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The Tax System and Corporate Payout Policies

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Abstract

In this thesis, I examine how corporate taxes, dividend taxes, personal income taxes, and consumption taxes affect corporate payout behaviour. Using rich international panel data that consist of 40,609 firms across 115 countries from 1999 to 2013, I run linear regressions of each of the four tax rates on three payout variables which measure frequency and magnitude of regular cash dividends distributed by firms. In my baseline model, I find that the predictions of the new view – one of the two views in neoclassical theory – on short-run payout responses only partially hold true. Inconsistent with initial hypotheses, corporate taxes on average do not impact a firm's dividend payout behaviour in the short run. Regarding dividend taxes, my results show that the hypothesised dividend tax neutrality only holds true for the relative amount of dividends but not for a firm's likelihood to distribute, increase, and initiate dividends. Consistent with initial hypotheses, personal income taxes and consumption taxes trigger mostly large payout responses in terms of frequency and magnitude of dividend payouts. In my two model extensions, in which I focus on payout behaviour of cash-rich firms and employ a more flexible definition of the time horizon characterising short-run payout, my findings are again only partially in line with predictions of the new view on short-run payout responses. With these results, this thesis not only analyses well-investigated tax rates – corporate taxes and dividend taxes – for which current literature shows mixed empirical evidence but also examines hitherto scarcely considered tax rates – personal income taxes and consumption taxes – in the neoclassical framework and determines their impact on corporate payout.

Keywords: corporate payout; corporate tax; dividend tax; personal income tax; consumption tax

1. Introduction

Corporate payout policy is a fundamental part of corporate finance decisions besides deciding where to invest and how to finance projects of a firm. Taxes, however, reduce shareholders' wealth on both the firm level (e.g., via corporate taxes) and shareholder level (e.g., via dividend taxes), and thus likely distort payout decisions (Jacob and Jacob, 2013b). Hence, it is important for managers, shareholders, and policy makers to understand how taxes affect corporate payout.

Previous literature has stipulated a variety of models showing whether and how a change in certain taxes potentially impacts payout decisions of firms. The most prominent frameworks in tax literature are neoclassical models which are typically divided into the old view (e.g., Harberger, 1962; Poterba and Summers, 1984) and the new view (e.g., Auerbach, 1979; King, 1977) suggesting that payout behaviour differs across firms due to different marginal sources of finance. Beyond neoclassical theories, agency models (e.g., Chetty and Saez, 2010; Jensen, 1986) provide an alternative explanation of how firms are predicted to react to changes in tax rates by considering the presence of agency issues. Neoclassical and agency models, however, mainly focus on corporate taxes and dividend taxes which both also constitute the primary area of interest in empirical studies as several tax reforms allowed a thorough examination of the

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impact of corporate taxes[1] and, in particular, dividend taxes on corporate payout. In the setting of dividend tax cuts in the U.S. in 2003 (e.g., Chetty and Saez, 2005) and in Sweden in 2006 (Jacob and Michaely, 2017), a variety of studies support predictions of agency models[2], but empirical evidence on the neoclassical predictions remains heavily disputed[3]. Tax research also discusses the impact of personal income taxes on corporate payout, but the exact definition varies strongly[4] and rarely refers to taxes on labour income in the context of dividends or share repurchases[5]. Regarding consumption taxes, previous literature has hitherto solely examined the effect on corporate investment (Jacob et al., 2018) without considering the effect on corporate payout. This is surprising given that, intuitively, corporate payout is somehow related to the level of investment since managers can either (i) immediately invest earnings in projects and distribute resulting profits in future periods or (ii) immediately distribute earnings to shareholders or (iii) retain earnings for future investments and payout.

Due to the different state of literature across tax rates, this thesis aims at providing a comprehensive overview of how a change in corporate taxes, dividend taxes, personal income taxes, and consumption taxes affects payout decisions of firms. Specifically, this thesis contributes to contemporary literature in two ways. First, it adds to the ongoing discussion about mixed empirical evidence on neoclassical theories for well-researched tax rates (i.e., corporate taxes, dividend taxes). Second, it bridges the current gap in literature by embedding scarcely considered tax rates (i.e., personal income taxes, consumption taxes) in the neoclassical frameworks and investigating their impact on corporate payout. To achieve this, I use international panel data with focus on non-financial, non-utility, non-transportation, and non-telecommunication firms across 115 countries over the period 1999 to 2013 with sufficient variation in tax rate changes. My estimation strategy involves three steps: (i) Pre-analysis, (ii) baseline regression, and (iii) extensions to the baseline model. Inspired by Jacob et al. (2018), the pre-analysis is mainly based on a linear probability model to rule out the concern that tax rate changes are determined by macroeconomic factors. The baseline regression is the main analysis in this thesis where I investigate the average effect on corporate payout in the same year in which a change in one of the four tax rates occurs. Consistent with previous studies (e.g., Jacob and Jacob, 2013a), I measure payout, which is defined as regular cash dividends due to insufficient data on other payout channels, by three dependent variables covering frequency and relative amounts of dividends. Beyond the baseline model, I also introduce two extensions which consider heterogeneity in payout responses potentially caused by different levels of cash holdings (e.g., Jacob and Michaely, 2017) and the impact of tax rate changes on payout one year after a tax rate change occurs.

The results of my baseline regression show that the average payout response only partially follows neoclassical predictions on short-run payout responses as stipulated by the new view. Inconsistent with initial expectations, corporate taxes on average do not change a firm's dividend payout behaviour in the year where a tax change becomes effective. Similarly, the hypothesised "dividend tax neutrality" (Chetty and Saez, 2010, p.5) only holds with respect to the relative amount of dividends. Vice versa, a change in dividend taxes interestingly impacts a firm's propensity to pay dividends and likelihood to increase or initiate dividends in different directions (i.e., sign of coefficients differs) even though the relative effect size is small. Personal income taxes show mostly significant coefficients suggesting that a higher tax rate increases the attractiveness of investments in corporate projects such that firms invest more. Thus, they exhibit a slightly lower propensity to pay dividends and distribute considerably lower amounts in the short run. The results on consumption taxes are fully in line with my initial hypotheses implying that a rise in this tax rate increases the tax wedge (Jacob et al., 2018) exerting pressure on profits of corporate projects such that firms invest less in the short run and therefore distribute, increase, and initiate dividends more frequently and pay higher relative amounts.

The baseline extensions reveal mostly similar findings. Cash-rich firms appear to react more strongly compared to the average payout response in terms of their likelihood to increase or initiate dividends if personal income taxes, consumption taxes, and (depending on the fixed effect) corporate taxes are changed. Although the payout response of cash-rich firms is expected to match more closely short-run predictions of the new view, the results do not fully confirm this expectation and thus are again only partially in line with predictions of neoclassical theory. When considering the payout response one year after a tax rate change, corporate taxes again do not appear to impact payout behaviour on average.

[1] In the context of corporate taxes, Poterba et al. (1987), for instance, examines how the 1986 Tax Reform Act in the U.S. is predicted to lower corporate savings and reduce tax incentives to retain earnings and distribute dividends.

[2] These studies conclude that frictions such as agency issues (Chetty and Saez, 2005, Jacob and Michaely, 2017) and shareholder conflicts (Jacob and Michaely, 2017) reduce the responsiveness of corporate payout in case of a dividend tax change.

[3] Chetty and Saez (2005) argue that listed U.S. firms responded to the 2003 dividend tax cut in accordance with the old view. By contrast, Brav et al. (2008) conclude that the immediate payout response of these firms was only temporary and that the dividend tax cut was of "second-order importance ... [as only] firms 'sitting on the fence' [to initiate dividends]" (p.390) were primarily affected.

[4] Wu (1996), for example, uses the term "personal taxes" (p.293) synonymously for dividend taxes in his empirical study on the payout behaviour of listed U.S. firms. Likewise, Lewellen and Lewellen (2006) employ "personal tax rates on interest, dividends, and realized capital gains" (p.5) in their single- and multi-period models when theorising how corporate payout changes depending on the firm's source of finance.

[5] In the context of private firms, Jacob and Michaely (2017), for instance, argue that the taxation of labour income vis-à-vis dividends incentivises only a specific group of owners to adjust the corporate payout of their firm due to "strong empirical evidence that, with a limited number of owner[-managers in closely-held corporations], there is strong substitutability between dividends and wages (the other possible form of payout to owners in private firms)" (p.3219). Other empirical studies also examine the sole impact of personal income taxes whose scope, however, is mainly on macroeconomic variables such as economic growth (Gale and Samwick, 2016; Palić et al., 2017).

Also, corporate payout is mostly not neutral to a change in dividend taxes. Interestingly, the coefficient of personal income taxes on a firm's likelihood to increase or initiate dividends changes its sign suggesting that payout decisions in subsequent periods are increasingly determined by the fact that firms bear higher labour costs from an increase in this tax rate. Regarding consumption taxes, the results are very similar to the findings of the baseline model.

The remaining part of this thesis is divided into seven further sections. Section 2 provides a profound theoretical background on both neoclassical frameworks old view and new view which I use as a foundation to formulate hypotheses on how each of the four tax rates affects dividend payout. Section 3 presents my methodology and displays descriptive statistics on all variables of interest employed in the main analysis. In section 4, I conduct my pre-analysis using the linear probability model and test whether my dataset contains sufficient variation in tax rate changes. Sections 5 and 6 show the results of my baseline regression and extensions to the baseline model, respectively. In section 7, I test for robustness of my baseline results. Finally, the conclusion of this thesis is shown in section 8.

2. Theoretical Background and Hypothesis Formulation

Even though various theories provide explanations on how taxes might affect corporate payout decisions, empirical studies mostly analyse their findings in the two neoclassical frameworks: The old view (Feldstein, 1970; Harberger, 1962, Harberger, 1966; Poterba, 2004; Poterba and Summers, 1984) and the new view (Auerbach, 1979; Auerbach and Hassett, 2003; Bradford, 1981; King, 1977). Conceptually, these views differ in the underlying assumption of how firms fund the additional project (i.e., what constitutes a firm's marginal source of finance). That is, the old view assumes that firms finance new projects via new equity whereas the new view is built on the idea that retained earnings are used (see also Chetty and Saez, 2005). In the following, old view and new view will be incorporated into an intuitive single-period model based on previous studies (Alstadsæter et al., 2017; Becker et al., 2013; Chetty and Saez, 2010; Lewellen and Lewellen, 2006) to illustrate the effect of corporate taxes (τ^C), dividend taxes (τ^{Div}), personal income taxes (τ^I), and consumption taxes (τ^{VAT}) on corporate payout decisions. Figure 1 visualises how an increase in each of these tax variables impacts investors' after-tax returns which, in turn, changes investment and payout decisions. For simplicity, my hypotheses are built on two assumptions. First, I restrict corporate payout to regular cash dividends and abstract from special dividends and share buybacks[6]. Second, I use a highly stylised definition of τ^I in my hypothesis formulation which involves both "personal taxes on interest" (Lewellen and Lewellen, 2006, p.5) and personal taxes on labour income[7].

2.1. Old View and New View in the Single-Period Model

In the old view, the individual investor decides at the beginning of period t whether to (i) invest in the firm's project by buying new equity or (ii) invest in an alternative investment opportunity which is for simplicity assumed to be a risk-free bond (see also Alstadsæter et al., 2017). If the investor decides to invest \$1 in a firm's project (see arrow A in Figure 1), the project will generate profits depicted by the pre-tax rate of return, r. These profits are assumed to be distributed in form of dividends in t+1 and are subject to double taxation due to taxes levied on both the firm level and the shareholder level (Jacob and Jacob, 2013b). On the firm level, corporate taxes are levied on pre-tax project earnings. Assuming that firms fully distribute their after-tax profits as dividends at the beginning of period t+1, potential payout \$1[1+r] is effectively reduced to actual payout (i.e., gross dividends distributed by firms) \$1[1+r(1- τ^C)] (arrow B). On the shareholder level, these dividends are further reduced by dividend taxes finally yielding the after-tax dividend income (i.e., net dividends received by shareholders) \$1[1+r(1- τ^C)(1-τ^{Div})] (arrow C). By contrast, the alternative investment in a risk-free bond generates an interest payment denoted by the coupon rate, i, and is not subject to double taxation. In this scenario, only personal income taxes reduce pre-tax interest income \$1[1+i] to the level of after-tax interest income \$1[1+i(1-τ^I)] (arrow D). Thus, the rational investor will always invest in the firm's project if and only if the after-tax dividend income (arrow C) is larger than after-tax income on the bond (arrow D). Hence, the investor invests in the firm if pre-tax return on the firm's project, r, at least meets the individual investor's minimum required rate of return, r^*_{old}, which is defined as the pre-tax rate of return on the firm's project where the investor is indifferent between buying new equity and investing in the risk-free bond in t.

In the new view, the firm decides at the beginning of period t whether to (i) invest in a profit-generating project and

[6] As discussed by Chetty and Saez (2005), firms have three payout channels: Regular cash dividends, special dividends, and share buybacks. I exclude special dividends as they occur infrequently and are difficult to measure such that clear causal inference would not be possible. I also exclude share buybacks since my dataset does not contain any information on this payout channel. However, I acknowledge the increasing importance of share buybacks as an alternative payout channel (Chetty and Saez, 2005; Von Eije and Megginson, 2008). In this context, Jacob and Jacob (2013b) have shown that the relative taxation of dividends vis-à-vis capital gains matters for a firm's payout channel choice. If capital gains are taxed at a higher rate than dividends, firms would prefer distributing dividends over share buybacks and vice versa, as this yields a higher after-tax income for shareholders. Thus, share buybacks and the corresponding relative taxation should be incorporated in future studies.

[7] This treatment is in line with the current tax code of the United States (Office of the Law Revision Council, 2018). However, it does not hold for other tax jurisdictions such as Germany where interest income (25% flat tax) is presently taxed at a different rate compared to labour income (45% top marginal income tax rate) (Federal Ministry of Justice and Consumer Protection, 2017). In the empirical part of this thesis, I nonetheless try to interpret my results using the hypothesised mechanism of my simplified single-period model, but I also acknowledge that the definition of τ^I varies across countries and therefore add footnote 28 on this topic in section 5.

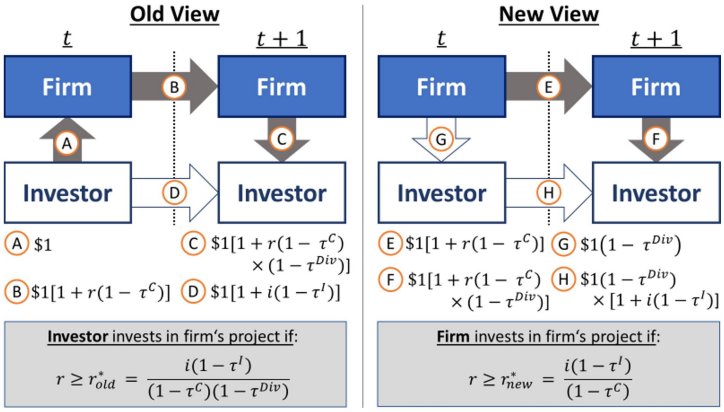

Figure 1: Investment and Payout Decisions in the Old View and the New View

subsequently distribute dividends at the beginning of t+1 or (ii) directly distribute its retained earnings at the beginning of period t to shareholders who invest in a risk-free bond immediately after receiving this dividend payment in t. Similar to the old view, the project will generate a pre-tax return, r, if the firm decides to invest \$1 in the project, and r will be again diminished by corporate taxes and dividend taxes (arrows E and F) yielding the shareholder's after-tax dividend income $\$1[1+r(1-\tau^C)(1-\tau^{Div})]$ at the beginning of period t+1. If the firm decides not to invest in its project, the dividends distributed in period t are again subject to τ^{Div} yielding net dividends $\$1(1-\tau^{Div})$ (arrow G). After investing these net dividends in a risk-free bond, investors finally obtain $\$1(1-\tau^{Div})\times[1+i(1-\tau^I)]$ (arrow H). Assuming that firms aim at maximising shareholders' after-tax wealth, the firm will invest in its project if and only if the shareholder's after-tax dividend income in t+1 (arrow F) is larger than the after-tax income on the risk-free bond (arrow H). Likewise, r must again at least meet the individual investor's minimum required rate of return, r^*_{new}, such that the firm invests in its project instead of directly distributing dividends in period t.

2.2. Hypothesis Formulation

Based on this theoretical foundation, four hypotheses will be outlined in the following. These hypotheses aim at explaining the potential effect of each of the four taxes on dividend payout in the light of both the old view and the new view, and thus consider that the marginal source of finance impacts dividend payout at different points in time: Firms in the old view can only distribute dividends in period t+1 (i.e., they receive new equity in period t which they invest in new projects generating profits and thus dividends of the next period) whereas firms in the new view can decide whether to distribute dividends in period t (i.e., immediate payout) or pay dividends in period t+1 (i.e., from profits generated by project investment in period t). A summary on the hypothesised effects of an increase in taxes on dividends is shown in Table 1.

> Hypothesis 1: In t+1, an increase in corporate taxes decreases dividends in both old view and the new view. In t, an increase in corporate taxes increases dividends in the new view.

If τ^C increases, firms for which new equity is the marginal source of finance are expected to pay lower dividends in period t+1 (Chetty and Saez, 2010). Ceteris paribus, higher corporate taxes increase the individual investor's minimum required rate of return, r^*_{old}, as investors demand a higher pre-tax return on projects, r, to receive the same after-tax dividend income as if taxes did not change. In other words, investing in firms becomes less attractive relative to investing in a risk-free bond since the after-tax returns on the bond (arrow D) remain unaffected; corporate after-tax earnings (arrow B) and the shareholder's after-tax dividend income (arrow C), however, decrease. Thus, fewer projects can offer an r that meets r^*_{old} of investors such that more investors decide not to buy new equity in period t. As investors invest in fewer projects, firms generate lower profits, and therefore dividend payout is expected to decrease in t+1.

If firms predominantly finance their projects via retained earnings, an increase in τ^C is predicted to increase dividends in period t but decrease dividends in period t+1 (Chetty and Saez, 2010).

Similar to the old view, higher corporate taxes in the new view increase r^*_{new} while r itself remains unaffected. Thus, firms are expected to distribute dividends in period t to maximise after-tax wealth of investors instead of investing in profitable projects for which r is below the higher r^*_{new}. Firms will therefore invest in fewer projects leading to lower profits for firms. This, in turn, results in lower dividends to be distributed in t+1. As firms, however, decide whether to invest in corporate projects or directly pay out dividends to shareholders in period t, a lower level of investments in t directly corresponds to higher dividends in t.

> Hypothesis 2: In t+1, an increase in dividend taxes is expected to decrease dividends in the old view while the new view predicts no change in dividends in t and t+1.

In the old view, an increase in τ^{Div} is expected to result in lower dividends in t+1 (e.g., Jacob and Jacob, 2013b).

Table 1: Effect of an Increase in Tax Rates on Corporate Payout

This table shows the effect of an increase in corporate taxes (column (1)), dividend taxes (column (2)), personal income taxes (column (3)), and consumption taxes (column (4)) on a firm's dividend payout in periods t and t+1 as predicted by the old view and the new view.

		Increase in Tax Rate			
		τ^C	τ^{Div}	τ^I	τ^{VAT}
		(1)	(2)	(3)	(4)
Old View	t+1	↓ Div	↓ Div	Direct: ↑ Div Indirect: ↓ Div	↓ Div
New View	t	↑ Div	No Change	Direct: ↓ Div Indirect: ↑ Div	↑ Div
	t+1	↓ Div	No Change	Direct: ↑ Div Indirect: ↓ Div	↓ Div

The line of argumentation is similar to the effect of τ^C on dividends predicted by the old view: A rise in τ^{Div} increases r^*_{old}, fewer projects with their given r will be able to satisfy the higher r^*_{old}, investors invest less in corporate projects, fewer projects are realised, and firms generate lower profits resulting in a lower level of dividends in t+1.

The new view stipulates "dividend tax neutrality" (Chetty and Saez, 2010, p.5) which implies that a rise in τ^{Div} has no effect on a firm's dividend payout decision. If τ^{Div} is increased at the beginning of period t and remains at this new level until the end of period t+1, net dividends received by the investor in t (arrow G) or t+1 (arrow F) would be equally reduced. Consequently, r^*_{new} stays constant and the firm's decision to distribute dividends in t or invest in a project followed by paying dividends in t+1 is not impacted at all. In essence, the new view expects dividend payout in t and t+1 to remain unaffected if τ^{Div} changes. This prediction is likely to hold in the absence of agency issues and shareholder conflicts[8].

> Hypothesis 3: An increase in personal income taxes reveals an ambiguous effect on corporate payout in both old view (t+1) and new view (t, t+1).

Irrespective of the marginal source of finance, an increase in τ^I impacts dividend payouts in two ways. First, there is a direct effect on the after-tax returns on the bond (old view: arrow D; new view: arrow H). An increase in τ^I reduces these after-tax returns such that investing in corporate projects becomes relatively more attractive for the investor (old view) and the firm (new view). In other words, an increase in τ^I reduces the investor's minimum required rate of return, r^*_{old} and r^*_{new}. Consequently, investors (old view) and firms (new view) will invest more in corporate projects in t leading to more projects being realised, and higher profits generated by firms which, in turn, result in higher dividends in t+1 in both old view and new view. The new view additionally predicts an effect on dividends in period t. More investments in corporate projects in t automatically mean that less retained earnings are available to be distributed in t. Hence, dividends in t are expected to decline if τ^I increases.

Second, there is an indirect effect on the project pre-tax returns, r, which are a function of τ^I. Intuitively, a rise in τ^I increases labour costs of firms. Assuming that revenues generated by projects remain constant, this rise in labour costs decreases r leading to lower after-tax earnings on the firm level (old view: arrow B; new view: arrow E) and reduced net dividends in t+1 (old view: arrow C; new view: arrow F). Hence, fewer projects will be able to meet r^*_{old} and r^*_{new} such that investors (old view) and firms (new view) invest less in corporate projects in t resulting in lower profits and a lower level of dividends in t+1 in both neoclassical models. Once again, the new view additionally predicts an effect on dividends in t. A lower level of investments in corporate projects in t directly corresponds to more retained earnings which can be distributed in period t. Thus, dividend payments in t are expected to rise if τ^I increases. This hypothesis is likely to hold if workers have a strong negotiation power vis-à-vis firms, for example in the presence of strong unions, allowing workers to shift part of the tax burden to firms (Alesina et al., 2002).

> Hypothesis 4: In t+1, an increase in consumption taxes decreases dividends in both old view and new view. In t, an increase in consumption taxes increases dividends in the new view.

Similar to personal income taxes, consumption taxes have an indirect effect on corporate payout. "Consumption taxes drive a wedge between the price that consumers pay and the price that producers receive. Hence, [the] firms' profitability

[8] For simplicity, I abstract from agency issues. However, I acknowledge that governance plays an important role in corporate payout decisions. In the setting of the 2003 dividend tax cut in the U.S., Chetty and Saez (2005) show that agency issues shape payout responses as well-governed firms (i.e., firms with strong principals such as institutional investors with large shareholdings) or agents whose interests are aligned with shareholders' interests (e.g., due to high executive share ownership) respond more strongly to a tax cut in dividends. Likewise, Jacob and Michaely (2017) find that agency issues and shareholder conflicts mute a firm's payout response in the context of the 2006 dividend tax cut in Sweden.

is expected to decrease when consumption taxes increase" (Jacob et al., 2018, p.3). In other words, an increase in τ^{VAT} lowers the pre-tax return on firms' projects, r. Thus, fewer projects are able to meet r^*_{old} and r^*_{new} such that investors (old view) and firms (new view) invest less in corporate projects in t. In t+1, this yields lower profits and therefore lower dividends according to both old view and new view. In addition, the new view stipulates higher dividends in t as a lower level of investment in corporate projects means that more retained earnings will be distributed in t.

3. Data and Descriptive Statistics

The majority of data used in my analysis was issued by the WHU Chair of Business Taxation which, in turn, withdrew these data from three main sources. First, firm-level information on listed firms around the world over the period 1997 to 2013 was derived from the Compustat North America and Global database. Second, annual tax rates involving corporate taxes, dividend taxes, personal income taxes, and consumption taxes were retrieved from tax handbooks released by Ernst & Young, KPMG, PricewaterhouseCoopers, and Deloitte. Third, country-level statistics comprising macroeconomic variables, country governance indicators, income group descriptions[9], and region group classifications[10] were extracted from the World Bank database.

After consolidating all data[11], I converted each monetary variable which was originally quoted in each firm's local currency into USD using average annual exchange rates provided by the WHU Chair of Business Taxation. Subsequently, I conducted general data cleaning by excluding firms with SIC codes 4000-4999 and 6000-6999[12]. The general data cleaning was further complemented by dropping all observations which appeared illogical for my analysis in six steps. First, I dropped observations for which there was no information on total assets or when total assets were negative. Second, I removed bankrupt firms (i.e., firms with a book value of common equity equal to or lower than zero) from my dataset. Third, I dropped firms with negative values for cash and short-term investments, sales, and cash dividends[13]. Fourth, firms with leverage values smaller than zero and larger than or equal to one were excluded, too. Fifth, I also removed observations with negative tax rates or tax rates exceeding one. Sixth, I excluded negative values for the macroeconomic variables GDP per Capita, Openness, Government Debt, and Interest Payments which, realistically, are not smaller than zero.

Lastly, I winsorised my lagged firm controls and non-dummy dependent variables below the 1st percentile and above the 99th percentile of observations to mitigate biased results caused by large outliers. After all adjustments, the sample used for my baseline regression consists of 42,672 firms across 115 countries over the period 1997 to 2013[14]. Table 2 shows descriptive statistics for all dependent variables, tax rates, firm-level variables, and country-level variables contained in this sample.

4. Pre-Analysis: Variation in Tax Rate Changes and Linear Probability Model

Prior to running a baseline regression, two major concerns have to be addressed. First, the underlying sample has to overcome the frequently objected "lack of compelling tax variations" (Chetty and Saez, 2005, p. 792) to avoid a small number of events potentially biasing my results. Otherwise, it would be difficult to make a well-founded generalisation of the impact of taxes on corporate payout. Second, all four tax rates, which constitute the independent variables of my baseline regression, have to be exogenous to conduct convincing causal inference.

To address the first concern, the sample of my baseline regression indeed contains sufficient variation in all four tax rates. Across all 115 countries over the period 1999 to 2013, there are 315 corporate tax changes (48 increases; 267 decreases), 144 dividend tax changes (72 increases; 72 decreases), 217 personal income tax changes (76 increases; 141 decreases), and 105 consumption tax changes (72 increases; 33 decreases).

[9] The original dataset provided by the WHU Chair of Business Taxation contained some missing data entries on income group descriptions which, however, were required to successfully change fixed effects in the robustness section. Using World Bank data, I manually amended 15 income group descriptions in total for Argentina, Jamaica, New Zealand, and Nigeria where some country-years contained a missing entry. Please refer to the Excel file WorldBank_Data_Income_History stored on the USB device for details on the missing income group descriptions for these four countries. Furthermore, I retrieved the full historical income group dataset from the World Bank database covering the period 1998 to 2013 for 66 countries like Estonia, Saudi-Arabia, Taiwan, and Vietnam for which firm data already existed but no information on income groups was present. Please refer to the Excel file WorldBank_income_group_history_missing stored on the USB device for details on the missing income group descriptions for these 66 countries.

[10] I extracted region names and region codes from the World Bank database and added these data to the information provided by the WHU Chair of Business Taxation. This step was required to cluster all countries in my dataset by region and successfully make changes to the definition of my fixed effects in the robustness section. Please refer to the Excel file WorldBank_Data_Region_Codes stored on the USB device for detailed region information provided by the World Bank.

[11] The WHU Chair of Business Taxation additionally provided data on Tobin's q with high coverage across firms in my sample which I merged into my dataset. The initially provided dataset revealed a poor coverage of Market Value (i.e., market value of equity) and thus Tobin's q. Other attempts to generate Market Value via Common Shares Outstanding and Price Close (i.e., market price per share) hardly increased the coverage.

[12] This treatment is similar to Chetty and Saez (2005) and Jacob and Jacob (2013b) dropping financial firms (6000-6999) and utility firms (4900-4999) because firms in these industries are subject to "additional regulations and hence might have different payout behaviour" (Chetty and Saez, 2005, p.798). I additionally excluded transportation and (tele-)communication firms (4000-4899) since most of these firms are privatised companies which are small in number but contribute disproportionately much to aggregate dividends especially in the European Union (Von Eije and Megginson, 2008).

[13] Cash dividends refer to the variable Cash Dividends (Cash Flow) in my consolidated dataset serving as a proxy for corporate payout.

[14] Since all tax rates start in 1999, my baseline sample effectively starts in 1999, too. Consequently, the number of firms used in my baseline regression drops to 40,609 while the number of countries remains unchanged.

Table 2: Summary Statistics of Main Variables

This table is an overview of summary statistics of my main variables covering 42,672 firms across 115 countries over the period 1997 to 2013. Panel A shows the three payout variables which are used as dependent variables in my baseline regression. Panel B presents the four tax variables of interest. Panel C and Panel D depict firm-level and country-level controls, respectively. Please see table A.1 in the appendix for detailed definitions of all main variables. Note: Summary statistics of Dividend Yield (t) in Panel A and all firm-level controls in Panel C are based on the winsorised version of the respective variables to debias the mean.

Variable	N	Mean	Standard Deviation	25th percentile	Median	75th percentile
Panel A: Payout Variables						
Dividend Payer (t)	272,182	0.6584	0.4742	0	1	1
Dividend Increase (t)	224,464	0.2458	0.4305	0	0	0
Dividend Yield (t)	251,472	0.0087	0.0230	0.0000	0.0002	0.0052
Panel B: Tax Variables						
Corporate Tax	345,995	0.3215	0.0742	0.2700	0.3300	0.3900
Dividend Tax	345,374	0.1965	0.1183	0.1000	0.2000	0.2643
Personal Income Tax	345,374	0.3973	0.0938	0.3500	0.4000	0.4641
Consumption Tax	325,902	0.1073	0.0627	0.0519	0.1000	0.1700
Panel C: Firm-level Controls						
Leverage	369,79	0.0933	0.1564	0.0007	0.0112	0.1167
Cash Holdings (L. TA)	338,23	0.1270	0.2728	0.0020	0.0203	0.1130
Cash Flow	327,475	0.0110	0.1602	-0.0002	0.0029	0.0541
Profits	337,816	0.0267	0.2107	-0.0037	0.0517	0.1141
Retained Earnings	336,703	-0.2718	1.3584	-0.0032	0.0033	0.0581
Ln(Sales Growth)	323,767	0.0876	0.4336	-0.0460	0.0730	0.2182
Tobin's q	279,478	1.5000	3.5913	0.3319	0.6838	1.4020
Firm Size	388,244	6.5550	3.0444	4.3861	6.3837	8.4699
Panel D: Country-level Controls						
Macroeconomic Variables						
Ln(GDP per Capita)	363,858	9.6126	1.3841	8.6600	10.4301	10.5557
GDP Growth	363,943	3.5811	3.4686	1.7292	3.1400	5.1472
Inflation	363,943	2.7069	4.3171	0.8477	2.0327	3.7157
Openness	304,225	0.7265	0.8648	0.2829	0.4831	0.6549
Deficit	269,554	-2.6677	3.9788	-4.8523	-3.1779	0.0177
Interest Payments	279,996	0.0225	0.0123	0.0150	0.0230	0.0276
Government Debt	196,656	60.9354	37.7064	40.0881	53.5029	64.0318
Governance Indicators						
Voice and Accountability	371,063	0.6718	0.8952	0.3900	1.0100	1.3500
Political Stability	371,058	0.3317	0.8166	-0.2000	0.6000	0.9600
Government Effectiveness	371,047	1.1320	0.7665	0.4000	1.4600	1.7500
Regulatory Quality	371,047	0.9723	0.7836	0.4200	1.1900	1.6200
Rule of Law	371,063	0.9889	0.7968	0.2900	1.3300	1.6100
Control of Corruption	371,047	0.9796	0.9781	0.0500	1.2900	1.8350

To address the second concern, I employ a linear probability model inspired by Jacob et al. (2018) to determine likely country-level correlates with the magnitude of tax rate changes and ideally rule out issues "that tax policy is not exogenously determined [sic] but related to changes in economic conditions" (Jacob et al., 2018, p.15). Results of the linear probability model are presented in Table 3.

Overall, changes in dividend taxes and personal income taxes appear to be exogenous. Changes in corporate taxes and consumption taxes, however, are likely to be influenced by the macroeconomic factors GDP Growth and Ln(GDP per Capita) and the factors GDP Growth and Deficit, respectively. The significance of GDP Growth suggests that, based on my dataset, policy makers tend to decrease (increase) corporate

Table 3: Results of Linear Probability Model

This table presents how macroeconomic determinants of tax rates potentially affect the magnitude of a tax rate change in corporate taxes (column (1)), dividend taxes (column (2)), personal income taxes (column (3)), and consumption taxes (column (4)). The definitions of all tax rates and macroeconomic variables are outlined in the appendix in Table A.1. I include country fixed effects and region-year fixed effects in all four regressions. I report robust standard errors clustered at the country level which are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	Magnitude of Tax Rate Change in			
	Corporate Taxes (1)	Dividend Taxes (2)	Personal Income Taxes (3)	Consumption Taxes (4)
GDP Growth	-0.0006**	-0.0004	0.0000	-0.0006***
	(0.0002)	(0.0008)	(0.0006)	(0.0001)
Ln(GDP per Capita)	0.0258**	-0.0353	0.0114	-0.0003
	(0.0113)	(0.0292)	(0.0218)	(0.0052)
Inflation	-0.0000	0.0002	0.0000	-0.0000
	(0.0001)	(0.0003)	(0.0002)	(0.0001)
Deficit	-0.0002	0.0005	-0.0005	0.0004*
	(0.0002)	(0.0008)	(0.0004)	(0.0002)
Openness	0.0089	0.0105	-0.0024	0.0037
	(0.0072)	(0.0215)	(0.0187)	(0.0036)
Interest Payments	0.1823	0.0757	0.1096	0.1045
	(0.1348)	(0.3864)	(0.1674)	(0.0632)
Observations	800	743	743	709
Country FE	Yes	Yes	Yes	Yes
Region-Year FE	Yes	Yes	Yes	Yes
Adjusted R-squared	0.014	-0.072	-0.106	0.095

taxes and consumption taxes in periods where the economy is in a boom phase (recession). Also, corporate taxes are likely to be increased (decreased) if a country generates a higher (lower) level of GDP per Capita implying that an economy becomes more (less) productive and thus wealthier (poorer). Consumption taxes are likely to rise (be reduced) if a country's budget deficit increases (decreases). This result seems to be reasonable as, intuitively, an increase in government spending needs to be somehow financed; this finding, however, is not in line with the linear probability model results of Jacob et al. (2018) despite using (almost) the same underlying dataset[15]. Across all tax rates, the variables Inflation, Openness, and Interest Payments appear to be insignificant.

Based on these results, I include a GDP-Growth-Ln(GDP per Capita) cluster in a fixed effect used in my baseline regression[16]. This way, it is possible to account for potential endogeneity in tax rate changes and compare countries which are economically similar in terms of GDP level and GDP growth rates.

5. Baseline Regression

To investigate the average effect of a tax rate change on corporate payout, I stipulate the following linear regression model using the ordinary least squares (OLS) estimation method:

$$\begin{aligned}\text{Payout}_{i,j,t} = \alpha_0 &+ \beta_1 \text{CorporateTax}_{j,t} + \beta_2 \text{DividendTax}_{j,t} \\ &+ \beta_3 \text{PersonalIncomeTax}_{j,t} + \beta_4 \text{ConsumptionTax}_{j,t} \\ &+ \delta_1 \Phi_{i,j,t-1} + \delta_2 \Gamma_{j,t} + \alpha_i + \alpha_{g,k,t} + \epsilon_{i,j,t}\end{aligned} \tag{1}$$

The dependent variable $\text{Payout}_{i,j,t}$ is a payout measure of firm i headquartered in country j in year t. This payout measure is a placeholder for the three payout variables Dividend Payer (t), Dividend Increase (t)[17] and Dividend Yield (t)[18]

[15] Interestingly, my linear probability model results on consumption taxes (column (4)) are based on 709 observations whereas Jacob et al. (2018) rely on 664 observations.

[16] I deliberately excluded Deficit from the fixed effect because the linear probability model only proves marginal significance of this variable (p=.091). This stands in stark contrast to GDP Growth (p=.024; p=.000) and Ln(GDP per Capita) (p=.027). Thus, the significance of Deficit arguably could have emerged by chance. Also, excluding Deficit is unlikely to adversely affect my baseline results since it is correlated with the other two macroeconomic variables incorporated in the fixed effect. Please refer to the correlation matrix in 2.0_LPM_RESULTS_(EDITED) for further details.

[17] Dividend Increase (t) covers a firm's likelihood to substantially increase (if a firm was a dividend payer in year t-1) or initiate dividends in year t (if a firm was no dividend payer in year t-1). This variable is particularly interesting as "against the background of the general stickiness of dividends ..., the decision to initiate or substantially increase dividends is a strong commitment to a long stream of cash outlays (as opposed to a simple 1-year commitment that can be easily reversed)" (Jacob and Jacob, 2013b, p.1256). In my baseline regression, a substantial increase in dividends is defined as an increase by at least 25%. This might be viewed as sufficiently strict since the number of observations where firms pay dividends in year t-1 and increase them in year t drops from 90,546 to 48,002 while observations covering initiations remain unaffected.

[18] Dividend Yield (t) is defined as the dividend-to-total-assets ratio similar

based on previous literature (e.g., Jacob and Jacob, 2013a; Alstadsæter et al., 2017). All variable definitions are presented in the appendix in Table A.1. In my baseline model, I restrict all dependent variables to the time identifier (t) representing year t (i.e., the year in which a change in taxes first becomes effective) for two reasons. First, most firms are likely to react quite fast to a change in taxes to maximise profits and shareholder value. This assumption seems to be reasonable as most tax rate changes are announced several months or, in favourable cases, a year in advance prior to becoming effective. Second, Brav et al. (2008) have shown that tax-related payout motives gain importance in the immediate aftermath of a tax rate change but only play a minor role in subsequent periods.

The independent variables of interest are the four tax variables $\text{CorporateTax}_{j,t}$, $\text{DividendTax}_{j,t}$, $\text{PersonalIncomeTax}_{j,t}$, and $\text{ConsumptionTax}_{j,t}$. The baseline regression also includes two control vectors to account for alternative determinants of corporate payout on the firm level and the country level which are denoted by $\Phi_{i,j,t-1}$ and $\Gamma_{j,t}$, respectively. Control vector $\Phi_{i,j,t-1}$ consists of the following eight firm-level controls which are frequently used in literature[19] (e.g., Jacob and Jacob, 2013b): Leverage, Cash Holdings (L. TA), Cash Flow, Profits, Retained Earnings, Tobin's q, Sales Growth, and Firm Size[20]. To rule out endogeneity concerns, I additionally lag each variable included in this vector by one year. Control vector $\Gamma_{j,t}$ consists of nine country-level controls. Inspired by Jacob et al. (2018), I included the three macroeconomic variables GDP Growth, Ln(GDP per Capita), and Inflation[21] besides the six governance indicators Voice and Accountability, Political Stability, Government Effectiveness, Regulatory Quality, Rule of Law, and Control of Corruption in this control vector.

I employ two fixed effects in my baseline regression. First, I use firm fixed effects, α_i, to control for firm characteristics which potentially impact payout decisions (e.g., firm age). Second, I employ group-industry-year fixed effects, $\alpha_{g,k,t}$, where group (subscript g) refers to a GDP-Growth-Ln(GDP per Capita) cluster. This cluster is additionally combined with a specific industry k in year t to compare firms in the same industry-year which also operate in economically similar countries in terms of GDP level and GDP growth rates. Finally, I use heteroskedasticity-robust standard errors which are clustered at the country level since firms headquartered in country j are exposed to the same tax system.

Returning to the four hypotheses in section 2, my baseline regression only allows a clear causal interpretation of results with respect to the new view in period t because of two reasons. First, periods t and t+1 in the single-period model are a simplified theoretical abstraction where period t models short-run effects (i.e., payout responses in year t and year t+1) and period t+1 models long-run effects (i.e., payout responses in more distant future periods such as year t+5). Long-run effects, in particular, are difficult to measure since period t+1 might represent many years (e.g., ten years) until old-view firms eventually start distributing dividends. Similarly, it could take new-view firms a long time until they show a payout response matching predictions of period t+1 assuming that no other tax rate change occurs in the meantime. Also, dividend payout in more distant future periods is increasingly determined by confounding factors (e.g., a firm's financial performance and general economic developments). Therefore, I measure payout in year t (baseline regression) and year t+1 (second baseline extension) and thus restrict the interpretation of my results to short-run responses matching period t in the neoclassical models. Second, the sole consideration of short-run responses, by definition, only allows validation or rejection of new-view predictions in period t as the old view does not predict any payout response in period t (i.e., old-view firms receive new equity and thus cannot adjust their payout behaviour to a change in taxes in period t). This argumentation is further supported when considering a typical old-view firm characterised by young age, high growth rates, and financial constraints (Chetty and Saez, 2010) suggesting that they are less likely to distribute dividends in order to grow further. If these firms become more mature, grow at lower rates, and have sufficiently high financial reserves, they are more likely to distribute dividends on a regular basis[22] (see also Sinn, 1991). Thus, even though my sample likely consists of dividend-paying firms which might

to Alstadsæter et al. (2017). Due to poor coverage of market capitalisation, conventional definitions such as "the dollar amount of dividends paid out in year t+1 divided by the end-of-year t equity market value" (Jacob and Jacob, 2013a, p.1251) are not used.

[19] My baseline regression does not include any proxy for ownership structure although previous literature has shown that it heavily impacts corporate payout decisions as agency issues (e.g., Chetty and Saez, 2005) and shareholder conflicts might arise or be mitigated (Jacob and Michaely, 2017). Due to lack of compelling data, however, I cannot proxy for ownership structure (e.g., via percentage of closely held shares (Jacob and Jacob, 2013b)) which may reduce the explanatory power of my model.

[20] Leverage considers that creditors in firms with a high debt-to-capital ratio tend to urge these firms to refrain from distributing dividends (e.g., Jensen, 1986). Cash Holdings (L. TA) acknowledges that cash-rich firms, intuitively, have more funds to be distributed to shareholders (e.g., Chetty and Saez, 2010). I incorporate Cash Flow to capture the positive effect of a company's cash flow on dividends (e.g., Jacob and Jacob, 2013a) which goes beyond considering pure cash holdings. Profits are a proxy for internal resources in addition to cash holdings (e.g., Jacob and Michaely, 2017). Retained Earnings acknowledge that mature firms tend to have larger retained earnings which are more likely to distribute dividends and pay larger amounts (e.g., Jacob and Jacob, 2013b). Tobin's q is "a proxy for stock undervaluation and growth opportunities" (Jacob and Jacob, 2013b, p.1254) and Sales Growth also measures growth opportunities (e.g., Alstadsæter et al., 2017). Firm Size is used since larger firms, intuitively, have a higher propensity to pay dividends and distribute larger amounts (e.g., Jacob and Michaely, 2017).

[21] I exclude the remaining macroeconomic variables Openness, Deficit, Interest Payments, and Government Debt from my baseline regression due to poor coverage which could potentially bias my results. Please refer to Table 1 showing that these four variables have a considerably lower coverage than GDP Growth, Ln(GDP per Capita), and Inflation. Nonetheless, I incorporate Openness, Deficit, and Interest Payments into the vector $\Gamma_{j,t}$ as a robustness test in section 7.

[22] Consistent with the model of Sinn (1991), I assume that old-view firms transform into new-view firms over time. This assumption is supported by DeAngelo et al. (2006, p. 227): "Consistent with a life-cycle theory of dividends, the fraction of publicly traded ... firms that pay dividends is high when retained earnings are a large portion of total equity (and of total as-

exhibit some characteristics of old-view firms (e.g., financial constraints), it is still reasonable to focus on the new view when interpreting my baseline results.

Based on my initial hypotheses in the light of the new view in period t, I derive the following four predictions. First, I expect the coefficient of $\text{CorporateTax}_{j,t}$ to be significant and positive (i.e., $\beta_1 > 0$) across all payout variables as an increase in corporate taxes in year t exerts pressure on firms which are financed via retained earnings to directly distribute dividends in year t instead of investing in a project whose after-tax returns, and thus dividends in future periods, decline from higher corporate taxes[23]. Second, I predict the variable $\text{DividendTax}_{j,t}$ to be insignificant as implied by the hypothesised "dividend tax neutrality" (Chetty and Saez, 2010, p.5). Third, the effect of a change in personal income taxes on corporate payout depends on whether the direct effect or the indirect effect prevails. The direct effect predicts lower (higher) dividends in year t in terms of probability and magnitude due to higher (lower) attractiveness of investing in corporate projects compared to other investment opportunities (e.g., bonds). Conversely, the indirect effect forecasts higher (lower) dividends in year t due to higher (lower) labour costs yielding a lower (higher) the relative attractiveness of corporate projects. Thus, if the direct (indirect) effect dominates, I expect $\text{PersonalIncomeTax}_{j,t}$ to have significant and negative (positive) coefficients across all payout variables (i.e., direct: $\beta_3 < 0$; indirect: $\beta_3 > 0$). Fourth, I predict the coefficients of $\text{ConsumptionTax}_{j,t}$ to be significant and positive (i.e., $\beta_4 > 0$) across all dependent variables as a rise in consumption taxes increases the tax wedge (Jacob et al., 2018) which reduces corporate investment. This, in turn, makes more retained earnings available to be distributed as dividends in year t instead.

The compact version of my baseline results is shown in Table 4. Columns (1), (2), and (3) (columns (4), (5), and (6)) report the coefficients of each tax rate (the relative effect of a one-percentage-point increase in a tax rate) with regard to the dependent variables Dividend Payer (t), Dividend Increase (t), and Dividend Yield (t), respectively. A detailed results overview of coefficients (standard errors) for all regressors (i.e., including firm-level and country-level controls) is shown in Table A.2 in the appendix.

Interestingly, the results of my baseline regression only partially confirm my hypotheses based on the new view in period t. On average, corporate taxes do not seem to impact any payout variable due to insignificant coefficients in all three columns. This suggests that firms do statistically not respond to a change in corporate taxes which is not consistent with the new view in period t. Although the insignificant coefficients suggest that an effect is statistically not present, it is surprising that the sign of all coefficients is negative and not, as expected, positive. My hypothesis on corporate taxes does not predict this outcome which I therefore recommend examining in future studies.

According to my baseline regression, the hypothesised "dividend tax neutrality" (Chetty and Saez, 2010, p.5) only holds with regard to a firm's relative amount of dividends[24] due to an insignificant coefficient in column (3). With respect to a firm's propensity to pay and the likelihood to increase or initiate dividends, dividend taxes seem to influence a firm's payout behaviour due to significant coefficients in columns (1) and (2). Surprisingly, the direction of the effect (i.e., sign of coefficient) differs between the dependent variables. Inconsistent with initial expectations, column (1) shows that a rise in dividend taxes in year t by one percentage point (in the following abbreviated as pp) increases the probability of a firm distributing dividends in year t by 0.24pp[25]. The relative effect, however, is comparatively small as a one-pp increase in dividend taxes in year t increases the probability of a firm paying dividends in year t by 0.36%[26] relative to the average probability of a firm paying dividends. Despite this small relative effect size, neither the new view nor empirical studies evidencing a negative relation between dividend taxes and a firm's propensity to pay dividends (e.g., Chetty and Saez, 2005) support the positive coefficient in column (1). Thus, the reason for this effect should be further investigated in future studies. On the contrary, a rise in dividend taxes in year t by one pp results in a lower likelihood to increase or initiate dividends in year t by 0.25pp. This result is again not in line with the new view but would be supported by the empirical

sets) and falls to near zero when most equity is contributed rather than earned."

[23]This explanation assumes one of the two following conditions. First, shareholders must be sufficiently strong to exert pressure on management teams. As shown by Chetty and Saez (2005), this is the case for firms with strong principals, i.e., large institutional investors such as pension funds and independent directors are major shareholders. Second, firms in which their management teams hold a high percentage of shares are more likely to act on behalf of their shareholders as managers are major shareholders themselves and thus benefit from higher dividends, too (Chetty and Saez, 2005).

[24]This interpretation appears to depend on the observations in my sample as the coefficient of $\text{DividendTax}_{j,t}$ in column (3) is only marginally not significant (p=.109). Therefore, it is possible that a slightly different sample composition could have shown significant results implying that the "dividend tax neutrality" (Chetty and Saez, 2010, p.5) does not hold. In such a scenario, the effect on Dividend Yield (t) would have a similar interpretation as the effect on Dividend Payer (t) (see column (1)), but the relative effect size of 1.02% is considerably larger given that Dividend Yield (t) is defined as dividends divided by lagged total assets. Please refer to footnote 26 for the relative effect calculation.

[25]Please note that all coefficients in Table 4 pertain to tax rates ranging from 0 (i.e., 0%) to 1 (i.e., 100%) in my original dataset. For example, the tax rate 0.30 for a specific country-year refers to a tax rate equal to 30%. To interpret the coefficients as a one-pp increase in a tax rate (i.e., a tax rate change by one unit equivalent to one pp), I mathematically transform these tax rates into whole numbers ranging from 0 to 100 (i.e., I multiply these tax rates by 100) and simultaneously divide the respective coefficients by 100. Hence, the coefficient 0.2389 (0.24 after rounding) turns into 0.002389 (0.0024). As my dependent variables are also defined between 0 (0%) and 1 (100%), I can interpret a one-pp increase in the corporate tax rate (e.g., from 30% to 31%) as a change in my dependent variable by 0.2389pp (0.24pp).

[26]The relative effect is calculated by dividing 0.002389 (i.e., transformed coefficient) by 0.6584 (i.e., the average value of the dependent variable; please refer to Table 2 presenting summary statistics on all dependent variables). This yields 0.0036 or 0.36%. Please refer to the tab Relative Effect Calculation in the Excel file 3.0_Baseline_Results_(Edited)_Final for all calculations.

Table 4: Results of Baseline Regression (incl. Relative Effects)

This table shows the compact version of the results of my baseline regression from 1999 to 2013. Additionally, the relative effect of a change in taxes on each dependent variable is included in columns (4), (5), and (6). Relative effects are computed by dividing the coefficient of a tax variable by the mean of the respective dependent variable. The dependent variables are Dividend Payer (t) (column (1) and (4)), Dividend Increase (t) (column (2) and (5)), and Dividend Yield (t) (column (3) and (6)). All independent variables are defined in the appendix in Table A.1. I include firm fixed effects and gdp-cluster-industry-year fixed effects in all three regressions. Please note that gdp-cluster is a placeholder representing a GDP-Growth-Ln(GDP per Capita) cluster. I report robust standard errors clustered at the country level which are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively. Please refer to Table A.2 in the appendix for a more detailed overview (including number of observations, adjusted R-Squared, etc.) of my regression results. Note: The mean of Dividend Yield (t) is based on the winsorized version of the respective variable to avoid biased results due to the presence of extreme values.

	Coefficients			Relative Effects		
	(1)	(2)	(3)	(4)	(5)	(6)
Corporate Tax	-0.1549	-0.2884	-0.0154	-0.24%	-1.17%	-1.78%
	(0.1821)	(0.1872)	(0.0166)			
Dividend Tax	0.2389***	-0.2461**	0.0088	0.36%	-1.00%	1.02%
	(0.0655)	(0.1213)	(0.0054)			
Personal Income Tax	-0.3154***	-0.1049	-0.0543***	-0.48%	-0.43%	-6.27%
	(0.1185)	(0.0903)	(0.0129)			
Consumption Tax	1.2559*	1.8259***	0.0883**	1.91%	7.43%	10.19%
	(0.6998)	(0.6860)	(0.0420)			

findings of Chetty and Saez (2005) showing that listed firms increasingly initiated or increased dividends in the six quarters following the dividend tax cut in the U.S. in 2003[27]. Yet, the relative effect size is again small: A one-pp increase in dividend taxes merely reduces a firm's likelihood of increasing or initiating dividends in year t by 1.00% compared to the average likelihood of increasing or initiating dividends.

Regarding personal income taxes, the direct effect on payout appears to dominate the indirect effect with regard to a firm's propensity to pay dividends and the relative amount of dividends due to negative and significant coefficients in columns (1) and (3), respectively. Thus, firms appear to acknowledge that an increase in personal income taxes makes future dividends from corporate investments more attractive for investors who would otherwise invest in less attractive investments such as bonds after receiving dividends in year t. Therefore, firms invest more in year t, which, in turn, yields lower dividends in year t[28]. To be more precise, a one-pp increase in personal income taxes reduces a firm's propensity to pay dividends by 0.32pp and the amount of dividends distributed by 0.05pp of lagged total assets with small (i.e., negative 0.48%) and large (i.e., negative 6.27%) relative effect sizes, respectively. Due to a negative but insignificant coefficient in column (2), an increase in personal income taxes in year t, however, reveals that neither the direct effect nor the indirect effect eventually dominates in terms of a firm's likelihood to increase or initiate dividends in year t.

Due to significant coefficients in columns (1), (2), and (3), consumption taxes seem to impact all payout variables. Also, the direction of the effect is consistent with my hypothesis as all coefficients are positive. For example, a one-pp rise in consumption taxes yields a 1.26pp (1.83pp; 0.09pp) increase in a firm's propensity to pay dividends (likelihood to increase or initiate dividends; amount of dividends relative to lagged total assets). Also, columns (5) and (6) suggest that the relative effect size of a change in consumption taxes is moderately large (7.43%) and considerably large (10.19%) compared to the average likelihood to increase or initiate dividends and the average relative amount of dividends, respectively. By contrast, column (4) suggests that the relative effect size of a change in consumption taxes compared to the average likelihood to pay dividends at all is moderately small (1.91%). These results provide evidence that a rise in consumption taxes increases the tax wedge which, in turn, reduces corporate investment. Thus, more retained earnings are available to be distributed as dividends which results in a higher probability to pay, increase or initiate, and a larger relative amount of dividends distributed in year t.

To conclude, my hypotheses based on the new view in period t are only partially confirmed[29]. My baseline results mostly corroborate the neoclassical predictions on personal

[27] Chetty and Saez (2005), however, implicitly argue that the payout response measured over these six quarters in 2003 and 2004 is sufficient to validate long-run responses. Thus, they conclude that their results resemble predictions of the old view. As outlined above, however, long-run payout responses are technically difficult to measure in year t and year t+1. Hence, I would be cautious when considering the conclusion of Chetty and Saez (2005) and rather interpret my findings in the context of the new view in period t.

[28] As mentioned in footnote 7, this interpretation assumes that firms and investors are in a tax jurisdiction where labour income and interest income are taxed at the same rate (e.g., the U.S.). Thus, my interpretation of the results at first glance seems to be vague when considering other countries. However, regarding the disproportionately high percentage of dividend-paying firms in my sample which are headquartered in the United States (17,786 out of 166,084 and 159,721 observations), they might have vastly contributed to this result due to major personal income tax changes in the U.S. in 2003 and 2013. Yet, there might also be an alternative explanation especially for other tax jurisdictions than the U.S. which I recommend examining in future studies.

[29] I also test for three alternative thresholds defining a substantial in-

income taxes (i.e., direct effect mostly prevails) and consumption taxes (i.e., positive and significant coefficients across all payout variables). The neoclassical predictions on corporate taxes and dividend taxes, however, are mostly not supported by the baseline results. In the following, I therefore additionally test whether my hypotheses hold in the context of (a) cash-rich firms and (b) dependent variables with the new time identifier (t+1).

6. Extensions to the Baseline Model

6.1. Heterogeneity in Payout Responses due to Different Levels of Cash Holdings

The first extension of my baseline model considers heterogeneity in payout responses arising from different levels of cash holdings. As the average payout response only partially confirms my initial hypotheses, I disentangle the average response and consider the payout behaviour of cash-rich firms. According to neoclassical theory, cash-rich firms are predicted to follow the new view because these firms have sufficient cash holdings and retained earnings to finance new projects or distribute dividends (Chetty and Saez, 2010). To account for differences in cash holdings, I therefore define the dummy variable High Cash which is equal to one if a firm has a cash-to-total-assets ratio (Cash Holdings (TA)) larger than the median value[30] of this ratio in a given country-year. Subsequently, I interact each tax variable with High Cash to examine whether cash-rich firms exhibit a different payout response compared to the average response of my baseline regression.

I expect one of the two following outcomes to materialise. First, the response of cash-rich firms could match predictions of the new view in period t more closely than suggested by the average response in my baseline regression. In this case, I would expect the sign of the combined effect (i.e., average effect plus marginal effect if firm is cash rich) of each tax rate in this extension to have the same sign as the beta of the respective tax rate as originally predicted for the baseline regression. For instance, the combined effect of corporate taxes on dividends is expected to be positive if a firm is cash rich, i.e., the marginal effect is predicted to be positive and significant offsetting the negative average effect. Second, cash-rich firms might simply react more strongly compared to the average response. That is, the sign of the interaction term coefficient is expected to be positive (negative) if the coefficient of the average response shows a positive (negative) sign. The latter expectation is based on the findings of Alstadsæter et al. (2017) showing that cash-rich firms respond more strongly to a tax cut in dividends. Building on this result, I extend the scope of Alstadsæter et al. (2017) and include three further tax rates.

Table 5 reports the results of my first baseline extension. In column (2), the coefficients of the interaction terms[31] suggest that cash-rich firms react more strongly to a change in personal income taxes and consumption taxes. In fact, cash-rich firms exhibit an even higher and even lower likelihood of increasing or initiating dividends if personal income taxes and consumption taxes rise, respectively. To be more precise, cash-rich firms are 0.15pp less (0.16pp more) likely to increase or initiate dividends if personal income taxes (consumption taxes) increase by one pp which corresponds to a total decrease (increase) in a firm's likelihood to increase or initiate dividends by 0.17pp (1.92 pp) if the firm is cash rich. In relative terms, a change in personal income taxes and consumption taxes implies that cash-rich firms respond more strongly almost by factor 8 and by 9.08%[32], respectively. However, a firm's propensity to pay dividends and the relative amount of dividends do not vary with different levels of cash holdings among firms.

From these results, I infer that the predictions of Alstadsæter et al. (2017) (i.e., my second expected outcome) conceptually hold for personal income taxes and consumption taxes with respect to a firm's likelihood to increase or initiate dividends. The expected stronger payout response of cash-rich firms to a change in dividend taxes, however, cannot be inferred from my results. Also, cash-rich firms do not appear to respond more strongly to changes in corporate taxes. Furthermore, the stronger response of cash-rich firms in the event of a change in personal income taxes (here: direct effect) and consumption taxes confirms my first expected outcome, too. In other words, the combined effect (i.e., average effect plus marginal effect if firm is cash rich) of both tax rates in this extension has the same sign as the beta of the respective tax rate as originally predicted for the baseline regression. This suggests that cash-rich firms as a proxy

crease for the variable Dividend Increase (t): 10%, 50%, and 100%. When modifying this threshold, results are similar for $\text{DividendTax}_{j,t}$ and $\text{PersonalIncomeTax}_{j,t}$ in significance and magnitude. Results on other tax rates, however, vary depending on the specification. Please refer to the Excel file 3.1_DivIncr(t)_THRESHOLDS_(EDITED) for detailed regression results on all alternative threshold definitions.

[30] I define the median value by country-year instead of country-industry-year to rule out a potentially incorrect High Cash classification of firms. For example, firms operating in cash-rich industries would be classified as cash-poor firms if they have lower cash holdings compared to their industry peers. This would occur even though these below-median firms have significantly larger cash holdings compared to firms in cash-poor industries. Hence, I abstract from industry-specific differences in cash reserves and solely acknowledge that cash holdings might vary across countries.

[31] Please note that I only interpret the interaction effects since I am interested in whether cash-rich firms exhibit a different payout response compared to the average response. Consequently, I disregard the average effects in this regression as they are not examined by my research question in this section.

[32] These numbers describe by how much more strongly cash-rich firms react relative to the average effect. Therefore, I use the coefficients in column (2) of Table 5 and divide the combined effect (i.e., average effect plus marginal effect if firm is cash rich) by the average effect and finally subtract 1. A change in personal income taxes yields a stronger response of cash-rich firms by factor 7.9319 or 793.19% (i.e., [((-0.1515) + (-0.0191)) / (-0.0191) – 1] which is the same as the marginal effect dividend by the average effect, i.e., [(-0.1515) / (-0.0191)]). Similarly, a change in consumption taxes causes a stronger response by 9.08% (i.e., 0.0908 = 0.1594 / 1.7563) if the firm is cash rich.

Table 5: Differences in Payout Behaviour due to Different Cash Holdings

This table displays the regression results showing whether different levels of cash holdings explain different payout responses between firms from 1999 to 2013. I define Dividend Payer (t) (column (1) and (4)), Dividend Increase (t) (column (2) and (5)), and Dividend Yield (t) (column (3) and (6)) as my dependent variables. All independent variables are defined in the appendix in Table A.1. Additionally, I interact each tax rate with a dummy (High Cash) equal to one if a firm has a cash-over-total-assets ratio (Cash Holdings (TA)) larger than the median in a given country-year. In columns (1), (2), and (3), I include firm fixed effects and gdp-cluster-industry-year fixed effects. Please note that gdp-cluster is a placeholder representing a GDP-Growth-Ln(GDP per Capita) cluster. In columns (4), (5), and (6), I include firm fixed effects and country-industry-year fixed effects. I report robust standard errors clustered at the country level which are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Corporate Tax	-0.1096	-0.2414	-0.0111			
	(0.1743)	(0.1888)	(0.0165)			
Corporate Tax	-0.0880	-0.0553	-0.0078	-0.0731	-0.0912**	-0.0066
× High Cash	(0.0807)	(0.0535)	(0.0049)	(0.0857)	(0.0431)	(0.0047)
Dividend Tax	0.2632***	-0.2383*	0.0111**			
	(0.0672)	(0.1241)	(0.0053)			
Dividend Tax	-0.0472	-0.0127	-0.0044	-0.0483	-0.0169	-0.0045
× High Cash	(0.0528)	(0.0141)	(0.0044)	(0.0529)	(0.0145)	(0.0044)
Personal Income Tax	-0.2852**	-0.0191	-0.0539***			
	(0.1181)	(0.0953)	(0.0135)			
Personal Income Tax	-0.0463	-0.1515***	-0.0001	-0.0496	-0.1247***	-0.0009
× High Cash	(0.0599)	(0.0409)	(0.0041)	(0.0618)	(0.0353)	(0.0039)
Consumption Tax	1.2762*	1.7563**	0.0852**			
	(0.6956)	(0.6766)	(0.0415)			
Consumption Tax	-0.0685	0.1594**	0.0073	-0.0705	0.1424**	0.0072
× High Cash	(0.0905)	(0.0638)	(0.0059)	(0.0980)	(0.0589)	(0.0058)
Observations	178,161	168,309	178,161	177,275	167,454	177,275
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
GDP-Cluster-Industry-Year FE	Yes	Yes	Yes	No	No	No
Country-Industry-Year FE	No	No	No	Yes	Yes	Yes
Adjusted R-squared	0.789	0.161	0.683	0.794	0.171	0.693

for new-view firms respond even more clearly in accordance with the new view in period t compared to the average response. Contrarily, the insignificant interaction coefficients of Corporate Tax and Dividend Tax with High Cash suggest that cash-rich firms respond statistically as strong as other firms to a change in these tax rates and thus do not corroborate predictions of the new view. This finding is surprising given that cash-rich firms in particular are predicted to follow the new view. As neoclassical theory does not explain this result, other factors might have contributed to this outcome or the interaction with High Cash does not proxy new-view firms sufficiently well.

The results are very similar if I choose different fixed effects to rule out the concern that unobservable characteristics in a certain country, specific industry, and a given year explain my results. I therefore replace the GDP-Growth-Ln(GDP per Capita)-cluster-industry-year fixed effect by country-industry-year fixed effects in columns (4), (5), and (6) "to absorb any previously omitted unobservable time-varying characteristics at the [country-industry] level" (Jacob et al., 2018, p.21). Similar to columns (1), (2), and (3), the level of significance and the magnitude of the interaction coefficients remain mostly unchanged. The sole difference is that the interaction of Corporate Tax and High Cash becomes significant, too. Hence, I cannot fully rule out the concern that "unobservable country-(industry)-year variables [are] correlated with ...[the] tax changes" (Jacob et al., 2018, pp.21-22)[33]. Yet, the negative coefficient of Corporate Tax and High Cash in column (5) is again not in line with predictions of the new view in period t which could therefore be an alley of future research.

6.2. Impact on Payout in Year t+1

The second extension of my baseline model considers the effect of tax rate changes in year t on payout in year t+1

[33] Also, my results are not robust to different definitions of High Cash. I define cash-rich firms in two alternative ways: Firms have a level of cash holdings (Cash Holdings (TA)) such that they are in (a) the top tercile and (b) the top quartile of cash holdings in a given country-year. Across both alternative definitions, interaction terms which show significant coefficients when using the median as the High Cash threshold are not significant anymore (and vice versa). Also, the dependent variables which are impacted by a tax rate change differ depending on the High Cash threshold. Changing the fixed effects also reveals an unclear picture of whether cash-rich firms react significantly differently than the average response. Thus, the effect of taxes on the response of cash-rich firms remains unclear.

Table 6: Results on Payout in Year t+1

This table presents the regression results showing how a change in taxes affects corporate payout in the year after a tax rate change (i.e., year t+1) from 1999 to 2013. I define Dividend Payer (t+1) (column (1)), Dividend Increase (t+1) (column (2)), and Dividend Yield (t+1) (column (3)) as my dependent variables. All independent variables are defined in the appendix in Table A.1. I include firm fixed effects and gdp-cluster-industry-year fixed effects in all three regressions. Please note that gdp-cluster is a placeholder representing a GDP-Growth-Ln(GDP per Capita) cluster. I report robust standard errors clustered at the country level which are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Corporate Tax	-0.1552	0.0925	-0.0084
	(0.1464)	(0.2794)	(0.0104)
Dividend Tax	0.2296***	0.0173	0.0164***
	(0.0612)	(0.1275)	(0.0041)
Personal Income Tax	-0.1693	0.5854***	-0.0330***
	(0.1252)	(0.1371)	(0.0070)
Consumption Tax	1.1282*	-0.0726	0.0861**
	(0.5684)	(0.8565)	(0.0366)
Observations	142,493	137,004	142,493
Controls	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes
GDP-Cluster-Industry-Year FE	Yes	Yes	Yes
Adjusted R-squared	0.805	0.150	0.709

assuming that tax rates in a certain country are not altered every year (i.e., tax regimes are quite stable). Generally, investigating the impact on payout in year t+1 seems to be reasonable as some firms might respond to a tax rate change with a certain delay (i.e., not in year t already) which, for example, might depend on how much in advance a tax rate change is announced before becoming effective and how flexibly individual firms are able to react. As outlined in section 5, dependent variables with time identifier (t+1) also cover short-run payout responses and are therefore expected to be in line with predictions of the new view in period t.

Table 6 reports the results of this second baseline extension. Interestingly, the results are quite similar to the ones of the baseline model suggesting that a tax rate change in year t does not only impact payout in year t but also has an effect on payout in year t+1. For instance, a change in the corporate tax rate on average again does not affect corporate payout. Surprisingly, the coefficient in column (2) becomes positive and the coefficient in column (3) converges to zero. This matches predictions of the new view in period t more closely than in the baseline regression but cannot be fully corroborated due to insignificant coefficients. Furthermore, the results of this extension confirm that an increase in dividend taxes in year t on average yields a higher propensity to pay dividends in the short run (i.e., in year t (baseline) and year t+1 (extension 2)) as the coefficient of Dividend Tax in year t+1 has a similar significance and magnitude as in year t. Also, the coefficient in column (3) is positive but, unlike in the baseline regression, highly significant suggesting that a one-pp rise in dividend taxes in year t increases the relative amount of dividends in year t+1 by 0.02pp of lagged total assets. This implies that firms pay a larger relative amount of dividends with a certain delay (i.e., in year t+1 (extension 2)) but not in the immediate aftermath of a change in dividend taxes (i.e., year t (baseline)). The positive coefficient, however, again can neither be explained by the new view nor by empirical studies evidencing a negative relation between dividend taxes and payout and thus could be an alley of future research. Contrary to the baseline results, the positive but insignificant coefficient in column (2) suggests that a change in dividend taxes on average does not change a firm's likelihood to increase or initiate dividends in year t+1. This implies that a change in dividend taxes only has an immediate impact (i.e., in year t (baseline)) on a firm's likelihood to increase or initiate dividends. Thus, the effect of Dividend Tax on Dividend Increase (t+1) is consistent with the "dividend tax neutrality" (Chetty and Saez, 2010, p.5).

Regarding personal income taxes, the results in column (1) and (2) differ from the baseline case. The coefficient in column (1) remains positive but becomes insignificant suggesting that the direct effect does not dominate the indirect effect in terms of a firm's propensity to pay dividends in year t+1; in other words, the direct effect on the variable Dividend Payer dominates the indirect effect only in the year when a change in personal income taxes occurs (i.e., year t (baseline)). Contrary to the baseline model, the indirect effect appears to prevail over the direct effect in column (2). Hence, higher labour costs incurred due to higher personal income taxes incentivise more firms to increase or initiate dividends in the year after the tax rate change (i.e., year t+1) implying that investing in corporate projects becomes increasingly unattractive compared to distributing dividends in year t+1. Only the coefficient in column (3) is similar to the baseline result: An increase in personal income taxes in year t yields a lower relative amount of dividends in year t+1 which validates the prevailing direct effect on the variable Dividend

Yield in the short run (i.e., year t (baseline) and year t+1 (extension 2)).

Similar to the baseline results, a rise in consumption taxes increases a firm's propensity to pay and the relative amount of dividends in year t+1, too, which is again in line with the predictions of the new view in period t. This implies that higher consumption taxes increase the relative attractiveness of directly distributing dividends in the short run (i.e., in year t and year t+1) instead of investing in corporate projects whose profit margins diminish due to the increased tax wedge. By contrast, an increase in consumption taxes on average yields no effect on a firm's likelihood to increase or initiate dividends in year t+1 (i.e., coefficient is insignificant but, surprisingly, negative). Thus, firms only appear to exhibit a higher likelihood to increase or initiate dividends in the immediate aftermath of a tax rate change (i.e., in year t (baseline)).

7. Robustness of Baseline Results

I test the robustness of my baseline results in two ways. First, I change the specification of my fixed effects to test whether my baseline results still hold when choosing alternative control groups. I therefore compare firms within the same country-group-industry-year where each country is clustered by (a) geographic region (i.e., countries are matched to one of the seven world regions defined by the World Bank) and (b) income group (i.e., countries are matched to one of the four income groups defined by the World Bank) instead of grouping countries by economic similarity in terms of the GDP level and GDP growth rate. Hence, I replace GDP-growth-Ln(GDP per capita)-cluster-industry-year fixed effects by (a) region-industry-year and (b) income-group-industry-year fixed effects. Second, I include the three additional country-level variables Openness, Deficit, and Interest Payments in control vector $\Gamma_{j,t}$ [34]. This allows me to rule out the concern that at least one of these newly included variables is a significant determinant of a firm's payout behaviour (i.e., omitted variable bias occurs) and that "nearly any desired result can be obtained" (Jacob and Jacob, 2013b, p.1259) when selecting a different set of control variables.

Table 7 presents the results of my baseline regression when including alternative fixed effects. Clustering countries by geographic regions (columns (1) to (3)) and income groups (columns (4) to (6)) mostly yields different results compared to the baseline model. All coefficients either vary in their magnitude or significance or both with the exception of dividend taxes and personal income taxes in columns (1) and (4) and columns (3) and (6), respectively. Surprisingly, the coefficient of Corporate Tax is significant implying that a rise in the corporate tax rate negatively impacts a firm's likelihood to increase or initiate dividends (clustered by region), relative amount of dividends (clustered by region), and propensity to pay dividends in year t (clustered by income). This finding stands in stark contrast to the results of my baseline regression suggesting that corporate taxes do not affect corporate payout. Despite clustering countries by region, the coefficients of Dividend Tax are mostly similar to the baseline model. Dividend Tax, however, shows different coefficients in columns (5) and (6) if countries are grouped by income. Regarding personal income taxes, income-group-industry-year fixed effects reveal results which are mostly similar to the baseline model whereas region-industry-year fixed effects show a similar magnitude of coefficients in columns (1) and (3) but a different significance of the coefficient in column (1). Interestingly, a change in consumption taxes hardly plays a role in payout decisions when different fixed effects are employed. Even though the magnitude of coefficients in columns (3), (4), and (6) is comparable to the baseline model, they are not significant in alternative specifications. This finding stands in stark contrast to the baseline results as this robustness test suggests that consumption taxes do not affect payout.

Table 8 presents the results of my baseline regression when including additional country-level variables in control vector $\Gamma_{j,t}$. The results of this model only partially resemble the results of the baseline model. Consistent with the baseline specification, an increase in consumption taxes positively impacts all payout variables while coefficients are similarly significant with similar magnitude. Also, the effect of a change in personal income taxes on Dividend Yield (t) is in line with the baseline model due to a negative and highly significant coefficient of similar magnitude. However, the coefficient of Personal Income Tax on Dividend Payer (t) becomes insignificant and even slightly positive suggesting that personal income taxes do statistically not impact a firm's propensity to pay dividends which is not in line with my baseline results. Regarding dividend taxes, the results differ vastly from my baseline regression as no coefficient is significant at all with a negative sign across all payout variables. Even though two coefficients of Corporate Tax in columns (1) and (2) become positive, a change in corporate taxes does again not impact corporate payout which is consistent with my baseline model.

Overall, the majority of baseline results are not robust to the inclusion of different fixed effects and additional country-level controls. The only result appearing to be fully robust to alternative regression specifications is the coefficient of Personal Income Tax on Dividend Yield (t) which, in most cases, is highly significant with a similar magnitude as in the baseline model. By contrast, the effect of other tax variables on payout highly depends on the specification and thus, I derive the following two conclusions. First, the choice of the fixed effect is critical. Second, I cannot rule out the fact that my baseline model might suffer from omitted variable bias even though the low coverage of newly included variables reduces the number of observations by one quarter compared to the baseline model.

[34] Government Debt is still excluded due to substantially poorer coverage of merely 196,656 observations compared to Openness, Deficit, and Interest Payments with a coverage of 304,225, 269,554, and 279,996 observations, respectively.

Table 7: Robustness of Main Results to Different Fixed Effects

This table shows the results of my baseline regression from 1999 to 2013 when employing different fixed effects. I replace gdp-cluster-industry-year fixed effects by region-industry-year fixed effects and income-group-industry-year fixed effects in columns (1) to (3) and columns (4) to (6), respectively. Both region and income-group follow definitions provided by the World Bank. The dependent variables are Dividend Payer (t) (column (1) and (4)), Dividend Increase (t) (column (2) and (5)), and Dividend Yield (t) (column (3) and (6)). All independent variables are defined in the appendix in Table A.1. I report robust standard errors clustered at the country level which are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Corporate Tax	-0.3664	-0.4609***	-0.0205*	-0.4678**	0.0514	-0.0164
	(0.2219)	(0.1519)	(0.0120)	(0.1857)	(0.2342)	(0.0149)
Dividend Tax	0.2127***	-0.2738***	0.0049	0.2126***	-0.0794	0.0144***
	(0.0637)	(0.0745)	(0.0046)	(0.0606)	(0.0702)	(0.0040)
Personal Income Tax	-0.3613	0.1851	-0.0437**	-0.4662***	0.3108	-0.0499***
	(0.2204)	(0.1154)	(0.0167)	(0.1535)	(0.2139)	(0.0141)
Consumption Tax	0.7412	0.9547	0.0762	1.2320	1.4067*	0.0760
	(0.8597)	(0.6903)	(0.0494)	(0.9408)	(0.7678)	(0.0635)
Observations	166,133	159,769	166,133	166,131	159,770	166,131
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes
GDP-Cluster-Industry-Year FE	No	No	No	No	No	No
Region-Industry-Year FE	Yes	Yes	Yes	No	No	No
Income-Group-Industry-Year FE	No	No	No	Yes	Yes	Yes
Adjusted R-squared	0.795	0.160	0.697	0.794	0.154	0.694

Table 8: Robustness of Main Results to Additional Country-level Controls

This table shows the results of my baseline regression from 1999 to 2013 when employing additional country-level variables in control vector $\Gamma_{j,t}$. I additionally include variables Openness, Deficit, and Interest Payments. Variable Government Debt is still omitted due to poor coverage. The dependent variables are Dividend Payer (t) (column (1) and (4)), Dividend Increase (t) (column (2) and (5)), and Dividend Yield (t) (column (3) and (6)). All independent variables are defined in the appendix in Table A.1. I include firm fixed effects and gdp-cluster-industry-year fixed effects in all three regressions. Please note that gdp-cluster is a placeholder representing a GDP-Growth-Ln(GDP per Capita) cluster. I report robust standard errors clustered at the country level which are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)
Corporate Tax	-0.1404	-0.2452	-0.0157
	(0.1696)	(0.1833)	(0.0165)
Dividend Tax	0.2468***	-0.2299**	0.0084
	(0.0654)	(0.1103)	(0.0056)
Personal Income Tax	-0.2838**	-0.1406	-0.0533***
	(0.1136)	(0.0982)	(0.0131)
Consumption Tax	1.0857	1.8513***	0.0797**
	(0.6712)	(0.6872)	(0.0391)
Observations	158,184	152,337	158,184
Controls	Yes	Yes	Yes
GDP-Cluster-Industry-Year FE	Yes	Yes	Yes
Adjusted R-squared	0.799	0.164	0.703

8. Conclusion

This thesis examines the effect of corporate taxes, dividend taxes, personal income taxes, and consumption taxes on corporate payout. For this, I use a cross-country panel consisting of 115 countries over the period 1999 to 2013 and run linear regressions of the four taxes on three dependent variables measuring dividend payout. The results of the baseline regression and subsequent extensions only partially confirm the predictions of the new view on short-run payout responses (i.e., responses in period t in the simplified single-period model). Inconsistent with initial hypotheses, corporate taxes on average do not impact dividend payout in the same year when a tax rate change becomes effective in terms of frequency and relative amounts, but a change in dividend taxes yields a statistically significant payout response even though the magnitude is small and the direction of the ef-

fect depends on the payout variable. Consistent with initial expectations, changes in personal income taxes (here: direct effect) and consumption taxes trigger mostly large payout responses. Also, cash-rich firms respond more strongly to a change in personal income taxes, consumption taxes, and (only on the country-industry level) corporate taxes. The results on payout one year after a tax rate change are mostly similar to the baseline model.

The analysis of this thesis, however, is limited to only one aspect of corporate payout (i.e., dividends) and only one part of neoclassical theory (i.e., new view in period t). In order to draw clear policy recommendations, it is therefore imperative to adopt a more holistic view by extending the scope of this thesis and investigating alternative explanations for the findings which are not in line with neoclassical theory. One way of achieving this could involve the analysis of total payout (i.e., share repurchases plus dividends; see also Chetty and Saez, 2005) since (i) share repurchases have gained importance over the last decades in the U.S. and Europe (Von Eije and Megginson, 2008) and (ii) share repurchases and dividends are, to a certain extent, interchangeable payout channels implying that a tax rate change might lead to dividends being substituted by share repurchases and vice versa (Chetty and Saez, 2005). In this context, the relative taxation of dividends vis-à-vis capital gains has to be considered, too (see also Jacob and Jacob, 2013a). Another way of deriving holistic implications involves the consideration of agency models (e.g., Chetty and Saez, 2010) which might also explain some deviations of the regression results from neoclassical predictions. Thus, I would recommend incorporating ownership structure or alternative proxies for shareholder conflicts (Jacob and Michaely, 2017) and agency issues (Chetty and Saez, 2005; Jacob and Michaely, 2017) into the regression model. Signalling models (e.g., Gordon and Dietz, 2006) could be taken into account, too, for which many executives would have to be interviewed to test whether a payout response deviating from neoclassical predictions might be interpreted as a "signal of managerial confidence in future earnings" (Jacob and Jacob, 2013a, p.188). Finally, it is possible that firms anticipated a change in taxes in previous periods such that the response in year t rather matches the predictions of the new view in period t+1 and is therefore a question worth being pursued in future research.

Overall, the results of this thesis should be regarded as a starting point and give managers, shareholders, and policy makers a first impression of how taxes impact corporate payout decisions which are, nonetheless, still to be complemented by future research.

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