2500*** [2.3534]	-11.1260** [4.9937]	0.6028*** [0.2127]	9.9130* [5.7520]	9.9130* [5.7520]	9.3285 [6.4289]	-0.2063 [0.2676]
EarnRepFreq	-0.4956 [0.3581]	-0.1705 [0.2857]	1.8816 [2.0327]	0.0649** [0.0317]	0.2417 [0.6666]	0.2417 [0.6666]	1.4381* [0.8256]	-0.1618*** [0.0397]
CloseLy	-0.0680*** [0.0152]	0.0237** [0.0115]	-0.0110 [0.0208]	-0.0027*** [0.0007]	-0.0954*** [0.0207]	-0.0954*** [0.0207]	-0.1166*** [0.0213]	-0.0020* [0.0012]
Q	-0.2217** [0.0930]	-0.1432** [0.0716]	0.4788** [0.1931]	-0.0989*** [0.0095]	-0.1671 [0.1842]	-0.1671 [0.1842]	-0.2194 [0.1747]	-0.0831*** [0.0125]
CashRatio	50.2736*** [8.3886]	13.6158** [5.6698]	54.4672*** [11.0475]	1.7088*** [0.3630]	45.4118*** [9.6485]	45.4118*** [9.6485]	44.5801*** [9.2893]	-0.0259 [0.3781]
RE-TE	3.2022*** [0.4876]	0.1278 [0.1787]	-0.0571 [0.2706]	0.0899*** [0.0139]	-1.4527*** [0.3474]	-1.4527*** [0.3474]	-1.2603*** [0.3701]	0.0238 [0.0196]
GDPGrowth	0.5932*** [0.1676]	0.1849 [0.3192]	-0.6039 [0.6644]	0.0172 [0.0206]	0.4508 [0.4275]	0.4508 [0.4275]	0.6034 [0.4744]	0.0492*** [0.0163]
MarketCap	0.0230* [0.0123]	-0.0251** [0.0123]	0.1227*** [0.0566]	-0.0037*** [0.0012]	-0.0508 [0.0311]	-0.0508 [0.0311]	-0.0426 [0.0340]	-0.0001 [0.0011]
RuleLaw	-8.9264** [4.0860]	-0.1433 [4.1126]	-1.7098 [13.7611]	1.2408*** [0.3584]	-24.2722* [12.9982]	-24.2722* [12.9982]	-29.3306** [14.4565]	-0.7488* [0.3935]
Observations	49,726	49,610	49,610	49,681	39,333	39,333	39,333	40,489
Adjusted R <sup>2</sup>	0.7225	0.0619	0.1846	0.5723	0.0533	0.0533	0.1191	0.2204
F-statistic	23.7539	10.4837	10.4341	12.5258	14.7659	14.7659	19.2056	17.0308
Prob > F	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

The interaction term  $\text{DivTPSubs}^*\text{Closely}$  in the dividend regressions in columns (1) to (3) has the 'correct' negative sign but is statistically significant only in Column (2). Compare to this the highly significant and positive coefficient for  $\text{DivTPSubs}^*\text{Closely}$  in columns (6) through (8), the regressions with dependent variables share repurchase initiations and increases, and share repurchase volume. Note that these are exactly the regressions in which the statistical significance of  $\text{DivTaxPen}$  (Table 5) and  $\text{DivTaxPen}^*\text{Float}$  was least. This result suggests that the decision to initiate share repurchase, increase repurchases, and share repurchase volume overall are determined more by insiders' tax positions relative to outside shareholders' tax preferences than dividend payout decisions. This is a noteworthy result. It implies that the recognition of outside shareholders' interests decreases (and personal tax considerations of corporate insiders increase) from dividends to share repurchases. This is consistent with the notion in the literature that institutional owners and 'informed' shareholders have preferential access to the benefits of share repurchases (Bradley and Wakeman (1983), Barclay and Smith (1988), Brennan and Thakor (1990), Dunsby (1995)). By contrast, dividends are allocated proportionally to all shareholders and are more 'visible', thus making dividends more outside shareholder-driven compared to share repurchases. Hence, because the redistributive character of dividends and share repurchases differs, the substitution effect between dividends and share repurchases detected throughout our analyses is particularly relevant for wealth redistribution-minded regulators. More so, the relative small weight of outside investors' tax preferences in share repurchase decisions calls for critical evaluation of existing transparency and guidelines for the repurchase process.

## 5 Conclusion

Our analysis shows that dividend and capital gains taxation are not something that matters at the margin but that they are first-order determinants of corporate payout. This stands in contrast to prior evidence in the literature, mostly based on U.S. data, which tends to conclude that taxes do not seem to have a first-order effect on dividends and share repurchases. We believe that we reach a different conclusion due to the nature of our sample, an abundant set of cross-country tax variation and tax changes over time. This research design helps to attenuate potential epiphenomenal factors (such as growing corporate earnings, post-corporate scandal pressures to regain investor confidence, or industry maturity) that may influence corporate payout around tax reforms in a particular country. That is, our research design allows for measurement of taxation's effect with less noise than single-country, single tax regime change studies presented thus far.

We close with a final comment regarding policy implications. Our evidence from a large international sample confirms prior single-country findings that we should expect to see significant firm responses to tax changes out-of-sample. In this respect, appreciation of the effects of taxation on firm payout behavior is quite topical, as large increases in the taxation of corporate payouts are scheduled in the United States and other OECD countries. In the U.S. the Senate Budget Committee passed a fiscal 2011 budget resolution that features an increase in the tax rate on dividends (to 39.6% from the current 15%) and capital gains (from 15% to 20%). Likewise, the Finnish Ministry of Finance has set up a working group to review taxation in Finland which proposes that the effective tax rate on dividends from limited companies as well as the capital gains tax for individuals be increased. The results presented in this paper provide regulators with a richer understanding of the likely economic magnitude of the consequences that their tax policies have for corporate payout. This proves helpful to evaluate the benefits and costs of tax policy changes. After all, even if a tax cut were to generate meaningful economic benefits, such effects might be mitigated by the high cost of this tax policy that adds significantly to the budget deficit, ultimately shrinking the pool of saving available for investment, and leading to lower future incomes and reduced long-term growth. At the same time, dividends and capital gains possess differing redistribution characteristics and stimulate private spending of unequal investor classes. Amid the persistent fragility of post-housing-bubble economic recovery a careful assessment of the consequences of tax reforms is more than ever mandated.

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