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Towards Neutral Distribution Taxes and Vanishing Tax Effects in the European Union

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ABSTRACT

The European Union (EU) has no explicit common income tax law. Nevertheless, Court of Justice decisions have driven EU member states to adopt more similar corporate tax systems, and thus, to align the tax treatment of corporate profit distributions—dividends and capital gains.

This paper empirically analyzes the influence of the tax preferences of individual and corporate shareholders for the two corporate distribution types—dividends or capital gains—from 1990 to 2012. In the first years of the observation period, European tax systems have provided opposing tax advantages, where individual shareholders have preferred capital gains and corporate shareholders have preferred dividends. To account for these differences depending on the firm's shareholder structure, we derive firm-specific tax preferences for profit distributions. Our empirical analysis reveals that—in line with current literature—the firm-specific tax preferences indeed affect dividend payments. Moreover, we show that in contrast to our detailed study, a simplified approach to measure tax effects on distributions overestimates this influence. In subsequent years, as European Court of Justice decisions have indirectly aligned EU corporate tax systems, we find that tax preferences have converged to a great extent with the tendency to equal tax treatment of dividends and capital gains for both—individual and corporate—shareholder groups. In line with this development, we find that the association of tax preferences and distribution policies vanishes in the last years of the observation period. Our study implies that the EU common regulatory framework, even in the absence of explicit law, can affect corporate distribution decisions and foster neutral taxation of dividends and capital gains across EU member states.

Towards Neutral Distribution Taxes and Vanishing Tax Effects in the European Union

1. Introduction

Despite the lack of a harmonized European Union (EU) income tax law, the common European regulatory framework influences the corporate tax systems of the member states and, thus, firms' profit distribution policies. In response to member states' tax reforms, firms adapt their distribution policies in accordance with their shareholders' tax preferences (König, 1990). Accordingly, our research question is: How does the influence of firm-specific shareholders' tax preferences on corporate distribution decisions change against the background of common European regulation?

Due to the different tax burdens on dividends and capital gains, particularly in the 1990s, individual shareholders, on average, face the widely studied 'dividend tax penalty' (e.g. Dhaliwal et al., 2003). Contrarily, corporate shareholders face a 'capital gain tax penalty'. Tax reforms—in light of European Court of Justice decisions and the EU-Parent-Subsidiary Directive—and peer group pressure supported the convergence of distribution taxation across EU member states. This implicit trend is remarkable, since the EU lacks common harmonization legislation for income taxes. The tax reforms tend to decrease the 'tax penalties' for both individual and corporate shareholders, taxing dividends and capital gains more equally. While the international trend of decreasing dividend tax penalties is well documented for individual shareholders (Jacob and Jacob, 2013), we document a similar trend for corpate shareholders. Our empirical analysis, based on 14 EU member states from 1990 to 2012, reveals a significant influence of the firm-specific tax preferences on corporate dividend payments—firms increase dividends if dividends hold tax advantages compared to capital gains for the majority of the firm's shareholders and vice versa. However, as capital gains and dividend taxation converges for both types of shareholders to a great extent, we find that this

effect vanishes towards the end of the observation period. Additionally, robustness checks suggest that approaches solely considering the country-specific tax treatment of distributions for individual shareholders overestimate the tax effects on distribution policy and provide less consistent results in our sample.

The contribution of our paper is two-fold: First, we can draw shareholder group-specific conclusions, as our analysis is based on detailed, firm-specific rather than country-specific data. Thus, our research design combines the approach of large-scale multi-country studies (such as Jacob and Jacob, 2013) with the differentiated consideration of the shareholders' tax status over a long observation period (Schanz and Theßeling, 2012). Our approach allows us to consider the tax burdens in classical and imputation systems, which is crucial in cross-country studies (Hegemann et al., 2016). Second, we extend prior literature by considering the (indirect) influence of the EU framework on distributions. To the best of our knowledge, we are the first to link common European long-term taxation trends with distribution behavior. Our study implies that the EU common regulatory background induces tax reforms that have fostered neutral taxation across EU member states, even in the absence of explicit law.

This paper is structured as follows. Section 2 provides an overview of dividend and capital gain taxation trends against the common European regulatory background. In Section 3, we develop hypotheses based on the literature and the taxation trends in Europe. We derive firm-specific tax preferences and empirically analyze their influence on corporate distributions in Section 4. Section 5 concludes.

2. Diminishing Tax Advantages for Dividends or Capital Gains in the EU

2.1. Regulatory Background

Throughout the world, two different types of corporate tax systems are applied—imputation systems and classical systems. In corporate tax systems, profits subject to distribution are

typically taxed on the level of the distributing corporation. The distribution is then taxed on the level of the shareholder, which causes economic double taxation. Imputation systems address this double taxation by providing a (full or partial) tax credit on the shareholder level for the corporate tax paid on the level of the distributing corporation. Classical systems cause more severe investment distortions (Sureth and Langeleh, 2007). They accept economic double taxation, but often provide some sort of shareholder relief, in the form of a reduced tax rate or tax base, in order to limit the tax burden on distributions. In Europe, both systems have been common.

The European Community law is a crucial driver of corporate tax reforms in the EU. As early member states of the EU, 11 of the 14 countries[1] in our analysis operate under the direct influence of common European regulation over the full observation period from 1990 to 2012. Although Austria, Finland and Sweden became full members only in 1995, preliminary accession negotiations suggest the influence of European regulation even prior to 1995.

In contrast to indirect taxes such as Value Added Taxes, the European harmonization of (direct) income taxes has shown little progress. The exception to this development—the Parent-Subsidiary Directive[2]—is solely relevant for the taxation of dividends to corporate shareholders. Yet, European Court of Justice decisions and intensified tax competition across member states due to European integration efforts constitute potential drivers of an implicit harmonization process (Maier and Schanz, 2016).

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[1] We analyze the tax systems of all EU member states in the 1990s except for Luxembourg. We excluded Luxembourg, as it is a typical holding location for financial firms that are not in the scope of the analysis. We include the tax systems of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, and the United Kingdom.
[2] Council Directive 90/435/EEC of 23 July 1990 on the common system of taxation applicable in the case of parent companies and subsidiaries of different member states. The Parent-Subsidiary Directive prevents multiple taxation of dividends with corporate taxes by stipulating a tax exemption or a corporate tax credit for dividends paid to a corporation in a EU member state that holds more than 10 % of a European dividend-paying corporation. Each member state had to implement the directive into national tax law by 1 January 2005.

Although common EU regulation often aims at the non-discrimination of cross-border EU shareholders, the subsequent tax system reforms[3] also have changed the taxation for the domestic individual and corporate shareholders. Beginning with the Avoir Fiscal case (1986), the European Court of Justice pointed out several violations of European law in the member states' tax treatment of cross-border dividends (Graetz and Warren, 2007). The European Court of Justice mainly criticized imputation systems, because some member states restricted the inbuilt tax credits for corporate tax only to resident shareholders. Under the pressure from these court decisions, not only the directly affected member states had to revise their tax systems, but also member states with similar tax law. In response, the concerned member states questioned the imputation system and introduced classical systems. While imputation systems were predominant in 1990, all member states in this analysis, except for the United Kingdom, apply a classical system in 2012. These reforms show us how the European Court of Justice decisions triggered tax reforms that made the European corporate tax systems considerably more homogeneous.

Two major corporate tax system reforms in Germany exemplarily emphasize the influence of EU regulation and peer group pressure. In the light of the European Court of Justice decisions, the European Commission assessed the German imputation system to be non-EU-compatible. In response, Germany initiated the corporate tax reform 2001 with the aim to design a new, EU-compatible tax system. The German parliament stated that the new tax system requires being EU-compatible and must allow an increased harmonization of EU corporate tax systems in the medium-term in order to avoid distortions of competition.[4] With the corporate tax reform 2008, again, the German legislator explicitly pursued the aim of EU-

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[3] We ignore announcement effects of these tax reforms because no consistent data is available for our sample.

[4] Deutscher Bundestag, Drucksache 14/2683, 15 February 2000, p. 93ff. „Das gewählte Besteuerungssystem muss gleichzeitig so gewählt sein, dass es europatauglich ist und dadurch mittelfristig die Aussicht auf eine stärkere Angleichung der Systeme in der Europäischen Union besteht, um systembedingte Wettbewerbsverzerrungen zukünftig zu vermeiden" (p.93).

compatibility and competitiveness (Deutscher Bundestag, Drucksache 16/4841, 27 March 2007, p. 29).

Measurement

Based on Maier and Schanz (2016), we calculate the shareholders' tax burdens for dividends (t_{div}) and capital gains (t_{cg}) for single-tier distributions in each sample country from 1990 to 2012. This approach assumes a corporation earning a standardized profit of *one* and distributing the after-tax profit in the form of dividends or capital gains[5] to direct shareholders.[6] We differentiate this shareholder to be either an individual or a corporation, since these shareholder groups are subject to different tax regimes.[7] We consider both federal and representative local income taxes, as well as surtaxes. For individual shareholders, we assume the top income tax rate of high-net-worth individuals.[8]

We apply the measure of King (1974) for the relative taxation of dividends and capital gains (country, shareholder, and year subscripts are suppressed.):

$$\theta = \frac{1 - t_{div}}{1 - t_{cg}} \quad . \tag{1}$$

The tax variable θ relates the after-tax value of a dividend $(1 - t_{div})$ to the after-tax value of a capital gain $(1 - t_{cg})$. Values of θ larger (smaller) than 1 represent a tax advantage in favor of dividends (capital gains). We model the yearly tax variable for each of the 14 countries and the two different shareholder groups.

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[5] The taxation of capital gains can depend on the holding period. As, however, only long-term invested shareholders rather have preferences for dividends instead of capital gains, we focus on this group and leave out short-term traders, who are interested in capital gains *per se*. Moreover, we neglect share repurchases as distribution form, because they have been prohibited in many European countries during a major part of our sample period.

[6] The calculated tax burdens in year t are the sum of the taxes on the level of the distributing corporation in year $t - 1$ and the taxes on the level of the shareholder in year t.

[7] Due to limited shareholder data availability for the observation period our empirical analysis concentrates on these two most important shareholder groups—individual and corporate shareholders—neglecting other shareholder groups, such as the government, investment funds, or foreign shareholders.

[8] Figures taken from the study 'Aktionärszahlen des Deutschen Aktieninstituts 2013' (Shareholder figures of the German Shares Institute 2013) show a strong dependence of shareholdings in Germany from income of the individuals.

2.2. Evolution

The taxation of dividends and capital gains converges, on average, for both corporate and individual shareholders in the EU (Maier and Schanz, 2016). Figure 1 compares the distributions of the tax variables for dividends or capital gains of individual and corporate shareholders in 1990 and 2012. Corporate shareholders in 1990 have faced a 'capital gains tax penalty', represented by values of θ considerably higher than 1, due to a higher a tax burden on capital gains compared to dividends. Consequently, the widely-studied 'dividend tax penalty' fails to hold for EU corporate shareholders. In contrast, the 'dividend tax penalty' applies to EU individual shareholders only. In 1990, tax variables range from the minimum value of 0.4 for individual shareholders in the Netherlands to the maximum value of approximately 2.3 for corporate shareholders in Germany. Equal tax treatment of dividends and capital gains, represented by a value of 1, was rare in 1990. Only Denmark and the Netherlands applied equal tax treatment for corporate shareholders, while no country taxed dividends and capital gains equally for individual shareholders in 1990.

INSERT FIGURE 1 ABOUT HERE

After substantial tax reforms, 10 of the 14 countries in the sample tax dividends and capital gains for corporate shareholders equally in 2012 (θ=1). Only corporate shareholders in Austria, Greece, Portugal, and the United Kingdom (UK) still face a favorable tax treatment of dividends. For individual shareholders, the distribution of the tax variable in 2012 ranges from a minimum value of approximately 0.7 (Belgium) to a maximum value of 1.0. 1 represents the modus of the histogram, and is reached by seven countries. Only the tax systems in Belgium, Greece, and the Netherlands continue to provide a tax-exemption for capital gains of individual shareholders. Germany (in 2009) and Portugal (in 2012), expanded existing dividend tax treatment to capital gains. To summarize, equal tax treatment of dividends and capital gains is the standard across the analyzed EU member states by 2012.

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3. Literature and Hypotheses

Corporations have to take into account their shareholders' preferred profit distribution. They can either pay out dividends or retain cash, which then offers shareholders the opportunity of realizing the earned cash in the form of capital gains[9] by selling shares. Tax research concentrates on the aspect of how taxes on dividends and capital gains influence distribution decisions (König, 1990; Allen and Michaely, 2003; DeAngelo et al., 2008). Theoretical studies in this field reach ambiguous conclusions when addressing the question of whether or not taxes generally have an influence on distributions. According to the 'old view' or 'traditional view', different tax treatments of dividends and capital gains distorts the distribution decisions in the direction of the tax-favored alternative (Harberger, 1962; Shoven, 1976). In order to increase shareholder value, corporations consider the tax preferences of their shareholders in distribution decisions. Brennan (1970) concludes that dividend payments cannot be optimal in equilibrium if investors face a dividend tax penalty. In contrast, the 'new view' predicts that changing the distribution taxes has no impact on the distribution decisions of corporations. Auerbach (1979) and Bradford (1981) show that in equilibrium, taxes on future dividends are perfectly capitalized in the share price, so that investors are indifferent between the immediate dividend payment and the realization of a capital gain.[10] Furthermore, tax clientele theory predicts the irrelevance of taxes for corporate distribution decisions, since specific investor clienteles perfectly adapt to the distribution policies of different firms according to their tax preferences (Black and Scholes, 1974).

Tax reforms as 'natural' experiments provide valuable settings to empirically test these contrary predictions from theoretical literature. Researchers extensively analyze the 'Jobs and Growth Tax Relief Reconciliation Act' of 2003 in the United States (U.S.) that radically lowered the tax rates on dividends in order to align the taxation of dividends and capital gains.

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[9] Capital gains taxation might cause paradoxal investment effects (Niemann and Sureth, 2013).
[10] While 'old view' models assume financing of investments by newly issued shares, the 'new view' models are based on the assumption of financing with retained earnings (Sinn, 1991; Sørensen, 1995).

Most of these studies find evidence for substantially higher dividends in response to this reform (e.g. Auerbach and Hassett, 2006; Blouin et al., 2011; Brown et al., 2007; Chetty and Saez, 2005).[11] As radical tax reforms are rare and changes in tax systems (and even changes in tax rates) are typically moderate, long observation periods can increase heterogeneity in the tax measure for more meaningful empirical tests. For example, Poterba (2004) finds evidence in U.S. data from 1935 to 2002 that the decision to distribute or to retain earnings depends on the relative taxation of these two alternatives.

As taxpayers have to comply with the same tax law within one country, recent publications use multi-country settings with cross-sectional heterogeneity to single out the tax effects. Von Eije and Megginson (2008) report that the probability of paying dividends increases with favorable dividend taxation for a sample of 15 European countries. Focusing preliminarily on individual shareholders, Jacob and Jacob (2013) present sophisticated strategies of separating tax effects from other determinants of distribution policies in their extensive worldwide panel of corporations from 25 different countries. They find evidence for tax effects according to the 'traditional view'. As individual investors traditionally faced a higher tax burden on dividends than on capital gains, the focus of the study lies on identifying significant effects of the 'dividend tax penalty'.[12] However, they also present convincing robustness checks to control for the influence of a possibly different tax status of corporate shareholders. Lie and Lie (1999) and Moser (2007) find evidence for U.S. settings that managers consider the tax status of different shareholders when choosing the channel of corporate distributions—dividends or share repurchases.

The empirical literature suggests that taxes are a significant factor in corporate distribution decisions. In line with the 'traditional view' (and opposed to the tax irrelevance prediction of

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[11] Julio and Ikenberry (2004) are concerned about the causality of this tax reform, since they find rising dividends before the announcement of the reform.

[12] La Porta et al. (2000), for instance, find 'dividend tax penalties' in most of the 33 analyzed countries in their international sample from 1994.

the 'new view' or of the tax clientele theory), corporate distributions should reflect the shareholders' firm-specific tax preferences. Hence, corporations consider the tax status of their shareholders in their distribution decisions in order to increase shareholder value. In an empirical study, we should thus observe:

> H1: The distribution policies of European corporations depend on the tax preferences of their specific shareholders.

According to the derived convergence trend of tax advantages for dividends or capital gains induced by tax reforms within member states of the EU during the observation period (1990-2012) we expect:

> H2: The influence of the firm-specific tax preferences on corporate distributions diminishes over time due to tax reforms in EU member states.

For testing these hypotheses, we build on the study of Jacob and Jacob (2013) and extend their research approach by explicitly considering the different tax treatment of individual and corporate shareholders. Schanz and Theßeling (2012) apply an approach accounting for the tax status of corporate and individual shareholders in the course of German tax reforms. Methodologically, we follow this approach in its basic steps and extend it to firms from 14 EU member states.[13] Maier and Schanz (2016) provide detailed information on the calculation of the tax burdens on dividends and capital gains for both shareholder groups in the 14 countries. We extend the literature by the detailed consideration of firm-specific tax preferences in large scale empirical analyses.

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[13] Kaserer et al. (2013) also consider several shareholder groups in a European setting. However, they have a different scope than this paper by delineating and focusing on the conflict between shareholders. They present a promising approach of integrating taxes in the literature stream of conflicts between blockholders and minority shareholders.

4. Empirical Analyses

4.1. Sample and Data

Our sample comprises basically all listed firms of the 14 EU member states that are available in the Thomson Reuters® Worldscope database and provide the corresponding accounting and capital market data from 1990 to 2012. We initially start with 256,036 firm-year observations and use strategies for data adjustments similar to Jacob and Jacob (2013).

In accordance with prior research, we restrict our analysis to non-financial and non-utility firms using the Standard Industrial Classification (SIC) codes, since financial and utility firms have different motives and regulatory requirements for distribution decisions (e.g. Blouin et al., 2011; Chetty and Saez, 2005). We lose 81,558 observations.

By restricting our sample to firm observations that have total assets of more than EUR 10 million, we eliminate micro listings (Baker et al., 2003) with 13,698 firm-year observations. In order to control for potential data errors, we drop 3,932 firm-year observations if dividends exceed the market capitalization, or if they are negative. We also exclude 4,894 firm-year observations with a return on total assets (pretax income / total assets) or a Tobin's q (market capitalization / common equity) or a share price development exceeding the values + / - 50. 18,015 observations with a percentage of closely held shares or a cash rate (cash / total assets) greater than 100 % or retained profits that contribute to more than 100 % of the equity, as well as negative contributions, are also dropped. We complement our firm-specific data with macroeconomic country-specific data. The gross domestic product (GDP) data, institutional ownership data, and data about seniors in the population come from the OECD-iLibrary of the Organisation for Economic Co-operation and Development (OECD). World Bank data about the education level in a country complete our macroeconomic variables.

We winsorize our variables at the 1st and 99th percentile of the observations. Furthermore, we restrict the analysis to firm-year observations with non-missing values for the specified variables in our panel regression analyses. However, we do not require complete data for the firm over the whole observation period, to avoid a potential survivorship bias. Due to missing data for 105,161 firm-year observations, the final sample comprises 28,788 firm-year observations and 3,991 firms (see Table 1). The UK has the biggest share of corporations and observations in the sample. This economy has a long tradition of equity markets financing compared to, for instance, Germany that traditionally relies on financing via banks. Approximately half of the firms in the sample are manufacturers; service firms and trade firms are further important industries.

4.2. Methodology

We employ ordinary least squares (OLS) with firm fixed effects on our panel data in order to determine the influence of tax preferences on corporate distributions across the 14 EU member states. We estimate our panel regressions with heteroscedasticity-robust standard errors that are clustered on the firm level (Petersen, 2009). Our specification of the empirical model closely follows Jacob and Jacob (2013) choosing firm-specific and country-specific control variables. However, we apply our firm-specific tax variable that accounts for the single firm's shareholder structure. Accordingly, we estimate the model in equation (2):

$$
\begin{aligned}
Divyield_{i,j,t+1} = {} & \alpha_0 + \alpha_i + \alpha_{it} + \beta\theta_{i,j,t+1} + \gamma_1 Leverage_{i,j,t} + \gamma_2 Closely_{i,j,t} + \gamma_3 Income_{i,j,t} \\
& + \gamma_4 CapExp_{i,j,t} + \gamma_5 Cash_{i,j,t} + \gamma_6 RetainedEquity_{i,j,t} + \gamma_7 TobQ_{i,j,t} \\
& + \gamma_8 SalesTrend_{i,j,t} + \gamma_9 StockTrend_{i,j,t} + \gamma_{10} ReportFrequ_{i,j,t} + \delta_1 lnGDP_{j,t} \\
& + \delta_2 Education_{j,t} + \delta_3 Institutional_{j,t} + \delta_4 ADRI_{j,t} + \delta_5 Seniors_{j,t} \\
& + \varepsilon_{i,j,t} \, .
\end{aligned}
\tag{2}
$$

The dependent variable is the distribution measure of firm i in country j and in year $t + 1$. Distributions are measured as dividend payments scaled by market capitalization ($Divyield$).

The parameter of interest is β, which indicates the effect of the firm-specific tax variable on dividend payments. We expect this coefficient to be positive, since higher values of the tax variable θ stand for better tax treatment of dividends compared to capital gains. The timing of the tax variable in $t + 1$ corresponds to the timing of the distribution measure, since the tax treatment of this period is relevant for shareholders.[14] Two firm-specific tax variables are employed in the analysis using the $Closely$ variable from Thomson Reuters Worldscope® (ID: 08021) as a proxy for the fraction of corporate shareholders in a corporation. This variable provides the percentage of closely held shares of a firm. It includes shares held by any other corporation (except shares held in a fiduciary capacity by banks or other financial institutions), shares held by corporate insiders, and shares held by substantially invested individuals (more than 5%). To our knowledge, this variable is the best available proxy for corporate shareholders in large scale analyses. Hence, more detailed shareholder data only cover recent observation periods in which the differences in the tax burdens on dividends and capital gains are small in Europe. Accordingly, we weight the tax advantages of corporate shareholders $\theta_{j,t}^{corporate}$ and individual shareholders $\theta_{j,t}^{individual}$ with their respective fraction, $Closely_{i,j,t}$ and $(1 - Closely_{i,j,t})$, for the shareholders of each corporation i in equation (3) for generating the firm-specific tax variable, θ^{firm}, (Schanz and Theßeling, 2012):

$$\theta_{i,j,t}^{firm} = \theta_{j,t}^{corporate} \times Closely_{i,j,t} + \theta_{j,t}^{individual} \times \left(1 - Closely_{i,j,t}\right). \qquad (3)$$

The remaining independent variables are firm-specific and country-specific control variables for mostly non-tax related effects on distribution decisions. The typical separation of ownership and control in (large) corporations bears the risk that managers could abuse the free cash flows for unfavorable investments in their own interest. Distributing free cash flows

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[14] Note that the modeling of the tax preferences also considers that the profit of the corporation is taxed in year t.

to shareholders reduces these agency costs (Jensen, 1986). However, the agency conflict is mitigated in firms with strong shareholders and creditors. We include the variable $Leverage$ (total debt / total assets) and $Closely$ (the percentage of substantially held shares) to control for these agency effects on distributions. The availability of internal resources could drive dividend payments (Moser, 2007; Skinner, 2008). We therefore include the variables $Income$[15], the pre-tax income divided by total assets, and $CapExp$, capital expenditures divided by total assets. High cash resources ($Cash$), as proxied by the percentage of cash to total assets and a high degree of equity that consists of retained earnings ($RetainedEquity$) might foster dividend distributions. Pecking order and lifecycle theories suggest that high-growth firms with profitable investment opportunities retain earnings instead of making distributions to shareholders (Grullon et al., 2002; Myers, 1984). To control for growth opportunities, we use Tobin's q ($TobQ$), here defined as the market capitalization divided by common equity, and $SalesTrend$, which measures the development of sales compared to the prior year. In the course of a positive stock price development ($StockTrend$)[16], shareholders prefer dividends due to a high potential capital gains tax burden (Lie and Lie, 1999; Moser, 2007). We include the earnings reporting frequency per year ($ReportFrequ$) in order to control for high disclosure standards that might reduce the need for dividend distributions (von Eije and Megginson, 2008). We lag all these firm-specific control variables by one year in order to address endogeneity concerns. Accordingly, the regression analyses start in 1991.

To control for stock market development effects on distributions, we include the country-specific natural logarithm of GDP per capita ($lnGDP$) and the gross percentage of the population with tertiary education ($Education$) (Jacob and Jacob, 2013). Hence, more developed economies should also have more developed stock markets, and a highly educated

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[15] The variable *Income* as a proxy for good quality firms also controls for signaling effects. Hence, according to the signaling literature (Hakansson, 1982), firms signal their quality by making distributions which are too costly for bad quality firms.
[16] $StockTrend$ is measured by the development of the stock price to the prior year.

population should have more financial knowledge. This knowledge could foster the degree of stock market participation (Grinblatt et al., 2011; van Rooij et al., 2011). The degree of institutional ownership, measured as the value of stocks held by institutional investors relative to market capitalization of listed stocks in a country (*Institutional*), could influence dividend payments (Grinstein and Michaely, 2005). We use the corrected anti-director rights index (*ADRI*) of Spamann (2010) to control for the quality of institutions that ensure investors' rights. The study of Graham and Kumar (2006) indicates that older investors prefer dividend-paying stocks. Accordingly, we include the variable *Seniors*, which measures the percentage of people over the age of 65 in a country.

By employing fixed effects at the firm level (α_i), we control for sticky distribution strategies within a firm and for any time-invariant characteristics, such as the legal traditions in the countries. Industry-year fixed effects (α_{it}) allow to control for correlation of dividend payout strategies within an industry over time.

4.3. Summary Statistics

The descriptive analysis (see Table 2) shows that the mean dividend yield (*Divyield*) of a firm in our European sample is 2.99 %. The majority (85.97 %) of the firms pay dividends. Most of the firms in the sample are profitable. As expected, there is a high variation in the variables that are involved with the valuation of capital markets (*TobQ* and *StockTrend*).

Multicollinearity across the independent variables seems to be of minor importance in this sample, since the independent variables do not suffer from high correlations between each other (see Appendix 1 for the correlation matrix).

INSERT TABLE 2 ABOUT HERE

Our firm-specific tax variable θ^{firm} reveals cross-sectional heterogeneity in the tax preferences across firms. In contrast, simplified country-specific tax variable $\theta^{country}$ that

attributes the tax preferences of individual shareholders to all firms of a country (see Figure 2) shows much lower heterogeneity. In the panel regressions, we are able to exploit the high cross-sectional heterogeneity of θ^{firm}.

4.4. Results

We find highly significant statistical evidence (at the 1 % significance level) for the influence of tax preferences on the dividend yield, as predicted by hypothesis 1, applying the weighted firm-specific tax variable θ^{firm} over the entire observation period (see model specification (1) in Table 3). If dividends are taxed more favorably than capital gains for the firm's shareholders, corporations make higher dividend payments. The economic interpretation of the effect is: a change in this tax variable by one standard deviation (by 22.66 percentage points) increases the dividend yield by 4.37 % of the sample average in the following year.

Our firm-specific tax variables cover both tax reforms and changes in the shareholder structure. A possible self-selection process of shareholders in firms with the preferred distribution policies lowers the incentives for firms to adapt their distribution policies. However, our analysis still shows that firms adapt their distributions to the tax policy. Thus, these firms' responses support the traditional view that corporations take their shareholders' tax preferences into account and adjust their distributions to a certain extent.

Most of the control variables have the expected signs and are statistically significant. Profitable firms pay more dividends, while firms with a high percentage of substantially held shares pay fewer dividends. Growth opportunities measured by Tobin's q and a positive sales trend have a negative effect on dividend payments. Surprisingly, the percentage of seniors in a country has a very strong negative impact on dividend payments. We assume that this

variable controls for further important macroeconomic effects than originally intended. A higher percentage of seniors might be an indicator for how developed a country is. In these countries, capital markets could also be more developed and efficient, which decreases the need to payout dividends in order to protect claims.

Our prior analysis of the EU member states' tax systems suggests convergence of the taxation of dividends and capital gains for individual and corporate shareholders in the recent years of the observation period. This trend should be reflected in the firm-specific tax preferences and the distributions in our sample. We are able to provide descriptive statistics supporting the hypothesis 2 of diminished influence of taxation on firm-specific distribution decisions. Accordingly, the median firm-specific tax variable θ^{firm} (see the development of the box plots over time in

Figure 3) converges to 1, which represents no preference for either dividends or capital gains. From a tax perspective, European firms are, on average, indifferent in distribution decisions in the last years of the observation period. The variation of the firm-specific tax variable θ^{firm} decreases dramatically, and the vast majority of firms accumulate around the value of 1.[17]

INSERT FIGURE 3 ABOUT HERE

For analyzing the diminished influence of taxation in our panel regression, we present a sample split, which is in line with, and not opposed to, hypothesis 2: if the sample is restricted to only the last six years of the observation period (2007-2012), the significance of the tax effects on dividends disappears for both tax variables (see model specifications (3) in Table 3). We choose this period because of two reasons: First, between 2006 and 2007 was the last tax reform switch in the sample—Spain switched to the classical system. Second, the median of the firm-specific tax variable θ^{firm} dropped from higher values to a stable value around 1.0—which represent equal taxation of both distribution forms—after 2006.

Furthermore, we include the interaction term $Post2006x\theta^{firm}$ in the basic panel regression (see model specification (2) in Table 3) of the firm-specific tax variable θ^{firm} with a dummy variable that takes values of 1, if the observation is after 2006, and 0 otherwise. The interaction term shows that the influence of taxes diminishes in recent years of the observation period. In line with this result, we are not able to reject the null hypothesis of the F-Test (p-value: 0.8680) that the sum of the firm-specific tax variable θ^{firm} and the interaction term $Post2006x\theta^{firm}$ is zero. The effects compensate and we fail to identify a tax influence on profit distributions in the post-2006 period.

In summary, taxation has become a less important factor in the distribution decisions of European corporations.

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[17] As Figure 3 reveals, the convergence process seems not to be continuous. Instead, there is a quite constant high-tax penalty period at the beginning, and a quite constant low-tax penalty period at the end. Therefore, we do not use a time trend variable, but rather a sample split for analyzing the convergence effect.

4.5. Robustness Checks and Limitations

We test whether alternative simplified specifications, which only account for country-specific tax preferences of individual shareholders, are sufficient for providing equivalent basic results for tax effects on distributions in Europe. As individual and corporate shareholders have (temporarily) opposing tax preferences for dividends and capital gains in the EU, restricting the analysis to the tax status of individual shareholders as a simplification could distort the identification of tax effects on distributions. Nevertheless, our empirical analysis suggests similar basic results between the firm-specific tax variable θ^{firm} (0.5760***) and the simplified modeling of the tax preferences with the country-specific tax variable $\theta^{country}$ (1.1619***) in the observation period from 1991 to 2012. Both tax variables indicate a highly significant influence of taxation on the distribution policy of corporations. However, simplified modeling overestimates the tax effects on distribution policy by far. For the simplified specification, one standard deviation of the country-specific tax variable $\theta^{country}$ increases the dividend yield by 7.75% of the sample average in the following year. This effect exceeds the effect (4.37%) that is measured with the firm-specific variable θ^{firm} by 77%. Compared to the tax effects (more than 10%) documented by Jacob and Jacob (2013) for their worldwide sample with a comparable simplified approach, we find smaller effects for our European sample.

INSERT TABLE 4 ABOUT HERE

In Table 4, we also split the baseline regression model in the period 1991-2006 and 2007-2012 in order to reveal differences between the firm-specific and the simplified country-specific approach. While the detailed approach (specification (1a) and (2a)) provides consistent results, the simplified approach (in specification (2b)) reports highly significant tax effects in the period 2007-2012, although the differences in taxation have diminished over time. Again, the simplified approach seems to overestimate tax effects.

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We test our empirical model with an alternative dependent variable. Regressing on a dummy variable that indicates whether the firm is a dividend payer with a logit model for panel data, we still derive consistent results.[18]

As an alternative measure for the weighted firm-specific tax preferences, we use the tax variable $\theta_{i,j,t}^{major}$. If $Closely$ takes values equal or higher than 0.5 (majority), the tax preferences of corporate shareholders as the dominant group represent the tax preferences of this firm. For values of $Closely$ below 0.5, $\theta_{i,j,t}^{major}$ takes the tax preferences of individual shareholders. The underlying idea is that corporations only consider the tax preferences of the dominant shareholder group in their distribution decisions. With this alternative tax variable, we find smaller statistical significant tax effects at the 10% significance level (0.1728*) in the observation period from 1991 to 2012.

Our results are also robust with regard to the inclusion of different macroeconomic variables. Directly measuring stock market development using the values of the MSCI country indices[19] (e.g., MSCI Finland for the Finish stock market development) instead of $Education$ or $lnGDP$ does not fundamentally alter the results. The baseline results even hold under the exclusion of all macroeconomic variables.[20]

Moreover, we estimate our basic panel regression with heteroscedasticity-robust standard errors that are clustered at the country-industry level or two-way clustering at the firm and the country-industry level, instead of clustering at the firm level. Both estimations still support H1 at the 5% significance level.

We address concerns about neglecting the tax preferences of foreign shareholders in our tax variable. Therefore, we exclude all firms with substantial foreign shareholdings, i.e., if the

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[18] See a comparison of the baseline model (specification (1); also presented in Table 3) and the logit model (specification (2)) in Appendix 2. Note that the integration of industry-year effects in the logit model decreases the number of observations. However, we still find a significant influence of taxation on distributions in the period 1991-1996.

[19] Data come from Thomson Reuters Datastream®. Tests are not presented in the paper.

[20] See specification (2) without country-specific macroeconomic control variables in Appendix 3.

percentage of foreign shareholders of one observation is higher than 10 % (with ThomsonFinancial® data that start in 2002).[21] Our baseline results do not change, which indicates that the results are not driven by the tax preferences of foreign shareholders.[22]

Regarding our split samples (1991-2006; 2007-2012), we had chosen the cut-off year to be 2006, because this was the last year where Spain applied the imputation system. Afterwards, there were no further tax system reforms in our sample; the United Kingdom remains as only country with a (still applied) imputation system. Moreover, this was the year in which the median firm-specific variable θ^{firm} dropped to a value around 1.0. Nevertheless, one could argue in favor of other cut-off years. For example,

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[21] ThomsonFinancial® only provides foreign shareholder data from 2002 onwards. Hence, we implicitly assume for this test that firms are also under significant influence of foreign shareholders before 2002.
[22] See specification (3), in which firms with substantial foreign ownership (> 10 %) are excluded from the sample in Appendix 3.

Figure 3 could also suggest a sample split after 2007. This split leads to the same basic results like the presented split after 2006 (results not reported). However, our goal is to reveal a general development and it is not to identify a perfect cut-off, since we lack a clear cut event. In our split sample analysis, the reason for the disappearance of the tax effects is not the reduced number of observations in the sample restricted to 2007-2012: We find highly significant tax effects (coefficient θ^{firm}: 1.1402***) if we run the regression in the first six years of the observation period from 1991-1996 with only 6,487 observations.

Data availability remains a limiting factor for this analysis. As one example, we have to ignore possible announcement effects of these tax reforms due a lack of data. Moreover, our results do not necessarily apply to firms that are not traded in capital markets, since we are not able to run empirical tests for non-listed firms. Nevertheless, we do not expect that tax preferences depend on the listing in capital markets. Although our modeling of the tax law is more detailed than prior approaches, individual features of every single shareholder, such as loss carry-forwards for capital gains or the specific holding period of the stock, could influence the tax preferences of this shareholder. However, it is questionable whether corporations are aware of—or react to—this information when making the distribution decision.

5. Conclusions

Despite the lack of a harmonized European Union income tax law, we observe that the corporate tax systems of EU member states underlie an alignment trend. Court of Justice decisions have driven EU member states to adopt more similar corporate tax systems, and thus, to align the tax treatment of corporate profit distributions—dividends and capital gains.

The analysis of the tax systems of the 14 European countries shows that individual and corporate shareholders have had, on average, opposing tax advantages for dividends and capital gains in the 1990s. However, tax reforms in Europe, which are under the influence of

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the European Court of Justice, the EU-Parent-Subsidiary Directive and peer group pressure, have then reduced these differences—and the taxation of distributions has converged. Imputation systems tend to disappear, and classical systems with reduced rates on the shareholder level have replaced the former tax systems. Based on our empirical analysis, we find a significant influence of the tax preferences of both individual and corporate shareholders on dividend payments at the beginning of the observation period. Following the convergence trend in the taxation of distributions, we do not find empirical evidence for tax effects on distribution policies in the recent years of the observation period. Thus, our analysis reveals that a common regulatory European Union framework, even in the absence of explicit common European Union income tax law, can affect corporate distribution decisions and foster neutral taxation across EU member states.

Appendix 1. Correlation Matrix

Variable	Divyield	l.Leverage	l.Closely	l.Income	l.CapExp	l.Cash	l.Retained Equity	l.TobQ	l.Sales Trend	l.Stock Trend	l.Report Frequ	l.lnGDP	l.Education	l.Institutional	l.ADRI	l.Seniors
Divyield	1.0000															
l.Leverage	-0.0583 (0.0000)	1.0000														
l.Closely	-0.0857 (0.0000)	-0.0137 (0.0202)	1.0000													
l.Income	0.1300 (0.0000)	-0.3220 (0.0000)	-0.0410 (0.0000)	1.0000												
l.CapExp	-0.0153 (0.0096)	0.1097 (0.0000)	0.0122 (0.0383)	0.1082 (0.0000)	1.0000											
l.Cash	-0.0302 (0.0000)	-0.2233 (0.0000)	0.0279 (0.0000)	0.1961 (0.0000)	-0.1146 (0.0000)	1.0000										
l.Retained Equity	0.1342 (0.0000)	-0.1480 (0.0000)	-0.2027 (0.0000)	0.2315 (0.0000)	0.0282 (0.0000)	0.0166 (0.0048)	1.0000									
l.TobQ	-0.1230 (0.0000)	-0.0948 (0.0000)	-0.0607 (0.0000)	0.4622 (0.0000)	0.1061 (0.0000)	0.1322 (0.0000)	0.1117 (0.0000)	1.0000								
l.SalesTrend	-0.0796 (0.0000)	0.0285 (0.0000)	-0.0157 (0.0078)	0.1086 (0.0000)	0.0643 (0.0000)	-0.0067 (0.2568)	-0.0576 (0.0000)	0.1382 (0.0000)	1.0000							
l.StockTrend	-0.0916 (0.0000)	-0.0280 (0.0000)	0.0016 (0.7877)	0.1394 (0.0000)	0.0401 (0.0000)	0.0523 (0.0000)	0.0025 (0.6761)	0.2484 (0.0000)	0.1394 (0.0000)	1.0000						
l.ReportFrequ	-0.0053 (0.3724)	-0.0689 (0.0000)	0.1550 (0.0000)	-0.0271 (0.0000)	0.0845 (0.0000)	-0.1218 (0.0000)	-0.0952 (0.0000)	-0.0351 (0.0000)	0.0209 (0.0004)	0.0075 (0.2005)	1.0000					
l.lnGDP	-0.0294 (0.0000)	0.0344 (0.0000)	-0.0212 (0.0003)	-0.0219 (0.0002)	-0.1574 (0.0000)	0.1032 (0.0000)	0.1518 (0.0000)	-0.0024 (0.6796)	-0.0065 (0.2725)	-0.0524 (0.0000)	-0.3857 (0.0000)	1.0000				
l.Education	0.0372 (0.0000)	0.1088 (0.0000)	-0.0715 (0.0000)	-0.0066 (0.2626)	-0.0962 (0.0000)	0.0959 (0.0000)	0.1137 (0.0000)	0.0128 (0.0300)	-0.0161 (0.0064)	-0.0330 (0.0000)	-0.4132 (0.0000)	0.6063 (0.0000)	1.0000			
l.Institutional	0.1164 (0.0000)	-0.1224 (0.0000)	-0.4040 (0.0000)	0.0859 (0.0000)	-0.0097 (0.1005)	-0.0719 (0.0000)	0.3287 (0.0000)	0.0754 (0.0000)	0.0309 (0.0000)	-0.0237 (0.0001)	-0.0428 (0.0000)	0.1359 (0.0000)	0.0740 (0.0000)	1.0000		
l.ADRI	-0.0547 (0.0000)	-0.0527 (0.0000)	-0.0094 (0.1122)	-0.0009 (0.8809)	-0.0772 (0.0000)	-0.0439 (0.0000)	-0.0668 (0.0000)	0.0158 (0.0075)	0.0161 (0.0063)	-0.0085 (0.1500)	-0.0266 (0.0000)	0.2110 (0.0000)	0.1108 (0.0000)	0.0250 (0.0000)	1.0000	
l.Seniors	-0.0148 (0.0121)	0.0283 (0.0000)	0.1272 (0.0000)	-0.0149 (0.0114)	-0.0971 (0.0000)	0.1108 (0.0000)	-0.0215 (0.0003)	-0.0316 (0.0000)	-0.0448 (0.0000)	-0.0343 (0.0000)	-0.3607 (0.0000)	0.3768 (0.0000)	0.1827 (0.0000)	-0.1968 (0.0000)	-0.1730 (0.0000)	1.0000

Note: p-values are presented in parentheses. The prefix l1 indicates that the variable is lagged by one year.

Appendix 2. Panel Regression Analysis with Alternative Dependent Variable

Variables	Baseline Model			Logit Model		
	(1a)	(1b)	(1c)	(2a)	(2b)	(2c)
	1991-2012	1991-1996	2007-2012	1991-2012	1991-1996	2007-2012
	Divyield	*Divyield*	*Divyield*	*Divdummy*	*Divdummy*	*Divdummy*
θ^{firm}	0.5760***	1.1402***	-0.0931	0.8430***	2.2457*	0.4773
	(0.1569)	(0.2609)	(0.5325)	(0.2531)	(1.2758)	(1.0587)
l1.Leverage	0.0092	-1.1087**	-1.3600**	-2.1950***	-7.0811***	-4.3180***
	(0.2795)	(0.5343)	(0.6231)	(0.3818)	(2.1196)	(0.9804)
l1.Closely	0.4157***	-0.4695*	-0.5158*	-1.3031***	-1.9567	-0.9949**
	(0.1389)	(0.2793)	(0.2764)	(0.2196)	(1.2615)	(0.4733)
l1.Income	6.0405***	4.6065***	9.3414***	14.5352***	30.1721***	11.7646***
	(0.4119)	(0.8656)	(0.7819)	(0.6669)	(4.1449)	(1.3387)
l1.CapExp	0.2422	0.4595	2.3000**	4.7696***	10.5630***	2.3558
	(0.4650)	(0.7613)	(1.1602)	(0.9074)	(3.3368)	(1.9488)
l1.Cash	0.1211	0.0067	0.5386	0.9411**	3.3617	2.0365**
	(0.2565)	(0.4733)	(0.5483)	(0.4153)	(2.3378)	(0.9353)
l1.RetainedEquity	0.8355***	1.0023***	2.1575***	1.8417***	0.7138	2.9289***
	(0.1341)	(0.2563)	(0.3469)	(0.2137)	(0.9453)	(0.5554)
l1.TobQ	0.2672***	-0.0929**	-0.1239***	-0.0369	0.1113	0.0741
	(0.0158)	(0.0393)	(0.0393)	(0.0319)	(0.2537)	(0.0906)
l1.SalesTrend	0.1325***	0.0707	0.0251	0.0194	0.3522	0.1404
	(0.0483)	(0.0603)	(0.1467)	(0.0909)	(0.3058)	(0.1979)
l1.StockTrend	0.0967***	-0.0984***	-0.1406***	0.0253	-0.0256	0.2586***
	(0.0136)	(0.0223)	(0.0375)	(0.0346)	(0.1188)	(0.0955)
l1.ReportFrequ	0.0344	0.0808**	-0.1623*	-0.0763	0.1055	-0.3480**
	(0.0249)	(0.0341)	(0.0942)	(0.0466)	(0.1697)	(0.1459)
l1.lnGDP	-0.0434	0.3756	4.3778***	0.1232	13.0634	2.4862
	(0.5461)	(2.1883)	(1.2240)	(0.9005)	(10.1954)	(2.0933)
l1.Education	1.3521**	-2.3796	-0.8954	0.6735	4.2065	2.4846
	(0.5715)	(2.5179)	(1.2069)	(0.8893)	(10.7816)	(1.9058)
l1.Institutional	0.4130**	-0.4712	-0.6116*	0.3807	3.7533	0.4951
	(0.1831)	(0.5730)	(0.3399)	(0.2832)	(4.4291)	(0.5591)
l1.ADRI	0.0075	0.0000	(0.0000)	-0.2411	-	-
	(0.1062)	(0.0000)	0.0000	(0.1754)	-	-
l1.Seniors	-9.9884**	7.5909	-47.7046**	14.6392***	-145.6065	-17.4769
	(0.0092)	(29.0740)	(19.1847)	(5.6166)	(91.8883)	(40.0333)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28,788	6,487	8,593	9,261	721	2,086
Number of firms	3,991	1,752	2,302	1,015	171	432
R^2	0.1290	0.1107	0.1952	-	-	-

Notes: Appendix 2 compares the baseline model (specification (1); also presented in Table 3) with the logit model (specification (2)). *Divdummy* indicates whether a firm is a dividend payer (value of 1, 0 otherwise) and is the dependent variable in the logit model. Other variables are defined as in Table 2. Firm- and industry-year fixed effects (FE) are included in all regressions. Robust standard errors that are clustered on the firm level for the baseline model are in parentheses (*** $p<0.01$, ** $p<0.05$, * $p<0.10$). The prefix l1 indicates that the variable is lagged by one year.

Appendix 3. Panel Regression Analysis with Alternative Specifications

	Baseline Model		Without Macroeconomic Control Variables		Without Firms with Substantial Foreign Ownership	
-	(1a)	(1b)	(2a)	(2b)	(3a)	(3b)
	1991-2012	2007-2012	1991-2012	2007-2012	1991-2012	2007-2012
Variables	Divyield	Divyield	Divyield	Divyield	Divyield	Divyield
θ^{firm}	0.5760***	-0.0931	0.8076***	0.1109	0.6911***	1.2228
	(0.1569)	(0.5325)	(0.1533)	(0.4220)	(0.2252)	(0.8596)
l1.Leverage	0.0092	-1.3600**	0.0329	-1.2676**	-0.1789	-1.4066
	(0.2795)	(0.6231)	(0.2824)	(0.6216)	(0.3751)	(0.9063)
l1.Closely	-0.4157***	-0.5158*	-0.4517***	-0.5174*	-0.2631	-0.2678
	(0.1389)	(0.2764)	(0.1391)	(0.2777)	(0.1832)	(0.4139)
l1.Income	6.0405***	9.3414***	5.9946***	9.4788***	6.5565***	9.8756***
	(0.4119)	(0.7819)	(0.4112)	(0.7888)	(0.5510)	(1.2044)
l1.CapExp	0.2422	2.3000**	0.3082	2.4300**	0.1779	-0.0113
	(0.4650)	(1.1602)	(0.4655)	(1.1720)	(0.5955)	(1.5030)
l1.Cash	0.1211	0.5386	0.0730	0.6261	-0.0049	1.1761
	(0.2565)	(0.5483)	(0.2582)	(0.5451)	(0.3155)	(0.8788)
l1.RetainedEquity	0.8355***	2.1575***	0.8698***	2.1691***	0.7541***	2.2712***
	(0.1341)	(0.3469)	(0.1333)	(0.3472)	(0.1831)	(0.5070)
l1.TobQ	-0.2672***	-0.1239***	-0.2640***	-0.1212***	-0.2536***	-0.0862
	(0.0158)	(0.0393)	(0.0157)	(0.0395)	(0.0223)	(0.0612)
l1.SalesTrend	-0.1325***	0.0251	-0.1322***	0.0385	-0.0883	-0.0090
	(0.0483)	(0.1467)	(0.0481)	(0.1468)	(0.0637)	(0.2409)
l1.StockTrend	-0.0967***	-0.1406***	-0.0994***	-0.1491***	-0.0911***	-0.1123**
	(0.0136)	(0.0375)	(0.0137)	(0.0377)	(0.0177)	(0.0540)
l1.ReportFrequ	0.0344	-0.1623*	0.0451*	-0.1712*	-0.0048	-0.1675
	(0.0249)	(0.0942)	(0.0300)	(0.1184)	(0.0300)	(0.1184)
l1.lnGDP	-0.0434	4.3778***	-	-	0.4602	4.9194***
	(0.5461)	(1.2240)	-	-	(0.8866)	(1.8797)
l1.Education	1.3521**	-0.8954	-	-	1.3011*	0.8051
	(0.5715)	(1.2069)	-	-	(0.7685)	(1.8362)
l1.Institutional	0.4130**	-0.6116*	-	-	0.4586*	-0.5126
	(0.1831)	(0.3399)	-	-	(0.2396)	(0.4875)
l1.ADRI	0.0075	(0.0000)	-	-	-0.0722	-
	(0.1062)	0.0000	-	-	(0.1378)	-
l1.Seniors	-9.9884**	-47.7046**	-	-	12.3691**	58.2217**
	0.0092	(19.1847)	-	-	(5.9984)	(26.0701)
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	28,788	8,593	28,788	8,593	16,864	4,061
Number of firms	3,991	2,302	3,991	2,302	2,623	1,171
R^2	0.1290	0.1952	0.1274	0.1924	0.1212	0.1941

Notes: Appendix 3 compares the baseline model (specification (1); also presented in Table 3) with the model without macroeconomic control variables (specification (2)), and with the same model with a different sample that excludes firms with substantial (>10 %) foreign ownership (specification (3)). We run all regressions over the entire observation period (1991-2012) and from 2007-2012, as in Table 3. Other variables are defined as in Table 2. Firm- and industry-year fixed effects (FE) are included in all regressions. Robust standard errors that are clustered on the firm level are in parentheses (*** $p<0.01$, ** $p<0.05$, * $p<0.10$). The prefix l1 indicates that the variable is lagged by one year.

References

Allen, F., & Michaely, R. (2003). Payout policy, in G. M. Constantinides, M. Harris & R. M. Stulz (Eds.) *Handbook of the Economics of Finance*, 337-429 (Elsevier).

Auerbach, A. J. (1979). Wealth maximization and the cost of capital. *The Quarterly Journal of Economics*, 93, 433-446.

Auerbach, A. J., & Hassett, K. A. (2006). Dividend taxes and firm valuation: New evidence. *American Economic Review*, 96, 119-123.

Baker, M., Stein, J. C., & Wurgler, J. (2003). When does the market matter? Stock prices and the investment of equity-dependent firms. *Quarterly Journal of Economics*, 118, 969-1005.

Black, F., & Scholes, M. (1974). The effects of dividend yield and dividend policy on common stock prices and returns. *Journal of Financial Economics*, 1, 1-22.

Blouin, J. L., Raedy, J. S., & Shackelford, D. A. (2011). Dividends, share repurchases, and tax clienteles: Evidence from the 2003 reductions in shareholder taxes. *Accounting Review*, 86, 887-914.

Bradford, D. F. (1981). The incidence and allocation effects of a tax on corporate distributions. *Journal of Public Economics*, 15, 1-22.

Brennan, M. J. (1970). Taxes, market valuation and corporate financial policy. *National Tax Journal*, 23, 417-427.

Brown, J. R., Liang, N., & Weisbenner, S. (2007). Executive financial incentives and payout policy: firm responses to the 2003 dividend tax cut. *Journal of Finance*, 62, 1935-1965.

Chetty, R., & Saez, E. (2005). Dividend taxes and corporate behavior: Evidence from the 2003 dividend tax cut. *The Quarterly Journal of Economics*, 120, 791-833.

DeAngelo, H., DeAngelo, L., & Skinner, D. J. (2008). Corporate payout policy. *Foundations & Trends in Finance*, 3, 95-287.

Dhaliwal, D., Li, O. Z., & Trezevant, R. (2003). Is a dividend tax penalty incorporated into the return on a firm's common stock? *Journal of Accounting and Economics*, 35, 155-178.

Graetz, M. J., & Warren, A. C. J. (2007). Dividend taxation in Europe: When the ECJ makes tax policy. *Common Market Law Review*, 44, 1577-1623.

Graham, J. R., & Kumar, A. (2006). Do dividend clienteles exist? Evidence on dividend preferences of retail investors. *Journal of Finance*, 61, 1305-1336.

Grinblatt, M., Keloharju, M., & Linnainmaa, J. (2011). IQ and stock market participation. *The Journal of Finance*, 66, 2121-2164.

Grinstein, Y., & Michaely, R. (2005). Institutional holdings and payout policy. *The Journal of Finance*, 60, 1389-1426.

Grullon, G., Michaely, R., & Swaminathan, B. (2002). Are dividend changes a sign of firm maturity? *Journal of Business*, 75, 387-424.

Hakansson, N. H. (1982). To pay or not to pay dividend. *The Journal of Finance*, 37, 415-428.

Harberger, A. C. (1962). The incidence of the corporation income tax. *Journal of Political Economy*, 70, 215-240.

Hegemann, A., Kunoth, A., Rupp, K., & Sureth-Sloane, C. (2016). Hold or sell? How capital gains taxation affects holding decisions. *Review of Managerial Science*, 1-33.

Jacob, M., & Jacob, M. (2013). Taxation, dividends, and share repurchases: Taking evidence global. *Journal of Financial and Quantitative Analysis*, 48, 1241-1269.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, 76, 323-329.

Julio, B., & Ikenberry, D. L. (2004). Reappearing dividends. *Journal of Applied Corporate Finance*, 16, 89-100.

Kaserer, C., Rapp, M. S., & Trinchera, O. (2013). Blockholder power, shareholder conflicts and legal protection: Evidence from tax preferences and payout decisions. *Available at SSRN: http://ssrn.com/abstract=2024014*.

King, M. A. (1974). Taxation and the cost of capital. *The Review of Economic Studies*, 41, 21-35.

König, R. (1990). Ausschüttungsverhalten von Aktiengesellschaften, Besteuerung und Kapitalmarktgleichgewicht, Hamburg.

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., & Vishny, R. W. (2000). Agency problems and dividend policies around the world. *Journal of Finance*, 55, 1-33.

Lie, E., & Lie, H. J. (1999). The role of personal taxes in corporate decisions: An empirical analysis of share repurchases and dividends. *The Journal of Financial and Quantitative Analysis*, 34, 533-552.

Maier, C., & Schanz, D. (2016). Convergence of dividend and capital gains taxation in the EU from 1990 to 2015. *Intertax*, forthcoming.

Moser, W. J. (2007). The effect of shareholder taxes on corporate payout choice. *Journal of Financial & Quantitative Analysis*, 42, 991-1019.

Myers, S. C. (1984). The capital structure puzzle. *The Journal of Finance*, 39, 575-592.

Niemann, R., & Sureth, C. (2013). Sooner or Later? - Paradoxical Investment Effects of Capital Gains Taxation Under Simultaneous Investment and Abandonment Flexibility. *European Accounting Review*, 22, 367-390.

Petersen, M. A. (2009). Estimating standard errors in finance panel data sets: Comparing approaches. *The Review of Financial Studies*, 22, 435-480.

Poterba, J. (2004). Taxation and corporate payout policy. *The American Economic Review*, 94, 171-175.

Schanz, D., & Theßeling, H. (2012). The influence of tax regimes on distribution policy of corporations – Evidence from German tax reforms. *Available at SSRN: http://ssrn.com/abstract=1775942*

Shoven, J. B. (1976). The incidence and efficiency effects of taxes on income from capital. *Journal of Political Economy*, 84, 1261-1283.

Sinn, H.-W. (1991). Taxation and the cost of capital: The "old" view, the "new" view, and another View. *Tax Policy and the Economy*, 5, 25-54.

Skinner, D. J. (2008). The evolving relation between earnings, dividends, and stock repurchases. *Journal of Financial Economics*, 87, 582-609.

Sørensen, P. B. (1995). Changing views of the corporate income tax. *National Tax Journal*, 48, 279-284.

Spamann, H. (2010). The "Antidirector Rights Index" revisited. *Review of Financial Studies*, 23, 467-486.

Sureth, C. & Langeleh, D. (2007). The Degree of Integrating Corporate and Capital Gains Tax into Income Tax and its Impact on Investment Decisions, *Schmalenbach Business Review*, 59, 310-339.

van Rooij, M., Lusardi, A., & Alessie, R. (2011). Financial literacy and stock market participation. *Journal of Financial Economics*, 101, 449-472.

von Eije, H., & Megginson, W. L. (2008). Dividends and share repurchases in the European Union. *Journal of Financial Economics*, 89, 347-374.
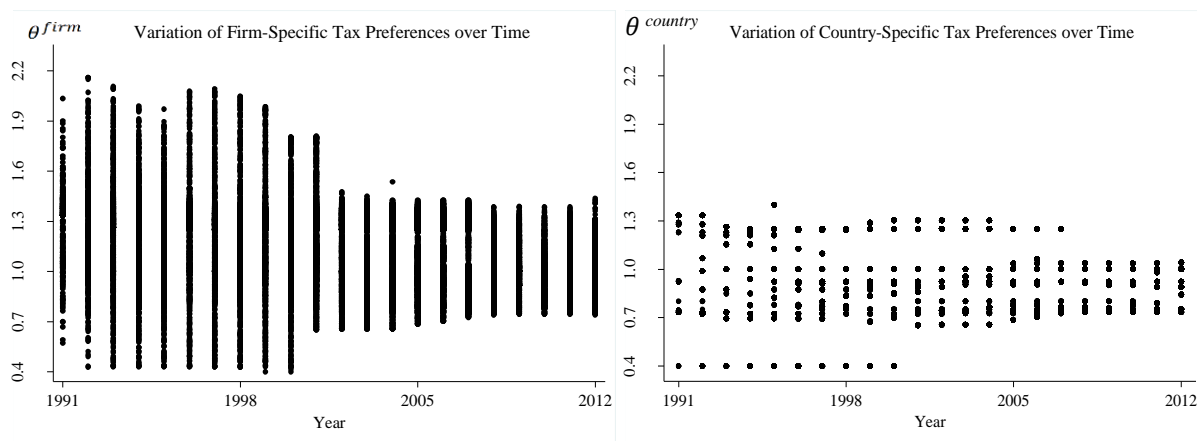
Figure 1. Histogram of Tax Variables for Dividends or Capital Gains (1990 and 2012)
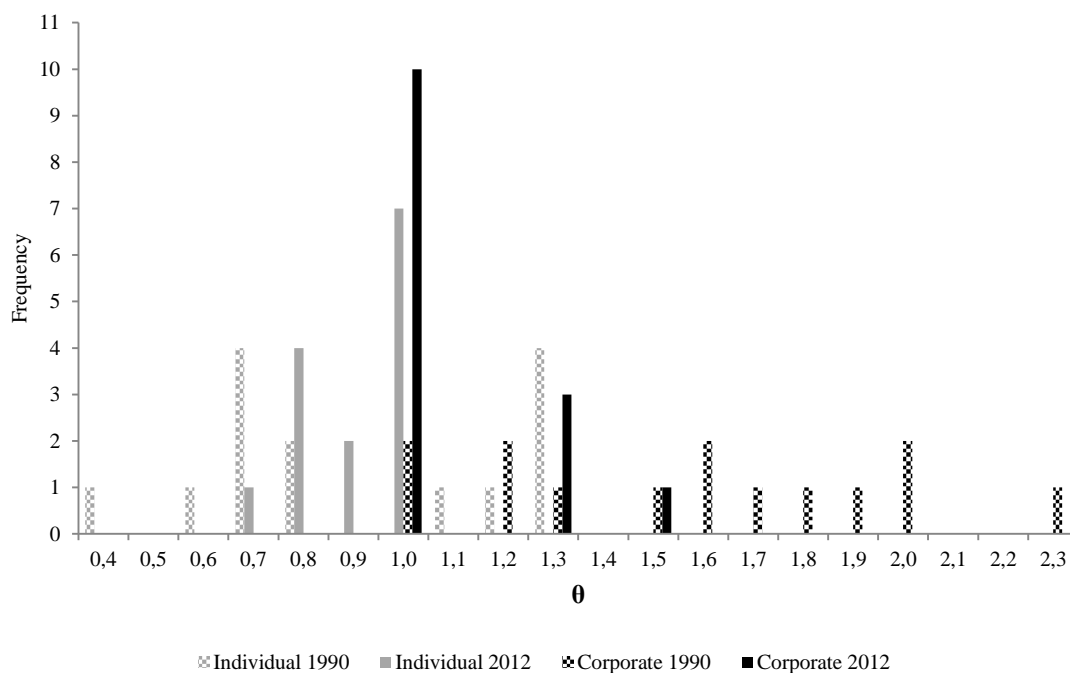
Values of θ larger (smaller) than 1 represent a tax advantage in favor of dividends (capital gains). Note: Based on Maier and Schanz (2016).

Figure 2. Cross-sectional Heterogeneity of Firm-Specific and Country-Specific Tax Variables over Time

Values of θ larger (smaller) than 1 represent a tax advantage in favor of dividends (capital gains).

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Figure 3.   Distribution of Firm-Specific Tax Variable over Time
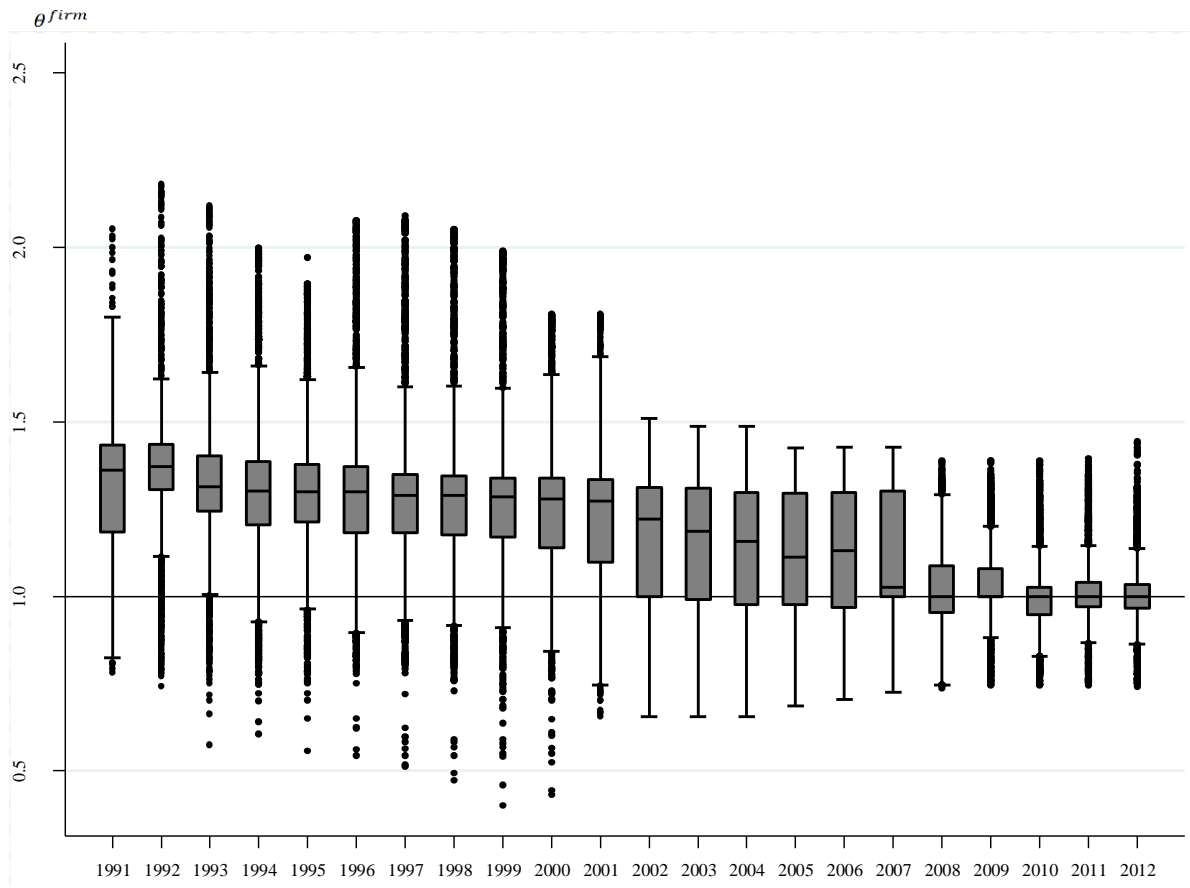
Notes: Figure 3 illustrates the development of the firm-specific tax variable θ^{firm} over time with box plots. The lower (upper) limit of the boxes is the 0.25th (0.75th) percentile, while the line inside of the box represents the median. The ends of the whiskers are either the maximum and minimum values or 1.5 times the interquartile range of the lower and the upper quartile. Data exceeding this 1.5 interquartile range, are outliers, illustrated as dots.

List of Tables

Table 1.   Sample Overview

Country	Number of Observations	Percentage of Observations	Number of Firms	Percentage of firms
Austria	440	1.5	67	1.7
Belgium	456	1.6	83	2.1
Denmark	542	1.9	99	2.5
Finland	1,261	4.4	130	3.3
France	4,934	17.1	687	17.2
Germany	4,281	14.9	554	13.9
Greece	355	1.2	112	2.8
Ireland	455	1.6	54	1.4
Italy	1,329	4.6	200	5.0
Netherlands	627	2.2	112	2.8
Portugal	213	0.7	39	1.0
Spain	958	3.3	114	2.9
Sweden	972	3.4	169	4.2
United Kingdom	11,965	41.6	1,571	39.4
Total	28,788	100.0	3,991	100.0

Industry	Number of Observations	Percentage of Observations	Number of Firms	Percentage of firms
Agriculture/Mining	1,139	4.0	171	4.3
Construction	1,637	5.7	192	4.8
Manufacturing	15,760	54.7	2,043	51.2
Trade	4,719	16.4	611	15.3
Service	5,525	19.2	973	24.4
Administration	8	0.0	1	0.0
Total	28,788	100.0	3,991	100.0

Table 2.   Descriptive Statistics

Variable	Obs	Mean	Std Dev	Min	Percentiles 0.25	0.50	0.75	Max
Divyield	28,788	2.9909	2,7786	0.0000	1.1432	2.4307	4.0552	15.2908
θ^{firm}	28,788	1.1723	0.2266	0.4300	1.0000	1.1660	1.3136	2.1775
θ^{major}	28,788	1.1809	0.2921	0.4000	1.0000	1.2438	1.2642	2.1835
$\theta^{individual}$	28,788	1.0208	0.1994	0.4000	0.8873	1.0000	1.2500	1.4000
$\theta^{corporate}$	28,788	1.3300	0.2810	0.9799	1.0000	1.3889	1.4493	2.1835
Leverage	28,788	0.1949	0.1445	0.0000	0.0714	0.1834	0.2930	0.6040
Closely	28,788	0.4367	0.2665	0.0005	0.2138	0.4461	0.6400	0.9820
Income	28,788	0.0768	0.0765	-0.2545	0.0342	0.0679	0.1128	0.3293
CapExp	28,788	0.0576	0.0521	0.0000	0.0224	0.0438	0.0753	0.2894
Cash	28,788	0.1202	0.1404	0.0000	0.0279	0.0723	0.1573	0.8121
RetainedEquity	28,788	0.4186	0.2710	0.0016	0.1712	0.3939	0.6490	0.9607
TobQ	28,788	2.1512	1.8192	0.2672	1.0314	1.6443	2.6275	12.2809
SalesTrend	28,788	0.1328	0.3646	-0.6420	-0.0086	0.0731	0.1818	2.6455
StockTrend	28,788	0.2753	1.0455	-0.8871	-0.1634	0.0741	0.3806	7.5810
ReportFrequ	28,788	2.0382	0.9468	0.0000	2.0000	2.0000	2.0000	4.0000
lnGDP	28,788	10.1852	0.2620	9.3067	9.9675	10.2146	10.4139	10.7129
Education	28,788	0.5438	0.1279	0.2002	0.4636	0.5514	0.5943	1.1320
Institutional	28,788	0.5920	0.4044	0.0059	0.2260	0.5268	0.9178	1.5632
ADRI	28,788	4.3427	0.6936	2.0000	4.0000	4.0000	5.0000	6.0000
Seniors	28,788	0.1621	0.0150	0.1088	0.1561	0.1584	0.1655	0.2078

Notes: Table 2 reports the summary statistics for the dependent payout variable *Divyield*, which is defined as the amount of dividends paid relative to the market capitalization of a firm, for the different tax variables, and for the control variables. θ^{firm} is the firm-specific weighted tax variable of the modeled tax preferences of individual shareholders ($\theta^{individual}$) and corporate shareholders ($\theta^{corporate}$). θ^{major} is an alternative firm-specific measure that takes the values of $\theta^{corporate}$ if more than 50 % in a firm are considered as corporate shareholders. *Leverage* is total debt relative to total assets. *Closely* is the percentage of substantial shareholders. *Income* is pretax income divided by total assets. *CapExp* is capital expenditures relative to total assets. *Cash* is the percentage of cash to total assets. *RetainedEquity* is the share of equity that consists of retained earnings. *TobQ* is market capitalization relative to common equity. *SalesTrend* (*StockTrend*) measures the change of sales (stock price) compared to the prior year. *ReportFrequ* is the earnings reporting frequency, which takes values between 1 (yearly) and 4 (quarterly). *lnGDP* is the natural logarithm of GDP per capita. *Education* is the gross percentage of the population of a country with tertiary education. *Institutional* is the value of stocks stocks held by institutional investors relative to market capitalization of listed stocks in a country. *ADRI* is the anti-director rights index (higher values mean better protection of shareholder rights). *Seniors* is the percentage of people over the age of 65 in a country.

Table 3. Panel Regression Results for Different Observation Periods

Variables	1991-2012		2007-2012
	(1)	(2)	(3)
	Divyield	*Divyield*	*Divyield*
θ^{firm}	0.5760***	0.6190***	-0.0931
	(0.1569)	(0.1591)	(0.5325)
$Post2006x\theta^{firm}$		-0.5624*	
		(0.3279)	
l1.Leverage	0.0092	0.0087	-1.3600**
	(0.2795)	(0.2795)	(0.6231)
l1.Closely	-0.4157***	-0.3960***	-0.5158*
	(0.1389)	(0.1386)	(0.2764)
l1.Income	6.0405***	6.0335***	9.3414***
	(0.4119)	(0.4119)	(0.7819)
l1.CapExp	0.2422	0.2375	2.3000**
	(0.4650)	(0.4651)	(1.1602)
l1.Cash	0.1211	0.1290	0.5386
	(0.2565)	(0.2566)	(0.5483)
l1.RetainedEquity	0.8355***	0.8330***	2.1575***
	(0.1341)	(0.1342)	(0.3469)
l1.TobQ	-0.2672***	-0.2667***	-0.1239***
	(0.0158)	(0.0158)	(0.0393)
l1.SalesTrend	-0.1325***	-0.1338***	0.0251
	(0.0483)	(0.0483)	(0.1467)
l1.StockTrend	-0.0967***	-0.0970***	-0.1406***
	(0.0136)	(0.0136)	(0.0375)
l1.ReportFrequ	0.0344	0.0326	-0.1623*
	(0.0249)	(0.0249)	(0.0942)
l1.lnGDP	-0.0434	0.0070	4.3778***
	(0.5461)	(0.5476)	(1.2240)
l1.Education	1.3521**	1.2771**	-0.8954
	(0.5715)	(0.5712)	(1.2069)
l1.Institutional	0.4130**	0.4235**	-0.6116*
	(0.1831)	(0.1838)	(0.3399)
l1.ADRI	0.0075	0.0205	(0.0000)
	(0.1062)	(0.1065)	0.0000
l1.Seniors	-9.9884**	-10.2943**	-47.7046**
	0.0092	(4.2942)	(19.1847)
Firm FE	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes
Observations	28,788	28,788	8,593
Number of firms	3,991	3,991	2,302
R^2	0.1290	0.1292	0.1952

Notes: Table 3 reports fixed effects (FE) panel regression results for the equation (2), which we estimate with robust standard errors clustered on the firm level:

$$Divyield_{i,j,t+1} = \alpha_0 + \alpha_i + \alpha_{it} + \beta\theta_{i,j,t+1} + \gamma_1 Leverage_{i,j,t} + \gamma_2 Closely_{i,j,t} + \gamma_3 Income_{i,j,t} + \gamma_4 CapExp_{i,j,t}$$
$$+ \gamma_5 Cash_{i,j,t} + \gamma_6 RetainedEquity_{i,j,t} + \gamma_7 TobQ_{i,j,t} + \gamma_8 SalesTrend_{i,j,t}$$
$$+ \gamma_9 StockTrend_{i,j,t} + \gamma_{10} ReportFrequ_{i,j,t} + \delta_1 lnGDP_{j,t} + \delta_2 Education_{j,t}$$
$$+ \delta_3 Institutional_{j,t} + \delta_4 ADRI_{j,t} + \delta_5 Seniors_{j,t} + \varepsilon_{i,j,t}$$

In specification (2), we additionally include $Post2006x\theta^{firm}$, which is the interaction term of the firm-specific tax variable θ^{firm} with a dummy variable that takes the value of 1, if the year > 2006 and 0 zero otherwise. The other variables are defined as in Table 2. Firm- and industry-year fixed effects are included in all regressions. Robust standard errors are in parentheses (*** p<0.01, ** p<0.05, * p<0.10). The prefix l1 indicates that the variable is lagged by one year.

Table 4.   Comparing Empirical Models with Firm-Specific and Country-Specific Tax Variables for different Observation Periods

	1991-2006		2007-2012	
	(1a)	(1b)	(2a)	(2b)
Variables	*Divyield*	*Divyield*	*Divyield*	*Divyield*
θ^{firm}	0.4844***		-0.0931	
	(0.1808)		(0.5325)	
$\theta^{country}$		0.7569**		1.1225***
		(0.3013)		(0.4302)
Controls	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
Industry-year FE	Yes	Yes	Yes	Yes
Clustering	Firm	Firm	Firm	Firm
Observations	20,195	20,195	8,593	8,593
Number of firms	3,216	3,216	2,302	2,302
R^2	0.0978	0.0977	0.1952	0.1961

Notes: Table 4 compares the baseline model with the firm-specific tax variable θ^{firm} (specification (1a); also presented in Table 3) and a model with the country-specific tax variable $\theta^{country}$ (specification (1b)) in the period 1991-2006. In specification (2) we analogously run these regressions for the period 2007-2012. Variables are defined as in Table 2. Firm- and industry-year fixed effects (FE) are included in all regressions. Robust standard errors that are clustered on the firm level are in parentheses (*** p<0.01, ** p<0.05, * p<0.10).