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What if dividends were tax-exempt? Evidence from a natural experiment

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What if dividends were tax-exempt?

Evidence from a natural experiment

Abstract

We study the effect of dividend taxes on the payout and investment policies of publicly listed firms. We exploit a unique setting in Switzerland where, following the corporate tax reform of 2011, some but not all firms were suddenly able to pay tax-exempt dividends. We show that treated firms increase their dividend payout by around 30% after the tax cut. The impact on payout is less pronounced for firms prone to agency conflicts. We find a significant positive abnormal stock return after the announcement of the payment of a tax-exempt dividend. However, reducing dividend taxes does not boost investment. (*JEL* G35, G38, H25, K34)

Do dividend taxes materially affect corporate behavior? Pro-business politicians, in line with the neoclassical theory of corporate dividend taxation (Poterba and Summers 1985), claim that lower dividend taxes reduce cost of equity and boost investments and payouts in the long run. However, surveys of corporate executives (Brav et al. 2008) and theories in which the marginal source of finance is retained earnings (King 1974, Auerbach 1979, Bradford 1981, Auerbach 2002) suggest that dividend taxation should not materially affect total payout and investment. The main empirical challenge in testing the effect of a dividend tax cut is that fiscal shocks affect all firms simultaneously (Farre-Mensa et al. 2014). Hence, it becomes difficult to tease out the causal effect of a tax cut on a pro-cyclical variable, which inherently limits the policy implications of such empirical studies.

In this paper, we study the effect on dividend and investment policies of an abrupt removal of the dividend tax for *some, but not all,* firms by exploiting a fiscal shock that occurred in Switzerland in 2011. This shock was an unintended consequence of a corporate tax reform allowing small and medium-sized companies to return capital contributions made by their shareholders, without being taxed on these repayments. A capital contribution or paid-in capital is a financial injection made by shareholders of a firm to build or increase its equity. When implementing the reform, the Federal Tax Authority rather surprisingly stated that any company incorporated in Switzerland would be allowed to pay tax-exempt dividends (hereafter TED) to their shareholders from their capital contributions. The quasi-experimental nature of this fiscal reform offers a unique setup to test whether a tax cut causally affects firms' financial and real decisions. Using a difference-in-differences specification, we compare the payout and investment policies of firms affected by the reform (i.e., treated firms with reserves from capital contribution or 46% of all public firms) with those of firms that are not (i.e., control firms without any reserves from capital contribution). Interestingly, treated and control firms are very similar along important characteristics, such as age, profitability, payout, and investment.

The Swiss tax reform has several desirable characteristics that allow us to avoid common problems that arise when estimating the effects of tax changes on payout and investment. First, the tax cut only affected some firms incorporated in Switzerland. As a result, we can use a sample of control firms to filter out the effects of the business cycle on firms' payout and investment policy. Furthermore, the tax cut was unexpected (the reform was not intended to affect public firms), sudden (firms only had a few months to benefit from the tax cut in 2011 or they would have to wait until 2012), massive (the maximum marginal tax rate dropped from 36.2% to zero), and permanent. The surprise was quite big as the average treated firm had enough reserves to pay more than seven years of tax-exempt dividends. Finally, the overall reform includes no concurrent changes to the income tax or capital gains tax, and no other tax advantages on investments, which would be a threat to the internal validity of the empirical design.

Our empirical analysis goes as follows. First, we study the impact of the tax cut on the payout policy of listed firms. By contrasting treated and control firms, both graphically and using regressions, we document that the reaction to the shock was immediate and both statistically and economically large. We consider several dimensions of the payout policy: dividend yield, dividend payout, total payout, as well as the percentage of firms paying dividends. They all increased dramatically after the tax cut for treated firms. For instance, the dividend yield increased by 32.8% and the dividend payout by 26.5% for treated firms, while these variables remained stable for control firms. Our findings are robust to changing the event window or removing, respectively, the largest, smallest, or financial firms. We also contrast treated firms with others that, although being theoretically eligible, had to wait until 2012 before the Swiss Federal Tax Authority recognized their eligibility. This group of firms constitutes an ideal control sample as they also have similar reserves as treated firms but these reserves were not validated yet. The dividend payout also increased significantly in this

alternative setting. Looking at treatment effect heterogeneity, we find that firms being more strongly treated by the reform, in terms of number of years of tax-exempt dividends they can pay, increase relatively more their payout after the tax cut. Finally, in the cross-section, the effect of the tax cut on payout is less pronounced in firms where the controlling shareholders have more voting rights than cash-flow rights. This suggests that dividend taxes and agency conflicts reinforce each other by keeping too much cash within the firm.

Second, we investigate the effect of the tax cut on the stock prices of the firms that benefit from the reform and of those that do not. Unlike previous event studies around dividend tax cuts (Auerbach and Hassett 2005, Brown et al. 2007), we identify firm-specific dates at which the information about their own tax treatment became official and public. Indeed, Swiss firms only had little time to get their reserves from capital contribution validated by the Federal Tax Authority and many validation requests were rejected. Hence, investors only learned which firms could actually pay tax-exempt dividends and which firms had to pay taxed dividends when the firms publicly announced their dividends in early 2011. On the dividend announcement day, we find that abnormal returns are 1.1% higher for firms announcing tax-exempt dividends than for firms announcing taxed dividends. The return gap between dividend-paying firms with and without taxes grows to 2.4% over a 20-day horizon.

Third, we measure the real effects of the tax cut. Overall, we find no difference between the investment policies of treated and control firms in our sample. Not only do we extend the conclusion of Yagan (2015) to publicly traded firms and to another country, but we also aim to identify the channel at play. We show that the absence of real effects can be attributed to a significant drop in retained earnings, which is caused by the increase in the total payout of treated firms. Indeed, we find that the rise in dividends is not compensated by a drop in share repurchases. We also show that the tax reform has no impact on the number of employees and on salaries. Furthermore, treated firms do not raise more capital, through seasoned equity

offerings, than control firms. From a theoretical viewpoint, our findings are consistent with models where the marginal source of finance of firms is retained earnings ("new view" of Auerbach (1979)) and not new equity ("old view" of Poterba and Summers (1985)).

Existing empirical evidence on the effect of dividend tax on firms' payout policy is mixed. Poterba (2004) reports a strong positive long-run, but no short-run, elasticity of dividends with respect to the relative tax burden on dividends and capital gains. Chetty and Saez (2005) and Yagan (2015) find that the enactment of the Jobs and Growth Tax Relief Reconciliation Act of 2003 led US corporations to increase their dividends right after the tax cut significantly. However, Brown et al. (2007) show that share repurchases went down at the same time, which left total payout unaffected by the tax cut. Differently, Hubbard and Michaely (1997) report that investors seem to ignore taxation when pricing a stock paying a cash dividend (heavily taxed) and a clone stock paying a stock dividend (lightly taxed). Furthermore, Brav et al. (2008) indicate that more than two-thirds of US executives stated that the 2003 dividend tax reduction would definitely or probably not affect their dividend decisions. Recently, Jacob and Michaely (2017) show that conflicting objectives between owners and managers dampen the sensitivity of payout policy to dividend taxation.

The question of the effect of dividend taxes on investment also remains unsettled in the empirical literature. Using data on dividends and capital gain taxes from 25 countries, Becker et al. (2013) find that, after dividend tax cuts, firms with limited internal equity increase their investment relative to firms with plenty of internal equity. In their study of a large increase in dividend tax in France, Boissel and Matray (2019) report an elasticity of 0.5 for dividends and -0.3 for investment. On the other hand, Yagan (2015) finds that the 2003 US dividend tax cut had no impact on firms' investment over the subsequent five years. Evidence from Sweden provided by Alstadsæter et al. (2017) lies between these two views: they show that aggregate

investments did not increase following the local tax cut of 2006 but that cash-constrained firms did increase external equity and investment more relative to cash-rich firms.

Our main contribution to the literature is to identify and exploit a unique setup allowing us to contribute substantially to the important, and so far unsettled, debate on the effects of dividend taxes on corporate behavior. We believe our identification strategy to be as close as it gets from an adequately controlled experiment and to allow us to make causal statements about the financial and real effects of taxes. Furthermore, unlike most previous empirical studies, we focus on publicly traded firms. This turns out to be an advantage given the key theoretical role played by the equity channel in the relationship between dividend taxes and investment. Indeed, unlike private firms, public firms enjoy direct access to equity markets.

1 THEORY AND HYPOTHESES

Free cash flows are either *retained* by corporations to finance new investments or increase cash reserves, or *distributed* to shareholders. In the perfect capital market setting of Modigliani and Miller (1958), the earning retention vs. payout decision is irrelevant to firm value as the investment policy only determines the latter. When a firm has funded all positive-NPV investment projects, shareholders are indifferent between receiving a dividend now (Div_0) and investing it in a financial security that pays an interest rate r_f, or letting the firm investing its excess cash in the financial security and paying it out later as a dividend (Div_1). Indeed, we see below that the shareholder ends up with the same final value, $(1 + r_f)$, in both cases:

	Now	In one year
Payout	Firm pays $Div_0 = \$1$ Shareholder invests at rate r_f	Final value = $1 + r_f$
Retain	Firm invests \$1 at rate r_f	Final value = $1 + r_f$

		Firm pays $Div_1 = 1 + r_f$

Once we allow for taxes, the interest earned by the firm on its investments is taxed twice: at the firm level (corporate tax, τ_c) and then when paid as a dividend (dividend tax, τ_d). In this case, retaining cash appears less attractive when the corporate tax rate exceeds the individual tax rate (τ_i). However, as shown below or in Berk and DeMarzo (2020), because the dividend tax reduces the current and future dividends, it does not affect the cost of retaining cash and the retain-payout decision. Hence, the dividend tax is irrelevant to the payout policy of the firm.

	Now	In one year
Payout	Firm pays $Div_0 = \$1$ Shareholder receives $1 - \tau_d$ and invests at rate r_f	Final value = $(1 - \tau_d)(1 + r_f (1 - \tau_i))$ where t_i is the individual tax rate
Retain	Firm invests \$1 in a security at rate r_f	Final value = $1 + r_f(1 - \tau_c)$ Firm pays $Div_1 = (1 - \tau_d)(1 + r_f (1 - \tau_c))$

We note that the result on the neutrality of the dividend tax on the retain-payout decision is only valid if the dividend tax rate remains constant through time. If we allow τ_d to be stochastic, every time the firm pays a dividend, it gives up the option to pay future dividends at a lower dividend tax rate. Paying dividends now also hedges shareholders against an increase in the dividend tax rate. In the case of the tax cut investigated in this paper, the dividend tax is currently set to zero. As the rate can only increase or remain constant, the option value is zero, and the optimal payout strategy is to pay dividends early. Consequently, in this context, cutting or removing dividend taxes leads to a higher payout today. To test this theoretical implication, we formulate our first hypothesis:

H1: *Total payout increases after a dividend tax cut.*

Miller and Modigliani (1961) show that the firm's choice of payout policy between cash dividends and share repurchases is irrelevant and does not affect its value. Indeed, by reinvesting dividends or selling shares, shareholders can replicate either payout method on their own. However, this irrelevance result does not hold anymore in the presence of taxes. When taxes on dividends exceed taxes on capital gains, share repurchases are the most tax-efficient way to return cash to shareholders. The tax disadvantage of dividends depends on the relative tax rates between dividends and capital gains. Consequently, cutting or removing dividend taxes attenuates this fiscal disadvantage and increases dividend payout. This leads to our second hypothesis:

H2: *Dividend payout increases after a dividend tax cut.*

The effect of the dividend tax on payout policy can also exhibit some variations across firms. Indeed, when there is a disconnect between voting rights and cash-flow rights, controlling shareholders may be reluctant to increase payout as this cash would be allocated among shareholders based on cash-flow rights. For such controlling shareholders, one dollar inside the firm has more value than one dollar outside the firm. To test for the effects of agency conflicts among shareholders on the payout policy of treated and control firms, we formulate our third hypothesis:

H3: *Payout increases after a dividend tax cut, but less so in firms in which controlling shareholders own more voting rights than cash-flow rights.*

We now turn to the theoretical effect of the dividend tax on the firm's investment policy. To do so, we distinguish two cases: firms that finance their investment projects using external funds, i.e., by raising equity, and firms that finance their investment projects using internal

funds, i.e., by retaining earnings. The first case corresponds to the neoclassical theory of dividend taxation, also known as the "old view" (Harberger 1962, 1966, Feldstein 1970, Poterba and Summers 1985, Poterba 2004). It states that reducing dividend taxes mechanically reduces the firms' cost of equity and boosts investment. In this theory, the marginal source of funds for investments is the new shares issued. Reducing the tax rates on dividends lowers the pre-tax required rate of return of shareholders, which is the cost of equity of the firm. This drop in the cost of equity mechanically turns the Net Present Value (NPV) of some investment projects from negative to positive, hence boosting capital expenditures. Such an increase in investment is funded through seasoned equity offerings. We test the equity channel and the effect of the tax cut on investments in H4 and H5.

H4: *Firm's investment increases after a dividend tax cut*.

H5: *Firms raise new equity after a dividend tax cut.*

However, when firms fund their investment projects internally using retained earnings, H4 is not supposed to hold. This situation corresponds to the “new view” developed by King (1974), Auerbach (1979), and Bradford (1981), which concludes that dividend taxes should have no impact on investment. Under this view, even if the firm distributes all its earnings to its shareholders, it can still fund its positive NPV projects with cash and without having to issue new equity. In this setting, the firm compares three options for each dollar of free-cash-flow:

	Now	In one year
Payout	Firm pays $Div_0 = \$1$ Shareholder receives $1 - \tau_d$ and invests at rate r_f	Final value = $(1 - \tau_d)(1 + r_f (1 - \tau_i))$

Retain 1	Firm invests \$1 in a security at rate r_f	Final value = $1 + r_f (1 - \tau_c)$ Firm pays $Div_1 = (1 - \tau_d)(1 + r_f (1 - \tau_c))$
Retain 2	Firm invests \$1 in a project at rate r	Final value = $1 + r(1 - \tau_c)$ Firm pays $Div_1 = (1 - \tau_d)(1 + r (1 - \tau_c))$

In this case, the firm only invests in projects for which the rate of return r leads to a final dividend Div_1 that is higher than the final value of the alternative strategies. The firm prefers the investment project to the payout strategy if $1 + r (1 - \tau_c) > 1 + r_f (1 - \tau_i)$ and the firm prefers the investment project to investing in a security if $r > r_f$. We also note that, because the dividend tax reduces the three strategies similarly, it should not affect the investment decision, which contrasts with H4. Differently, when we allow the dividend tax rate to vary through time, paying a dividend induces the firm to give up the option to pay future dividends at a lower dividend rate, and hedges against an increase in the dividend tax rate. When the current dividend tax rate is zero, the final value of the payout strategy increases in expectation as the tax rate can only increase. Consequently, some investment projects that used to be attractive before the tax cut are now dominated by the payout strategy. In other words, the hurdle rate that investment projects have to clear is higher than with a constant dividend tax rate. We conclude that for firms that generate enough cash to fund their investment policy and when the current tax rate is zero, cutting dividend taxes *decreases* investment, which is opposite to H4. Other models also conclude that investment should decline following a dividend tax cut. For instance, the agency model of Chetty and Saez (2010) includes agency problems between managers and shareholders in the form of investments in pet projects by managers. In their context, a dividend tax cut leads to a reduction in such unproductive investments.

To be able to test these five hypotheses, we provide in the next three sections, some information about the Swiss stock market and tax system, the natural experiment we consider in this paper, and our data.

2 STOCK MARKET AND CORPORATE TAXES IN SWITZERLAND

2.1 The Swiss stock market

As of December 2019, the Swiss stock market, SIX Swiss Exchange, is the 13th largest stock exchange in the world. Its USD 1.8 trillion total domestic market capitalization, for example, represents 91% of the German stock market (Deutsche Börse), 46% of the British stock market (London Stock Exchange) or 38% of the Euronext pan-European stock market (World Federation of Stock Exchange, 2020). Djankov et al. (2008) present Switzerland as a positive outlier in terms of stock market development, as measured by its total market capitalization to GDP ratio. At the end of 2019, this ratio stood at 2.47 for Switzerland vs. 1.74 for the US, 1.48 for the UK, and 0.50 for Germany (own calculation). Despite its relatively large size and international importance, the number of firms listed on the SIX Swiss Exchange remains moderate, with only around 260 listed companies, 235 thereof as the primary listing. However, this restricted club includes some global leaders such as UBS, Credit Suisse, Novartis, Roche, Nestle, or Swiss Re. Hauser et al. (2009) estimate that Swiss listed firms contribute 18% to the GDP, employ 11% of the Swiss workforce, account for 51% of aggregate R&D expenses, and pay 42% of all corporate taxes.

The ownership structure is typical for continental Europe. Although a majority of Swiss firms have a controlling shareholder (Isakov and Weisskopf 2014), they display a broad shareholder base with an average (median) free-float of 62% (61%) between 2007 and 2015. In terms of corporate governance, Switzerland belongs to the group of German-origin civil law countries, which tend to provide lower investor protection (La Porta et al. 1998). Switzerland's

poor ranking both in terms of anti-director rights (La Porta et al. 1998) and anti-self-dealing (Djankov et al. 2008) illustrates this. It also has a nearly inexistent but slowly evolving market for corporate control (Lowinski et al. 2004). These observations suggest that, on this market, controlling shareholders such as families have significant freedom. Agency problems between majority and minority shareholders and private benefit extraction can therefore be potentially severe. However, as in many other markets, corporate governance practices have gradually improved over the past two decades. For instance, in 2013, Swiss citizens voted a new law introducing binding say-on-pay and forbidding golden parachutes.

2.2 The Swiss corporate tax system

This section describes the tax treatment of dividends, share repurchases, and capital gains for the various types of shareholders in Switzerland. There are three main features of the Swiss corporate tax system that one needs to be aware of. First, Switzerland has a standard corporate tax system with a double taxation of dividends, with both a corporate tax and a dividend tax, as in many developed countries. Second, whenever a Swiss corporation pays dividends to its shareholders (domestic and foreign), it has to directly pay a withholding tax to the tax authority that corresponds to 35% of the amount of dividends, i.e., investors only receive 65% of the gross dividend. They then have to claim back the withholding tax once they have declared and paid taxes on their income.[1] Third, taxes must be paid at the municipal, cantonal (state), and Federal levels and, consequently, the overall fiscal burden depends on the domicile of the fiscal subject. This multi-layer system is similar to the US tax system in which individuals not only have to pay Federal taxes but in most cases also state and municipal taxes on income and dividends.

[1] The withholding tax system is not unique to the Swiss setting and can be found in the US and in 23 European Union member states. However, in contrast to most of these countries, the withholding tax in Switzerland is not limited to foreign entities but applies to all investors.

In Switzerland, taxes on dividends depend on the fiscal status of the shareholder who receives them. First, for individual investors, dividends are taxed as ordinary income, while capital gains are not taxed.[2] The top marginal personal income tax rate is 36.3% for this category of investors. Second, dividends on stocks held by corporations are taxed as ordinary corporate income, just like capital gains, at a 21.2% rate.[3] Third, institutional investors, such as pension funds and investment funds, do not pay taxes on dividends and capital gains. Other tax-exempt shareholders include government organizations at any level (Federal, cantonal or municipal), charitable organizations, and international organizations.[4] Fourth, dividends distributed to foreign investors are subject to the 35% withholding tax. Foreign investors can reclaim this tax if they declare these revenues in their home country and if their country has signed an agreement with Switzerland to avoid double taxation (such agreements currently exist with more than 100 countries).

As there are no taxes on capital gains in Switzerland, share repurchases may a priori appear as a more tax-efficient way for a firm to transfer cash to shareholders. However, in practice, share repurchases turn out to be particularly costly, both from a fiscal and operational viewpoint. Indeed, the tax treatment of share repurchases depends on the goal of the share repurchase program. On the one hand, if firms keep the repurchased shares as treasury stocks (to use them later), then they are taxed as capital gains, and they are an attractive alternative to dividends. On the other hand, if companies repurchase shares to cancel them, the difference between the repurchase price and the nominal value of the stock is taxed at the same rate as a dividend.[5] Since share cancellations are much more common than shares being held as treasury

[2] There is an exception for individuals obtaining more revenues from trading securities than from their own labor income. The Federal Tax Authority treats these individuals as professional traders and impose capital gains as income.
[3] Source: OECD Tax database website. The rates indicated here are for an investor or a firm located in the city of Zurich for the year 2010.
[4] In our sample, government entities on average hold 5.9%, or 2.4% if we exclude banks.
[5] Since the tax is not calculated on the difference between the repurchase price and the price originally paid by the investor, it creates an important fiscal disadvantage for taxed investors. Indeed, the nominal value is much

shares in Switzerland (the split is around 80% vs. 20%), it explains why dividends are preferred to repurchases.[6]

[Insert Figure 1 here]

We see in Figure 1 that dividends are the dominant form of payout in Switzerland. The fraction of firms paying dividends increased steadily until the great recession, with a maximum of 63% of the firms paying dividends in 2008. The percentage of payers is slightly higher than in the US (Farre-Mensa et al. (2014). Between 2003 and 2012, the fraction of US firms with a positive total payout increased from 42 to 58%. For the year 2016, Michaely and Moin (2020) find that 37% of US firms (rising to 63.6% for S&P500 firms) pay dividends and 61% have a payout in the form of dividends and/or share repurchases. They further have an average dividend payout of 36%, compared to 35% in our setting.

Even if dividends are known to be sluggish at the firm level, aggregate dividends fluctuate according to the business cycles. For instance, the drop in the payout of Swiss companies after 2008 corresponds to a period of weak economic conditions with negative GDP growth between 2008Q3 and 2009Q1. The impact of this recession was more severe on the investment of Swiss companies as the fixed gross capital formation dropped by CHF5 billion (-15%) over the same three quarters. The sensitivity of both payouts and investments to business-cycle conditions reinforce the importance of having a control sample, as we do, when testing the effect of a fiscal shock on payout and investments. Otherwise, observed swings in dividends or investments could be wrongly attributed to the fiscal shock.

lower than the current stock price (on average less than 1%) and therefore the basis on which the tax burden is computed is much larger than the capital gain.

[6] An additional complication with share repurchases in Switzerland arises because repurchasing firms must collect the withholding tax that is due by investors and transfer it to the tax authority. If the transaction takes place in the open market, anonymous trading prevents the firm from collecting the tax. As a consequence, repurchasing firms have to open "second trading lines" with the SIX Swiss Exchange, solely dedicated to their repurchasing activity and on which they pay prices net of tax (Chung et al. (2007)).

Figure 1 confirms that share repurchases are not widespread across publicly traded firms in Switzerland. Indeed, on average, only 6.5% of Swiss corporations repurchase their shares in a given year. This contrasts with the behavior of US public firms, for which the fraction of repurchasing firms ranges between 30 and 40% (Farre-Mensa et al. 2014).

3 THE NATURAL EXPERIMENT

The possibility to pay tax-exempt dividends in 2011 was an unintended consequence of the second Corporate Taxation Reform (CTR2) initiated by the Swiss Federal government.[7] As stated by the Federal government, the main objective of this reform was to lower the tax burden on corporations to favor economic growth and stimulate employment. For instance, the Federal Council stated that CTR2 "*aims to improve the fiscal conditions for small and medium-sized companies*" and "*to lower the fiscal burden that distorts business decisions, and to boost economic growth and employment*".

Specifically, the three main changes to the Swiss corporate tax system are: (1) To reduce the fiscal burden on firms' capital, CTR2 introduces the *capital contribution* principle, which allows Swiss firms to exempt from withholding and income taxes the repayment of capital contributions made by the direct shareholders (see Figure 2). This change aims to eliminate the particularly unfavorable tax treatment of exits by shareholders of small and medium-sized enterprises – hence hurting equity issuance in the first place; (2) To dampen the double taxation of corporate earnings, CTR2 exempts 40% of the dividend paid to any physical person or firm owning at least 10% of a given firm. Before CTR2, the threshold was at 20%. Such large equity stakes are a common feature among small and medium-sized enterprises; and (3) To simplify the reorganization and transfer of small and medium-sized enterprises, CTR2 fully exempts

[7] The first Corporate Tax Reform (CTR1) took place in 1997, hence 10 years before the starting date of our sample period. The third Corporate Tax Reform (CTR3) has been accepted by the Swiss parliament in June 2016 but it was eventually rejected in February 2017 by the Swiss people in a referendum.

from taxes any cash flows coming from the sale of production factors, such as vehicles or pieces of equipment. It also improves the tax treatment on corporate transfers or liquidations.

[Insert Figure 2 here]

The Swiss Parliament approved the CTR2 bill on April 13, 2007 and it was enforced on January 1, 2011.[8] Prior to this date, the Swiss government always presented the capital contribution principle as applying only to small and medium-sized enterprises. However, on December 9, 2010, or 23 days before the enforcement date of CTR2, the Swiss Federal Tax Authority published a circular describing in great detail the conditions under which capital contributions could be tax-exempt. In this document, the Federal Tax Authority explicitly considered the case of paying tax-exempt dividends out of capital contributions, a case never mentioned in the preceding debates. Consequently, all firms incorporated in Switzerland that were able to prove the existence of capital contributions were allowed to distribute TED to their shareholders from their paid-in capital.[9] Such contributions are made either at the time of the Initial Public Offering, when new shares are issued (Seasoned Equity Offerings), or when executives and employees exercise their stock options.[10]

Since the possibility to pay tax-exempt dividends came as a surprise in December 2010, and the deadline to get the capital contributions approved by the Federal Tax Authority was very short, only a fraction of eligible companies could use this possibility in 2011.[11] 46% of all listed

[8] The entry into force of the new bill was postponed because a coalition of political parties launched a referendum against the new law on the ground that it would lead to substantial revenue losses for the Federal Government. Eventually, the Swiss people accepted the new law on February 24, 2008 with a short majority of 50.8%.
[9] The tax break for investors investigated in this paper applies to all Federal, cantonal, and municipal taxes.
[10] Only capital contributions from January 1, 1997 onwards were eligible for tax-free repayment from 2011 onwards. Capital contributions had to be presented to the Federal Tax Authority at the latest 30 days after the approval of the 2011 fiscal year accounts. In order to do so companies had to go through their capital contributions for fiscal years 1997-2010, fill out a form to be sent to the Federal Tax Authority and justify their demand for the creation of a capital contribution account. Given the modest role of executive stock options in Switzerland, this channel plays a minor role in the build-up of the reserves from capital contribution.
[11] Swiss companies are legally obliged to have their annual meeting at the latest six months after their fiscal year end. In our sample, 90.1% of the firms have their fiscal year-end on December 31 and must therefore hold their annual meeting before the end of the following June.

companies had some reserves from capital contribution recognized in 2011 while an additional 20% had reserves recognized in 2012. As a result, the introduction of the capital contribution principle in 2011 creates a natural experiment setting as the possibility to pay tax-free dividends was unexpected. We assign firms to the treatment group if they had recognized reserves from capital contribution in 2011 and were authorized to pay tax-exempt dividends. Firms are in the control group if they did not have such reserves recognized by the Federal Tax Authority and hence could not pay TED in 2011. Moreover, the allocation of firms into one of the two groups appears to be exogenous as one cannot argue that firms increased their capital, made an Initial Public Offering or granted stock options on purpose since it was virtually impossible to predict the actual scope of CTR2.

The introduction of the tax-exemption of dividends sparked a heated political debate in the country. The leading newspaper in the country, the *Neue Zürcher Zeitung* provided detailed information to the public about these unexpected tax-exempt dividends and the size of the reserves from capital contribution.[12] Furthermore, several members of the Swiss Parliament tried to cancel the vote of 2008, claiming that the government had not adequately informed the citizens. In December 2011, the Swiss Supreme Court rejected the appeal and confirmed the new law but blamed the Federal Council for having improperly informed citizens before the vote.

Unlike other dividend tax cuts studied in the literature, the 2011 Swiss fiscal shock only allows firms to pay tax-exempt dividends up to the level of their reserves from capital

[12] "New laws sometimes lead to unexpected consequences. A prime example is given by the Corporate Tax Reform II which was adopted by a narrow majority in 2008. What then only appeared as a footnote in public discussions, now provides for heated debates. Since the beginning of this year dividends are free from the withholding and income tax when paid out from capital contributions. […] The debate these days is less about the system change than its retroactive effect. Contrary to the original proposal of the Federal Council, companies can not only have "new" capital contributions credited for future dividends. Under certain circumstances, the capital contributions which shareholders have paid since the beginning of 1997 can be used. […] In parliament and the voting debate the matter was hardly an issue. It became an issue, when this year, several major companies announced to pay out a tax-free dividend on the basis of the new rule." *Neue Zürcher Zeitung*, March 8, 2011.

contribution. Once the firms have paid out this capital, there will be no more tax-exempt dividends in the future unless the firm replenishes its reserves (e.g. by raising equity).

4 DATA AND SUMMARY STATISTICS

Our sample of firms includes all constituents of the broadest stock index in Switzerland, the *Swiss Performance Index*, between 2007 and 2015. In any given year, the index is made of around 220 firms traded on the SIX Stock Exchange. It includes virtually all publicly-traded firms in Switzerland as it only excludes listed firms with less than a 20% free float, open-end funds, and foreign firms being cross-listed in Switzerland. To be included in our sample, a firm has to be part of the index for at least one year. Consequently, we end up with an unbalanced panel of 264 companies.[13] Table 1 displays the breakdown of sample firms by industry and market capitalization. The main takeaway from this table is that public firms cover all industries. However, the distribution remains somewhat unbalanced, with very few observations in the oil & gas or telecommunication industries and most firms belonging to the financial, industrial, and pharmaceutical sectors.

[Insert Table 1 here]

While our analysis requires precise information on the tax status of the dividends for each firm/year, this information is typically not included in standard financial databases. We, therefore, hand-collected such information from the companies' annual reports and systematically cross-checked it with the *Swiss stock guide*.[14] In particular, we collected the yearly dividend paid per share as well as its tax status: taxed or tax-exempt.[15] We also collected

[13] When studying investment (capex) and financing options, we exclude financial firms from the sample. Differently, in our tests on payout, we estimate the specifications sequentially with all firms and with non-financial firms only. We believe including financial firms can be interesting in our setting as all financial firms in Switzerland, including state-owned banks, can freely choose their dividend policy.
[14] The *Swiss stock guide* is an annual publication presenting for all Swiss public firms a large number of financial information in a standardized format.
[15] Swiss firms pay dividends once a year.

detailed data on the share repurchase activities of all sample firms from the Swiss Takeover Board (http://www.takeover.ch), which is the supervisory authority overseeing repurchase activities in Switzerland. Data on the length of the program and repurchase methods were also collected from the Swiss Takeover Board website. The actual amounts repurchased by firms were obtained from the firms' websites/annual reports, and the website of the Swiss stock exchange (www.six-swiss-exchange.com). All accounting data are from Worldscope. An exception is the reserves from capital contribution giving the right to pay TED, which had to be hand collected from the firms' annual reports. Moreover, stock price data were obtained from Datastream. Finally, we also collect from the firms' annual reports data on voting rights, classes of shares issued, and ownership. For each firm, we know the identity and holdings of all shareholders having at least 3% of voting rights.

We report in Table 2 some summary statistics for all sample firms in the year preceding the enactment of the reform (2010). All firm characteristics and investment variables are winsorized at the 1st and 99th percentiles. In our sample, around 70% of firms pay a cash dividend to their shareholders, and the average dividend yield is 2.03%. On average, a typical firm pays out 34.78% of its earnings as dividends, and 36.31% as dividends and/or share repurchases.[16]

When splitting our sample into treated and control firms, we end up with two groups that are well balanced in terms of size (114 vs. 96 firms) and remarkably similar in terms of composition. Indeed, treated and control firms look very much alike as far as payout, firm characteristics, investment, and ownership are concerned. For instance, the dividend yield is 2.07% for treated firms vs. 1.99% for control firms, and the total payout is 37.19% for treated firms vs. 35.58% for control firms. Moreover, prior to the reform, 67.71% of the treated firms

[16] Following Julio and Ikenberry (2004) and Von Eije and Megginson (2008), payout ratios are set to 100% if they are negative or if a firm distributes more than 100% of its earnings.

were paying dividends vs. 70.18% of the control firms. As for investment, the capex-to-PPE (Property, Plant & Equipment) ratio is 18.19% for treated firms vs. 18.88% for control firms, and the cash-to-total-assets ratio is 12.91% for treated firms vs. 12.81% for control firms. For most considered variables, we cannot reject the null hypothesis that treated and control firms have the same mean. There are only four dimensions, out of 39, for which the two subsamples differ significantly: treated firms display higher salaries and cash reserves and fewer dual-class shares and control-enhancing mechanisms.

[Insert Table 2 here]

5 EMPIRICAL RESULTS

5.1 Effects on payout

We start our investigation on the effect of removing dividend taxes by comparing the evolution of the main payout variables for firms affected by the reform (treated firms) and those that are not (control firms). As explained in Section 3, to be treated, a firm must have some *reserves from capital contribution* that have been recognized by the Federal Tax Authority in 2011. On the other hand, control firms do not benefit from the dividend tax cut and can only pay taxed dividends to their shareholders. This setting allows us to cleanly assess the impact of removing the dividend tax on firms' financial decisions.

[Insert Figure 3 here]

Figure 3 displays the evolution of the average dividend yield, average dividend payout, and of the fraction of dividend-paying firms, using the following definitions:

$$dividend\ yield_{it} = \frac{dividend\ per\ share_{it}}{stock\ price_{it}}$$

$$dividend\ payout_{it} = \frac{dividend\ per\ share_{it}}{earnings\ per\ share_{it}}$$

$$\%\ of\ dividend\ payers_t = \frac{\#\ of\ dividend\ paying\ firms_t}{\#\ of\ sample\ firms_t}$$

The evidence in Figure 3 is remarkable. Indeed, before the introduction of CTR2, both control and treated firms behave similarly. In the first year of the reform (2011), treated firms' dividend yield sharply increases while it remains quite stable for control firms. The economic magnitude of the effect appears to be substantial. Interestingly, we obtain consistent results when looking at the other two dimensions of the firms' dividend payout. Furthermore, the evolution of the curves after the tax cut also suggests that the effect seems to be reasonably persistent over time. We complement our analysis by analyzing total payout, which we define as:

$$total\ payout_{it} = \frac{dividend\ per\ share_{it} + amount\ per\ share\ spent\ for\ repurchases_{it}}{earnings\ per\ share_{it}}$$

Accounting for share repurchases allows us to have a full picture of the payout policy of the firms. We also display the evolution of this additional variable in Figure 3 and see that going from dividend payout to total payout does not materially affect the overall pattern. The payout ratio of treated and control firms follows a common trend before the reform and their evolution diverges significantly afterwards.[17]

[17] For completeness, we also study other payout variables considered in the literature (see Chetty and Saez (2005)): the percentage of firms starting to pay a dividend (first timers) and the percentage of firms increasing their dividends compared to the previous year. Both variables are significantly higher for treated firms in 2011 but are comparable in magnitude over the 2012-2015 period. Note that the effect is not expected to be permanent for these variables as a given firm cannot, by definition, initiate dividend payment two years in a row, and the second variable is in first-difference and not in level.

We then formally contrast the payout policy of treated and control firms using a difference-in-differences setting. We estimate the following specification using OLS regressions and robust standard errors clustered at the industry level:

$$y_{it} = \alpha + \beta \cdot treated_{it} + \boldsymbol{\gamma}' \boldsymbol{X}_{it} + FE_i + FE_t + e_{it} \quad (1)$$

where y_{it} is a payout variable, $treated_{it}$ is a dummy variable taking the value of one if the firm is treated and the year is 2011 or later, $\mathbf{X_{it}}$ is a vector of control variables, and FE_i and FE_t are firm and year fixed effects.

Such a specification appears particularly appropriate in our setting as the payout variables of treated and control firms follow a common trend prior to the fiscal shock (see the 2007-2010 subperiod in Figure 3). Estimation results in Table 3 indicate that treated firms tend to increase dividend and total payout following the fiscal shock (columns 1, 3, 5, and 7). The beta coefficient is both statistically significant at the 99% confidence level and economically significant. It means that treated firms saw their dividend yield increase after the tax cut by 0.665% more than control firms. This is a sizable increase as the average of the pre-reform dividend yield was 2.03%: 0.665 / 2.03 = 32.8%. When turning to the three other payout variables, the pattern remains very similar: the payout ratios and the propensity to pay a dividend increase significantly more for treated firms after the tax cut. For instance, for dividend payout, the beta coefficient is 9.221, and the average payout ratio before the tax cut was 34.78%: 9.221 / 34.78 = 26.5%.

As an alternative, we present our results in terms of elasticity. Following Yagan (2015), we call ε the elasticity of the y variable with respect to one minus the tax rate, $(1-\tau_d)$, and report

the elasticity at the bottom of each column in Table 3.[18] We observe that the elasticity is positive, which is consistent with the fact that payout rises with (1-τ_d), or decreases with τ_d. As for the magnitude, the elasticity appears to be high, around 0.4, for the dividend yield, dividend payout, and total payout. Furthermore, the associated confidence intervals remain in positive territory. Interestingly, our elasticity estimates are slightly lower than those reported by Chetty and Saez (2005) and Yagan (2015) for US firms (around 0.5) or by Boissel and Matray (2019) for French firms (0.5-0.6), and much lower than the estimates in Jacob and Michaely (2017) for Swedish firms owned by one or a few owners. The elasticity for the percentage of dividend-paying firms is 0.15 and its lower bound is close to zero.

[Insert Table 3 here]

To reinforce the causal explanation between the tax cut and payout policy, and to better understand the dynamics of the payout policy around the fiscal shock, we estimate an alternative specification in which we treat each year separately:

$$y_{it} = \alpha + \beta_{-1} \cdot treated_{it}(-1) + \beta_0 \cdot treated_{it}(0) + \beta_1 \cdot treated_{it}(+1) + \beta_{2+} \cdot treated_{it}(2+) + \boldsymbol{\gamma}' \boldsymbol{X}_{it} + FE_i + FE_t + e_{it} \quad (2)$$

where *treated*$_{it}$(-1) is a dummy variable taking the value one if the firm is treated and the year is 2010, *treated*$_{it}$(0) is a dummy variable taking the value one if the firm is treated and the year is 2011, *treated*$_{it}$(+1) is a dummy variable taking the value one if the firm is treated and the year is 2012, and *treated*$_{it}$(2+) is a dummy variable taking the value one if the firm is treated and the year is 2013, 2014, or 2015. Such a specification allows us to get a better sense of the

[18] The elasticity is computed as $\varepsilon = [\hat{\beta}/\bar{y}_{treated}]/[(\tau_{d,before} - \tau_{d,after})/(1 - \tau_{d,before})$ where $\hat{\beta}$ comes from equation (1), $\bar{y}_{treated}$ is the mean of the y variable for treated firms, and the τ_d parameters are the tax rates before and after the tax change (Yagan, 2015). Confidence intervals can be obtained by replacing $\hat{\beta}$ by $\hat{\beta} +/-1.96 * s.e.(\hat{\beta})$ in the elasticity formula.

gradual adjustment of the payout policy of the firms and to test whether the effect is persistent. It also allows detecting or ruling out any potential anticipation effect. The results in columns 2, 4, 6, and 8 of Table 3 clearly show that most of the increase occurs in the first year of the reform (year 0), which is consistent with the visual analysis of Figure 3. The non-significant β_{-1} coefficients indicate that there is no anticipation, which points toward a causal explanation. Moreover, both the estimated values and t-stats of the β_1 and β_{2+} coefficients collectively indicate that the effect of the tax cut on dividends is not short-lived.

We conduct a series of additional tests and robustness checks. A first potential source of concern is the fact that some control firms did react to the fiscal shock during the post-reform period. Indeed, some firms started building *reserves from capital contribution* to be able to pay TED to their shareholders in the future. To take care of this concern, we drop these switching firms from the analysis and re-estimate both equations (1) and (2). Doing so leads to a reduction in the number of observations from 1,859 to 1,681, but it does not materially change the overall pattern. We see in Table 4 that the coefficient associated with the treatment variable remains positive and statistically significant at the 99% confidence level (columns 1, 3, 5 and 7), and the estimated dynamics remains virtually unaffected (columns 2, 4, 6 and 8).

An alternative way to deal with switching firms is to terminate the sample period at the end of year 0. Doing so allows us to design a particularly clean test of the effect of removing dividend taxes on corporate payout. However, it comes at the cost of reducing both sample size and statistical power. We present the estimation results in columns 1, 3, 5 and 7 of Table 5. The estimated beta coefficients remain statistically significant at the 95% or 99% confidence levels for the first three variables (columns 1, 3 and 5), but their values are smaller than when we consider the full five years after the tax cut. The latter is consistent with the fact that the effect was building up over the three years following the event. For the percentage of payers, the β coefficient on the treatment dummy remains positive and statistically significant at the

90% confidence level. However, in this case, there is no drop in the value of the coefficient compared to Table 4 as the full adjustment is made after one year.

In an auxiliary test, we exploit a specific feature of our setup. Indeed, firms had little time between the announcement of the possibility to pay TED (December 2010) and their next general assembly (typically between January and June 2011). Indeed, some firms with potential reserves from capital contribution did not have enough time to file their request with the Federal Tax Authority and to get its approval in due time.[19] As a result, such firms, although being theoretically eligible, had to wait an extra year to benefit from the tax cut. From an identification point of view, these "late firms" constitute an ideal control sample as they are *similar* to the firms treated in 2011. Our setting looks, in some respects, like the one used by Bernstein (2015) in his study of the effects of going public on firms' innovation. He contrasts the innovation activity of firms that go public with firms that withdraw their initial public offering filing and remain private. Just like in the present test, these two groups of firms are ex-ante similar and offer a clear identification strategy. Columns 2, 4, 6 and 8 in Table 5 display the regression results for treated firms vs. late firms over the sample period 2007-2011. In this case too, we find that firms quickly and massively adjusted their payout policy after the tax cut.

[Insert Tables 4 and 5 here]

We look at treatment effect heterogeneity using a firm-specific intensity measure, which is the theoretical number of years of tax-exempt dividends (*YTED*) a given firm can pay:

$$YTED_i = \frac{reserves\ from\ capital\ contribution\ of\ firm\ i\ in\ 2010\ (Dec.31)}{amount\ of\ dividend\ paid\ by\ firm\ i\ in\ 2010}$$

[19] In its 2011 annual report, Swiss company Comet states: "The distribution is expected to qualify as a tax-exempt repayment of contributed capital […] Confirmation of this tax-exempt status from Switzerland's Federal Tax Administration is still pending at the time of writing this annual Report".

Computing *YTED* for all our treated firms for the year 2010 indicates that, at the time of the reform, the reserves from capital contribution were sizable. The average (median) treated firms can pay 7.4 years (3.7 years) of tax-exempt dividends, with some firms being able to pay several decades of tax-free dividends (maximum = 47.4 years). In Table 6, we conduct the same analysis as in Tables 3 and 4 by replacing our treatment dummy variable by *YTED*.[20] Overall, results remain coherent and similar to those in the base case. Six out of the eight variables/specifications considered yield positive and statistically significant coefficients. The only variable for which the coefficient is insignificant is *Payer*, which suggests that treatment intensity impacts more heavily the intensive margin (increasing dividends) than the extensive margin (initiating dividends).

[Insert Table 6]

As an additional robustness check, we remove all firms belonging to the financial industry. This reduces our sample size from 1,859 to 1,338 observations. We estimate equations (1) and (2) with non-financial firms only and report the results in Table A1 in the Appendix. Regardless of the payout variable, we obtain consistent results, which suggests that the baseline results are not materially affected by the presence of financial firms.[21] Finally, as our sample is very heterogeneous in terms of size with some smaller local companies and some multinational firms, we redo our tests after removing the bottom and top quintile of firms in terms of total assets. Results in Table A4 in the Appendix indicate that our findings are not driven by the smallest or the largest firms.

Overall, the evidence presented above hints at a strong impact of dividend taxes on the payout policy of firms, which comes in contrast with the often alleged minor effect of corporate taxes (Myers et al. 1998). More specifically, we cannot reject the first two hypotheses (H1 and

[20] We discard observations for which the intensity would be infinite as no dividend was paid in 2010.
[21] In Tables A2 and A3, we replicate Tables 4 and 5 using non-financial firms only and obtain similar results.

H2) according to which a dividend tax cut increases both dividend payout and total payout. This empirical evidence is consistent with previous evidence (Yagan 2015, Alstadsæter et al. 2017, Jacob and Michaely 2017). Our findings are also consistent with our theoretical framework presented in Section 2.

5.2 Agency conflicts

In this section, we investigate whether there are cross-sectional differences in the firms' responses to the disappearance of dividend taxes. We consider the presence of control-enhancing mechanisms (CEM). These mechanisms allow controlling shareholders to have more voting rights than cash flow rights in a firm and therefore, capital structure in those firms deviates from the one share-one vote principle. The use and existence of such mechanisms are widespread around the world (see for instance Faccio and Lang (2002) for Europe, Carney and Child (2013) for East Asian countries or Gompers et al. (2009) for the US). Swiss firms mainly use two such mechanisms: dual-class shares and voting right restrictions. Dual-class shares allow controlling shareholders to have more control rights than cash-flow rights and represents an efficient anti-takeover tool. Voting caps are an alternative way for large shareholders to limit the power of other shareholders when the capital structure is made of shares with equal voting rights. In practice, the cap is set between 2 and 10%. Similar to dual class-shares, these limitations generate a discrepancy between voting and cash flow rights of shareholders. The existence of CEM in a firm indicates the presence of a controlling shareholder who aims to keep control of the firm without necessarily having the capital to do so. Such individuals might, therefore, be reluctant to distribute more dividends to all shareholders, as those resources are costly and, dependent on the level of the wedge between cash flow and voting rights, from which he would only partly benefit. Table 2 shows that, in 2010, 39% of firms in our sample

have one of these two kinds of CEM and that the average (median) wedge, defined as the ratio of voting rights to ownership rights of the largest shareholder, is 1.20 (1.00).

We estimate a variation of Equation (1) in which we break down the treatment variable into two components: one that takes a value of one if the treated firm has dual-class shares and another one that takes a value of one if the treated firm does not have dual-class shares. We see in columns 1 and 4 of Table 7 that the beta coefficients on the treatment variables are only positive and statistically significant for firms that do not have dual-class shares. This means that only firms with a unitary capital structure significantly increase their dividends, measured with four different metrics, after the tax cut. Treated firms with dual-class shares do not react to the tax cut and behave similarly to firms from the control group. The associated F-test indicates that we can only reject the null hypothesis at the 90% confidence level that the beta coefficients are equal for firms with and without dual-class shares for the *Dividend Payout* and *Payer* variables. We obtain qualitatively similar results when we modify the definition of treated firms to those having CEM in general (dummy taking the value 1 if the company has dual-class shares or voting right caps) or those displaying a wedge (dummy variable taking the value 1 if voting rights of the largest blockholder are higher than ownership rights). The results are presented in columns 2 and 5 for CEM and columns 3 and 6 for the wedge. We observe that the beta coefficients of firms without CEM or without a wedge are all significant and much higher than their respective complements.

A potential concern one may have is that voting rights variables may be correlated with the share of a stock's ownership that would have previously been subject to tax. Thus, it may be that the voting right distortion does not itself matter. We aim to address this concern in two ways. First, we compute the frequencies of the use of CEM separately for two groups of firms whose shareholders face a similar dividend tax treatment. Indeed, dividends paid by firms mainly owned by individuals (e.g. widely held companies and firms having a family

blockholder) will be, before the reform, more heavily taxed than dividends paid by firms mainly owned by institutional investors or the government. We find that the share of firms using CEM is 37.4% for firms owned by individuals and 44.1% for other firms. Hence, the relative similarity between the two numbers suggests that the correlation between voting right distortion and the tax treatment of dividends does not appear to be large. Second, we rerun the analysis presented in Table 7 by limiting the sample to firms mainly owned by individuals, hence being under similar taxation. We report the results in Table A5 for widely held and family firms combined and in Table A6 for family firms only. In both cases, the estimated coefficients mirror those in Table 7.

[Insert Table 7 here]

Overall, our cross-sectional results indicate that firms with some voting right distortion do not increase their dividend after the tax cut. This finding is consistent with Hypothesis H3 and with the idea that firms with CEM have more agency and entrenchment problems than firms without CEM (Masulis et al. 2009). The former would prefer to keep cash to extract private benefits of control and avoid increasing dividends. This suggests that dividend taxes and agency conflicts reinforce each other by maintaining too much cash within the firm. Our results on the effects of the ownership structure on the interplay between dividend taxes and payout are fully consistent with Jacob and Michaely (2017) and Berzins et al. (2019). They find that as agency issues and shareholder conflicts increase, shareholders' taxes have a significantly smaller impact on payout. We show here that their conclusion remains valid in our sample of publicly traded firms.

5.3 Effects on stock prices

In this section, we measure the stock price reaction to the change in the dividend tax rate. Theoretically, as the current price of any share of stock is supposed to be the present value of future dividends, net of dividend tax, several counterbalancing effects are at play. For instance, larger after-tax cash-flows tend to increase stock prices. Differently, if a firm reacts to the tax reform by increasing its leverage, by shrinking equity and/or reducing cash reserves, it will be perceived as more risky. This will mechanically increase the discount rate and decrease stock prices. Empirically, the identification of a precise event date for any legislative event is a complex task, as information gradually percolates through the various steps of the legislative process. For instance, in their event studies around the 2003 dividend tax cut in the US, Auerbach and Hassett (2005) and Brown et al. (2007) use eight different event dates to capture the market reaction. Differently, we exploit the peculiar setting of the Swiss tax reform to identify firm-specific event dates. Indeed, as the impact of the tax reform on publicly-traded firms was unintentional, many were caught by surprise. As a result, firms only had a few months to gain the approval of reserves from capital contribution by the Federal Tax Authority. Some firms were not able to get their reserves validated in time for the 2010 dividend (paid in 2011), and hence only benefited from the tax reform the subsequent year. Moreover, according to the Federal Tax Authority, 38.9% of all submitted validation requests were rejected and had to be modified. Consequently, investors only truly learned about a firm's capacity to pay out tax-exempt dividends when each firm publicly announced its dividend after the enactment of the reform.

We, therefore, investigate the market reaction to the first-time announcement of a tax-exempt dividend payment, in either 2011 or 2012. This firm-specific date corresponds to the first public signal a treated firm can send out and, hence, is used as date 0 in the event study. As a benchmark, we also calculate the market reaction for firms paying taxed dividends and

formally test whether the absence of taxes is reflected in firm value. As in most European countries, Swiss firms announce dividend payments simultaneously with earnings and other financial news. This makes the identification of the dividend announcement impact on stock prices more challenging and requires controlling for potential confounding effects. We collect dividend announcement dates from *Dow Jones Factiva* for firms that paid tax-exempt dividends for the first time in 2011 or 2012 and for firms that paid taxed dividends. The initial sample contains 208 firms in 2011 and 204 firms in 2012. Of these, only 142, respectively 153, firms paid dividends in 2011, respectively in 2012. Finally, we discard 52 firms in 2012 that already paid tax-exempt dividends for the first time in 2011, as there is no additional surprise effect in 2012. Hence, we obtain a final sample of 243 observations. In order to control for potential confounding effects of earnings announcements on the same day, we also collect earnings surprises from *Datastream*. Earnings surprises are defined as the percentage difference between the actual annual EPS (earnings-per-share) published by the firm minus the mean forecasted annual EPS by analysts divided by the mean forecasted annual EPS. Forecasted EPS data are from I/B/E/S. Since other important corporate information may be announced on that day, we read reports published by financial news agencies on the annual results conference organized by the company and eliminate firms for which other important information besides dividend and earnings announcements are disclosed (e.g. mergers & acquisitions). Our final sample contains 160 announcements.

In the first stage, we perform an event study with a window of 20 days before and after the dividend announcement. Normal returns are obtained with a market model estimated on a 200-days window preceding the event window. Figure 4 shows the cumulative average abnormal return for two groups of firms: those announcing the first-time payment of tax-exempt dividends in 2011 or 2012 and those paying taxed dividends over the same period. We observe in this figure that the reaction to the announcement of tax-exempt dividends is on average

positive and that prices for those firms increase by approximately 2% over the event window. On the other hand, firms paying taxed dividends experience approximately a 1% price decrease.

In the second stage, we control for potential confounding effects by regressing the individual firms' (cumulative) abnormal returns on (1) a dummy variable indicating that a firm paid a tax-exempt dividend for the first time and (2) a series of control variables identified in the literature as having an impact on stock prices around dividend announcements (Yoon and Starks 1995). The control variables include earnings surprises, a dummy variable taking the value 1 if the dividend increases compared to the previous year, and several firm-specific financial variables (market value, return on assets, market-to-book ratio, and leverage) and a liquidity variable (average daily volume over the number of outstanding shares). The sample drops to 157 observations because of missing observations.

Column 1 in Table 8 provides the results for the abnormal returns on the announcement day. We observe that firms paying tax-exempt dividends have abnormal returns that are 1.1% higher than firms with taxed dividends and that the difference is statistically significant at the 95% confidence level. This confirms the visual impression gained in Figure 4 and indicates that the elimination of dividend taxes induces an increase of 1.1% in firm value, all else constant. Columns 2 to 8 present results for cumulative abnormal returns computed over various trading horizons. The return gap between dividend-paying firms with and without taxes increases up to 2.4% for a 20-day horizon and is, in all cases, statistically significant. Throughout the different regressions, earnings surprises and the sign of the dividend change prove to be important determinants of the market reaction to dividend announcements. Their estimated coefficients are always positive and, most of the time, statistically significant.

[Insert Figure 4 and Table 8 here]

5.4 Effects on investment

We now analyze whether the introduction of the CTR2 had any effect on the investment policy of Swiss companies (Hypothesis H4). Our measures of corporate investment are the log of capital expenditures, the ratio of capital expenditures on lagged property, plant & equipment, as well as (R&D + capital expenditures) on lagged fixed assets. These variables are widely used in the empirical corporate finance literature to represent firm investment levels (Almeida and Campello (2007); Foucault and Fresard (2014).[22] We start by plotting the evolution of the average of the log of capital expenditures. We observe in Figure 5 that prior to the reform, the evolution of this investment variable was remarkably similar for both treated and control firms. Unlike for payout, we do not detect visually any increase in average investment for the treated firms after the enactment of the reform. If anything, the average investment is increasing for control firms following the reform.[23] Similarly for the other two investment variables, we observe no post-reform surge.

Next, we estimate Equation (1) using our three investment variables as the endogenous variable. For each variable, we estimate the main two specifications that we used for the payout variables in Section 6.1. Specifically, we contrast treated and control firms over the whole sample (Table 9, columns 1, 3, 5), and treated and control firms, except switching firms, over the entire sample (columns 2, 4, 6). Overall, we do not detect any significant effects of the tax cut on the investment of treated firms. The value of the elasticity parameters is systematically close to zero and their associated lower and upper bounds always have opposite signs. Depending on the investment variable and the specification, our elasticity estimates range between -0.12 and 0.01, which is in line with those reported by Yagan (2015) in the US. The

[22] We winsorize the capex-to-PPE variable at the 1st and 99th percentiles. In Table A7, we re-estimate our specifications on investment using different winsorizing thresholds.
[23] We report in Figure A1 in the appendix the difference in the annual average of investment variables for treated and control firms, along with two standard-deviation confidence intervals.

confidence intervals we report in Table 9 are tighter than in Yagan (2015). In all but one case, the lower bound of the interval is smaller than the [0.2, 0.4] range implied by the theoretical Poterba-Summers model.

We further consider robustness tests using a balanced panel (Table A8), a time-invariant denominator in the two investment ratios (Table A9), as well as standard errors clustered at the firm-level instead of at the industry-level (Table A10). All these additional tests deliver consistent results. We also test whether investment reacts with a delay to the tax cut by estimating equation 2, in which we treat each year separately. Results in Table 10 again allow us to reject the idea of an increase in investment triggered by the tax cut. Consistent with visual evidence in Figure 5, our estimates sometimes point towards a relative *reduction* in the investment of treated firms. However, even if this negative result is both interesting and consistent with the theoretical framework laid out in Section 2, and with Chetty and Saez (2010), it turns out not to be robust in our analysis.

Finally, we complement our real-effect analysis by considering two alternative variables: the number of employees and salaries, which we consider both in level and scaled by the firm's annual total sales. We see in Table 11 that employment and compensation are not affected by the tax reform. This lack of evidence concerning employment is particularly problematic given the fact that it was one of the primary objectives of the reform. The zero-effect result on employment is however in line with the finding of Boissel and Matray (2019) in France whereas the zero-effect result on salaries is consistent to the one obtained by Yagan (2015) in the US.

Given the ample evidence presented in this section, we can reject hypothesis 4, which states that investment increases after the dividend tax cut. This set of results indicates that CTR2 did not meet one of its main objectives, which was to produce positive real effects. Our results are in line with Yagan (2015) who reports that the 2003 dividend tax cut had no material effect on

the investment policy of private firms in the US. This body of evidence contradicts the neoclassical theory of dividend taxation, which focuses on the key role of equity and its reduced cost following a tax cut. Instead, it is consistent with an economy where the marginal source of finance is retained earnings and not new equity.[24]

[Insert Figure 5 and Tables 9, 10, 11 here]

5.5 Effects on equity and cash

To better understand why reduced taxes on dividends did not materialize into more investment, we test whether treated firms raise equity (hypothesis H5). To do so, we first display in Figure 4 the log of the book-value of equity and the percentage of firms that conduct a seasoned equity offering in a given year. In this figure, we see that raising new equity is not a common practice among Swiss companies, which is consistent with the idea that their marginal source of finance is retained earnings. There is also no indication that treated firms are more prone to raise equity than their peers after the tax cut. We complement this visual analysis using a series of regression analyses. The estimation results in Panel A of Table 12 confirm that treated firms do not significantly increase their equity, and we obtain consistent results for the three considered variables: log(equity), equity scaled by total assets, and the percentage change of equity.[25] Given the fact that, at the same time, we report a sudden and large increase in total payout, the residual financial resources available to finance new investments are mechanically shrinking. Overall, our findings allow us to reject both Hypotheses H4 and H5, as well as the neoclassical theory they are directly derived from.

[24] Alstadsæter et al. (2017) also find that the Swedish 2006 dividend tax cut did not affect aggregate investment. However, they show that cash-constrained firms raised more equity and increased investment relative to cash-rich firms.

[25] We winsorize the equity/total assets variable at the 1st and 99th percentiles. In Tables A11, A12 and A13, we re-estimate our specifications on equity and cash using different winsorizing thresholds, a balanced panel, and a time-invariant denominator. See Table 13 for the specification with dynamics. We also report in Figure A1 in the appendix the difference in the annual average of financing variables for treated and control firms, along with two standard-deviation confidence intervals.

As a final consistency test, we study the evolution of cash holdings before and after the enactment of the reform. We plot in Figure 5, the average level of the cash reserve, expressed in log, separately for treated and control firms. The level of cash remains quite stable for treated firms, whereas it is following a positive trend for control firms. We then estimate our main specifications for three variables capturing cash holdings: log(cash), cash scaled by total assets, and the percentage change of cash. The estimation results are displayed in Panel B of Table 13. It appears that the coefficient associated with the treatment variable is always negative and is marginally statistically significant for log(cash) and the percentage change of cash. Our interpretation is that the lower growth rate of cash holdings within treated firms comes from the fact that these firms increased their payout markedly after the tax cut. In other words, they retain a smaller fraction of their annual earnings compared to their peers. However, our findings collectively indicate that this relative contraction in cash for treated firms is not due to a boost in investments, as the latter did not materialize in our sample.

[Insert Tables 12 and 13 here]

6 CONCLUSION

Informing policy-makers about the financial and real effects of taxes is part of the fundamental mission of financial economists (Yagan 2015, Giroud and Rauh 2019). In this paper, we contribute to this important debate by focusing on the 2011 corporate tax reform in Switzerland. It gives us a quasi-experimental setup as some firms were suddenly able to pay tax-exempt dividends while others were not. The main findings from our study are the following. We find that treated firms immediately and massively increased payouts after the tax cut. Because the rise in dividends is not compensated by an equally sized drop in share repurchases, the total payout also significantly increased after the tax cut, or in other words, retained earnings significantly decreased. We show that agency problems considerably dampen

the effect of the tax cut on firms' payout policy. In an event study, we report that the value of firms benefiting from the reform increased by around 2%. When turning to corporate investment, we report a zero-elasticity with respect to dividend taxes. This comes from the fact that treated firms do not raise enough equity to compensate for the contraction in retained earnings. We show that our results are consistent with a model where the marginal source of finance of firms is retained earnings (King 1974, Auerbach 1979, Bradford 1981, Auerbach 2002) and not new equity (Poterba and Summers 1985).

Overall, our findings suggest that (1) corporations do care about the taxes faced by their shareholders, (2) dividend taxes induce firms to retain a higher fraction of earnings compared to their optimal level, and (3) dividend taxes do not induce firms to deviate from the optimal investment level. Taken together, (2) and (3) point towards the distortive effects of dividend taxes. We interpret this result as a detrimental effect of dividend taxes on the allocation of capital across firms. If paid out to shareholders, this cash could be reinvested more efficiently elsewhere in the economy.

More than ten years after the Swiss Parliament passed the second Corporate Taxation Reform, tax-exempt dividends are still a prominent way for firms to return cash to their shareholders, and it is likely to remain the case for the years to come. Indeed, the latest figures for the year 2019 indicate that current reserves from capital contribution (required to pay tax-exempt dividends) amount CHF1,372 billion for all Swiss corporations, which is two times the Swiss GDP.

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Table 1
Industry and size composition of the sample

Industry	Nb of obs.	% sample	% MV	MV p25	MV median	MV p75
Oil & Gas	18	0.94	1.28	1,173	6,973	10,600
Basic Materials	122	6.39	4.15	131	343	3,454
Industrials	506	26.49	14.61	188	518	1,604
Consumer Goods	184	9.63	22.15	94	315	3,599
Health Care	197	10.31	29.99	195	648	3,813
Consumer Services	163	8.53	1.10	92	312	846
Telecommunications	9	0.47	1.87	20,400	21,300	23,900
Utilities	49	2.57	0.69	305	1,218	1,698
Financials	526	27.54	23.40	280	1,051	2,841
Technology	136	7.12	0.76	107	285	691
Total	1,910	100.00	100.00	171	598	2,180

Notes: *Nb of obs.* indicates the number of firm-year observations. Market values (*MV*) are expressed in million Swiss Francs (CHF). *p25* denotes the lower quartile and *p75* the upper quartile of the distribution.

Table 2
Descriptive statistics

	All	Treated		Control		Difference of means
	Mean	Nb of obs.	Mean	Nb of obs.	Mean	p-value
Dividends						
Dividend yield (in %)	2.03	96	2.07	114	1.99	0.77
Dividend pay-out (in %)	34.78	96	35.73	114	33.97	0.70
Total pay-out (in %)	36.31	96	37.19	114	35.58	0.72
Payer (in %)	69.05	96	67.71	114	70.18	0.70
Investment & Financing						
Capital expenditures (capex) (in CHF)	118.65	95	137.63	111	102.41	0.51
ln(capital expenditures)	9.39	95	9.72	111	9.10	0.10
Property, Plant & Equipment (in CHF)	823.95	96	893.62	114	765.29	0.70
Capex / PPE (in %)	18.56	86	18.19	100	18.88	0.82
(R&D + capex) / Total assets (in %)	8.50	44	8.00	40	9.06	0.42
Nb. employees	7550	91	8306	98	6849	0.59
ln(nb. employees)	7.29	91	7.52	98	7.07	0.11
Nb. Employees / Sales	0.33	84	0.33	91	0.33	0.93
Salaries (in CHF)	674.06	89	757.07	110	60.90	0.62
ln(salaries)	11.67	89	11.97	110	11.43	0.04
Salaries / Sales (in %)	27.52	82	27.17	98	27.82	0.73
Market value of equity (in CHF)	4.64	96	4.50	114	4.77	0.90
Book value of equity (in CHF)	2.19	96	2.61	114	1.83	0.40
ln(book value of equity)	12.83	96	13.08	114	12.62	0.08
Book value of equity / Total assets (in %)	42.90	87	43.41	101	42.46	0.79
Cash (in CHF)	647.97	83	955.21	93	373.76	0.11
ln(cash)	11.20	83	11.57	93	10.88	0.03
Cash / Total assets (in %)	12.86	75	12.91	84	12.81	0.96
Firm characteristics						
Total assets (in CHF)	14,142.78	96	20,061.04	114	9,159.77	0.18
EBIT (in CHF)	527.65	95	507.30	108	545.54	0.88
Net Income (in CHF)	312.08	96	271.88	114	345.92	0.65
Age (in years)	76.60	96	71.42	114	80.96	0.29
Return on assets (in %)	2.89	95	3.07	108	2.74	0.86
Return on equity (in %)	3.98	96	4.90	114	3.20	0.64
Sales growth (5y) (in %)	6.26	88	6.83	108	5.79	0.71
Market-to-book	2.13	96	2.24	114	2.04	0.49
Leverage (in %)	33.96	96	32.30	114	35.35	0.42
Ownership & Agency						
Freefloat (in %)	62.01	94	62.62	107	61.48	0.76
Widely-held (in %)	19.23	94	23.40	114	15.79	0.17
Blockholder (in %)	80.77	94	76.60	114	84.21	0.17
Family (in %)	50.96	94	48.94	114	52.63	0.71
Non-family blockholder (in %)	29.81	94	27.66	114	31.58	0.43
Dual-class shares (in %)	19.23	94	10.64	114	26.32	0.00
Control-enhancing mechanism (in %)	39.42	94	29.79	114	47.37	0.01
Wedge	1.20	94	1.17	114	1.23	0.52

Notes: This table presents descriptive statistics for the year 2010 for all sample companies, treated companies, and control companies. The last column displays the p-values of differences of means between the treated and control groups. All variables expressed in Swiss francs (CHF) are in millions. To be considered a blockholder, a family or a non-family blockholder company, the largest shareholder must hold at least 10% of voting rights in a company otherwise the company is classified as widely-held. Dual-class shares indicate companies having multiple share classes. Control-enhancing mechanisms denote multiple share classes or voting right restrictions. The wedge is defined as the ratio of voting rights to ownership rights for the largest shareholder.

Table 3
Treatment effect on payout

	Dividend Yield		Dividend Payout		Total Payout		Payer	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated	0.665***		9.221***		9.889***		6.725*	
	(0.146)		(1.774)		(2.012)		(3.160)	
Treated (y-1)		0.000		0.485		-1.406		-2.915
		(0.072)		(3.820)		(4.272)		(3.494)
Treated (y0)		0.473**		6.261**		6.336*		7.118
		(0.163)		(2.745)		(3.132)		(4.427)
Treated (y+1)		0.913*		7.256		7.448		7.574
		(0.467)		(4.200)		(4.544)		(4.828)
Treated (y2+)		0.650***		11.267***		11.449***		4.919
		(0.153)		(1.852)		(2.754)		(3.858)
Observations	1,859	1,859	1,859	1,859	1,859	1,859	1,859	1,859
R-squared	0.620	0.620	0.575	0.576	0.564	0.565	0.688	0.688
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Pre-2011 treated firms mean	2.677		39.067		42.573		76.829	
Implied ε wrt $(1-\tau_{div})$	0.44		0.41		0.41		0.15	
Bounds	[0.25, 0.62]		[0.26, 0.57]		[0.25, 0.57]		[0.01, 0.30]	

Notes: This table presents the results of a difference-in-differences OLS regression over the period 2007-2015. The explained variable is, alternatively, the *dividend yield* (dividend per share over stock price), *dividend payout* (dividend per share over earnings per share), *total payout* (dividends + repurchases over earnings), and *Payer* (dummy variable equal to one if the firm pays a dividend). *Treated* denotes companies that can pay tax-exempt dividends. (y-1) denotes the treatment effect one year before the tax cut, (y0) the year of the tax cut, (y+1) the year after the tax cut, and (y2+) two and more years after the tax cut. All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. Elasticities (ε) with respect to one minus the dividend tax rate are reported along with their upper and lower bounds. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 4
Treatment effect on payout without switching firms

	Dividend Yield		Dividend Payout		Total Payout		Payer	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated	0.681***		8.958***		9.492***		8.184*	
	(0.164)		(2.099)		(1.894)		(3.688)	
Treated (y-1)		0.004		0.572		-1.329		-2.485
		(0.071)		(3.807)		(4.268)		(3.313)
Treated (y0)		0.478**		6.333**		6.405*		7.504
		(0.161)		(2.757)		(3.159)		(4.422)
Treated (y+1)		0.995*		6.831		6.676		6.884
		(0.441)		(5.196)		(5.379)		(5.409)
Treated (y2+)		0.686**		11.595***		11.660***		7.764
		(0.223)		(2.110)		(2.247)		(4.828)
Observations	1,681	1,681	1,681	1,681	1,681	1,681	1,681	1,681
R-squared	0.623	0.623	0.575	0.575	0.564	0.564	0.713	0.713
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Pre-2011 treated firms mean	2.677		39.067		42.573		76.829	
Implied ε wrt $(1-\tau_{div})$	0.45		0.40		0.39		0.19	
Bounds	[0.24, 0.66]		[0.22, 0.59]		[0.24, 0.54]		[0.02, 0.35]	

Notes: This table presents the results of a difference-in-differences OLS regression over the period 2007-2015 discarding companies that were treated after the shock (switching firms). The explained variable is, alternatively, the *dividend yield* (dividend per share over stock price), *dividend payout* (dividend per share over earnings per share), *total payout* (dividends + repurchases over earnings), and *Payer* (dummy variable equal to one if the firm pays a dividend). *Treated* denotes companies that can pay tax-exempt dividends. (y-1) denotes the treatment effect one year before the tax cut, (y0) the year of the tax cut, (y+1) the year after the tax cut, and (y2+) two and more years after the tax cut. All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. Elasticities (ε) with respect to one minus the dividend tax rate are reported along with their upper and lower bounds. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 5
Treatment effect on payout over a shorter period

	Dividend Yield		Dividend Payout		Total Payout		Payer	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated	0.457**		6.642***		7.328**		7.868*	
	(0.173)		(1.977)		(2.290)		(3.937)	
Treated vs. Late		0.608**		11.594***		11.182***		11.189**
		(0.193)		(2.277)		(2.063)		(3.521)
Observations	1,049	675	1,049	675	1,049	675	1,049	675
R-squared	0.702	0.711	0.603	0.602	0.580	0.576	0.772	0.746
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Pre-2011 treated firms mean	2.677	2.677	39.067	39.067	42.573	42.573	76.829	76.829
Implied ε wrt $(1-\tau_{div})$	0.30	0.40	0.30	0.52	0.30	0.46	0.18	0.26
Bounds	[0.08, 0.52]	[0.15, 0.65]	[0.12, 0.47]	[0.32, 0.72]	[0.12, 0.49]	[0.29, 0.63]	[0.00, 0.36]	[0.10, 0.41]

Notes: This table presents the results of a difference-in-differences OLS regression over a shorter period: 2007-2011. In columns 1, 3, 5 and 7, we use all sample firms and in columns 2, 4, 6 and 8, the control sample only includes firms treated in 2012 (*Late*). The explained variable is, alternatively, the *dividend yield* (dividend per share over stock price), *dividend payout* (dividend per share over earnings per share), *total payout* (dividends + repurchases over earnings), and *Payer* (dummy variable equal to one if the firm pays a dividend). *Treated* denotes companies that can pay tax-exempt dividends. All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. Elasticities (ε) with respect to one minus the dividend tax rate are reported along with their upper and lower bounds. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 6
Treatment intensity on payout

	Dividend Yield		Dividend Payout		Total Payout		Payer	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated * intensity	0.043***	0.044***	0.688***	0.687***	0.712***	0.703***	0.125	0.204
	(0.011)	(0.009)	(0.137)	(0.170)	(0.094)	(0.125)	(0.209)	(0.129)
Observations	1,684	1,506	1,684	1,506	1,684	1,506	1,684	1,506
R-squared	0.667	0.675	0.597	0.599	0.575	0.575	0.728	0.764
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES

Notes: This table presents the results of a difference-in-differences OLS regression over the period 2007-2015. In columns 1, 3, 5 and 7, we use all sample firms and in columns 2, 4, 6 and 8, we discard companies that were treated after the shock (switching firms). The treatment effect is multiplied by the intensity of the treatment (number of years of tax-exempt dividends). The explained variable is, alternatively, the *dividend yield* (dividend per share over stock price), *dividend payout* (dividend per share over earnings per share), *total payout* (dividends + repurchases over earnings), and *Payer* (dummy variable equal to one if the firm pays a dividend). *Treated* denotes companies that can pay tax-exempt dividends. All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 7
Treatment effect on payout and voting rights

	Dividend Yield			Dividend Payout		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated (with DCS)	0.314			1.836		
	(0.182)			(2.316)		
Treated (w/out DCS)	0.712***			9.915***		
	(0.179)			(2.139)		
Treated (with CEM)		0.250			4.562*	
		(0.250)			(2.250)	
Treated (w/out CEM)		0.862***			11.117***	
		(0.230)			(2.763)	
Treated (with wedge)			0.328			3.562
			(0.249)			(2.421)
Treated (w/out wedge)			0.705***			9.629***
			(0.178)			(2.093)
Observations	1,823	1,823	1,823	1,823	1,823	1,823
R-squared	0.617	0.618	0.617	0.577	0.577	0.576
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
F-test	2.031	2.429	1.289	4.643	2.764	2.812
Prob > F	0.188	0.154	0.286	0.060	0.131	0.128

	Total Payout			Payer		
	(1)	(2)	(3)	(4)	(5)	(6)
Treated (with DCS)	5.299			-4.644		
	(5.025)			(7.491)		
Treated (w/out DCS)	10.246***			7.781**		
	(2.807)			(2.611)		
Treated (with CEM)		4.249			0.665	
		(2.895)			(5.546)	
Treated (w/out CEM)		12.228***			9.119**	
		(2.771)			(3.018)	
Treated (with wedge)			7.406			-6.622
			(5.826)			(7.528)
Treated (w/out wedge)			9.961***			7.824**
			(2.725)			(2.589)
Observations	1,823	1,823	1,823	1,823	1,823	1,823
R-squared	0.564	0.566	0.564	0.688	0.688	0.688
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
F-test	0.470	5.402	0.110	3.897	2.267	4.788
Prob > F	0.510	0.050	0.748	0.080	0.166	0.060

Notes: This table presents the results of a difference-in-differences OLS regression over the period 2007-2015 for treated companies with dual-class shares (DCS, columns 1 and 4), control-enhancing mechanisms (CEM) in the form of dual-class shares and/or voting right restrictions (columns 2 and 5) or a wedge dummy (columns 3 and 6). The explained variable is, alternatively, the *dividend yield* (dividend per share over stock price), *dividend payout* (dividend per share over earnings per share), *total payout* (dividends + repurchases over earnings), and *Payer* (dummy variable equal to one if the firm pays a dividend). All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 8
Market reaction to the tax cut

	AR(0)	CAR(0,+1)	CAR(0,+2)	CAR(0,+3)	CAR(0,+4)	CAR(0,+5)	CAR(0,+10)	CAR(0,+20)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
PayTED	0.011**	0.011*	0.014**	0.019***	0.017**	0.014*	0.017*	0.024**
	(0.005)	(0.006)	(0.007)	(0.007)	(0.008)	(0.008)	(0.009)	(0.010)
Earnings surprise	0.003	0.005	0.011**	0.015***	0.014**	0.010*	0.011*	0.005
	(0.003)	(0.004)	(0.005)	(0.005)	(0.006)	(0.006)	(0.007)	(0.008)
Dividend variation > 0	0.015**	0.022***	0.026***	0.026***	0.031***	0.027***	0.047***	0.039***
	(0.006)	(0.007)	(0.009)	(0.009)	(0.010)	(0.010)	(0.011)	(0.013)
Market value of equity	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Return on assets	0.000	0.001	0.000	0.001	0.000	0.001	0.001	0.002*
	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Market-to-book	-0.002	-0.003	-0.001	-0.001	-0.001	-0.001	-0.001	0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)
Leverage	-0.024	-0.032	-0.040	-0.046*	-0.052*	-0.044	-0.012	-0.022
	(0.017)	(0.022)	(0.026)	(0.027)	(0.029)	(0.029)	(0.034)	(0.039)
Average daily vol/tot nb shares	0.231	0.288	0.249	0.756	1.857*	1.729*	1.146	0.602
	(0.587)	(0.737)	(0.873)	(0.919)	(0.984)	(0.983)	(1.146)	(1.312)
Observations	157	157	157	157	157	157	157	157
R-squared	0.119	0.138	0.153	0.186	0.185	0.139	0.182	0.141

Notes: This table presents the results obtained by regressing (cumulative) abnormal returns of dividend-paying companies on the following variables: *PayTED* is a dummy variable indicating that the firm paid tax-exempt dividends for the first time in 2011 or 2012, *Earnings surprise* is the difference between the actual (reported) annual EPS (earnings-per-share) minus the mean forecasted annual EPS divided by the mean forecasted annual EPS, *Dividend variation >0* is a dummy variable indicating that the announced dividend on date 0 is larger than last year dividend, and zero otherwise, *Market value of equity*, *Return on assets*, the equity *Market-to-Book ratio*, the leverage (total debt over total assets), and the average daily volume of shares scaled by the total number of outstanding shares. In column 1, the explained variable is the abnormal return on the dividend announcement date whereas in the following columns the explained variable is the cumulative abnormal return between the announcement date and a post-announcement date: from one day ahead in column 2 to twenty days ahead in column 8. The standard-errors are in parentheses below the coefficients. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 9
Treatment effect on corporate investment

	capex		capex / PPE		(R&D + capex) / total assets	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.092	-0.121	-1.176	-1.287	0.056	-0.610
	(0.069)	(0.067)	(0.771)	(0.709)	(0.760)	(0.588)
Observations	1,276	1,165	1,275	1,165	773	707
R-squared	0.946	0.951	0.645	0.674	0.750	0.781
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Pre-2011 treated firms mean	10.107	10.107	23.099	23.099	9.216	9.216
Implied ε wrt $(1-\tau_{div})$	-0.02	-0.02	-0.09	-0.10	0.01	-0.12
Bounds	[-0.04, 0.01]	[-0.04, 0.00]	[-0.20, 0.03]	[-0.20, 0.01]	[-0.27, 0.29]	[-0.34, 0.10]

Notes: This table presents the results of a difference-in-differences OLS regression over the period 2007-2015 comparing treated firms to control firms (columns 1, 3 and 5) and treated firms to a control group discarding switching firms (columns 2, 4 and 6). The explained variable is, alternatively, the log of capex, the ratio of capex over lagged PPE and R&D expenses plus capex over total assets. The two ratios are winsorized at the 1st and 99th percentiles. *Treated* denotes companies that can pay tax-exempt dividends. All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. Elasticities (ε) with respect to one minus the dividend tax rate are reported along with their upper and lower bounds. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 10
Dynamic treatment effect on corporate investment

	capex		capex / PPE		(R&D + capex) / total assets	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated (y-1)	-0.072	-0.073	-0.517	-0.438	-0.979	-0.947*
	(0.091)	(0.091)	(2.053)	(2.115)	(0.524)	(0.498)
Treated (y0)	-0.036	-0.035	-0.057	0.170	-0.111	-0.018
	(0.075)	(0.075)	(1.824)	(1.909)	(0.865)	(0.793)
Treated (y+1)	-0.110	-0.114	-1.958	-0.684	-0.601	-1.132
	(0.089)	(0.108)	(1.353)	(1.343)	(0.864)	(0.892)
Treated (y2+)	-0.140	-0.216**	-1.573	-2.658*	-0.088	-1.298*
	(0.076)	(0.089)	(0.870)	(1.259)	(0.984)	(0.678)
Observations	1,276	1,165	1,276	1,165	773	707
R-squared	0.946	0.952	0.646	0.675	0.751	0.783
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Notes: This table presents the results of a difference-in-differences OLS regression over the period 2007-2015 comparing treated firms to control firms (columns 1, 3 and 5) and treated firms to a control group discarding switching firms (columns 2, 4 and 6). The explained variable is, alternatively, the log of capex, the ratio of capex over lagged PPE and R&D expenses plus capex over total assets. The two ratios are winsorized at the 1st and 99th percentiles. *Treated* denotes companies that can pay tax-exempt dividends. (y-1) denotes the treatment effect one year before the tax cut, (y0) the year of the tax cut, (y+1) the year after the tax cut, and (y2+) two and more years after the tax cut. All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 11
Treatment effect on additional real effects

	salaries		salaries / sales		employees		nb. employees / sales	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated	0.018	0.027	-0.870	-0.411	0.059	0.017	-0.008	-0.009
	(0.044)	(0.052)	(1.160)	(1.430)	(0.044)	(0.014)	(0.016)	(0.014)
Observations	1,190	1,083	1,190	1,083	1,190	1,089	1,190	1,089
R-squared	0.982	0.982	0.878	0.902	0.979	0.986	0.907	0.913
Firm FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Pre-2011 treated firms mean	12.154	12.154	26.723	26.723	7.852	7.852	0.349	0.349
Implied ε wrt $(1-\tau_{div})$	0.00	0.00	-0.06	-0.03	0.01	0.00	-0.04	-0.05
Bounds	[-0.01, 0.02]	[-0.01, 0.02]	[-0.21, 0.09]	[-0.21, 0.16]	[-0.01, 0.03]	[0.00, 0.01]	[-0.20, 0.12]	[-0.18, 0.09]

Notes: This table presents the results of a difference-in-differences OLS regression over the period 2007-2015 comparing treated firms to control firms (columns 1, 3, 5 and 7) and treated firms to a control group discarding switching firms (columns 2, 4, 6 and 8). The explained variable is, alternatively, the log of salaries, the ratio of salaries over total sales, the log of the number of employees, and the ratio of the number of employees over total sales. The two ratios are winsorized at the 1st and 99th percentiles. *Treated* denotes companies that can pay tax-exempt dividends. All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. Elasticities (ε) with respect to one minus the dividend tax rate are reported along with their upper and lower bounds. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 12
Treatment effect on financing sources

Panel A: equity						
	BV equity		BV equity / total assets		% ΔBV equity	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	0.043	0.022	2.426	1.794	-6.616	-8.550
	(0.026)	(0.038)	(1.739)	(2.164)	(5.595)	(5.682)
Observations	1,277	1,166	1,277	1,166	1,277	1,166
R-squared	0.977	0.977	0.838	0.847	0.332	0.361
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Panel B: cash						
	cash		cash / total assets		% Δcash	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.193*	-0.222*	-0.673	-0.677	-25.053**	-25.177**
	(0.093)	(0.101)	(1.389)	(1.463)	(9.149)	(9.307)
Observations	1,215	1,109	1,215	1,109	1,193	1,091
R-squared	0.871	0.877	0.718	0.720	0.177	0.203
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Notes: This table presents the results of a difference-in-differences OLS regression over the period 2007-2015 comparing treated firms to control firms (columns 1, 3 and 5) and treated firms to a control group discarding switching firms (columns 2, 4 and 6). In Panel A, the explained variable is, alternatively, the log of the book value (BV) of equity, the ratio of book value of equity over total assets, and the one-year change in the book value of equity. In Panel B, the explained variable is, alternatively, the log of cash, the ratio of cash over total assets, and the one-year change in cash. All ratios are winsorized at the 1st and 99th percentiles. *Treated* denotes companies that can pay tax-exempt dividends. All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Table 13
Dynamic treatment effect on financing sources

Panel A: equity						
	BV equity		BV equity / total assets		% ΔBV equity	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated (y-1)	0.060	0.058	3.064	3.000	-0.390	-0.328
	(0.066)	(0.067)	(1.828)	(1.839)	(5.675)	(5.665)
Treated (y0)	0.046	0.043	3.370*	3.239	-8.554	-8.542
	(0.029)	(0.030)	(1.790)	(1.823)	(10.296)	(10.340)
Treated (y+1)	0.054	0.015	3.547	2.259	-6.064	-9.555*
	(0.042)	(0.053)	(2.125)	(2.655)	(5.400)	(4.639)
Treated (y2+)	0.066	0.041	3.029	2.251	-6.229	-8.363
	(0.059)	(0.090)	(2.963)	(3.905)	(6.294)	(5.889)
Observations	1,277	1,166	1,277	1,166	1,277	1,166
R-squared	0.977	0.977	0.839	0.847	0.332	0.361
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Panel B: cash						
	cash		cash / total assets		% Δcash	
	(1)	(2)	(3)	(4)	(5)	(6)
Treated (y-1)	0.010	0.012	-0.000	0.009	8.545	10.295
	(0.114)	(0.113)	(1.290)	(1.287)	(20.322)	(20.383)
Treated (y0)	0.011	0.016	1.438	1.454	-5.553	-4.381
	(0.085)	(0.086)	(1.551)	(1.553)	(15.440)	(16.119)
Treated (y+1)	-0.048	-0.001	0.453	0.854	-12.535	-7.062
	(0.129)	(0.132)	(1.670)	(1.586)	(14.839)	(13.205)
Treated (y2+)	-0.324**	-0.443**	-1.930	-2.549	-33.523*	-39.261
	(0.131)	(0.166)	(1.701)	(2.030)	(17.741)	(22.754)
Observations	1,215	1,109	1,215	1,109	1,193	1,091
R-squared	0.872	0.879	0.720	0.723	0.179	0.206
Firm FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Notes: This table presents the results of a difference-in-differences OLS regression over the period 2007-2015 comparing treated firms to control firms (columns 1, 3 and 5) and treated firms to a control group discarding switching firms (columns 2, 4 and 6). In Panel A, the explained variable is, alternatively, the log of the book value (BV) of equity, the ratio of book value of equity over total assets, and the one-year change in the book value of equity. In Panel B, the explained variable is, alternatively, the log of cash, the ratio of cash over total assets, and the one-year change in cash. All two ratios are winsorized at the 1st and 99th percentiles. *Treated* denotes companies that can pay tax-exempt dividends. (y-1) denotes the treatment effect one year before the tax cut, (y0) the year of the tax cut, (y+1) the year after the tax cut, and (y2+) two and more years after the tax cut. All specifications include a constant, *Size* (log of total assets), and *Age* (log of company age) but for brevity the associated coefficients are not reported. Robust standard errors are clustered by industry and displayed below each coefficient. *, **, *** denote significance at the 10%, 5% and 1% level, respectively.

Figure 1
Evolution of payout in Switzerland

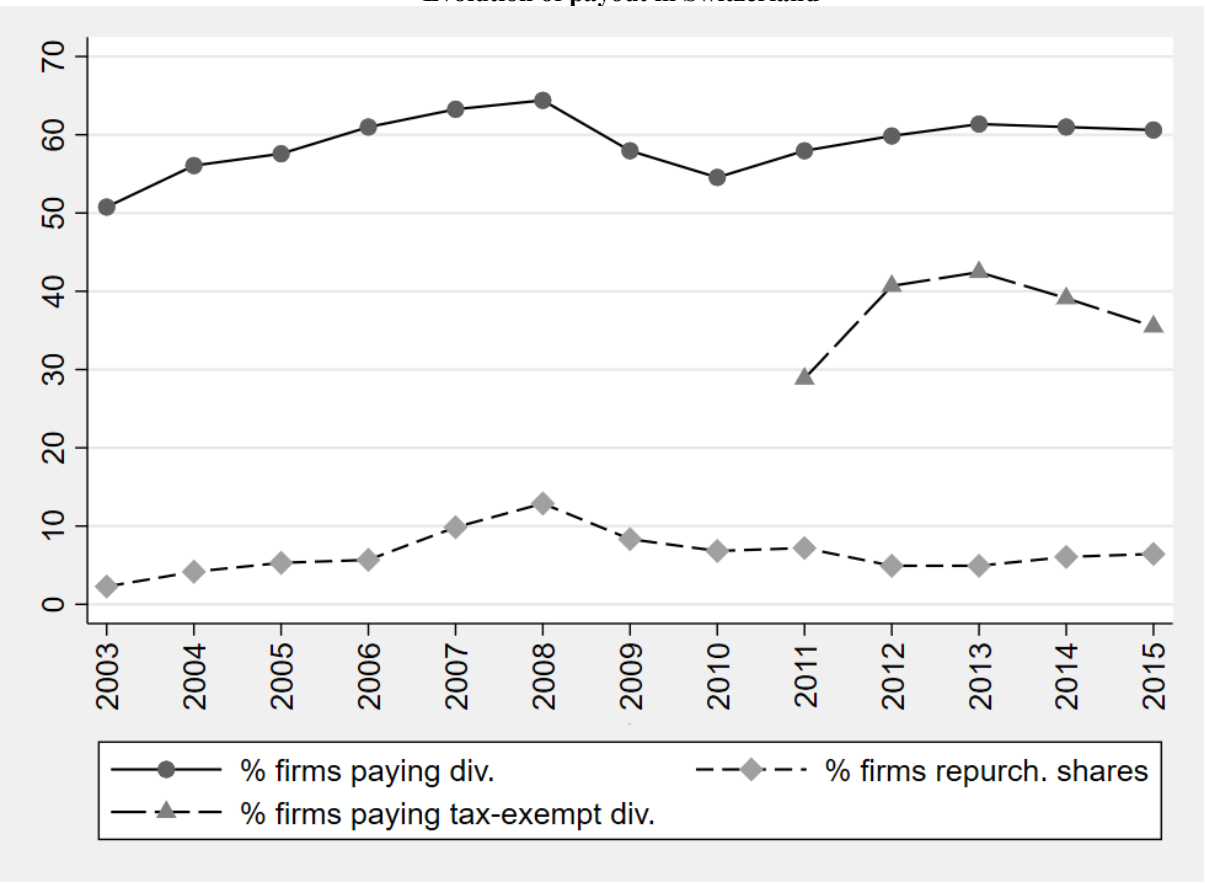

Figure 2
Impact of the reform on the composition of shareholder equity

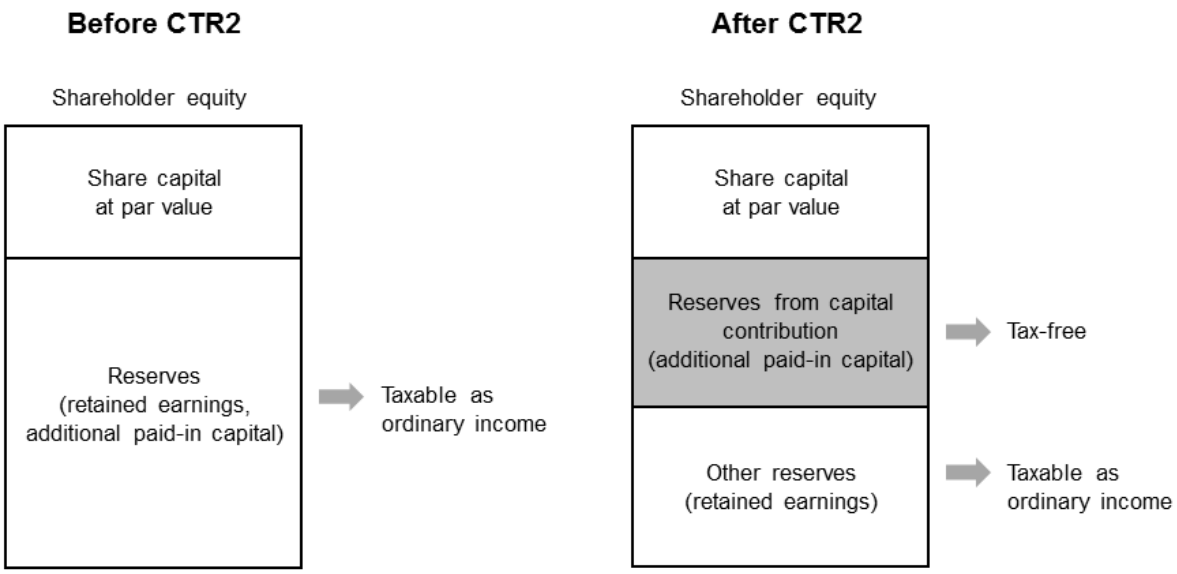

Figure 3
Impact of the dividend tax cut on payout

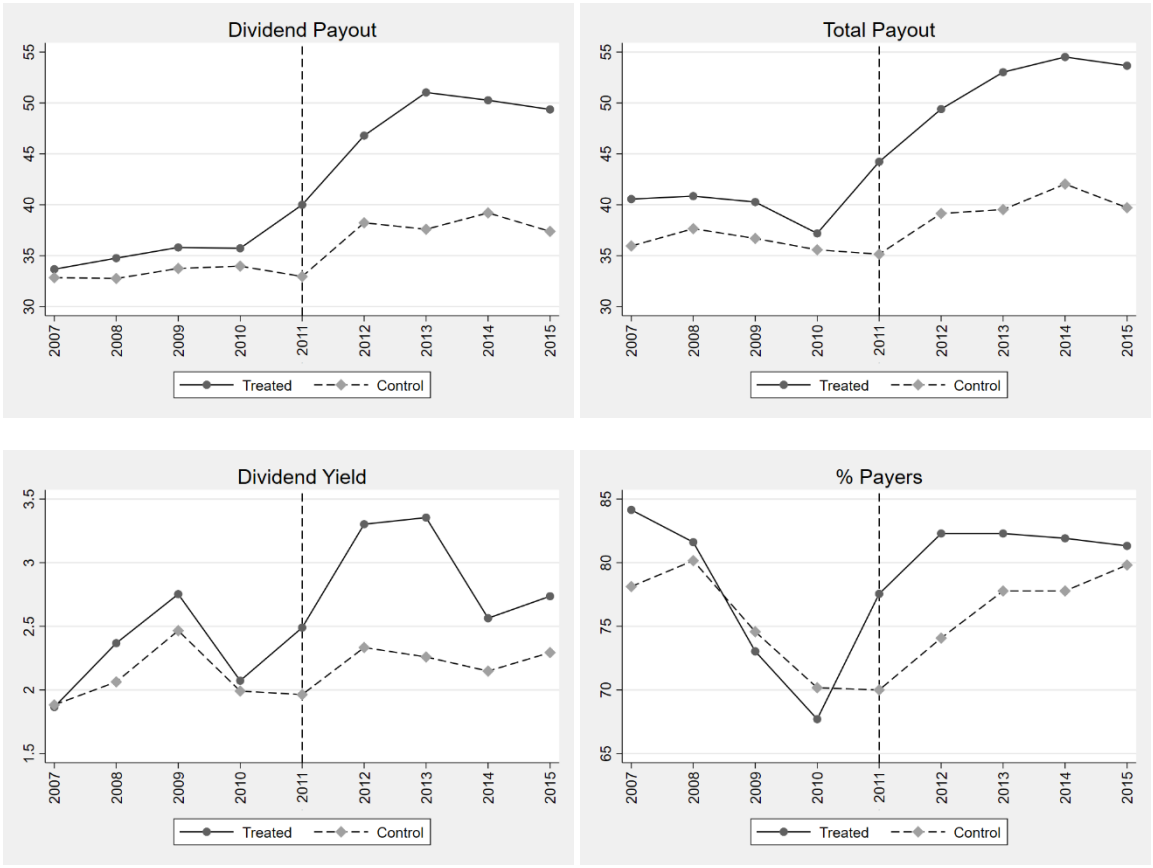

Figure 4
Market reaction following the tax shock

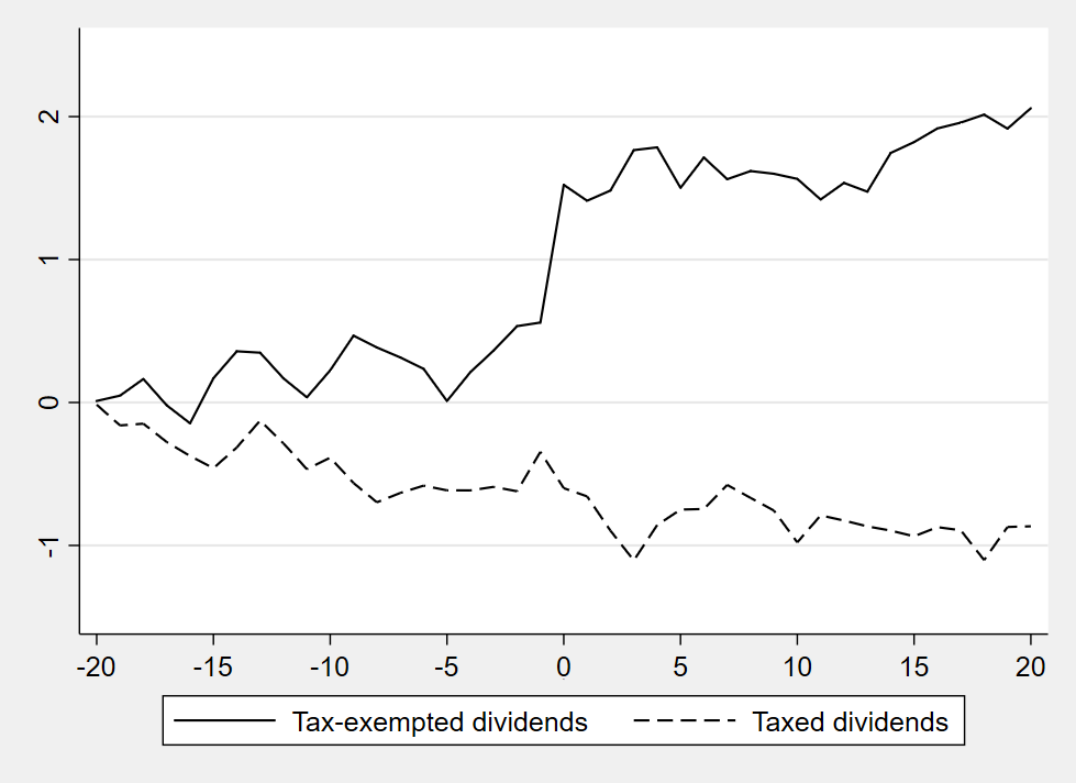

Figure 5
Impact of the dividend tax cut on corporate investment, equity, and cash

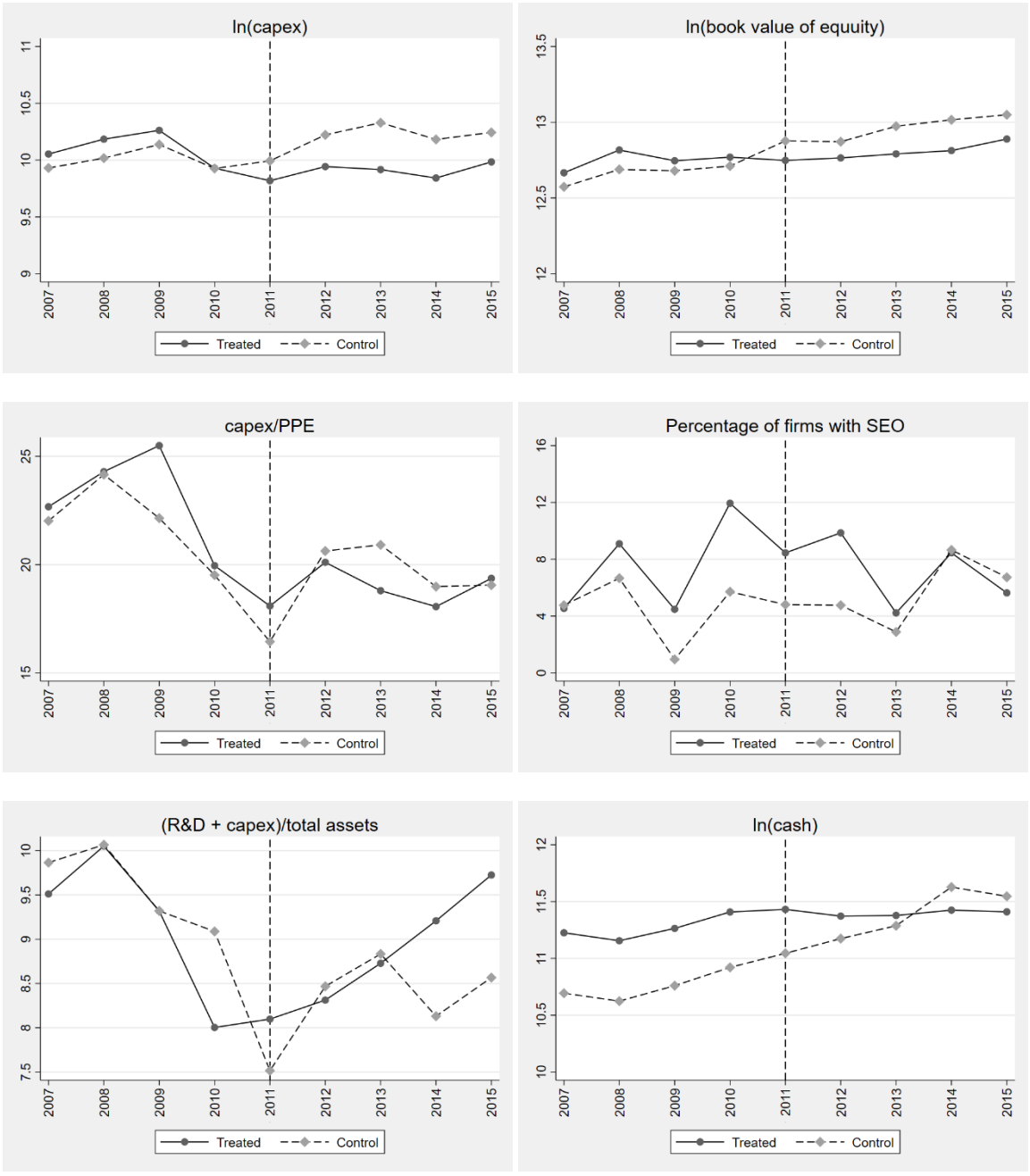

Figure 1

Notes: This figure displays the proportion of firms listed on the SIX Swiss Exchange that (1) pay dividends, (2) repurchase their own shares, and (3) pay tax-exempt dividends (only possible since the 2011 tax reform).

Figure 2

Notes: This figure presents how the second Corporate Taxation Reform (CTR2) modified the composition of the shareholder equity in the balance sheets of Swiss companies. After the reform, any company incorporated in Switzerland can pay tax-exempt dividends from its reserves from capital contribution (in red). The latter are created from paid-in capital from shareholders and need to be approved by the Federal Tax Authority.

Figure 3

Notes: These figures represent the time series of annual average payout variable for firms in the treatment group (*Treated*) and in the control group (*Control*). Firms in the treatment group are firms that had recognized reserves from capital contribution in 2011 and were authorized to pay tax-exempt dividends, while those in the control group did not have such reserves and could not pay tax-exempt dividends. The year 2011 is post-reform. *Dividend or total payout* is, respectively, the fraction of earnings paid as dividends or as dividends and repurchases cumulated. *Dividend yield* is the dividend per share divided by the year-end price. *Percentage of firms paying dividends* is the fraction of firms paying a dividend to their shareholders in the control and treatment groups.

Figure 4

Notes: This figure represents the stock price reaction of Swiss listed companies to the announcement of dividend payments in 2011 and 2012. The continuous line denotes cumulative average abnormal returns (in percentage points) over a 40-day window around the dividend announcement date for companies paying tax-exempt dividends. The dashed line does the same for companies paying taxed dividends.

Figure 5

Notes: These figures represent the time series of annual average of variables representing investment (three left figures), equity and cash (three right figures) for firms in the treatment group (*Treated*) and in the control group (*Control*). Firms in the treatment group are firms that had recognized reserves from capital contribution in 2011 and were authorized to pay tax-exempt dividends, while those in the control group did not have such reserve and could not pay tax-exempt dividends. The year 2011 is post-reform.