

Ownership Structure, Firm Value and Government

Intervention: The Case of the German Tax Reduction Act

Markus Brendel*, Bernhard Schwetzler†, Christian Strenger‡

January 5th 2017

ABSTRACT

This paper provides causal evidence on the effect of ownership structure on firm value and on the impact of large tax incentives on the divestiture decision of equity blockholders by exploiting a quasi-experimental policy change in Germany. The 2000 Tax Reduction Act repealed corporate shareholders from capital gains taxation, whereas individual shareholders experienced only minor tax reductions. We show that stronger tax incentives to dispose shares do not necessarily reduce ownership concentration in the presence of strategic value premia as we find an increase in ownership concentration in firms controlled by a (tax exempt) corporate investor in response to the tax repeal. As the general policy of the German government was aiming at a more active market for corporate control via a more dispersed ownership structure, this result is not in line with the intentions of the policy makers. With respect to the relation between ownership structure and firm value the results from our difference-in-differences estimation suggest that the tax repeal was effective in removing market frictions and allowing for a more efficient shareholder structure: we find a positive relationship between ownership concentration and firm value.

Keywords: Policy evaluation · ownership concentration · agency conflicts · difference-in-differences estimator · IV estimator

JEL Classification: G30, G32, H32

* Corresponding author; Chair of Financial Management; HHL Leipzig Graduate School of Management, Germany; email: markus.brendel@hhl.de.

† Chair of Financial Management; HHL Leipzig Graduate School of Management, Germany; email: bernhard.schwetzler@hhl.de.

‡ Center for Corporate Governance; HHL Leipzig Graduate School of Management, Germany; email: christian.strenger@hhl.de

1. Introduction

The relationship between ownership structure and firm value has long been attracting practical and academic interest. For the special case of ownership concentration research has found positive and negative effects of an increasing concentration (for an overview see (Edmans and Holderness, 2016)): On the bright side an increasing equity stake of a single shareholder fosters closer monitoring of the management by the owners of the firm and thus reduces agency costs on corporate level. On the dark side concentrated ownership may be value-destructive by allowing majority shareholders to extract private benefits at cost of the minority, e.g. via "tunneling". The question, whether there is an optimal level of ownership concentration, and if so, which factors are to determine it, is of significant academic interest.

Unfortunately, empirically disentangling the relationship between ownership concentration and firm value is challenging due to endogeneity problems: Demsetz and Lehn (1983) were the first to point out that both variables have to be determined simultaneously. Thus academic literature strongly recommends to look for exogenous shocks changing ownership structures, allowing to analyze this relationship in a quasi-experimental setting (Edmans and Holderness, 2016). This paper uses the German 2000 Tax Reform Act as such an exogenous shock. The reform exempted corporate owners completely from capital gains taxation when selling their stock, while individual shareholders were granted only a minor tax reduction. While providing an exogenous shock for the ownership structure this setting allows to analyze the impact of changes in ownership upon firm value without exposure to potential reverse causality. The different tax treatment additionally gives the opportunity to separate the (completely tax exempted) treatment group from the control group when investigating the impact of the tax reform on ownership concentration. This exogenous variation allows to explore the role of tax incentives on divestiture decisions.

While the 2000 Tax Reform Act has been long awaited and lengthily discussed before, an important detail came as a surprise to the capital markets ((Edwards et al., 2004), (Beschwitz, 2012)): Capital gains of corporate owners were completely abolished from taxation. The German government officially communicated fostering economic growth and increasing the competitiveness of the German economy as general motives for the reform. The overall economic policy at that time was characterized by aiming for a stronger control of corporations by the capital market and a more active market for corporate control. (Hoepner, 2003, p. 22). While not being communicated officially, the governments goals with respect to the tax exemption were more specific: Over the years after WW II a web of cross-holdings and minority stakes had emerged in Germany, referred as "Deutschland AG" (Germany Inc.). In the center of this web were German financial institutions (insurance companies and banks). Before the reform the tax rate on corporate capital gains was 52 per cent; as many of the equity stakes had been acquired at low prices in the 50s selling their equity stakes would have resulted in huge tax payments. As a result, financial institutions were perceived to be "locked in" in their equity stakes (Edwards et al., 2004). The 2000 German tax reform thus

allowed for unwinding the substantial holdings built up by the financial sector without paying taxes and eventually dissolving the network of "Germany Inc." (Hoepner, 2000, Keen, 2002)

Beyond the financial industry and with respect to the other sectors the expectations of the lawmakers were less specific and not directly addressed: Hoepner (2000 and 2003) and Weber (2009) argue that the intended dissolution of the "Deutschland AG" was also expected to create a more dispersed ownership structure and a more active market for corporate control.

This paper addresses two important questions with respect to ownership structure: First we analyze the impact of large tax payments on divestiture decisions and the magnitude of "lock in" effects imposing market frictions by investigating the impact of the tax reform on ownership structure and ownership concentration of German industrial firms. Second, using the quasi-experimental setting provided by the tax reform, we look at the relationship between ownership concentration and firm value. This setting provides various sources of exogenous variation as the tax reform caused changes in blockholdings over time, and further generated cross-sectional variation in the reform year due to the different tax incentives to shareholders. In particular, we compare CDAX firms that were either controlled by a corporate or an individual shareholder by the time the Tax Reduction Act became effective.

We find stronger reductions in control concentration in firms with an individual blockholder in control (and thus a lower tax incentive to dispose shares) as a result of higher share disposals. We argue that the exogenous shift in control concentration is to be attributed to the presence of strategic value premia, which affect the divestiture decision of blockholders. While these premia are low for financial institutions as owners, they may be high for other corporate owners with strategic and operating alignment to the firm owned. Thus, despite having higher tax incentives to reduce their equity stakes, we do not find a decline, but an increase of ownership concentration for corporate owners in Germany. We interpret our findings as other owners with a significant equity stake having used the additional supply of shares to increase their stake. As the German policy in general was aiming for a more active market for corporate control via a more dispersed ownership structure, this effect was not in line with its intentions.

With respect to the second question above the results of our difference-in-difference estimation and our instrumental variable (IV) estimates exploiting the exogenous cross-section variation suggest that increased control concentration yielded an increase in firm value. Looking at the shareholder wealth effect of control concentration as a trade-off weighing the positive effect of management monitoring against the negative expropriation activities by the controlling owner (e.g. Edwards and Weichenrieder, 2004), we find a positive (marginal) relationship between ownership concentration and firm value in Germany. In this sense, the government intervention was effective, as it increased shareholder wealth.

We make two significant contributions to the discussion on ownership structure and firm valuation: First, our study is the first analysis of the German 2000 Tax Reduction Act distinguishing between different types of owners differently affected by the tax reform. This allows to explore the magnitude of the different "lock

in" effects and potential strategic premia driving the decision to reduce or increase the ownership stake in a firm in greater detail. Second, we contribute to the literature by analyzing the effect of an exogenously triggered change in the ownership concentration on the market valuation of firms. Our results suggest a positive relationship between ownership concentration and firm value for our sample of German corporations.

This paper is organized as follows: Section 2 provides a simple framework on the divestiture decision of blockholders and how this is affected by possible value premia and the changes of the corporate and income tax law within the 2000 Tax Reduction Act. Section 3 presents our data and the development of ownership concentration and corresponding firm values around the tax reform. Section 4 outlines our estimation framework whereas section 5 discusses our results. Part 6 concludes.

2. Tax incentives and divestment decision

In this section, we introduce a simple model explaining the divestiture decision of share blocks and the potential impact of differing tax incentives - given by the Tax Reduction Act - on this decision.

2.1 A simple model of the divestment decision

Generally and in plain dress, given a frictionless capital market, homogenous shareholders receive in case of a share disposal the book value of their investment (V^B) plus potential capital gains - denoted as the difference between the market value (V^M) and the book value (V^B), hence $V^B + (V^M - V^B)$. Deviating from this perfect world, Edwards et al. (2004) further suggest equity blockholders to assign a subjective value premium V^S to their investments, further referred to as *investees*, which is mainly driven by a possible industry affiliation between investor and investee. A considerable strategic affiliation is suggested to allow for influential representation on the investee's supervisory board via a large block of control rights and, consequently, to provide access to valuable private know-how and information (Goergen et al., 2004). The magnitude of this strategic gain is assumed to differ mainly along the closeness of industry affiliation between the investor and the investee firm (Lins and Servaes, 1999). With respect to our study, this implies the strategic value premium to significantly differ for the controlling owners of our CDAX firms (investees) under consideration. This premium is proposed to be large for non-financial owners operating in the same industry, but smaller for owners from a more remote industry, and further declining in case of a financial investor. Given this notion, any controlling investor will decide against a disposal of shares as long as his subjective value premium V^S is greater than the capital gains ($V^M - V^B$) to be realized.¹

¹ The strategic value premium V^S can be expressed as the difference between the reservation price the investor would at least demand for a disposal and the book value of the investee firm.

2.2 The situation in Germany before 2000

Prior to the Tax Reduction Act, capital gains ($V^M - V^B$) had been subject to substantial taxation, which was varying over the different shareholder tax groups g . According to this, the tax rate τ_g reduced the capital gains to $[1 - \tau_g](V^M - V^B)$, and thus was suspected to impose severe trading barriers, contributing to a malfunctioning capital market with substantial cross-holdings, interlocking directorates, strong bank influence and strong ownership concentration (Hoepner, 2001). Therefore, the German capital market was argued to restrain viable corporate control as well as investment opportunities for outsiders and, hence, potential takeovers (Edwards et al., 2004). Given a value premium (V^S), the presence of large capital gains taxes additionally impeded the disposal of shares since:

$$V^S > [1 - \tau_g](V^M - V^B) \quad (1)$$

2.3 The Tax Reduction Act of 2000

The sluggish investment dynamics of the German economy had sparked a vibrant debate among policymakers. In the political arena the majority argued that the underdeveloped German capital market was one of the major reasons for this situation. Thus the general economic policy of the German government at that time was aiming for a more active market for corporate control (Hoepner 2001, 2003). The main point of contention was to find an appropriate policy response to the prevailing market frictions seen as the reason for the unsatisfactory situation. In an attempt to bolster the international competitiveness of the German economy by creating a more investment friendly environment with greater shareholder focus, the Tax Reduction Act (*Steuersenkungsgesetz*) was established. This tax reform aimed to reduce the corporate and individual tax burden while shifting from an imputation taxation system of taxing profits arising from shareholdings in German corporations - including dividends and capital gains - to a taxation system similar to the US.²

First announced in December 1999, the Tax Reduction Act was passed in July 2000 after intensive discussions (Hoepner, 2000), and came into effect on January 1, 2002. While the tax reform had been

² The prior imputation system was criticized to disadvantage foreign investors compared to German investors; however, the new taxation system created the problem of double taxation of profits at the corporate as well as at the shareholder level. In order to avoid a double taxation, tax exemptions on the shareholder level were granted, though differing substantially for corporate and individual shareholders. For a comprehensive summary on the tax reform see Edwards et al., 2004.

discussed intensely before being announced the tax exemption itself came as a complete surprise to the market and has not been anticipated.³ Thanks to the setting of the reform we are provided with a quasi-natural experiment as i) investors only had reasons to adjust their long-term equity holdings with effectiveness of announced tax incentives, and ii) as the tax reform provided substantially different degrees of tax concessions to the two major German shareholder groups, namely to corporate and individual blockholders.⁴ While there have been ways for owners to economically divest their ownership stake before the change of the tax code came into power,⁵ legal ownership, including voting rights, attendance in shareholder meetings etc., had to be maintained until the new regulation became law.⁶

Change in Corporation Tax Act

First, the change in the Corporation Tax Act (§ 8b (2) KStG) fully abolished capital gains taxation of around 50% for corporate shareholders. Particularly, the change in the corporate tax law was expected to allow unwinding the substantial holdings of the financial sector in order to create a more dispersed ownership structure in Germany, resembling the Anglo-American system (Keen, 2002, Lane, 2004). Some experts predicted the disappearance of the traditional structures of the so-called *Germany, Inc.* (Keen, 2002; Andres et al., 2011) due to the tax repeal. The announcement of the new tax regulation was followed by a positive stock price reaction for financial institutions holding significant equity stakes in other firms; Beschwitz and Foos (2013) report abnormal returns of 5 per cent for stock prices of banks with equity holdings.

Returning to our divestiture decision model, the removal of capital gains taxation offered a considerable tax incentive of $[\tau](V^M - V^B)$ to corporate shareholders. However, industrial blockholders may still refrain from divesting in case of significant strategic value premia, such as:

$$V^S > (V^M - V^B) \tag{2}$$

Therefore, the effect of the tax incentive on the divestiture decision had been a-priori unclear in presence of strategic value premia for non-financial corporate investors.

³ Beschwitz and Foos (2013) cite a newspaper dubbing the exemption as a “christmas present”.

⁴ Other studies exploiting the corporate tax reform for causal inference at announcement are e.g. Sautner and Villalonga (2010) who study the relationship between ownership concentration and capital market efficiency. Beschwitz and Foos (2013) analyze the impact of the reform on banks lending and holding equity stakes in their creditors. Beschwitz (2012) investigates the change in acquisition propensity and excess cash holdings caused by divestments triggered by the reform.

⁵ Beschwitz and Foos (2013) report Deutsche Bank divesting their stake in Allianz already in June 2000.

⁶ Edwards et al.(2004) report that debt exchangeable for common stock (DECS) was commonly used as a vehicle to separate divestment from disposing legal ownership. In this case, the firm takes up a loan as cash and redeems this debt by disposing equity shares.

Change in Income Tax Act

With respect to individual blockholders, the reform of the Income Tax Act (§ 3(40) EStG) reduced tax burdens on capital gains only by half. Hence, the so called half-income method granted a comparably small tax relief to individual shareholders of about $[\tau - \tau_{t_0}](V^M - V^B)$, such that following condition was to hold to make individuals further keeping their equity holdings:

$$V^S > [1 - \tau_{t_0}](V^M - V^B) \quad (3)$$

Despite the relatively small tax incentives provided by the tax reform, individual blockholders may responded with divestitures once we consider their rather low strategic interests in their investees as a result of naturally lacking industrial affiliations.

In the following, we conduct an empirical analysis in order to learn how these two blockholder groups eventually responded to the provided tax incentives. Differentiating between the tax treatment of the two most important owner groups allows for a quasi-experimental setup with a treatment group (corporate owners with a major tax relief) and a control group (private owners with a minor tax relief). We will analyze the impact of the change in the tax code using a difference-in-difference analysis.

3. Data and Descriptives

3.1 Sample

Observation Period

Starting point of our empirical analysis is a sample of all CDAX-listed firms in Germany observed at the year-ends of 2000 to 2003. We split the overall time period into two pre-reform years, 2000 ($t_0 - 2$) and 2001 ($t_0 - 1$), the coming into force year of the Tax Reduction Act, 2002 (t_0), as well into one post-reform year, 2003 ($t_0 + 1$). In our base case, we analyze the pre-reform ($t_0 - 1$) and the reform year (t_0), which we extend later to $t_0 - 2$ and $t_0 + 1$ to test for robustness and long-term effects of the reform.⁷

⁷ The political support for the tax exemption turned out to be fragile. Mr. Stoiber, candidate for chancellor in the election of 2002 announced his intention to re-introduce the tax as a chancellor (Hoepner 2003). As this threat imposed significant time pressure on potential divestitures we believe that the effect of the tax exemption on divestitures and ownership structure will be negligible beyond the year 2003.

Ownership Data

Our ownership information used in this study is from the German standard database *Wer gehört zu wem?* (WGZW), containing roughly 18,000 private as well as publicly listed firms and their owners. It was originally published by Commerzbank, but is meanwhile distributed by Picoware (www.picoware.com).⁸ Following Weber (2009) we confine ownership concentration to the equity stake of the controlling investor throughout this study; we assume equity concentration in the hands of the largest owner to primarily affect agency costs, and hence to determine the effect of ownership concentration. Our measure of control ownership concentration refers to voting rights at the direct ownership level, thus fully reflecting the tax effects upon the divestment decision.

Moreover, information on the tax type of each controlling owner is identified. Our *unrestricted sample* includes firms with all possible investor tax types observed from 2000-2003: controlling owners that fall under the corporate tax law (*Corp*), individual blockholders (*Indiv*) who are subject to personal income taxation, non-incorporated investors (*Non-incorp*), foreign investors (*Foreign*) as well as public investors (*State*). All firms with less than 5% control concentration are considered to have dispersed ownership (*Dispersed*).⁹ In order to exploit the quasi-natural experimental setting provided by the Tax Reduction Act, we form a *restricted sample* only consisting of firms either controlled by a corporate (*Corp*) or individual investor (*Indiv*) at the year-end of 2001 ($t_0 - 1$), as those are either indirectly affected -- through their controlling owner -- by the capital gains tax repeal (Corporation Tax Act) or the minor tax reduction (Income Tax Act), respectively. Firms held by a corporate investor at the end of the pre-reform year are assigned to the treatment group (*T*), whereas firms with an individual controlling owner serve as our control group (*C*). For the reform year (t_0) and later ($t_0 + 1$), we allow the controlling owner of a firm - identified by his tax type - to switch. For later analysis of the causal effect of the tax reform we can rule out self-selection of investors into one of the two groups as investors are unable to easily switch their tax type identity (e.g. turning from an individual to a corporation) in order to enjoy additional tax reductions.

Final Dataset

Complementary to the ownership information on our CDAX firms, we retrieve the corresponding financial data from Thomson Reuters Worldscope / Datastream, while excluding all financial¹⁰ (SIC 6000-6999) and utility firms (SIC 4900-4949) from our sample. With respect to the years 2000-2003, we eventually arrive

⁸ As it allows to differentiate between types of owners, WGZW is also used in other studies on German ownership structures. Beschwitz and Foos (2013) use WGZW data to analyze the impact of the 2000 Tax Reform Act on the equity holdings of German banks.

⁹ Details about the assignment rules we applied compiling the various groups of owner tax types are described in table 7.

¹⁰ In our later analysis of the impact of ownership concentration upon firm value we use log-scaled Tobin's Q as a measure for firm value, which cannot meaningfully be calculated for financial institutions. Note that we exclude financial institutions only as firms (investees), but not as owners.

at a total of 1542 firm year observations for our *unrestricted sample*, carrying complete ownership and financial information. With respect to our *restricted sample*, we retain only those firms observed in both years, the pre-reform ($t_0 - 1$) as well as the reform year (t_0). All firms observed only in one of the two years are dropped in order to rule out systematic composition changes. We end up with 130 firms assigned to the treatment, and 115 firms belonging to the control group, thus translating in total to 490 firm years for the restricted sample's analysis.

3.2 Ownership Development

In this section, we first have a look at the overall development of control ownership over time in Germany, followed by an analysis of evolution of ownership by investor tax types. Eventually, we examine the changes experienced by our treatment and control group at the time of the Tax Reduction Act.

Table 1 presents the development of average ownership concentration of all firms (*All*) during 2000-2003. In accordance with prior studies centering around the tax reform in Germany (e.g. Weber, 2009; Fehre et al., 2011), we observe an overall moderate decline over time with an average control concentration of 50.88% in 2000 ($t_0 - 2$) and 48.31% in 2003 ($t_0 + 1$).

For our study we cannot rely on the identity of the firm's majority shareholder as information; we only know the equity stake and the type of the majority owner. If ownership concentration has been decreasing between 2001 and 2002 we can definitely conclude that the pre-reform majority shareholder must have sold either all or at least a significant part of her equity stake, no matter whether the type of majority shareholder has changed or not. The same reasoning applies for the case of unchanged concentration, but a different ownership type. If ownership concentration and type are unchanged after the shock of the tax reform, we conclude that the same owner did neither buy nor sell any stock. The case of increasing ownership concentration is more complicated: If this case is coupled with the same ownership type it is reasonable to assume that the pre-shock majority owner has acquired further shares and increased her ownership stake.¹¹ For the case of increasing concentration and a different owner type we conclude that the old majority owner has sold at least a part of her stake to the new majority owner.¹²

However, surprisingly we find the number of firms held by *Corp* as their largest owner, and thus their average fraction on overall concentration to increase from 23.81% in 2000 to 26.34% in 2003. This is in

¹¹ Alternatively one could assume a block sale to another owner of the same type, who is then additionally buying shares.

¹² In many cases the majority holding of a different owner type would not be possible without the old majority owners selling their stake, e.g. at ownership stakes greater than 50 per cent. Note that these additional restrictions only relate to the interpretation of the impact of the tax relief upon the divestment decisions. Our finding with respect to the impact of the tax reform on ownership concentration is unaffected by this assumption.

contrast to existing literature attributing the overall reduction in control concentration to substantial divestitures of financial as well as non-financial corporate blockholders.¹³

Please insert Table 1 approximately here

Examining the ownership changes occurred within the reform period (2001-2002) in more detail (Table 2), we find at the end of the pre-reform year (2001) about 130 (of in total 322) firms belonging to the treatment group (*T*), 115 to the control group (*C*), 26 to be controlled by *Foreign*, 23 by *Non-incorp*, 10 by *State* and 18 firms to be characterized by dispersed ownership.

At the end of the reform year (2002), we observe 118 (91%) firms of the 130 initially identified treated firms (*T*) to be still controlled by corporate shareholders, which results in an increase of the average equity stake by 2.13 percentage points compared to the pre-reform year (2001). To put it differently, 155 firms (+ 25 firms) are now found to be controlled by a corporate blockholder as 18 firms underwent a change of control ownership from an individual controlling investor (*Indiv*) to a corporate controlling investor (*Corp*), another six firms each from initial *Foreign*, *Non – Inc* and *Dispersed* control ownership. Being the major interest to estimate the causal effect of the tax reform on divestiture behavior, the ownership concentration of those 130 firms initially assigned to *T* in $t_0 - 1$ increased by 1.92% within the tax reform.

Firms controlled by individual investors (*Indiv*) at the end of the pre-reform year, hence assigned to the control group (*C*), took a different development: out of the initially identified 115 firms, only 93 (81%) remained in control of individuals with their control concentration to decline by 1.51%. What is again of key interest, is that control concentration of all firms assigned to the control group in $t_0 - 1$ went down by on average 0.93% irrespective of the investor type observed at the end of the reform year (t_0).

Please insert Table 2 approximately here

When focussing on significant changes above 1% in the ownership stake of the two major shareholder groups in Germany (Franks and Mayer, 2001), corporate and individual shareholders, we find further evidence for an exogenous variation of control concentration induced by the tax reform. Panel A of Table 3 documents for the reform year (from $t_0 - 1$ to t_0), that 60% of the treated firms did not experience a change in control concentration, compared to only 40.87% of the control group. The different adjustment pattern

¹³ Weber (2009) reports the share of industrial firms -- of any legal form -- in non-financial corporations to decrease significantly from 2001 to 2005. In contrast to our approach and data, she does not consider the legal form of the controlling owner and thus is not able to differentiate owners according to their tax incentives. Weber (2009) uses data provided by the Bundesanstalt fuer Finanzaufsicht (BAFin) for four points in time: January 1, 1999; January 1, 2001; January 1, 2003; January 1, 2005.

comes down to more frequent share disposals in the control group (32.17%), with also larger changes in ownership concentration (16.13%). This is in contrast to the treatment group, where only 13.85% of corporate blockholders sold shares with an average share block of 10.73%. Additional share purchases were rather equal for both groups (26%).

In contrary, we find an overall similar adjustment behavior for both groups in the pre-reform period (from $t_0 - 2$ to $t_0 - 1$) - as presented in panel B (Table 3). An unchanged ownership structure for about 80% of each of the respective firms is recorded, which underpins the assertion of an inelastic equity market prior to the tax reform, which is in line with the literature (Koeke, 2001).

Please insert Table 3 approximately here

3.3 Identification Strategy

In order to reveal the causal effect of the Tax Reduction Act on divestiture behavior and eventually on firm value, we exploit the unconditional mean differences in ownership concentration and firm value across owner groups (T vs. C) and time ($t_0 - 1$ vs. t_0). Therefore, Table 4 compares the average ownership concentration and average firm value of firms that had little indirect exposure to tax reductions (C) to those that were strongly indirectly affected (T).

With respect to control concentration, firms with a controlling corporate investor are documented with a larger ownership concentration (56.58%) in the pre-reform year ($t_0 - 1$) than firms controlled by an individual shareholder (46.26%). As indicated above, this difference increased by 2.85% within the reform period t_0 as the treated group increased its concentration by 1.92%, while the control group experienced a decline of 0.93%.

Moreover, both groups experienced a decline in log Tobin's Q, our measure of firm value, from $t_0 - 1$ to t_0 . However, the decline in firm value is more pronounced for the control group (from 0.446 to 0.297) compared to the treatment group (from 0.482 to 0.404). Thus, the initial mean differential in firm value of 0.036 increased by 0.071 log points to 0.107 in favor of the control group. Summing up, the unconditional mean differences indicate a positive ownership concentration effect alongside with a positive value effect of stronger tax incentives to the treatment group. These mean differences can be interpreted as the unconditional causal effect of the tax reform under the key assumption that the unequal developments in both outcomes are only due to the tax reform. To prove this to be true, we are required to conduct further analysis.

Please insert Table 4 approximately here

4. Estimation Framework

4.1 The Effect of the Tax Reform on Control Concentration and Firm Value

In this part, we translate the above described identification strategy of comparing unconditional differences in ownership concentration and firm value between the pre-reform and reform year as well as across the treated and the control group into a regression framework.

Estimating the Effect of the Tax Reform on Control Concentration

First, for estimating the effect of the Tax Reduction Act on ownership concentration, we apply a Difference-in-Differences (*DiD*) estimator that controls for the additional impact of observable firm characteristics (W):

$$\begin{aligned}\gamma_1^{DiD} = & \mathbb{E}[CConc_{t_0} - CConc_{t_0-1} | W, T = 1] \\ & - \mathbb{E}[CConc_{t_0} - CConc_{t_0-1} | W, T = 0].\end{aligned}$$

The first bracket represents the average change in control ownership concentration ($CConc_i$) of the treatment group ($T_i = 1$) over time (from pre-reform $t_0 - 1$ to reform year-end t_0) and the second bracket reflects the average change of the control group's control concentration ($C_i = 1 \equiv T_i = 0$). Consequently, the estimate of γ_1^{DiD} provides the causal effect of different treatment intensity by the Tax Reduction Act on ownership concentration. This suggests running the following regression:

$$CConc_{it} = c_0 + \delta_1 t_0 + \eta_1 T_i + \gamma_1 (t_0 \times T_i) + W'_{it} \beta + (W'_{it} \times T_i) \beta_T + \epsilon_{it} \quad (4)$$

where $CConc_{it}$ represents the control concentration of firm i in year t , c_0 the omitted group effect of the control group C_i , while T_i is a dummy indicating whether the firm is assigned to the treatment group. The interaction of the reform year with the treatment group dummy ($t_0 \times T_i$) captures the stronger indirect exposure of treated firms to the reform's tax incentives. A $1 \times k$ vector of observable firm characteristics W_{it} is included, as well as their interactions with the treatment group indicator ($W_{it} \times T_i$) in order to account for heterogenous effects of the covariates.¹⁴ The error term ϵ_{it} is assumed to consist of a random idiosyncratic error component ϑ_{it} as well as a firm-specific error μ_i . Potential unobserved firm heterogeneity is accounted for by performing firm-fixed-effects regressions. Underlying key identifying assumption

¹⁴ An overview and further explanations of our control variables is given in table 7 in the Appendix.

requires γ_1 turning to zero in the absence of the reform, i.e. in absence of different tax incentives for both blockholder groups.

Furthermore, we account for a potentially slower ownership adjustment process towards the reform's incentives by additionally including the post-reform year 2003 ($t_0 + 1$). Alternatively, this measure delivers an indication whether the effect of the tax reform was rather short- or long-lived. The possibly differing effects of treatment intensity in the reform (t_0) and the post-reform ($t_0 + 1$) years are accounted for in a twofold way: first, we subsume both years under one single period ($t_{01} \times T_i$); second is to consider both years separately by including the interactions ($t_0 \times T_i$) and ($t_{0+1} \times T_i$) into our regression equation.

Estimating the Effect of the Tax Reform on Firm Value

Similarly, we apply the same approach when examining the indirect impact of differing tax incentives on firm value:

$$\ln(y_{it}) = c_0 + \delta_1 t_0 + \eta_1 T_i + \gamma_1 (t_0 \times T_i) + W'_{it} \beta + (W'_{it} \times T_i) \beta_T + \epsilon_{it} \quad (5)$$

only now with $\ln(y_{it})$ reflecting the natural logarithm of Tobin's Q as a measure of firm value; the notations and interpretations are accordingly to the estimated effect of stronger tax incentives on control concentration (eq. 4).

4.2 Estimating the Effect of Control Concentration on Firm Value

Apart from estimating the effect of tax incentives on control concentration as well as on firm value, the reform's experimental setting further provides an opportunity to overcome the potential reverse causality problem suggested by Demsetz and Lehn (1985) and Demsetz and Villalonga (2001). They suspect ownership and firm value to be simultaneously determined as adjustments in the ownership structure are possibly caused by changing expectations in the future firm value; running least square regressions may therefore produce a biased estimate of the effect of control concentration on firm value. In order to overcome this problem, we are required to find an instrumental variable that does not affect firm valuation other than by a change in ownership concentration. In this light, we argue that the exogenous cross-sectional variation in control concentration - induced by the Tax Reduction Act - provides an appropriate instrument; being controlled by *Corp* or *Indiv* at the end of the pre-reform year ($t_0 - 1$), thus, being assigned to either the treatment or control group, causes exogenous variation of control concentration. As presented in Table 3, the different trade activities before and during the tax reform across our two major shareholder groups support the assertion of our binary instrument (T_i) to fulfill the conditions of a valid instrument.

Therefore, we estimate the following structural form equation with respect to the reform year (t_0) by ordinary least squares as well as by the above introduced Wald (IV) estimator. Thus, we aim to estimate the unbiased effect (φ_1) of control concentration (*CConc*) on firm value ($\ln(y_i)$), as follows:

$$\ln(y_i) = a_0 + \varphi_1 CConc_i + W'_i \beta + \varepsilon_i. \quad (6)$$

In order to shed light on the potential value effect we look at the impact of control concentration on firm value as a trade-off relationship between additional management monitoring and expropriation activities by the controlling shareholder.

Benefits and costs of control concentration

Academic literature (e.g. Edwards and Weichenrieder, 2004; Sautner and Villalonga, 2010, Edmans and Holderness 2016) suggests control ownership concentration to have a double sided effect on firm value since: On the positive side increasing ownership stakes internalize a higher fraction of monitoring benefits and reduce free rider problems. (Shleifer and Vishny 1986; Edmans and Holderness 2016) On the other hand a blockholder may pursue her own private benefits instead of maximizing firm value, e.g. by "tunneling" corporate resources out of the firm (Zwiebel, 1995, Edmans and Holderness, 2016). This suggests a concave relationship between block size and firm value as suggested by Burkhart et al. (1997).

5. Results

5.1 The Effect of the Tax Reform on Control Concentration

The first three columns of Table 5 report the estimated effect of tax incentives on control ownership concentration by using three different specifications. The first specification is a plain regression with no covariates (column 1), the second controls for the impact of firm characteristics W (column 2) and thirdly, we control for potential heterogeneous effects of W across both groups (column 3). Further, Panel A (Table 5) covers the reform phase, which comprises the pre-reform year 2001 ($t_0 - 1$) and the reform-year 2002 (t_0). Panel B presents the results including the post-reform year (2003).

The reported estimate in Panel A (column 1) resembles the outcome of our unconditional difference-in-means analysis conducted in section 3.3., which is a positive but insignificant reform effect of 2.853%. Once we account for firm characteristics (columns 2-3), stronger indirect tax incentives are suggested to lead to an economically substantial and statistically significant increase in ownership concentration of 3.77% (column 3). Moreover, the results in Panel B (column 3) indicate a positive concentration effect of higher reform exposure also when including the post-reform year (2003). When averaged over the reform and post-reform year ($t_{01} \times T_i$), the effect equals 4.15% (column 3). When considered separately, the estimated reform effect is suggested to be even slightly stronger in the post-reform year (4.27%) than in the reform year (4.01%). However, the results for the post-reform year (2003) should be taken with some caution as the controlling investor may have changed again from end of 2002 to 2003.

These results promote the existence of subjective value premia, which caused corporate blockholders to divest less than individual shareholders in response to the Tax Reduction Act, though being more strongly incentivized by the capital gains tax repeal.

Note that this does not stand in contrast to the results of previous studies, documenting a substantial disposal of equity blocks by financial investors in the wake of the Tax Reduction Act (Edwards et al. 2004; Weber, 2009; Andres et al. 2011; Beschwitz and Foos 2013): First, despite being a blockholder, financial institutions are in many cases not the shareholder with the highest equity stake. Thus selling their shares does not reduce our ownership concentration measure. Second, as financial institutions do not have significant industry affiliations with their non-financial investees they have the lowest strategic premium and thus the highest incentive to divest their shares. Third, as the average concentration of corporate owners is increasing, either some other corporate blockholder owners already invested must have used this opportunity to increase her equity stake, or a new and different corporate owner as investor must have bought the block and added some additional shares. The majority of corporate investors in Germany - as well as in our sample - are industrial firms with substantial strategic interests in their investees. Their value premia presumably still exceeded the tax incentives provided by the tax repeal. Accordingly, Edwards et al. (2004) raise doubts whether the tax reform had any significant effect on the divestment decisions of non-financial corporations. Obviously some corporate owners used the additional supply of shares caused by the disposal by financial investors to increase their equity stake.

In contrast, individual blockholders responded more strongly towards comparably little tax concessions as their investments were of less strategic than of financial interest due to a naturally lacking industrial affiliation with their investees. Our finding is supported by Weber (2009), who reports a decline of individual and family blockholdings after the tax change came into force.

Please insert Table 5 approximately here

5.2 The Effect of the Tax Reform on Firm Value

The effect of tax incentives on firm value is presented in Table 5 (columns 4-6). Under all specifications, the estimated effect of stronger indirect reform exposure ($t_{01} \times T_i$) on firm value is positive and statistically significant. The unconditional effect (column 4: 0.0707) resembles again the outcome of preceding difference-in-means analysis. The full specification model (column 6) suggests the log-scaled Q to increase by 6.49% when exposed to stronger indirect tax concessions within the Tax Reduction Act. Panel B further provides some evidence for a lasting effect when additionally considering the post-reform year 2003 (t_{01}). The effect amounts to 5.2% when averaged over the reform and post-reform year ($t_{01} \times T_i$). However, when accounting for t_0 and $t_0 + 1$ separately, our estimates suggest the positive effect of stronger tax

incentives to fade with time as only a significant value effect of around 6% is reported for the reform year (columns 4-6).

Overall, our results imply a more favorable value development for firms indirectly exposed to greater tax concessions.

5.3 The Effect of Control Concentration on Firm Value

Table 6 presents the estimated effects of control concentration on firm value by performing i) least square (columns 1-4) and ii) instrumental variable (columns 5-6) regressions. Least square (OLS) regressions are run on the unrestricted (columns 1-2) as well as on the restricted sample (columns 3-4) with all being confined to the reform year (t_0). In either sample specification, the estimates are positive and statistically different from zero, though the effect of control concentration is suggested to be stronger for the restricted sample (column 4: 0.0029), compared to the unrestricted sample (column 2: 0.0019). In other words, a 1% increase in ownership concentration increases the investee's firm value by approximately 0.29% (column 4). Though not reported, we find no evidence for a non-monotonic relationship between control ownership and firm value.

Column (5) and (6) present the results of our IV regression; we again observe a significant positive impact of ownership concentration on firm value. Though displaying a slightly lower statistical significance, the absolute coefficient estimates (6.6% and 6,1%) are even higher than the OLS results.

Relating our estimates of the effect of ownership concentration to the discussion above, we infer that additional control in the hands of the controlling owner and, thus a greater monitoring effort causes a more favorable trade-off between curbing managerial excess and additional costs of private benefits. This effect is value enhancing.

Please insert Table 6 approximately here

Starting in the mid 90s and ending with the mandatory application of IFRS for listed firms from 2005 onwards German firms switched from German accounting standards (HGB) to international accounting standards IFRS when providing their annual statements (Daske et al., 2009). As the change of the accounting standards has significant impact on the book values of assets and liabilities and possibly on market valuations we performed a robustness check to rule out that our results are distorted by a change in the accounting standards during our investigation period potentially affecting Tobin's Q. We found 19 firms of our sample changing their accounting standards between 2001 and 2002 (13 firms from the treatment and 6 firms from the control group), excluded them from our analysis and reran our regressions (4) to (6) with the reduced sample. We found our results not to be affected by this robustness check: Still there is a significant

positive impact of the tax reform on Tobin's Q and a (highly) significant positive effect of ownership concentration on firm value.

6 Conclusion and Discussion

With the repeal of capital gains taxation for corporate shareholders by the 2000 Tax Reduction Act the German government intended to encourage large-scale divestitures by corporate blockholders, especially financial institutions. The general policy of the German government at this time was to foster a more active market for corporate control in Germany by dismantling the crossholdings and interlocking network of equity stakes constituting the "Germany Inc.". As concentrated ownership was seen as one characteristic of this regime, we are interested in the impact of the government intervention on ownership concentration of German firms (Hoepner, 2001). Surveying a sample of CDAX firms with owners differently affected by the Tax Reduction Act, we find a positive effect upon ownership concentration of around 4% in those firms with a corporate shareholder in control. At the same time, we estimate a positive value effect for the same firms. These findings are important because they show that the government- administered intervention was effective in increasing both ownership concentration and firm value. With respect to the German governments general goal of reducing ownership concentration the Tax Reform Act 2000 did not make a positive contribution. We attribute this finding to the presence of strategic value premia attached to the investees. A large premium is suggested in case of strong industry affiliation between the investor and the investee, which is the case for corporate non-financial investors, but less pronounced for financial or individual blockholders.

Furthermore, exploiting the exogenous variation induced by the Tax Reduction Act, we are able to estimate the unbiased effect of control concentration on firm value. We suggest a positive effect of control concentration on firm value, whereas ordinary least square estimation is found to produce downward biased estimates of the causal effect of ownership concentration. Increasing control concentration leads to stronger monitoring of management and, thus, to a reduction of management perquisites, outweighing the additional costs of private benefits extraction by the controlling owner. Therefore, higher ownership concentration leads to reduced agency costs and, thus, to a higher firm value. These results lend some support to the hypothesis that concentrated ownership was acting as an effective substitute for lacking minority shareholder protection in Germany (La Porta, Lopez-de-Silanes and Shleifer 1999; Franks and Mayer, 2001) by the time of the tax reform.

References

- Admati, Anat, Paul Pfleiderer and Josef Zechner (1994), 'Large shareholder activism, risk sharing, and financial markets equilibrium', *Journal of Political Economy* 102(6), 1097–1130.
- Andres, Christian, André Betzer and Inga van den Bongard (2011), 'Das Ende der Deutschland AG', *Kredit und Kapital* 44(2), 185–216.
- Ashenfelter, Orley and Michael Greenstone (2004), 'Using mandated speed limits to measure the value of a statistical life', *Journal of Political Economy* 112(1), 226–267.
- Berle, Adolf and Gardener Means (1932), *The Modern Corporation and Private Property*, Macmillan, New York.
- Beschwitz, Bastian von and Daniel Foos (2013), 'Bank's equity stakes and lending: Evidence from a tax reform', Working Paper .
- Burkart, Mike, Denis Gromb and Fausto Panunzi (1997), 'Large shareholders, monitoring, and the value of the firm', *The Quarterly Journal of Economics* 112 (3), 693– 728.
- Daske, Holger, Luzy Hail, Christian Leuz and Rodrigo Verdi (2009), 'Mandatory IFRS reporting around the world: Early evidence on the economic consequences', *Journal of Accounting Research* 46, 1085–1142.
- Demsetz, Harold and Belen Villalonga (2001), 'Ownership structure and corporate performance', *Journal of Corporate Finance* 7(3), 209–233.
- Demsetz, Harold and Kenneth Lehn (1985), 'The structure of corporate ownership: Causes and consequences', *Journal of Political Economy* 93(6), 1155–1177.
- Edmans, Alex and Clifford Holderness (2016), 'Blockholders: A survey of theory and evidence', Working paper, ECGI .
- Edwards, Courtney H., Mark H. Lang, Edward L. Maydew and Douglas A. Shackelford (2004), 'Germany's repeal of the corporate capital gains tax: The equity market response', *The Journal of the American Taxation Association* 26(Supplement), 73– 97.
- Edwards, Jeremy S.S. and Alfons J. Weichenrieder (2004), 'Ownership concentration and share valuation', *German Economic Review* 5(2), 117–261.
- Fehre, Kerstin, Marc Steffen Rapp, Bernhard Schwetzler and Marco O. Sperl (2011), 'The disappearing 'Deutschland AG' - an analysis of blockholdings in German large caps', *Problems and Perspectives in Management* 9(4), 46–58.

- Franks, Julian and Colin Mayer (2001), 'Ownership and control of German corporations', *Review of Financial Studies* 14(4), 943–977.
- Goergen, Marc, Miguel C. Manjon and Luc Renneboog (2008), 'Recent developments in German corporate governance', *International Review of Law and Economics* 28(3), 175–193.
- Grossmann, Sanford J. and Oliver Hart (1988), 'One share-one vote and the market for corporate control', *Journal of Financial Economics* 20, 175–202.
- Hoepner, Martin (2000), 'Unternehmensverflechtung im Zwielficht. Hans Eichels Plan zur Aufloesung der Deutschland AG', *WSI Mitteilungen* 10/2000
- Hoepner, Martin (2001), 'Corporate governance in transition: Ten empirical findings on shareholder value and industrial relations in germany', Max Planck Institut für Gesellschaftsforschung, Discussion Paper 01/5 .
- Hoepner, Martin (2003), 'European corporate governance reform and the german party paradox', Max Planck Institut für Gesellschaftsforschung, Discussion Paper 03/4 .
- Holderness, Clifford G. (2003), 'Joint ownership and alienability', *International Review of Law and Economics* 23(1), 75–100.
- Jensen, Michael C. (1986), 'Agency costs of free cash flow, corporate finance, and takeovers', *American Economic Review* 76(2), 323–329.
- Jensen, Michael C. and William Meckling (1976), 'The theory of the firm: Managerial behavior, agency costs, and capital structure', *Journal of Financial Economics* 3(4), 305–360.
- Keen, Michael (2002), 'The German tax reform 2000', *International Tax and Public Finance* 9(5), 603–621.
- Koeke, Jens (2001), 'New evidence of ownership structures in Germany', *Kredit und Kapital* 34(2), 257–292.
- La Porta, Rafael, Florencio Lopez-de Silanes and Andrej Shleifer (1999), 'Corporate ownership around the world', *Journal of Finance* 54(2), 471–517.
- Lane, Christel (2004), Institutional transformation and system change: Changes in corporate governance of German corporations., in G.Morgan and E.Whitley, Richard Moen, eds, 'Changing capitalisms? Complementaries, contradictions and capability development in an international context', Oxford University Press, Oxford., pp. 78–109.
- Lins, Karl and Henri Servaes (1999), 'International evidence on the value of corporate diversification', *Journal of Finance* 54(6), 2215–2239.
- Sautner, Zacharias and Belen Villalonga (2010), 'Corporate governance and internal capital markets', Harvard Business School Working Paper 10-100 .

- Shleifer, Andrei and Robert W. Vishny (1989), 'Management entrenchment: the case of manager-specific investments', *Journal of Financial Economics* 25(1), 123–139.
- Shleifer, Andrej and Robert W. Vishny (1986), 'Large shareholders and corporate control', *Journal of Political Economy* 94(3), 461–488.
- Thomsen, Steen, Torben Pedersen and Hans Kurt Kvist (2006), 'Blockholder ownership: Effects on firm value in market and control based governance systems', *Journal of Corporate Finance* 12(2), 246–269.
- Weber, Anke (2009), 'An empirical analysis of the 2000 corporate tax reform in Germany: effects on ownership and control in listed companies', *International Review of Law and Economics* 29(1), 57–66.
- Zwiebel, Jeffrey (1995), 'Block investment and partial benefits of corporate control', *Review of Economic Studies* 62, 161–185.

Table 1: Development of average control concentration over time.

This table provides the development of average control ownership concentration (*CConc*) over the years 2000-2003. Number of observations (obs.) and fraction (in %) of each owner tax type on the overall average control concentration (All) is further presented. *Corp* refers to firms with a controlling corporate investor, *Non-incorp* to a non-incorporated investor in control, *Indiv* to an individual investor, *State* to a public investor, and *Foreign* to a foreign investor. Firms with less than 5% control concentration are considered to have dispersed ownership (*Dispersed*).

Tax type		2000	2001	2002	2003	Total
All	Obs.	359	385	395	403	1542
	<i>CConc</i>	<i>50.88</i>	<i>50.51</i>	<i>49.63</i>	<i>48.31</i>	
<i>Dispersed</i>	Obs.	20	21	9	13	63
	<i>CConc</i>	<i>1.90</i>	<i>0.82</i>	<i>0.36</i>	<i>0.33</i>	
Corp	Obs.	148	159	191	196	694
	<i>CConc</i>	<i>23.81</i>	<i>24.74</i>	<i>27.51</i>	<i>26.34</i>	
<i>Non-incorp</i>	Obs.	20	25	19	20	84
	<i>CConc</i>	<i>17.20</i>	<i>16.58</i>	<i>13.85</i>	<i>12.88</i>	
Indiv	Obs.	130	138	134	125	527
	<i>CConc</i>	<i>2.42</i>	<i>2.87</i>	<i>2.72</i>	<i>3.02</i>	
<i>State</i>	Obs.	10	10	12	12	44
	<i>CConc</i>	<i>1.35</i>	<i>1.24</i>	<i>1.43</i>	<i>1.33</i>	
<i>Foreign</i>	Obs.	31	32	30	37	130
	<i>CConc</i>	<i>4.21</i>	<i>4.26</i>	<i>3.75</i>	<i>4.41</i>	

Table 2: Changes in average control concentration across investor tax types from 2001 to 2002.

The table shows the absolute frequency (Obs.) of tax owner type switches and corresponding average share blocks traded ($\Delta CConc$) from the pre-tax reform year-end $t_0 - 1$ (2001) to the tax reform year-end t_0 (2002). *Corp* refers to firms with a controlling corporate investor, *Non-inc* to a non-incorporated investor in control, *Indiv* to an individual investor, *State* to a public investor, and *Foreign* to a foreign investor. Firms with less than 5% control concentration are considered to have dispersed ownership (*Dispersed*).

		<i>Dispersed</i>	<i>Corp</i>	<i>Non-inc</i>	<i>Indiv</i>	<i>State</i>	<i>Foreign</i>	Total $t_0 - 1$
<i>Dispersed</i>	Obs.	5	6		3		4	18
	$\Delta CConc$	0.00	22.31		26.76		21.78	16.73
<i>Corp</i>	Obs.		118	2	5		5	130
	$\Delta CConc$		2.13	0.27	-0.66		0.20	1.92
<i>Non-inc</i>	Obs.		6	16	1			23
	$\Delta CConc$		4.34	0.12	-1.70			1.14
<i>Indiv</i>	Obs.	2	18		93	1	1	115
	$\Delta CConc$	-51.17	7.63		-1.51	-8.39	6.56	-0.93
<i>State</i>	Obs.		1			9		10
	$\Delta CConc$		0.00			-3.49		-3.14
<i>Foreign</i>	Obs.	1	6		3		16	26
	$\Delta CConc$	-5.73	2.31		2.80		3.32	2.68
Total to	Obs.	8	155	18	105	10	26	322
	$\Delta CConc$	-13.51	3.63	0.14	-0.54	-3.98	5.69	1.58

Table 3: Development of block trades over time.

We define block trades as changes in control concentration larger than 1%. The table presents the block trades of firms controlled by either corporate or individual blockholders (restricted sample), while the frequency (Obs.) as well as the corresponding average block trade ($\Delta CConc$) for the no-change case (No change), additional share purchase ($> 1\%$) and share disposal ($< 1\%$) is presented. Panel A shows the block trades in the reform period (2001-2002), Panel B presents the block trades during the pre-reform period (2000-2001).

		No change		> 1%		< 1%		Total $t_0 - k$
<i>Panel A: 2001-2002</i>								
<i>Corp (T)</i>	Obs.	78	60.00%	34	26.15%	18	13.85%	130
	$\Delta CConc$	0.10		12.81		-10.73		1.92
<i>Indiv (C)</i>	Obs.	47	40.87%	31	26.96%	37	32.17%	115
	$\Delta CConc$	-0.03		15.84		-16.13		-0.93
Total t_0		125	51.02%	65	26.53%	55	22.45%	245
<i>Panel B: 2000-2001</i>								
<i>Corp</i>	Obs.	109	83.21%	11	8.40%	11	8.40%	131
	$\Delta CConc$	0.02		19.90		-6.80		1.12
<i>Indiv</i>	Obs.	91	79.13%	11	9.57%	13	11.30%	115
	$\Delta CConc$	0.00		17.29		-18.08		-0.39
Total $t_0 - 1$		200	81.30%	22	8.94%	24	9.76%	246

Table 4: Differences-in-means.

The table presents the means of ownership concentration (Control concentration) and firm value (Log of Tobin's Q) and resulting differences across tax owner types (*Corp (T)* vs. *Indiv (C)*) and between pre-reform year-end ($t_0 - 1$ (2001)) and reform year-end (t_0 (2002)). Statistical significance levels of mean differences are reported at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Standard errors are in parenthesis.

	Control concentration			Log of Tobin's Q		
	<i>Indiv (C)</i> (1)	<i>Corp (T)</i> (2)	Difference (3)	<i>Indiv (C)</i> (4)	<i>Corp (T)</i> (5)	Difference (6)
No of firms	115	130		115	130	
$t_0 - 1$ (2001)	46.256 (2.099)	56.581 (2.525)	-10.330 *** (3.333)	0.446 (0.034)	0.482 (0.032)	-0.036 (0.047)
t_0 (2002)	45.326 (2.237)	58.504 (2.534)	-13.180 *** (3.419)	0.297 (0.028)	0.404 (0.029)	-0.107 *** (0.041)
Difference	0.930 (3.068)	-1.920 (3.578)	2.850 (3.376)	0.149 *** (0.044)	0.078 * (0.044)	0.071 * (0.043)

Table 5: Effect of the tax reform on control ownership concentration and firm value.

This table presents the effect of tax incentives - given by the Tax Reduction Act - on control ownership concentration (columns 1-3) and firm value (columns 4-6). We use our restricted sample, i.e. only consider firms either controlled by a corporate (T) or individual blockholder (C) at the year-end of 2001 (t_0-1). Panel A captures the reform period (from year-end 2001 to year-end 2002), while Panel B additionally includes the post-reform year (2003). All specifications include the treatment group dummy T and the year of the tax reform (t_0). Included control variables W_{it} are *firm size, leverage, EBIT/sales, cash/ta, sales growth and a dummy indicating payout of cash dividends*. Heterogenous effects of control variables are controlled for by the interaction of the treatment group dummy with each control variable $W_{it} \times T_i$. The possibly differing effect of treatment intensity in the reform (t_0) and the post-reform ($t_0 + 1$) years are accounted for in a twofold way: first, we subsume both years under one single period ($t_{01} \times T_i$); second is to consider both years separately by including the interactions ($t_0 \times T_i$) and ($t_{0+1} \times T_i$) into our regression equation. We perform firm-fixed effects regressions with standard errors clustered on firm level. Statistical significance levels are reported at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Standard errors are in parenthesis.

	Control Concentration			Log of Tobin's Q		
	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A: 2001 vs 2002</i>						
$t_0 \times T_i$	2.8531 (1.907)	3.2960 (2.042)	3.7699 * (2.169)	0.0707 ** (0.030)	0.0587 ** (0.030)	0.0649 ** (0.029)
W_{it}	No	No	Yes	No	No	Yes
$W_{it} \times T_i$	No	Yes	Yes	No	Yes	Yes
Obs.	490	474	474	490	474	474
No of firms	245	242	242	245	242	242
<i>Panel B: 2001 vs 2002/2003</i>						
$t_{01} \times T_i$	3.1797 (1.977)	3.2802 (2.105)	4.1476 * (2.198)	0.0465	0.0495 * (0.031)	0.0518 * (0.032)
$t_0 \times T_i$	3.0997 (1.945)	3.1347 (2.069)	4.0111 * (2.141)	0.0599 ** (0.030)	0.0639 ** (0.031)	0.0623 ** (0.032)
$t_{0+1} \times T_i$	3.2596 (2.237)	3.4274 (2.370)	4.2740 * (2.549)	0.0331 (0.036)	0.0330 (0.033)	0.0299 (0.035)
W_{it}	No	Yes	Yes	No	Yes	Yes
$W_{it} \times T_i$	No	No	Yes	No	No	Yes
Obs.	696	680	680	696	680	680
No of firms	232	232	232	232	232	232

Table 6: Effect of control ownership concentration on firm value.

This table presents the estimated effects of control concentration on firm value (log of Tobin's Q) with respect to the tax-reform year 2002 (t_0). Columns 1-4 show the results of OLS estimation, while columns 5-6 present the results for the unrestricted sample, column 3-4 for the restricted sample. Columns 5-6 refer to our instrumental variable (IV) regressions on the restricted sample; our binary instrument indicates whether a firm is controlled by *Corp(T)* or *Indiv(C)* at the end of the pre-reform year (t_0-1). We report only the second stage of our IV estimation, and apply small-sample statistics. Included control variables W_i contain *firm size, leverage, EBIT/sales, cash/ta, sales growth and a dummy indicating payout of cash dividends*. Industry effects are controlled for by Fama-French 12 industry classification (FF 12). Statistical significance levels are reported at *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$. Heteroscedastic-robust standard errors are applied on each specification and are reported in parenthesis.

	OLS				Wald (IV)	
	(1)	(2)	(3)	(4)	(5)	(6)
O_i	0.0019 *** (0.001)	0.0019 *** (0.001)	0.0028 *** (0.001)	0.0029 *** (0.001)	0.0066 ** (0.003)	0.0061 ** (0.003)
W_i	Yes	Yes	Yes	Yes	Yes	Yes
FF12	No	Yes	No	Yes	No	Yes
Obs.	316	316	241	241	241	241
R ²	0.343	0.385	0.343	0.391	0.242	0.322

Appendix

Table 7: Variable definitions.

The table summarizes the definitions of variables used in the descriptive statistics and empirical analyses.

Variable	Definition
Control ownership concentration (<i>CConc_i</i>)	Refers to voting rights of the largest shareholder type at direct ownership level in firm <i>i</i> . Requires blockholding of at least 5%. Further assumption that voting rights equal cash flow rights.
Corporations (<i>Corp</i>)	Firms with the following legal form: AG, GmbH, SE, eG, AG and Co.KGaA, KGaA, GmbH and Co., GmbH and Co.KGaA, foundations.
Individuals (<i>Indiv</i>)	Firms with following controlling owner: individuals, family owner, pools with share majority held by individual / family, management and employees, community of heirs.
Non-incorporated firms (<i>Non-inc</i>)	Firms with following legal form: GmbH and Co. KG, Co. OHG, GbR, AG and Co. KG, KG, OHG, GmbH and Cie. KG.
State (<i>State</i>)	Firms with following controlling owner: municipality, federal state, government, KfW and Landesbank.
Foreign investor (<i>Foreign</i>)	Firms with following legal form: Ltd., S.A., Inc., L.P., B.V., Corp., N.V., S.a.r.l., SpA, AB, plc, LLC, S.C.A.
Dispersed ownership (<i>Dispersed</i>)	Widely-held firms (largest owner has voting rights of $\leq 5\%$).
Log of Tobin's Q ($\ln(y_i)$)	$\ln((\text{Book value of total assets} - \text{book value of equity} + \text{year end market value of common stock}) / \text{book value of total assets})$.
Firm size	Logarithm of total assets.
EBIT / sales	Earnings before interest and taxes divided by total sales.
Cash / assets	Cash and short-term investments divided by total assets.
Leverage	Book value of debt divided by total assets.
Sales growth	Changes in sales from time $t - 1$ to t .
Dividend dummy	Takes the value one if cash dividends are paid, zero otherwise.
FF12	Fama-French 12 industry classification.