Shareholder illiquidity and firm behavior:
Financial and real effects of the personal wealth tax in private firms

Janis Berzins   Øyvind Bøhren   Bogdan Stacescu

BI Norwegian Business School*

Abstract

We examine how negative liquidity shocks to shareholders propagate to the firm. Analyzing regulatory changes to personal wealth taxation in Norway, we show that higher taxes on the home of private firms' controlling shareholders are associated with higher dividend and salary payments from firms to shareholders and lower cash holdings, growth, and performance in firms. A one percentage-point increase in the shareholder's wealth-tax-to-liquid-assets ratio is on average followed by a half percentage-point increase in the dividends-to-earnings ratio and a half percentage-point decrease in sales growth and profitability. These findings suggest that shareholder illiquidity has causal effects on firm behavior.

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1. Introduction

We show that household finance may drive corporate finance by showing how personal liquidity shocks to a private firm's controlling shareholder change the firm's behavior. Private firms are often unknown to new investors and face higher costs of external finance than public firms do (Leland and Pyle 1977). This situation makes the firm unusually dependent on internal funds to finance growth (Gilchrist and Himmelberg 1995; Khwaja and Mian 2008; Hadlock and Pierce 2010). Private firms also have less diversified owners and less liquid shares (Edmans and Holderness 2017), making their shareholders' personal finance unusually dependent on the firm's payout. Consequently, the firm may have to pay out more and abandon profitable projects when their shareholders need additional liquidity for personal reasons. If this happens, shareholder illiquidity has financial and real effects on the firm. To the best of our knowledge, our paper is the first to investigate this channel.

We find that when the controlling shareholder experiences a negative liquidity shock that is unrelated to the firm, the firm's subsequent dividend and salary payments to the shareholder increase, while its cash holdings, growth, and performance decrease. This novel finding suggests that household finance shocks propagate to corporate finance. We estimate this relationship using proprietary tax returns data from Norway for the population of private family-controlled firms and their shareholders from 2000 to 2010.

To identify the relationship between personal illiquidity and firm behavior, we use a shock to shareholder liquidity that is independent of the firm's situation and also of the shareholder's income and preexisting liquidity. Specifically, we exploit shocks to the tax value of the shareholder's residential real estate (i.e., personal home). The tax value was increased annually for four years by a fixed percentage per year across the board, producing a cumulated increase of 67%. Because about nine out of ten controlling families in our sample own residential real estate representing about one third of the family's taxable wealth, the increased tax value of the personal home produced a large shock to the family's overall tax value. Because the increased tax value is unrelated to the market value, there is no effect on collateral value, which could have influenced the firm's financing capacity (Chaney, Sraer, and Thesmar 2012). Because the tax change applies only to non-firm assets and is paid by the shareholder, the firm can only be affected indirectly, and only if the personal liquidity shock induces the controlling shareholder to take out larger dividends or salary from the firm. This increased payout reduces the firm's liquidity and may reduce growth and performance if the firm is financially constrained.

We take two further measures to ensure the effect of the personal home's tax shock on the firm is due to tax rule shocks to the existing home rather than changes in its market value, quality improvements and transactions, or personal assets other than the family's home. First, our main sample includes only firms where the tax value of the controlling shareholder's home changes by exactly the standard change implied by the tax rule.

Second, we instrument the family's wealth-tax-to-liquid-assets ratio, which is our main independent variable. This ratio may be high for reasons related to the firm, which we want to avoid. For instance, more profitable firms may have wealthier owners who pay higher taxes. Moreover, the ratio reflects the wealth tax paid on all taxable assets rather than just the tax on residential real estate. To reduce these sources of noise and bias, we instrument the wealth-tax-to-liquid-assets ratio by the change in the tax value of the family's home and by the proportion of the family's assets that is the home. Moreover, we account for firm-specific determinants of financial and real effects, such as the firm's age, size, risk, and leverage. Finally, we control for personal wealth and personal debt, and we include firm and year fixed effects, the latter being particularly important because the sample period includes the recent financial crisis.

We have two main results. First, we find that the increased tax value of the controlling shareholder's personal home, which leads to higher wealth tax payments, is associated with higher dividend and salary payments to the shareholder and with lower cash holdings in the firm. On average, when the controlling shareholder's wealth-tax-to-liquid-assets ratio (wealth tax payment per unit of liquid assets) increases by 1 percentage point, the firm's payout ratio (dividends plus salary paid to the controlling shareholder per unit of firm earnings before salary) increases by 0.49 percentage points, and the firm's cash ratio (cash holding per unit of assets) decreases by 1.09 percentage points. Also, the firm more often pays dividends even in loss-making years after a wealth tax shock. Thus, the personal liquidity shock propagates to the firm's liquidity because the shareholder withdraws cash to cover larger personal tax payments.

Our second result is that the larger payout to shareholders has real effects through lower growth and performance in the firm. A 1 percentage-point increase in the shareholder's wealth-tax-to-liquid-assets ratio is on average associated with a 0.45 percentage-points decrease in next year's sales growth. The effect on employment is also negative, but not statistically significant, perhaps because employment tends to be quite stable in family-controlled firms (Sraer and Thesmar 2007). We also find a negative and significant effect on firm performance, as a 1 percentage point increase in the wealth-tax-to-liquid-assets ratio leads to a 0.49 percentage-points decrease in returns on assets.

These results hold when we account for changes in the local market value of residential real estate, when we ignore wealth tax shocks that may be difficult to identify, and when we measure the firm's borrowing capacity in alternative ways. We also run difference-in-difference regressions as an alternative to the instrumental variables approach, using firms controlled by wealth-tax payers with residential real estate as the treatment group. We find that after a personal wealth tax shock the firms in the treated group decrease growth and profitability compared to what happens in the control group. This result is consistent with what we find using instrumental variables in the baseline model.

These findings suggest that even strictly personal taxes can affect firm behavior by draining liquidity away from the firm's owners, who in turn partially fill the gap with higher payout from the firm, which in turn reduces its growth and performance. The findings also suggests that even personal income and wealth completely unrelated to the firm should still be taxed in ways that account for the indirect effect of the tax on the firm.

Our baseline sample of about 33,000 firms on average per year is from the population of active, non-financial, private firms with limited liability. We restrict the attention to firms owned by a controlling family, which we define as parents and underage children owning more than 50% of the firm's equity. We use this definition to ensure the household experiencing the liquidity shock can single-handedly make the firm's financial and real decisions. We match firm data with personal tax returns data for the controlling family's capital income, labor income, assets, liabilities, and wealth tax payments. The sample period is 2000–2010, while the tax shocks occur annually from 2006 to 2010.

Our sample has the advantage of reflecting a tax system with uniform, flat personal taxation of dividends and other capital income. The tax on capital income is also aligned with the tax on labor income (Sørensen 2005). Thus, every controlling shareholder is subject to the same dividend tax rate, and nobody has tax reasons for shifting income between dividends and salary. Because changes in the tax base are unrelated to changes in market value, and because our results are insensitive to market value changes, the relationships we find are not due to changes in the collateral value of residential real estate.

We extend the existing literature in five ways. First, we show that household finance may interact with corporate finance. This link has received very little attention by researchers. Hurst and Lusardi (2004) show that bequests increase entrepreneurship, Andersen and Nielsen (2012) find that the quality of such entrepreneurship is low, while Schmalz, Sraer and Thesmar (2017) show that higher market value of residential real estate increases entrepreneurship and growth.

While this entrepreneurship literature studies the birth of firms, we examine existing firms. This allows us to keep firm characteristics constant, including governance and managerial talent, when analyzing how shocks to shareholders influence firm behavior. While the entrepreneurship literature studies shocks to overall shareholder wealth, we zoom in on shocks to shareholder liquidity. This allows for a cleaner test of how shareholder liquidity per se might influences the firm. Finally, while the entrepreneurship literature studies shocks to the firm's local economy, we measure the liquidity shock at the individual shareholder level. This allows for a more precise measurement of the liquidity shock and richer controls for other shareholder characteristics that may matter for the response to a personal liquidity shock, such as the shareholder's liquid assets and personal debt.

Moreover, unlike the literature on corporate debt and the collateral channel (Chaney, Sraer, and Thesmar 2012; Kerr, Kerr, and Nanda 2015; Schmalz, Sraer, and Thesmar 2017), we study corporate equity and the ownership channel. Retained earnings may be the least costly funding source, particularly for small, private firms with severe adverse selection problems (Leland and Pyle 1977, Myers and Majluf 1984). Thus, personal liquidity shocks to the controlling shareholder may hurt the firm's cheapest funding source by forcing earnings out of the firm.

Second, we show that even taxes that are strictly personal may matter for firm behavior. This relationship is underexplored in the literature, which has only studied the link between personal capital income taxes and capital structure (Graham 1999) or between dividend taxes, dividends, and investment (Chetty and Saez 2006, 2010; Desai and Jin 2011; Becker, Jacob, and Jacob 2013; Colombo and Caldeira 2018). While these taxes depend directly on the firm's decisions, we analyze a tax payment the firm cannot influence. Thus, we study how the firm responds to taxation that is independent of the firm's cash flow and value.

The existing paper closest to ours is by Tsoutsoura (2015), who shows that succession taxes have real effects. However, while succession happens only to a few owners, happens at their discretion, and changes the ownership structure, the event we analyze affects most owners, happens at a time the owners cannot decide, and leaves ownership unchanged. Moreover, while succession taxes depend on the value of the firm, the wealth tax we study does not. These differences allow us to exploit a regulatory shock outside the firm that may induce the owners of most firms in the economy to mitigate the shock by changing the firm's investment and financing decisions. We show that taxes that are strictly personal – like the tax on residential real estate, but unlike the tax on succession in firms – still matter for the firm's behavior.

Third, we contribute to the recent academic literature on inequality and wealth taxation (Piketty 2013, Fagereng et al. 2016, Fisman et al. 2017, Jakobsen et al. 2018, Guvenen et al. 2019, Zucman 2019), the current political debate on a potential wealth tax system in the United States (Financial Times 2019), and the discussions about the recent wealth tax reform in France, which narrows the tax base to real estate (Financial Times 2017). Our results suggest that any wealth tax system should carefully consider the implicit, but often ignored, link between the owner's non-firm assets and the firm's financial constraints. While rare globally, the personal wealth tax we study is not the only tax that must be paid regardless of the taxpayer's income and liquidity.[1] In fact, this principle also applies to property taxes, which are widespread globally and a significant source of tax revenue (OECD 2019).[2] Thus, our findings on how a personal wealth tax system for non-firm assets in Norway influences firm behavior may also apply to the more common personal property tax system used in other countries.

Fourth, we uncover a new determinant of cash holdings in private firms, where the lack of a liquid equity market may make cash particularly important for the firm's flexibility (Gao, Harford, and Li 2013). We show that the controlling shareholder's personal liquidity need spills over to the firm's liquidity. Because most private firms are majority owned (Berzins, Bøhren, and Stacescu 2018), the new cash determinant we find may apply to most firms in the economy.

Finally, we identify shareholder liquidity needs as a new determinant of firm payout, and we offer a novel explanation of why loss-making firms still pay dividends (DeAngelo, DeAngelo, and Skinner 1992). There is evidence from public firms that reduced share liquidity is associated with increased dividends (Banerjee, Gatchev, and Spindt 2007; Griffin 2010). These studies assume, however, that shareholders can easily trade their shares, and that control over the firm does not affect the shareholder's trading decision. In contrast, all shares in our sample firms are illiquid, and the controlling shareholder may want to keep the stake to preserve private benefits. This means the cost of not receiving dividends is higher in private firms than elsewhere. Accordingly, the need for dividends is not just driven by the illiquidity of the share, but also by the illiquidity of the shareholder's wealth. This property of our sample firms allows for a more powerful test of how shareholder liquidity interacts with dividend policy.

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[1] France, Iceland, Lichtenstein, Norway, and Switzerland (at the cantonal level) have a personal wealth tax system, while the system was recently abolished in Denmark, Finland, Germany, Netherlands, and Sweden. The Norwegian wealth tax revenue in 2017 was NOK 15 billion, which was 4.3% of the total tax revenue from persons.
[2] Property taxes are on average 1.94% of GDP in OECD countries in 2017, up from 1.75% in 2000. The proportion is higher in the United Kingdom, France, and the United States, and lower in Norway (1.27% in 2017).

We describe the Norwegian wealth tax system in Section 2, present the data in Section 3, and show summary statistics for the controlling shareholder's tax payments and the tax value of residential real estate in Section 4. We examine the relationship between wealth tax shocks and the firm's payout and cash holdings in Section 5, analyze how wealth tax payments interact with the firm's growth and performance in Section 6, and make robustness tests in Section 7. We conclude in Section 8.

2. The Norwegian wealth tax system

The tax base for the wealth tax is the person's net assets (i.e., assets less debt) above a standard deduction. The assets include shares, bonds, bank savings, residential real estate, and other physical assets. Bank savings, listed shares, and other traded securities are valued at their year-end market value. Nonlisted shares are valued as the firm's book value of equity.[3] The tax rules are updated in each annual state budget. For instance, the wealth tax rules for the tax year 2009, to be paid in early 2010, were announced in October 2008. Because the tax rate was 1.1% during the entire sample period, the tax shocks worked exclusively through the tax value rules.

Despite the opportunity to respond to the new tax rule before it became effective, the incentives to respond may be rather weak. First, residential real estate is still among the most tax-advantaged assets. Second, the shareholder needs a place to live, and selling the home and instead rent may generate large transaction costs. Nevertheless, we try to account for the family's possible response by only including observations where we know for sure the family remains in the same home and has neither remodeled it nor bought a new one.

While the tax value of residential real estate has historically been far below the market value, two of the three tax code changes in our sample period reduced the gap. First, starting in 2006, successive upwards adjustments brought the tax value closer to the market value. Specifically, the tax value was increased by 25% in 2006[4] and by 10% annually in 2007, 2008 and 2009. Second, the book value was replaced by the market value in 2010. As we show below, the switch to market-based valuation in 2010 produced once again a large increase in tax value. We also show that the tax value grew faster than the market value, and that the increased tax value was unrelated to economic growth. Thus, the wealth tax shock was not just independent

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[3] Because we study nonlisted firms where a family owns more than 50% of the equity, the firm's net assets are included in the family's tax base at their book value. The controlling owner may also own shares in listed firms, which we count at market value as part of the family's liquid wealth.

[4] The initial increase of 25% was announced in November 2005, following the election in September 2015. The change affected the tax value for 2006, with the wealth tax payment in early 2007.

of any wealth shock coming from the person's ownership in the firm, but was also independent the overall economy and the market value of the person's private home.

The third significant change in the wealth tax system is a gradual increase in the standard deduction from NOK 120,000 in 2000 to NOK 700,000 in 2010.[5] As a result, many households that used to pay a small wealth tax pay no wealth tax by the end of the sample period. However, the change matters more for the number of households affected than for the tax paid per household. Therefore, the overall effect of the three tax code changes was that wealthier households, who are more likely to own firms and more likely to own valuable homes, pay increasing amounts of wealth tax.

Overall, these tax law characteristics suggest that the tax increase is unrelated to the firm, unrelated to the shareholder's personal liquidity, and is difficult to avoid. It is also important to note that the wealth tax changes are not temporary shocks. Once the tax value is increased, it will generate higher tax payments every year. Thus, the increased tax value was persistent, and it has not been reversed since.

There was one additional significant tax change during our sample period. A new system for capital income taxation implemented in 2006 increased the (flat) tax on dividends received by personal shareholders from 0% to 28%. The tax increase made dividends more expensive, and payout decreased significantly. For instance, the average payout ratio for our sample firms was 49% before 2006 and 13% after. The radical change in payout policy makes it difficult to run difference-in-difference tests with dividends as the dependent variable. This is why we use only the post-reform period in our main statistical tests of the payout effect. The first dividend we include is for the accounting year 2005 (dividend paid in 2006), when dividends are subject to the new tax regime for the first time. Therefore, all dividends we analyze are taxed at the same rate for all investors and all years.[6] Because dividend taxes make it costlier to mitigate shareholder liquidity problems with dividends, the higher post-reform dividend tax increases the power of our test.

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[5] The average exchange rate in 2010 was 1 USD = 6.04 NOK and 1 EUR = 8.01 NOK (source: Norges Bank).
[6] Capital gains were taxed at the same rate as dividends both under the old and new tax system. Capital gains taxes are largely irrelevant for our study, however, as share repurchases are extremely rare in private firms. We find evidence of repurchase activity in less than 1% of the firm years.

3. Data

The data set covers the period 2000–2010.[7] Our dating system uses the accounting year rather than the payout year, which is the year after. Thus, the wealth tax for year *t* is paid in year *t+1* based on assets and debt at the end of year *t*.[8] Moreover, the dividends we report for year *t* are paid out in year *t*+1. We apply several filters to build the sample of economically active firms from the population of all firm with limited liability:

1. We exclude financial firms in order to avoid the impact of peculiar accounting rules, capital requirements, and caps on ownership concentration.
2. We require positive sales, assets, and employment to avoid inactive firms. We ignore the smallest 5% of firms by assets, sales, and employment to avoid firms with unusually low activity.
3. We exclude subsidiaries in business groups to avoid dividends distorted by special tax rules for cash transfers between group members. The only exception is subsidiaries owned through a single holding company with no significant economic activity.
4. We only include firms where a nuclear family (parents and underage children) owns more than 50% of the shares measured by ultimate (i.e., direct plus indirect) ownership. We restrict the attention to firms with a controlling family owner in order to ensure one household can single-handedly make the financing and investment decisions. The family's gross assets must be positive.

We match firm data with the controlling family's tax returns data, which contains details about the family's capital and labor income, assets, liabilities, and wealth tax payments. Using this matched data set, we relate the firm's behavior to changes in the family's wealth tax liability after the tax shock.

We measure the annual change in the tax value of residential real estate owned by the controlling family over the period 2006–2010. Because our tax data reflects all residential real estate items in the family rather than the tax value per item, the observed change could come from a change in the tax value of the items held last year, or from improvements and

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[7] Accounting, ownership, and board data are delivered by Experian (www.experian.com). The data on family relationships are from Skattedirektoratet (www.skatteetaten.no), and the personal tax returns data are from Statistics Norway (https://www.ssb.no/), both of which are state agencies. All data items were received electronically and stored by the Centre for Corporate Governance Research (www.bi.edu/ccgr).

[8] If the asset is shares in a nonlisted firm, the tax value is based on the net asset value at the end of year *t-1*.

transactions this year. We want to pick up the former, but not the latter. We ensure this happens by using one particular sampling procedure for 2006–2009 and one for 2010.

The annual tax rule shocks in 2006–2009 involve standard percentage increases in book valuation of 25% in 2006 and 10% in each of the three subsequent years. As we show below, the observed percentage change in the family's total tax value of residential real estate equals the standard percentage in around three quarters of the cases. Therefore, we ensure our sample has no cases of transactions or improvements by using only observations where the change in tax value exactly equals the change implied by the new tax rule.[9] Thus, the tax payer we observe obviously lives in the same house with the same characteristics before and after the tax shock.

The final sample year (2010) involves a change in valuation principle from book value to market value rather than a standard percentage increase of book value. To make sure we again exclude improvements and transactions, we only include owners for whom the change in tax value of residential real estate is between NOK -100,000 and NOK +500,000. This change is likely to reflect only the change in valuation and not large enough to represent a transaction.

This sampling procedure produces the sample we will use in our instrumental-variable (IV) regressions. Because our cleaning procedure for 2010 is an approximation to a perfect cleaning, we also show the results of regressions using only 2006–2009.

Our difference-in-difference regressions uses a sample from the population of all firms with controlling shareholders in 2001–2010. We define the treatment group as the firms where the controlling owner has residential real estate and is a wealth tax payer, which means the personal liquidity is likely to be affected by the tax changes in 2006–2010. The control group includes the remaining firms. We compare the period when the treatment group is affected by the tax changes (2006–2010) to the prior period (2001–2005).

The time period we study overlaps with the global financial crisis. However, the effect of the crisis on the Norwegian economy was small due to high oil prices. The dip in GDP was just -1.0% in the last quarter of 2008 and -0.8% in the first quarter of 2009. Payout ratios remained quite stable throughout the financial crisis. Nevertheless, we use year fixed effects in our regressions to account for the economic cycle.

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[9] To allow for possible rounding, we allow for a deviation of +/- 1%.

4. Summary statistics

Our first step in documenting the importance of the personal wealth tax for the firm's shareholders is to measure the wealth tax amount due and relate it to the ability to pay. Table 1 shows annual descriptive statistics along these lines for the firm's controlling family. The sample consists of all controlling families selected by the criteria specified in Section 3. Panel A shows that these families are the majority shareholder in 32,563 firms on average per year.

Table 1

The average wealth tax paid per family increases from NOK 35,284 in year 2000 through NOK 57,004 in 2006 to NOK 66,245 in 2010, representing a 87.7% nominal growth over a decade. The amounts are larger and the increase is much steeper for wealth-tax-paying families with residential real estate than for those without: The average amount is NOK 92,347 and 44,140, while the growth rate is 137.8% and 96.3%, respectively.[10] The proportion of controlling shareholders owning residential real estate remains high and stable, being 85.5% on average.[11]

The threshold triggering wealth tax payments was gradually increased over the sample period. Panel B shows that, as expected, the increasing threshold is accompanied by a decreasing proportion of controlling families paying wealth tax. For instance, while 63.4% of those with residential real estate pay wealth tax in 2000, only 49.4% do so in 2010.

Panel C measures the wealth tax burden by relating the tax payment to the family's liquid assets (cash, bank accounts, and listed securities). The change in this ratio is our main proxy of the shareholder's wealth tax shock. The ratio is on average 3.6% in 2010 for families with residential real estate and 2.9% for those without. Controlling families who pay wealth tax and own their home pay on average 7.4% of their liquid assets as wealth tax in 2010.

Table 2 shows that the tax value of the controlling family's residential real estate increases every year after 2005 to a median of NOK 787,586 in 2010. The nominal growth in 2000–2010 is 157.6%. The median growth in 2001–2009 is exactly equal to the standard change in tax value given by the tax rules: An increase of 15% in 2001, a decrease of 5% in 2003, and increases of 25%, 10%, 10%, and 10% in 2006, 2007, 2008, and 2009, respectively. In fact, a change in tax value exactly equal to the standard change represents about three quarters of the

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[10] The atypically low mean wealth tax payment for families with residential real estate in 2005 may be due to missing observations for a few families with unusually high wealth.

[11] Norway has a high proportion of home ownership in general. For instance, the ownership rate was 83% in 2010, while the in the EU was 71% (source: Eurostat).

residential real estate owners. This pattern is not surprising, as most families own just one home and remain in the same home rather than move to another.

Table 2

Figure 1 shows indexes for the tax value of residential real estate, the market value,[12] and the standard tax value change. The figure shows that while market values have increased steadily every year, the tax value has increased even more after 2005, when the regulator started increasing the tax value every year. These results reflect that the evolution of tax values is largely unrelated to market values, and that the increase in the tax value of residential real estate occurs at a higher rate than the increase in its collateral value.

Figure 1

The magnitude of the personal tax shock and its impact at the personal and corporate level depend on the features of families and firms. Table 3 shows the mean and median value of family and firm characteristics we will use in the statistical tests. We use the cleaned sample described in Section 3.[13] In the following, we compare mean characteristics for controlling shareholders with and without residential real estate.

Table 3

Controlling families with residential real estate have more than twice as much assets (gross wealth) as those without (mean of NOK 7.8 vs. 3.3 mill.). Their net wealth is three times larger (NOK 5.7 vs 1.9 mill.), their assets are less liquid (liquid assets to gross assets is 0.25 vs. 0.37), while their wealth tax payment requires more of their liquid assets (3% vs. 2%).[14]

As we will discuss in Sections 5–7, the firm's financing and investment behavior may depend not just on the controlling owner's liquidity, but also on the firm's size, age, risk, growth opportunities, leverage, profitability, asset tangibility, and aggregate retained earnings. Table 3 shows that firms controlled by families with residential real estate are larger (mean sales of 9.4 vs. 7.8 mill. NOK), older (14 vs. 12 years), less levered (debt to assets of 0.72 vs. 0.78), and more profitable (return on assets of 9% vs. 7%), while the assets are less tangible (tangible assets to gross assets of 0.20 vs. 024). The ratio of sales to assets, which is our proxy for future

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[12] We use the market price per square meter for existing real estate from Statistics Norway.

[13] The sample for 2006–2009 only includes firms controlled by a family who either has no residential real estate or experience a standard change in its tax value. For 2010, when no standard change was made, we restrict the sample of shareholders with residential real estate to those with a change in tax value in the narrow range of NOK -100,000 to NOK +500,000.

[14] Mean family leverage exceeds 100% because some assets, such as real estate and shares in private firms, have tax value below the market value, while debt is normally stated at market value.

growth opportunities, is very similar (2.4 vs. 2.5).[15] This is also the case for the ratio of retained earnings to equity (0.65 vs. 0.66) and for risk, which we measure as the coefficient of variation of sales over the past three years (0.35 vs. 0.37).

The summary statistics for financial and real effects of shareholder illiquidity are shown in the lower part of the table. Although the median firm pays no dividends regardless of whether the controlling family owns residential real estate, the mean dividends to earnings ratio is higher when the family owns residential real estate (0.17 vs. 0.10). This tendency is also reflected in the sum of dividends and salary paid to the family: Measured as a fraction of earnings plus salary, the mean of this ratio is higher when the family owns its home (0.67 vs. 0.62).

Finally, we measure real effects as the impact of the owner's personal liquidity shock on the firm's performance and the growth in sales, assets, and employment. The summary statistics show that mean growth is lower when the firm's controlling shareholder owns residential real estate, regardless of whether we consider sales (10% vs 12%), assets (13% vs. 15%), or employment (4% vs. 6%). However, the median firm has the same number of employees in two subsequent years regardless of whether the controlling shareholder has residential real estate. This stable employment is similar to earlier findings in French family firms (Sraer and Thesmar 2007). Finally, performance tends to be higher when the controlling shareholder owns residential real estate (9% vs. 7% mean return on assets).

Table A1 in the Appendix shows the equivalent of Table 3 when we include all family-controlled firms, i.e., also those where the family does not experience a standard change in the tax value of its home. The table shows that the family characteristics, firm characteristics, and firm behavior variables in this extended sample are virtually identical to those in in Table 3. This pattern suggests that transactions and modifications of the personal home are orthogonal to the characteristics we will use in our tests. Therefore, excluding these observations, which we do to reduce noise and bias, will not reduce the general validity of our results.

Summarizing this section, we find that fewer controlling owners of family firms pay wealth tax over time, that those who do pay increasingly more relative to their liquid wealth, and that this effect is strongest for families with residential real estate. The tax value of residential real estate increases by exactly the standard rate in three out of four cases, producing a particularly clean sample for our statistical tests. Controlling families with residential real estate have more assets, more net wealth, pay more wealth tax relative to their liquid assets, and the firms they

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[15] Firms generating high sales with their existing assets may need to invest to support the growth. Therefore, a higher sales-to-assets ratio may reflect lower slack and hence a stronger need to invest.

control are larger, more profitable, less liquid, pay higher dividends, and grow more slowly. Thus, both owner and firm characteristics correlate with whether the controlling family owns its home. We will account for these characteristics in Section 5–7, where we analyze how the liquidity shocks to controlling family change the firm's behavior.

5. Shareholder illiquidity and financial effects on the firm

The controlling family's personal liquidity may be insufficient to finance the family's cash outflow after a liquidity shock. Therefore, the family may choose to withdraw cash from the firm it controls, transforming the personal liquidity shock into a liquidity shock for the firm, which may have financial and real effects. The model we test in order to analyze this relationship is as follows, where i is the firm and t is time:

$$Financial\ effect_{it} = \alpha + \beta_1 Personal\ liquidity\ shock_{it} + \beta_2 Family\ characteristics_{it}$$
$$+ \beta_3\ Firm\ characteristics_{it} + \varepsilon_{it} \tag{1}$$

We hypothesize that the personal liquidity shock coming from higher wealth tax payments will propagate to the firm and reduce its liquidity by generating abnormal cash flows from the firm to the controlling shareholder. Specifically, we regress several dependent variables measuring the financial effect in the firm on measures of the personal liquidity shock, controlling for family and firm characteristics. We use panel regressions with firm fixed effects to control for unobserved, time-invariant firm and family characteristics, and we use year fixed effects to control for the business cycle. We cluster the standard errors at the firm level to account for dependent observations.

We use four alternative dependent variables. The first is *Dividends to earnings* (the dividend payout ratio), which we measure as dividends to operating earnings.[16] We test whether the personal liquidity shock for the shareholder is followed by abnormally high dividends.

It has been noted that many firms pay dividends even in years when they make a loss, but the reasons behind this decision are unclear (DeAngelo, DeAngelo and Skinner, 1992). The idea behind our second dependent variable is that dividends may need to be paid to illiquid shareholders even in bad times low because the shareholder must cover increased wealth tax

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[16] We ignore repurchases because less than 1% of our sample firms make repurchases. This is not surprising, because the sample firms are private and have illiquid shares. Also, because the tax rate is the same for dividends and capital gains, there is no tax advantage for repurchases,

payments. We capture this situation by the variable *Distressed dividends*, which is 1 if the firm pays dividends in a year with negative earnings, and 0 otherwise.

The firm may have a controlling owner who receives salary from the firm. Therefore, what matters may be the sum of dividends and salary rather than each component. Our third dependent variable is *Dividends and salary to earnings before salary*. We measure this variable as the sum of the dividends and salary the controlling shareholder receives from the firm divided by the shareholder's part of the firm's net income plus the salary.

Finally, the increased cash flow from the firm to shareholders facing a liquidity shock may reduce the firm's optimal cash holdings. We capture this situation by the fourth dependent variable, *Change in cash to assets*, which we measure as the change in the firm's cash to assets ratio from the previous year.

Our main independent variable is the *Family wealth-tax-to-liquid-assets* ratio. The higher it is, the heavier burden the wealth tax puts on the family's liquidity, and the stronger the need for liquidity from other sources, such as the family firm. However, running an OLS regression of firm financial effects on this ratio may create endogeneity bias. First, there may characteristics that influence both sides of the equation. For instance, successful firms will pay larger dividends, and their owners will be wealthier and hence pay larger wealth taxes. Second, the wealth tax payment is based on all personal assets the shareholder owns, and the shareholder's personal liquidity may depend on firm characteristics.

Therefore, there may be omitted variables correlated with the wealth-tax-to-liquid-assets ratio and with the firm's payout and liquidity. This is why we instrument the wealth-tax-to-liquid-assets ratio by the change in the tax value of residential real estate and by the proportion of residential real estate in the family's gross assets. The larger these two variables, the larger the family's tax shock (relevance). Neither variable is likely to have an effect on the firm's payout, growth, or profitability except indirectly through their impact on the shareholder's need to finance the wealth tax payments (exclusion).

The owner's wealth tax payment and liquid assets are not the only variables that may influence the cash flow from the firm to its owners. Therefore, we include additional variables in the regression that reflect family and firm characteristics. Regarding family characteristics, we control for the family's gross assets because wealthier families may need less cash from the firm. A high pre-shock leverage for the family may also increase the need for cash from the

firm if a large part of the family's liquidity is already used to cover debt payments. We control for this possibility by personal indebtedness measured as the ratio of debt to gross assets.

Regarding firm characteristics, firms with larger liquidity reserves (measured as the cash to assets ratio) and higher profitability (measured as return on assets) are more likely to pay dividends (DeAngelo, DeAngelo, and Stulz 2006). Conversely, firms with higher growth opportunities and higher risk tend to pay less (Grullon, Michaely, and Swaminathan 2002). We measure growth opportunities by the sales-to-assets ratio and risk by the coefficient of variation of sales over the past three years, respectively.

Larger and older firms are more likely to pay dividends (Fama and French 2001). Therefore, we include the firm's sales and age, taking logs in both cases to reduce skewness. Firms with higher leverage may find it difficult to pay their owners large amounts because of contractual obligations to creditors (Jensen 1988). Because mature firms are more likely to pay dividends (Grullon, Michaely, and Swaminathan 2002), we include the ratio of retained earnings to equity as a proxy for firm maturity (DeAngelo, DeAngelo, and Stulz 2006).

The results are presented in Table 4. The estimates show that, regardless of how we measure payout (as dividends to earnings, distressed dividends, or dividends plus salary to earnings before salary), a higher liquidity drain on the controlling family is associated with a higher cash flow paid from the firm to the family. The regression using the change in cash to assets as the dependent variable shows that a larger liquidity drain on the family is associated with lower cash holdings in the firm.

Table 4

These are the two main results in this section. They support the hypothesis that liquidity shocks to the owners induce the firm to pay out more in order to mitigate the effect of the shock, which in turns reduces the firm's liquidity position. The effects are economically large. A one percentage-point increase in the ratio of personal wealth tax to personal liquid assets increases the expected dividend payout ratio by 0.49 percentage points, the ratio of total cash payments to shareholders to the firm's earnings before salary by 0.84 percentage points, and decreases the firm's cash to assets ratio by 1.09 percentage points. The sample means (medians) for dividend payout ratios, total cash payment ratios, and firm cash to assets ratios are 15% (0%), 33% (4%), and 30% (24%), respectively.

The coefficients of the family- and firm-level controls have the expected signs: Families with low gross assets and high debt more often receive dividends after a tax shock unrelated to

the firm. Dividends also associate positively with more liquid, more profitable, larger, less risky, less levered, older firms with low growth.

Summing up this section, we find that a higher wealth tax payment for the firm's controlling shareholder due to higher tax value of residential real estate is associated with higher dividends and salaries paid from the firm to the shareholder, more frequent dividends even in loss-making years, and with reduced cash holdings in the firm. These findings suggest a causal effect going from the owners' personal liquidity position to the firm's payout and asset liquidity.

6. Real effects of shareholder illiquidity

The results in Section 5 identify an effect going from the owner's personal liquidity to the firm's liquidity. In the absence of financing frictions for the firm, however, sudden cash drains on the firm should have no real effects. New funding for profitable projects would be raised at no extra cost from investors unaffected by the liquidity shock. If raising finance from other investors is costly due to market frictions such as information asymmetry, however, profitable projects may be lost. This lost value would be a cost due to financial constraints for the firm.

Our sample consists of private firms with concentrated ownership, less known to investors, and generally thought to be financially constrained. Therefore, we hypothesize that the controlling owner's personal tax shock, which generates higher payout from the firm, will also slow down the firm's growth and profitability, which are the real effects we consider. Our first model type in this section has the following structure:

$$Real\ effect_{it} = \alpha + \beta_1 Personal\ liquidity\ shock_{it} + \beta_2 Family\ characteristics_{it} \\ + \beta_3\ Firm\ characteristics_{it} + \varepsilon_{it} \tag{2}$$

We first measure the real effect by the firm's growth, alternatively considering the growth rate of sales, assets, and employment, respectively. We measure the growth between year t and year $t+1$ in order to capture the effect of the increased wealth tax payment in year t.

Our second measure of real effects is profitability. The negative liquidity shock on the firm may not just affect the firm's growth, but also its earnings. We measure performance by the firm's return on assets in the following year ($t+1$).

Like in Section 5, we measure the personal liquidity drain as the wealth tax levied on the family divided by the family's liquid assets. We again instrument this ratio by the change in the tax value of residential real estate and by the proportion of residential real estate in the family's

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gross assets. The aim is once again to reduce endogeneity bias. For instance, if the firm is downsizing, it may be selling assets at market values above the book values used for wealth tax purposes, and the owner may receive proceeds from the sale that will increase the wealth tax. In such a case, we would observe both slower growth for the firm and a higher wealth tax payment for the owner, but causality would go from firm behavior to the owner's tax payments rather than the opposite way. Our instruments ensure we capture only the exogenous part of the wealth tax payment coming from the change in the tax value of residential real estate.

We use a similar set of family and firm characteristics as in Section 5. Specifically, we expect that wealthier families find it easy to support firm growth, while more levered families find it more difficult. Larger, more mature, and more levered firms may grow more slowly, while cash-rich firms may find it easier to support growth. Higher risk may hinder the financing of growth. We expect that firm and family characteristics that foster growth will be positively associated with profitability. Finally, we include firm fixed effects and year fixed effects to account for unobservable firm characteristics and the effects of the business cycle. Like in Section 5, we use the clean sample for 2006–2010 in order to avoid effects of transactions in residential real estate or significant home improvements.

Panel A of Table 5 shows the results. The estimates show that higher wealth tax payments for the shareholder are associated with significantly lower growth in the firm's sales and assets. The coefficient on employment has the expected negative sign, but is statistically insignificant at conventional levels.

Table 5

The estimates also show that a higher wealth tax shock leads to lower asset returns. Thus, the drain on firm liquidity and the slower growth after the personal liquidity shock are also associated with decreased profitability.

Some controlling shareholders own residential real estate, and some do not. Also, some have net wealth above the deduction at the time of the initial shock in 2006, and others do not. Residential real estate owners with net wealth above the deduction are likely to face higher wealth tax payments after the new tax value rule, while the other groups are not. Accordingly, an alternative way of analyzing how shareholder illiquidity can have real effects on the firm is to compare firms where the controlling owner does vs. does not experience a wealth tax shock. In Panel B of Table 5 we use a difference-in-difference model to make this comparison.

The treatment group consists of firms where the controlling shareholder owns residential real estate and pays wealth tax in 2006, while the control group consists of the remaining family firms. We compare the pre-tax-increase period (2001–2005) to the tax-increase period (2006–2010), using the same dependent variables as in Panel A.[17] The model we estimate is:

$$Real\ effect_{it} = \alpha + \beta_1 Residential\ real\ estate\ owner_{it} + \beta_2 After\ tax\ shock_{it}$$
$$+\beta_3 Residential\ real\ estate\ owner_{it} \bullet After\ tax\ shock_{it} \qquad (3)$$
$$+\beta_4 Family\ characteristics_{it} + \varepsilon_{it}$$

We use the same set of dependent variables as in (2): The growth rates of sales, assets, and employment from year t to year $t+1$ and the profitability measured as returns on assets in year $t+1$. *Residential real estate owner* equals 1 if the controlling shareholder owns a home and pays wealth tax in 2006, and 0 otherwise. *After tax shock* equals 1 in year 2006 or later, and 0 otherwise. We control for family and firm characteristics and include industry fixed effects.

The results in Panel B are consistent with those in Panel A. The interaction term shows that the firm's sales growth post 2006 compared to pre 2006 is slower if the controlling shareholder has residential real estate and pays wealth tax. The effect is statistically significant and also economically large, as the expected annual growth rate of sales slows down by one percentage point more in treated firms than in control firms. The result for asset growth is slightly weaker economically, but still statistically significant. Like in Panel A, the coefficient for employment growth is insignificant both statistically and economically. Finally, the estimates show that profitability is reduced post 2006 compared to pre 2006 if the controlling owner has residential real estate and is a wealth-tax payer. Thus, like in Panel A, the effects on growth and profitability go in the same direction. In sum, the difference-in-difference results confirm our findings from the IV estimation for all four dependent variables.

Summarizing this section, we have shown that the liquidity shock propagating from the controlling owner to the firm does not only affect the firm's dividend policy and cash balance as documented in Section 5. There are also real effects in the firm on top of financial effects, because firms with controlling owners subject to wealth tax shocks experience reduced growth in sales and assets and also reduced profitability. This evidence suggests that at least in private firms with concentrated ownership, shocks to shareholders' personal liquidity produce shocks

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[17] We cannot do a corresponding difference-in-difference test under the payout measures used in Section 5, because the large dividend tax reform in 2006 makes the pre-reform payout data very noisy.

to corporate liquidity, growth, and performance. Such dependence between the owner and the firm may be costly because the firm may have to forego profitable projects.

7. Robustness

In this section we address three potential concerns about our main results that have not been discussed so far. These concerns are how we construct the sample to minimize noise and bias, that we use leverage as a measure of capital structure, and that we ignore the market value of residential real estate as collateral for the firm's debt.

7.1 The sample

The instrumental variable regressions in Table 4 and Table 5 use a sample that we cleaned the following way: For the first years (2006-2009), the fixed percentage increase in tax values across the board allows us to identify the cases where the change in tax value is purely due to the change in tax rules. In the final sample year (2010), however, the regulator adjusts tax values not based on book value, but market value. Because we cannot precisely separate changes in the reported tax value due to the new valuation rule from changes due to actual real estate transactions, we imposed a rather narrow window of acceptable changes in tax value (between NOK -100,000 and +500,000) in Table 4 and Table 5. Because this window represents less than the typical tax value of a house as documented in Table 2, we think this approximation is reasonable. Nevertheless, our approach is obviously imperfect.

To address this problem, we rerun the IV regressions using a sample that excludes 2010. We choose the IV specification because, unlike the difference-in-difference specification, the IV regressions use the (instrumented) actual tax shock. The results are reported in Table A2 (financial effects) and A3 (real effects) of the Appendix. The estimates show that, compared to the baseline results in Table 4 and Table 5A, respectively, financial and real effects are insensitive to whether we include the year where we cannot precisely identify whether the change in wealth tax is only doe to the new tax rule.

7.2 The capital structure

The regressions in Table 4 use leverage in order to capture the effect that may arise if controlling shareholders increase personal debt and firm debt in order to reduce the personal wealth tax.

The idea is that the higher the leverage, the smaller the potential to use more debt to reduce the wealth tax shock.

An alternative approach is to measure the firm's debt capacity by asset tangibility, which is a deeper determinant of capital structure than leverage and arguably more costly to adjust (Frank and Goyal 1992). Firms with more tangible assets, such as manufacturing firms, have higher debt capacity than firms with less tangible assets, such as software firms, and may find it easier to raise new debt. Unlike leverage, asset tangibility reflects the ability to borrow rather than the decision to do so. Moreover, asset tangibility can also be considered a proxy for the strength of the collateral channel (Chaney, Sraer, and Thesmar 2012). We measure asset tangibility as the ratio between the firm's fixed and total assets.

We use this alternative measure of debt capacity in Tables A4, A5, and A6, where we exclude personal and corporate leverage and instead use asset tangibility, which we measure as the firm's tangible fixed assets divided by its total assets. The results are quite close to those from the main specification using lagged leverage.

7.3 The market value

The literature on the collateral channel (Chaney, Sraer, and Thesmar 2012; Kerr, Kerr, and Nanda 2015; Schmalz, Sraer, and Thesmar 2017) finds a relationship between changes in the market value of commercial real estate and firm growth. This result suggests that higher market value of real estate provides more collateral that can be pledged to raise more debt financing in the firm, which may reduce the firm's financial constraints.

We do not use changes in the market value of residential real estate in the baseline regressions. Instead, we use changes in the conventional tax value, which we have shown are uncorrelated with changes in market value. The two only values only move in tandem after 2010, which is after our sample period. Accordingly, changes in tax value should not reflect changes in the collateral value residential real estate, and hence in the ability to raise additional finance in the firm.

Nevertheless, to alleviate remaining concerns about a possible residual correlation between changes in tax value and market value, we account for the average price change per square meter in the local county in the same year. We collect data on the market price per square meter

for residential real estate in the each county and year and match it to our firms and owners.[18] We rerun our baseline models augmented by the change in the local market price.

Table A7 in the Appendix shows the results for financial effects in the firm (model (1) from Section 5), Table A8 shows the results for real effects using instrumental variables (model (2) from Section 6), while table A9 shows the results for real effects under the difference-in-difference approach (model (3) from Section 6). The estimates show that our results remain largely unchanged. We also find some evidence of a positive relationship between changes in the market price of residential real estate and firm growth in Table A9. This result is consistent with earlier findings about commercial real estate in the literature on the collateral channel.

8. Conclusions

We examine the causal effect of household finance on corporate finance, which is just starting to get attention in the economics literature. We do this by studying how the firm behaves after its controlling shareholder experiences a shock to personal wealth tax payments. Importantly, this wealth tax shock is independent of the shareholder's income, liquidity, and the firm's situation.

Our first main finding is that shocks to the household's liquidity produce shocks to the firm's liquidity. Firms controlled by shareholders with higher personal liquidity needs after a tax shock pay higher dividends and salaries to their shareholders, and the firm's cash holdings decrease. Our second main finding is that this drain on the firm's liquidity after the shareholder's personal tax shock reduces the firm's subsequent growth and profitability. Both findings suggest that household finance matters for corporate finance.

This evidence also suggests that the effect of personal liquidity concerns for the shareholders and financial concerns for the firm should be analyzed jointly. This perspective is particularly important in private firms with concentrated ownership and moderate size, where both the owners' liquidity constraints and the firm's financial constraints are likely to be strong. From a policy point of view, our results suggest that taxes strictly related to the personal sphere may have important spillover effects on the corporate sphere through the ownership channel.

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[18] The data source is Statistics Norway.

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Figure 1: The change in market value and tax value of residential real estate
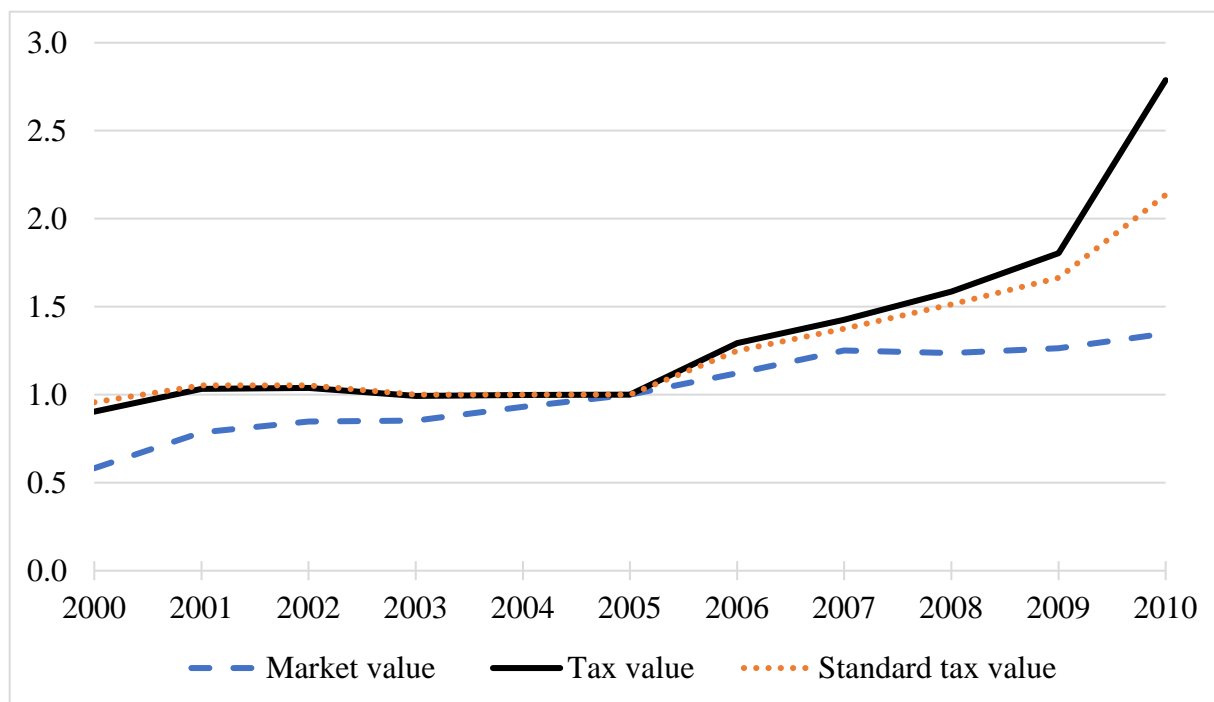
This figure shows indexes of the market value and tax value of residential real estate owned by controlling families in our sample. The figure also shows the standard change in the tax value according to the tax rule change that year. The base year is 2005 (index value = 1). The year 2010 does not have a standard change and reflects the median change in the residential real eastate values in our sample. The sample firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. A family consists of parents and underage children. The sample excludes financials, business groups, holding companies, and the smallest 5% of firms by assets, sales, and employment. The source of the market values is Statistics Norway.

Table 1: Wealth tax payments by the controlling family

Panel A. Mean wealth tax paid by the controlling family

Year	All	With residential real estate	Without residential real estate	With residential real estate; wealth tax payers	Without residential real estate; wealth tax payers	Proportion with residential real estate	Number of firms
2000	35,284	38,418	19,361	60,571	39,166	83.6%	29,528
2001	33,769	36,728	18,813	57,559	37,524	83.5%	30,987
2002	39,123	43,175	17,437	69,044	35,714	84.3%	31,341
2003	40,708	45,416	14,477	74,979	30,001	84.8%	32,400
2004	53,111	59,372	16,875	101,364	35,701	85.3%	33,031
2005	30,308	32,428	18,533	56,746	38,563	84.7%	32,929
2006	57,004	62,131	24,074	111,296	50,465	86.5%	33,630
2007	54,904	60,435	21,319	111,828	45,987	85.9%	33,014
2008	55,693	60,792	24,121	111,505	51,373	86.1%	33,510
2009	57,100	62,660	18,946	116,863	44,152	87.3%	33,437
2010	66,245	71,099	27,571	144,061	76,898	88.8%	34,386
Average	47,568	52,059	20,139	92,347	44,140	85.5%	32,563

Panel B. Proportion of controlling families paying wealth tax

Year	All	With residential real estate	Without residential real estate
2000	61.1%	63.4%	49.3%
2001	61.6%	63.8%	50.1%
2002	60.4%	62.5%	48.8%
2003	58.7%	60.6%	48.3%
2004	56.9%	58.6%	47.3%
2005	55.8%	57.1%	48.1%
2006	54.7%	55.8%	47.7%
2007	53.0%	54.0%	46.4%
2008	53.5%	54.5%	47.0%
2009	52.3%	53.6%	42.9%
2010	47.8%	49.4%	35.9%
Average	56.0%	57.6%	46.5%

Panel C. The controlling family's wealth-tax-to-liquid-assets ratio

Year	All	With residential real estate	Without residential real estate	With residential real estate, wealth tax payers	Without residential real estate, wealth tax payers
2000	3.6%	3.7%	2.7%	5.9%	5.4%
2001	3.7%	3.8%	2.7%	6.0%	5.4%
2002	2.6%	2.7%	2.1%	4.3%	4.3%
2003	1.9%	2.0%	1.5%	3.3%	3.2%
2004	1.6%	1.6%	1.3%	2.8%	2.8%
2005	1.3%	1.3%	1.1%	2.3%	2.2%
2006	1.5%	1.5%	1.3%	2.7%	2.6%
2007	1.9%	2.0%	1.6%	3.7%	3.4%
2008	3.4%	3.5%	2.8%	6.4%	6.0%
2009	3.8%	4.0%	3.1%	7.4%	7.2%
2010	3.6%	3.6%	2.9%	7.4%	8.1%
Average	2.6%	2.7%	2.1%	4.7%	4.6%

This table shows summary statistics for wealth tax payments made by the families who control our sample firms. The sample includes all active limited-liability firms in Norway where a family holds more than 50% of the equity. We exclude financials, business groups, holding companies, families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. A family consists of parents and underage children. Panel A shows the mean wealth tax payments measured in NOK as of 2010 for all controlling families, controlling families with and without residential real estate, controlling families with and without residential real estate who also pay wealth tax, and the proportion of controlling families who own residential real estate. Panel B shows the proportion paying wealth tax among all controlling families, among controlling families with residential real estate, and among controlling families without residential real estate. Panel C shows the mean ratio of wealth tax payments to liquid assets (cash, bank deposits, and marketable securities) for all controlling families, for controlling families with and without residential real estate, and for controlling families with and without residential real estate who also pay wealth tax.

Table 2: The tax value of residential real estate

Year	Tax value of residential real estate (NOK)				Median percentage change in the tax value of residential real estate	Proportion of residential real estate owners with standard tax value change	Number of firms
	5th percentile	Mean	Median	95th percentile			
2000	74,800	352,145	305,700	770,308	9.8%	76.3%	24,673
2001	86,242	402,679	348,508	885,500	15.0 %	76.6%	25,869
2002	85,388	404,612	349,970	890,970	0.0%	77.0%	26,407
2003	81,719	386,632	331,683	856,322	-5.0%	86.2%	27,470
2004	82,920	389,151	330,480	878,478	0.0%	73.7%	28,165
2005	82,920	389,590	328,695	878,846	0.0%	77.5%	27,904
2006	98,356	503,749	422,114	1,177,737	25.0%	72.8%	29,100
2007	109,058	555,664	461,065	1,298,825	10.0%	74.3%	28,346
2008	121,783	618,012	505,540	1,465,315	10.0%	75.5%	28,850
2009	134,505	702,955	575,830	1,674,352	10.0%	68.5%	29,184
2010	208,926	1,085,960	787,586	2,801,992	31.6%	56.8%	30,551

This table shows the evolution of the tax value of residential real estate owned by families who control our sample firms. "Tax value of residential real estate" is the tax value of all residential real estate owned by the controlling family. "Median change in the tax value of residential real estate" is the median percentage increase over the year in the tax value of residential real estate owned by the controlling family. "Proportion of residential real estate owners with standard value change" is the fraction of controlling families whose tax value of residential real estate changes by the percentage specified by the tax rule plus/minus 1% (2000–2009), or where the change in tax value is between NOK -100,000 and NOK +500,000 (year 2010)). "Number of firms" is the number of firms where a family owns more than 50% of the equity. The sample consists of active limited-liability firms in Norway where a family holds more than 50% of the equity. A family consists of parents and underage children. The sample excludes financials, business groups, holding companies, families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. The table reports only firms where the largest family also owns residential real estate.

Table 3: Characteristics of the controlling family and the controlled firm

Variable	All Mean	All Median	With residential real estate Mean	With residential real estate Median	Without residential real estate Mean	Without residential real estate Median	Number of observations
Family characteristics							
Family gross assets	7.18	2.07	7.76	2.21	3.34	1.10	167,977
Family leverage	1.18	0.58	1.11	0.58	1.70	0.60	167,977
Family net wealth	5.19	0.68	5.69	0.77	1.87	0.24	167,977
Family residential real estate to gross assets	0.28	0.21	0.32	0.25	0.00	0.00	167,977
Family liquid assets to gross assets	0.27	0.20	0.25	0.19	0.37	0.29	167,977
Family wealth tax to liquid assets	0.03	0.00	0.03	0.00	0.02	0.00	167,836
Firm characteristics							
Cash to assets	0.30	0.24	0.30	0.24	0.25	0.18	167,937
Return on assets	0.09	0.08	0.09	0.08	0.07	0.06	167,937
Sales to assets	2.39	2.00	2.37	2.00	2.50	2.06	167,937
Volatility of sales	0.35	0.27	0.35	0.26	0.37	0.29	152,292
Sales	9.20	3.43	9.42	3.48	7.77	3.12	167,977
Firm age	13.40	11.00	13.64	11.00	11.78	9.00	167,977
Firm leverage	0.73	0.72	0.72	0.72	0.78	0.76	167,937
Asset tangibility	0.21	0.10	0.20	0.09	0.24	0.13	167,936
Retained earnings to equity	0.65	0.76	0.65	0.76	0.66	0.74	167,893
Financial effects							
Dividend payer	0.21	0.00	0.22	0.00	0.15	0.00	167,977
Dividends to earnings	0.16	0.00	0.17	0.00	0.10	0.00	167,465
Dividends and salary to earnings before salary	0.66	0.71	0.67	0.72	0.62	0.64	167,875
Number of employees	5.97	3.00	6.06	3.00	5.35	3.00	167,977
Real effects							
Sales growth	0.10	0.04	0.10	0.04	0.12	0.05	152,175
Asset growth	0.14	0.04	0.13	0.04	0.15	0.05	161,449
Employment growth	0.04	0.00	0.04	0.00	0.06	0.00	152,508
Profitability	0.09	0.08	0.09	0.08	0.07	0.06	167,937

This table shows summary statistics for the controlling families and the firms they control. The sample period is 2006–2010. The sample includes all active limited-liability firms in Norway where a family holds more than 50% of the equity, and where the family has either no residential real estate, experiences a standard change in its tax value plus/minus 1% (2006–2009) or where the change in tax value is between NOK -100,000 and NOK +500,000 (year 2010). We exclude financials, business groups, holding companies, the families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. A family consists of parents and underage children. "Family gross assets" is the family's total assets in million NOK as of 2010 from the family's tax returns. "Family leverage" is the family's personal debt to gross wealth. "Family net wealth" is the family's total assets less its liabilities in million NOK as of 2010. "Family residential real estate to gross assets" is the tax value of the family's residential real estate divided by the family's gross wealth. "Family liquid assets to gross assets" is the family's cash, bank savings, and tradeable securities divided by gross wealth. "Family wealth tax to liquid assets" is the family's wealth tax payments divided by its liquid assets. "Cash to assets" is the firm's cash holdings over the year divided by the firm's assets. "Return on assets" is the firm's operating earnings divided by assets. "Sales to assets" is the ratio between the firm's sales and assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Sales" is the firm's revenues in million NOK as of 2010. "Firm age" is the number of years since the firm was founded. "Firm leverage" is the firm's liabilities divided by its assets. "Asset tangibility" is the ratio between the firm's tangible fixed assets and its total assets. "Retained earnings to equity" is the firm's retained earnings divided by its equity. "Dividend payer" is 1 if the firm pays a dividend and 0 otherwise. "Dividends to earnings" is the ratio between the firms dividends and operating earnings. "Dividends and salary to earnings before salary" is the sum of dividends and salary paid to the controlling family divided by the firm's operating earnings plus salary. "Number of employees" is the number of people working in the firm. The growth of sales, assets, and employment are annual rates. "Profitability" is operating earnings divided by assets. All ratios are windorized at 5% (0% if only positive values are meaningful) and 95%.

Table 4: The controlling owner's wealth tax shock and financial effects on the firm

	Dividends to earnings		Distressed dividends		Dividends and salary to earnings before salary		Change in cash to assets	
	Dependent variable							
Independent variable	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Family wealth tax to liquid assets	0.487	*0.001*	0.119	*0.009*	0.838	*0.000*	-1.085	*0.000*
Family gross assets	-0.003	*0.006*	-0.005	*0.025*	-0.001	*0.070*	0.076	*0.000*
Family leverage	0.003	*0.041*	0.001	*0.000*	0.005	*0.089*	-0.001	*0.567*
Firm characteristics								
Cash to assets	0.245	*0.000*	-0.001	*0.998*	0.101	*0.000*	0.968	*0.000*
Return on assets	0.084	*0.000*	-0.032	*0.000*	-0.160	*0.000*	-0.005	*0.321*
Sales to assets	-0.005	*0.003*	0.001	*0.298*	0.006	*0.069*	0.000	*0.801*
Volatility of sales	-0.040	*0.001*	0.005	*0.000*	-0.049	*0.010*	0.006	*0.426*
Size	0.033	*0.000*	-0.002	*0.003*	0.029	*0.001*	0.021	*0.000*
Age	-0.012	*0.562*	0.001	*0.326*	-0.021	*0.496*	0.004	*0.763*
Firm leverage	-0.261	*0.000*	-0.017	*0.018*	-0.361	*0.000*	0.096	*0.000*
Retained earnings to equity	0.011	*0.000*	0.002	*0.000*	0.023	*0.000*	-0.002	*0.001*
Firm fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
R^2	0.079		0.195		0.100		0.127	
Number of observations	77,545		78,146		56,911		78,263	
Number of firms	31,846		31,491		27,083		31,941	

The models estimated in this table reflect how tax shocks to the controlling family's personal wealth influence the cash flow from the firm to the family and the firm's liquid position. The population is all active limited-liability firms in Norway is 2006–2010 where a family holds more than 50% of the equity. The sample excludes financials, business groups, holding companies, the families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. We only include firms where the controlling family has either no residential real estate, experiences a standard change in its tax value plus/minus 1% (2006–2009) or where the change in tax value is between NOK -100,000 and NOK +500,000 (year 2010). A family consists of parents and underage children. "Dividends to earnings" is the ratio between the firms dividends and operating earnings. "Distressed dividends" equals 1 if the firm has negative operating earnings and positive dividends, and 0 otherwise. "Dividends and salary to earnings before salary" is the sum of dividends and salary paid to the controlling family divided by the firm's operating earnings plus salary. "Change in cash to assets" is the change in firm's cash to total assets ratio. "Family wealth tax to liquid assets" is the family's wealth tax payments divided by its liquid assets. This variable is instrumented by the change in the tax value of the family's residential real estate and by the ratio between residential real estate and the family's gross assets. "Family gross assets" is the family's assets from the tax returns. "Family leverage" is the lagged family's personal debt to gross wealth. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Firm leverage" is the firm's liabilities divided by its assets lagged. "Retained earnings to equity" is the firm's retained earnings divided by its equity. Standard errors are clustered at the firm level. All ratios are winsorized at 5% (0% if only positive values are meaningful) and 95%.

Table 5: Shareholder liquidity shocks and the firm's subsequent growth and profitability

Panel A. IV estimation

	Dependent variable							
	Sales growth		Asset growth		Employment growth		Profitability	
Independent variable	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Family wealth tax to liquid assets	-0.450	*0.003*	-0.301	*0.058*	-0.186	*0.192*	-0.486	*0.000*
Family gross assets	0.001	*0.942*	0.001	*0.681*	0.001	*0.944*	0.001	*0.037*
Family leverage	-0.005	*0.004*	-0.002	*0.336*	-0.001	*0.440*	0.002	*0.018*
Firm characteristics								
Cash to assets	-0.205	*0.000*	0.024	*0.019*	0.087	*0.000*	-0.049	*0.000*
Return on assets	-0.114	*0.000*	-0.046	*0.000*	0.018	*0.037*		
Sales to assets	-0.030	*0.000*	0.170	*0.000*	-0.004	*0.020*	0.027	*0.000*
Volatility of sales	-0.019	*0.131*	0.017	*0.191*	0.016	*0.175*	0.001	*0.871*
Size	-0.533	*0.000*	-0.414	*0.000*	-0.063	*0.000*	-0.076	*0.000*
Age	0.081	*0.000*	0.059	*0.006*	-0.004	*0.822*	0.009	*0.419*
Firm leverage	0.061	*0.000*	-0.060	*0.000*	-0.038	*0.000*	0.124	*0.000*
Retained earnings to equity	-0.001	*0.533*	0.001	*0.717*	0.001	*0.468*	0.001	*0.717*
Firm fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
R^2	0.005		0.006		0.010		0.007	
Number of observations	71,707		71,841		71,841		71,830	
Number of firms	28,564		28,594		28,594		28,592	

The models in this table estimate how the controlling shareholder's personal wealth tax payments relates to the firm's growth and profitability. The sample is all firms where the controlling family has either no residential real estate, experiences the standard regulatory change in the tax value of its residential real estate plus/minus 1% (years 2006–2009) or where the change in tax value is between NOK -100,000 and NOK +500,000 (year 2010). Family-controlled firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. We exclude financials, business groups, holding companies, the families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. A family consists of parents and underage children. The sample period is 2006–2010. "Sales growth", "Asset growth", and "Employment growth" are the log of the percentage change in sales, assets, and employment in the year after the wealth tax shock. "Profitability" is the return on assets the year after the tax shock. "Family wealth tax to liquid assets" is the controlling family's wealth tax payments divided by its liquid assets. This variable is instrumented by the change in the tax value of the family's residential real estate and by the ratio between residential real estate and the family's total gross assets. "Family gross assets" is the controlling family's assets from the family's tax returns. "Family leverage" is the controlling family's lagged personal debt to gross wealth. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Firm leverage" is the firm's liabilities to assets lagged. "Retained earnings to equity" is the firm's retained earnings divided by its equity. Standard errors are clustered at the firm level. All ratios are windsorized at 5% (0% if only positive values are meaningful) and 95%.

Table 5: Shareholder liquidity shocks and the firm's subsequent growth and profitability *(Continued)*

Panel B. Difference-in-difference estimation

	Dependent variable							
	Sales growth		Asset growth		Employment growth		Profitability	
Independent variable	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Residential real estate owner	0.012	*0.032*	0.008	*0.000*	-0.003	*0.060*	0.020	*0.000*
After tax shock	-0.005	*0.000*	-0.013	*0.000*	-0.001	*0.525*	-0.012	*0.000*
Residential real estate owner * After tax shock	-0.011	*0.001*	-0.004	*0.091*	-0.001	*0.558*	-0.010	*0.000*
Family gross assets	-0.003	*0.004*	0.007	*0.000*	-0.004	*0.000*	0.003	*0.000*
Family leverage	0.002	*0.050*	0.003	*0.000*	-0.001	*0.440*	-0.001	*0.009*
Firm characteristics								
Cash to assets	-0.042	*0.000*	-0.041	*0.000*	-0.009	*0.001*	0.115	*0.000*
Return on assets	-0.262	*0.000*	0.092	*0.000*	0.079	*0.000*		
Sales to assets	-0.012	*0.000*	0.024	*0.000*	-0.003	*0.000*	-0.005	*0.000*
Volatility of sales	0.016	*0.000*	0.036	*0.000*	-0.002	*0.522*	-0.023	*0.000*
Size	-0.007	*0.000*	-0.020	*0.000*	0.009	*0.000*	0.017	*0.000*
Age	-0.026	*0.000*	-0.010	*0.000*	-0.012	*0.000*	-0.014	*0.000*
Firm leverage	0.013	*0.004*	-0.043	*0.000*	-0.019	*0.000*	0.043	*0.000*
Retained earnings to equity	-0.004	*0.000*	-0.002	*0.079*	-0.003	*0.000*	0.002	*0.002*
Industry fixed effects	Yes		Yes		Yes		Yes	
R^2	0.026		0.023		0.010		0.064	
Number of observations	149,286		149,615		149,618		149,598	
Number of firms	22,076		22,083		22,083		22,081	

This table uses a difference-in-difference approach to compare the effect on firm growth and profitability in family firms where the controlling shareholder is vs. is not affected by a tax shock on personal residential real estate. Family firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. A family consists of parents and underage children. The sample excludes financials, business groups, holding companies, the families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. The sample period is 2001–2010. "Residential real estate owner" equals 1 for firms where the controlling family owns residential real estate and pays wealth tax in 2006, and 0 otherwise. "After tax shock" is 1 for 2006–2010 and 0 otherwise. "Sales growth", "Asset growth", and "Employment growth" are the log of the percentage change the year after the tax shock in sales, assets, and employment, respectively . "Profitability" is the return on assets the year after the tax shock. "Family gross assets" is the controlling family's assets from the family's tax returns. "Family leverage" is the controlling family's personal debt to gross wealth lagged. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Firm leverage" is the firm's liabilities to assets lagged. "Retained earnings to equity" is the firm's retained earnings divided by its equity.

Table A1: Characteristics of the controlling family and the controlled firm in all family-controlled firms

Variable	All		With residential real estate		Without residential real estate	
	Mean	Median	Mean	Median	Mean	Median
Family characteristics						
Family gross assets	7.18	2.07	7.76	2.21	3.34	1.10
Family leverage	1.09	0.58	1.05	0.58	1.39	0.60
Family net wealth	5.19	0.68	5.69	0.77	1.87	0.24
Family residential real estate to gross assets	0.28	0.21	0.32	0.25	0.00	0.00
Family liquid assets to gross assets	0.27	0.20	0.25	0.19	0.39	0.29
Family wealth tax to liquid assets	0.04	0.01	0.04	0.01	0.03	0.01
Firm characteristics						
Cash to assets	0.30	0.24	0.30	0.24	0.25	0.18
Return on assets	0.09	0.08	0.09	0.08	0.07	0.06
Sales to assets	2.39	2.00	2.37	2.00	2.50	2.06
Volatility of sales	0.34	0.23	0.34	0.23	0.36	0.26
Sales	9.20	3.43	9.42	3.48	7.77	3.12
Firm age	13.40	11.00	13.64	11.00	11.78	9.00
Firm leverage	0.71	0.72	0.70	0.72	0.76	0.76
Asset tangibility	0.21	0.10	0.20	0.09	0.24	0.13
Retained earnings to equity	0.60	0.71	0.61	0.72	0.59	0.69
Financial effects						
Dividend payer	0.21	0.00	0.22	0.00	0.15	0.00
Dividends to earnings	0.15	0.00	0.15	0.00	0.10	0.00
Dividends and salary to earnings before salary	0.34	0.04	0.35	0.04	0.25	0.02
Number of employees	5.97	3.00	6.06	3.00	5.35	3.00
Real effects						
Number of firms	0.10	28945.00	0.10	0.04	0.12	0.05
Asset growth	0.11	0.04	0.11	0.04	0.12	0.04
Employment growth	0.03	0.00	0.03	0.00	0.03	0.00
Performance	0.09	0.08	0.09	0.08	0.07	0.06

This table shows summary statistics for the controlling families and the firms they control. The sample period is 2006–2010. Unlike in Table 3, this table also includes firms where the controlling family does not experience a standard change in the tax value of its residential real estate in 2006–2009. The sample firms are selected from all active limited-liability firms in Norway where a family holds more than 50% of the equity. We exclude financials, business groups, holding companies, families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. A family consists of parents and underage children. "Family gross assets" is the family's total assets in million NOK as of 2010 from the family's tax returns. "Family leverage" is the family's personal debt to gross wealth. "Family net wealth" is the family's total assets less its liabilities in million NOK as of 2010 from the family's tax returns. "Family residential real estate to gross assets" is the tax value of the family's residential real estate divided by the family's gross wealth. "Family liquid assets to gross assets" is the family's cash, bank savings, and tradeable securities divided by gross wealth. "Family wealth tax to liquid assets" is the family's wealth tax payments divided by its liquid assets. "Cash to assets" is the firm's cash holdings over the year divided by the firm's assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Sales" is the firm's revenues in million NOK as of 2010. "Age" is the number of years since the firm was founded. "Firm leverage" is the firm's liabilities divided by its assets. "Asset tangibility" is the ratio between the firm's tangible fixed assets and its total assets. "Retained earnings to equity" is the firm's retained earnings divided by its equity. "Dividends to earnings" is the ratio between the firm's dividends and operating earnings. "Dividends and salary to earnings and salary" is the sum of dividends and salary paid to the controlling family divided by the firm's operating earnings before salary. "Number of employees" is the number of people working in the firm. The growth of sales, assets, and employment are annual rates.

Table A2: Shareholder liquidity and financial effects on the firm in 2006–2009

Independent variable	Dividends to earnings		Distressed dividends		Dividends and salary to earnings before salary		Change in cash to assets	
	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Family wealth tax to liquid assets	0.326	*0.058*	0.130	*0.014*	0.561	*0.012*	-1.176	*0.000*
Family gross assets	-0.002	*0.031*	-0.004	*0.061*	0.001	*0.044*	0.014	*0.039*
Family leverage	0.004	*0.033*	0.001	*0.020*	0.006	*0.034*	-0.001	*0.382*
Firm characteristics								
Cash to assets	0.240	*0.000*	-0.001	*0.378*	0.112	*0.000*	1.030	*0.000*
Return on assets	0.089	*0.000*	-0.030	*0.000*	-0.148	*0.000*	-0.011	*0.074*
Sales to assets	-0.004	*0.036*	0.000	*0.326*	0.008	*0.021*	0.001	*0.652*
Volatility of sales	-0.042	*0.005*	0.005	*0.000*	-0.061	*0.010*	0.005	*0.552*
Size	0.035	*0.000*	-0.002	*0.006*	0.033	*0.001*	0.022	*0.000*
Age	0.006	*0.813*	0.000	*0.652*	0.003	*0.934*	-0.016	*0.312*
Firm leverage	-0.289	*0.000*	-0.017	*0.000*	-0.424	*0.000*	0.091	*0.000*
Retained earnings to equity	0.012	*0.000*	0.002	*0.000*	0.024	*0.000*	-0.002	*0.089*
Firm fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
R^2	0.080		0.079		0.080		0.130	
Number of observations	63,918		64,489		47,414		64,489	
Number of firms	28,945		29,041		24,511		29,041	

The models estimated in this table show how tax shocks to the controlling family's personal wealth relate to the cash flow from the firm to the family and to the firm's liquid position. The population is all active limited-liability firms in Norway where a family holds more than 50% of the equity. The sample is all family-controlled firms where the family either has no residential real estate or experiences a standard change in its tax value plus/minus 1%. We exclude financials, business groups, holding companies, families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. The sample period is 2006–2009. A family consists of parents and underage children. "Dividends to earnings" is the ratio between the firms dividends and operating earnings. "Distressed dividends" is a dummy variable that equals 1 if the firm has negative operating earnings and positive dividends, and 0 otherwise. "Dividends and salary to earnings before salary" is the sum of dividends and salary paid to the controlling family divided by the firm's operating earnings plus salary. "Change in cash to assets" is the change in firm's cash to total assets ratio. "Family wealth tax to liquid assets" is the family's wealth tax payments divided by its liquid assets. This variable is instrumented by the change in the tax value of the family's residential real estate and by the ratio between residential real estate and the family's total gross assets. "Family gross assets" is the family's assets from the family's tax returns. "Family leverage" is the family's personal debt to gross wealth lagged. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Firm leverage" is the firm's liabilities to assets lagged. "Retained earnings to equity" is the firm's retained earnings divided by its equity. The standard errors are clustered at the firm level.

Table A3: Shareholder liquidity and real effects on the firm in 2006–2009

Independent variable	Dependent variable							
	Sales growth		Asset growth		Employment growth		Profitability	
	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Family wealth tax to liquid assets	-0.442	*0.010*	-0.367	*0.043*	-0.284	*0.087*	-0.501	*0.000*
Family gross assets	0.000	*0.872*	0.000	*0.681*	0.000	*0.961*	0.000	*0.057*
Family leverage	-0.007	*0.000*	-0.001	*0.601*	-0.001	*0.462*	-0.001	*0.227*
Firm characteristics								
Cash to assets	-0.128	*0.000*	-0.062	*0.000*	0.014	*0.170*	-0.062	*0.000*
Return on assets	-0.212	*0.000*	0.016	*0.188*	0.084	*0.000*		
Sales to assets	-0.030	*0.000*	0.181	*0.000*	-0.007	*0.001*	0.026	*0.000*
Volatility of sales	-0.079	*0.000*	0.003	*0.854*	0.016	*0.300*	-0.006	*0.475*
Size	-0.583	*0.000*	-0.460	*0.000*	-0.062	*0.000*	-0.084	*0.000*
Age	0.103	*0.000*	0.044	*0.130*	0.021	*0.437*	-0.003	*0.849*
Firm leverage	0.070	*0.000*	-0.047	*0.000*	-0.035	*0.001*	0.110	*0.000*
Retained earnings to equity	-0.001	*0.488*	0.001	*0.701*	0.000	*0.891*	-0.002	*0.049*
Firm fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
R^2	0.01		0.01		0.01		0.01	
Number of observations	58,916		59,027		59,027		59,017	
Number of firms	25,895		25,925		25,925		25,922	

This table shows how the controlling owner's wealth tax payments relates to the firm's growth and profitability in the subperiod 2006–20009. The sample is all firms where the controlling family has either no residential real estate or experiences the standard regulatory change in the tax value of its residential real estate plus/minus 1%. Family-controlled firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. We exclude financials, business groups, holding companies, families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. A family consists of parents and underage children. "Sales growth", "Asset growth", and "Employment growth" are the log of the growth in sales, assets, and employment in the year after the wealth tax shock. "Family wealth tax to liquid assets" is the family's wealth tax payments divided by its liquid assets. This variable is instrumented by the change in the tax value of the family's residential real estate and by the ratio between residential real estate and the family's total gross assets. "Family gross assets" is the family's assets from the family's tax returns. "Family leverage" is the family's personal debt to gross wealth lagged. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Firm leverage" is the firm's liabilities divided to assets lagged. "Retained earnings to equity" is the firm's retained earnings divided by its equity. Standard errors are clustered at the firm level.

Table A4: Financial effects using asset tangibility

	Dependent variable							
	Dividends to earnings		Distressed dividends		Dividends and salary to earnings before salary		Change in cash to assets	
Independent variable	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Family wealth tax to liquid assets	0.896	*0.000*	0.153	*0.000*	1.143	*0.000*	-1.237	*0.000*
Family gross assets	-0.001	*0.001*	-0.001	*0.622*	-0.001	*0.004*	0.001	*0.001*
Firm characteristics								
Cash to assets	0.103	*0.000*	0.005	*0.000*	0.117	*0.000*	0.976	*0.000*
Return on assets	0.155	*0.000*	-0.034	*0.000*	-0.310	*0.000*	0.032	*0.000*
Sales to assets	-0.014	*0.000*	0.000	*0.284*	-0.010	*0.001*	0.005	*0.000*
Volatility of sales	-0.038	*0.002*	0.005	*0.000*	-0.043	*0.026*	0.006	*0.400*
Size	0.041	*0.000*	-0.003	*0.000*	0.036	*0.000*	0.018	*0.000*
Age	-0.030	*0.144*	0.000	*0.766*	-0.038	*0.231*	0.011	*0.358*
Asset tangibility	-0.031	*0.015*	0.000	*0.704*	-0.086	*0.000*	0.073	*0.000*
Retained earnings to equity	0.004	*0.009*	0.001	*0.000*	0.016	*0.000*	0.001	*0.205*
Firm fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
R^2	0.06		0.01		0.01		0.12	
Number of observations	77,626		78,345		56,960		78,329	
Number of firms	31,886		31,982		27,110		31,976	

The models in this table estimate how the controlling owner's tax payments relate to the firm's cash flows when we use asset tangibility to replace leverage. The sample is all family-controlled firms where the family experiences the standard change in the tax value of its residential real estate plus/minus 1% (years 2006–2009) or where the change in tax value is between NOK -100,000 and NOK +500,000 (year 2010). Family-controlled firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. The sample excludes financials, business groups, holding companies, families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. A family consists of parents and underage children. The sample period is 2006–2010. "Dividends to earnings" is the ratio between the firms dividends and operating earnings. "Distressed dividends" equals 1 if the firm has negative operating earnings and positive dividends, and 0 otherwise. "Dividends and salary to earnings before salary" is the sum of dividends and salary paid to the controlling family divided by the firm's operating earnings plus salary. "Change in cash to assets" is the change in firm's cash to total assets ratio. "Wealth tax to liquid assets" is the family's wealth tax payments divided by its liquid assets. This variable is instrumented by the change in the tax value of the family's residential real estate and by the ratio between residential real estate and the family's total gross assets. "Family gross assets" is the family's assets from the tax returns. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Asset tangibility" is measured as the firm's tangible fixed assets to total assets ratio. "Retained earnings to equity" is the firm's retained earnings divided by its equity.

Table A5: Real effects effects using asset tangibility and IV estimation

Independent variable	Sales growth		Asset growth		Employment growth		Profitability	
	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Family wealth tax to liquid assets	-0.533	*0.000*	-0.218	*0.050*	-0.131	*0.255*	-0.743	*0.000*
Family gross assets	0.001	*0.861*	0.001	*0.762*	0.001	*0.924*	0.001	*0.007*
Firm characteristics								
Cash to assets	-0.187	*0.000*	0.004	*0.687*	0.058	*0.000*	-0.047	*0.000*
Return on assets	-0.128	*0.000*	-0.040	*0.000*	0.022	*0.005*		
Sales to assets	-0.028	*0.000*	0.167	*0.000*	-0.004	*0.008*	0.031	*0.000*
Volatility of sales	-0.022	*0.073*	0.018	*0.178*	0.009	*0.379*	0.002	*0.783*
Size	-0.534	*0.000*	-0.412	*0.000*	-0.048	*0.000*	-0.071	*0.000*
Age	0.085	*0.000*	0.054	*0.012*	-0.002	*0.922*	0.013	*0.294*
Asset tangibility	-0.035	*0.006*	-0.001	*0.960*	0.004	*0.667*	0.033	*0.000*
Retained earnings to equity	0.001	*0.522*	-0.001	*0.586*	0.000	*0.933*	0.001	*0.120*
Firm fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
R^2	0.01		0.01		0.01		0.01	
Number of observations	71,772		71,906		71,906		71,895	
Number of firms	28,593		28,622		28,622		28,622	

The models in this table estimate how the controlling owner's tax payments relate to the firm's growth and profitability when we when we use asset tangibility to replace leverage. The sample is all family-controlled firms where the family experiences the standard change in the tax value of its residential real estate plus/minus 1% (years 2006–2009) or where the change in tax value is between NOK -100,000 and NOK +500,000 (year 2010). Family-controlled firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. The sample excludes financials, business groups, holding companies, families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. A family consists of parents and underage children. The sample period is 2006–2010. "Sales growth", "Asset growth", and "Employment growth" are the log of the percentage change in sales, assets, and employment, respectively, in the year after the wealth tax shock. "Profitability" is the return on assets the year after the tax shock. "Wealth tax to liquid assets" is the family's wealth tax payments divided by its liquid assets. This variable is instrumented by the change in the tax value of the family's residential real estate and by the ratio between residential real estate and the family's total gross assets. "Family gross assets" is the family's assets from the tax returns. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Asset tangibility" is measured as the firm's tangible fixed assets to total assets ratio. "Retained earnings to equity" is the firm's retained earnings divided by its equity.

Table A6: Real effects using asset tangibility and difference-in-difference estimation

	Dependent variable							
	Sales growth		Asset growth		Employment growth		Profitability	
Independent variable	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Residential real estate owner	0.010	*0.000*	0.006	*0.003*	-0.004	*0.043*	0.021	*0.000*
After tax shock	-0.004	*0.126*	-0.009	*0.000*	0.001	*0.740*	-0.014	*0.000*
Residential real estate owner * After tax shock	-0.012	*0.000*	0.005	*0.074*	-0.002	*0.495*	-0.012	*0.000*
Family gross assets	-0.004	*0.000*	0.007	*0.000*	-0.003	*0.000*	0.002	*0.000*
Firm characteristics								
Cash to assets	-0.047	*0.000*	-0.033	*0.000*	-0.007	*0.015*	0.100	*0.000*
Return on assets	-0.257	*0.000*	0.083	*0.000*	0.076	*0.000*		
Sales to assets	-0.011	*0.000*	0.023	*0.000*	-0.004	*0.000*	-0.004	*0.000*
Volatility of sales	0.020	*0.000*	0.037	*0.000*	0.000	*0.939*	-0.023	*0.000*
Size	-0.007	*0.000*	-0.020	*0.000*	0.009	*0.000*	0.017	*0.000*
Age	-0.026	*0.000*	-0.010	*0.000*	-0.012	*0.000*	-0.015	*0.000*
Asset tangibility	-0.003	*0.556*	-0.004	*0.194*	-0.008	*0.006*	-0.010	*0.000*
Retained earnings to equity	-0.004	*0.006*	-0.003	*0.000*	-0.003	*0.000*	0.004	*0.001*
Industry fixed effects	Yes		Yes		Yes		Yes	
R^2	0.03		0.02		0.01		0.06	
Number of observations	157,424		157,779		157,779		157,757	
Number of firms	22,244		22,246		22,246		22,245	

This table uses a difference-in-difference approach to compare the effect on firm growth and profitability in family firms where the controlling shareholder is vs. is not affected by a tax shock on personal residential real estate. Family firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. A family consists of parents and underage children. The sample excludes financials, business groups, holding companies, the families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. The sample period is 2001–2010. "Residential real estate owner" equals 1 for firms where the controlling family owns residential real estate and pays wealth tax in 2006, and 0 otherwise. "After tax shock" is 1 for 2006–2010 and 0 otherwise. "Sales growth", "Asset growth", and "Employment growth" are the log of the percentage change the year after the tax shock in sales, assets, and employment, respectively . "Profitability" is the return on assets the year after the tax shock. "Family gross assets" is the controlling family's assets from the family's tax returns. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Asset tangibility" is measured as the firm's tangible fixed assets to total assets ratio. "Retained earnings to equity" is the firm's retained earnings divided by its equity.

Table A7: Financial effects when accounting for the market value of residential real estate

Independent variable	Dividends to earnings		Distressed dividends		Dividends and salary to earnings before salary		Change in cash to assets	
	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Family wealth tax to liquid assets	0.494	*0.001*	0.119	*0.000*	0.536	*0.000*	-1.087	*0.000*
Family gross assets	-0.001	*0.006*	-0.001	*0.710*	-0.001	*0.004*	0.001	*0.002*
Family leverage	0.003	*0.037*	0.001	*0.019*	0.006	*0.002*	-0.001	*0.561*
Firm characteristics								
Cash to assets	0.084	*0.000*	0.001	*0.996*	0.052	*0.000*	0.969	*0.000*
Return on assets	0.245	*0.000*	-0.032	*0.000*	-1.023	*0.000*	-0.005	*0.321*
Sales to assets	-0.005	*0.003*	0.000	*0.299*	0.035	*0.000*	0.000	*0.820*
Volatility of sales	-0.040	*0.001*	0.005	*0.000*	-0.040	*0.002*	0.006	*0.425*
Size	0.033	*0.000*	-0.002	*0.003*	0.004	*0.486*	0.021	*0.000*
Age	-0.011	*0.587*	0.001	*0.323*	-0.022	*0.285*	0.003	*0.766*
Firm leverage	-0.261	*0.000*	-0.017	*0.000*	-0.173	*0.000*	0.096	*0.000*
Retained earnings to equity	0.011	*0.009*	0.002	*0.000*	0.007	*0.000*	-0.002	*0.056*
Change in local real estate prices	0.000	*0.139*	0.000	*0.264*	0.001	*0.018*	0.000	*0.113*
Firm fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
R^2	0.06		0.01		0.06		0.13	
Number of observations	77,516		78,234		56,878		78,234	
Number of firms	31,833		31,928		27,067		31,928	

The models in this table estimate how the controlling owner's tax payments relate to the firm's cash flows when we control for changes in market real estate prices. The sample is all family-controlled firms where the family experiences the standard change in the tax value of its residential real estate plus/minus 1% (years 2006–2009) or where the change in tax value is between NOK -100,000 and NOK +500,000 (year 2010). Family-controlled firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. The sample excludes financials, business groups, holding companies, families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. A family consists of parents and underage children. The sample period is 2006–2010. "Dividends to earnings" is the ratio between the firms dividends and operating earnings. "Distressed dividends" equals 1 if the firm has negative operating earnings and positive dividends, and 0 otherwise. "Dividends and salary to earnings before salary" is the sum of dividends and salary paid to the controlling family divided by the firm's operating earnings plus salary. "Change in cash to assets" is the change in firm's cash to total assets ratio. "Wealth tax to liquid assets" is the family's wealth tax payments divided by its liquid assets. This variable is instrumented by the change in the tax value of the family's residential real estate and by the ratio between residential real estate and the family's total gross assets. "Family gross assets" is the family's assets from the tax returns. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Change in local real estate prices" is the change in the price per square meter for real estate in the county. "Retained earnings to equity" is the firm's retained earnings divided by its equity.

Table A8: Real effects when accounting for the market value of residential real estate

Independent variable	Sales growth		Asset growth		Employment growth		Profitability	
	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Family wealth tax to liquid assets	-0.450	*0.003*	-0.303	*0.056*	-0.187	*0.123*	-0.486	*0.000*
Family gross assets	0.001	*0.944*	0.001	*0.682*	0.001	*0.844*	0.001	*0.716*
Family leverage	-0.005	*0.004*	-0.002	*0.322*	-0.001	*0.462*	0.001	*0.120*
Firm characteristics								
Cash to assets	-0.114	*0.000*	0.025	*0.018*	0.070	*0.000*	-0.049	*0.000*
Return on assets	-0.030	*0.000*	-0.046	*0.000*	0.017	*0.020*		
Sales to assets	-0.019	*0.000*	0.170	*0.000*	-0.003	*0.061*	0.027	*0.000*
Volatility of sales	-0.533	*0.121*	0.017	*0.185*	0.009	*0.394*	0.001	*0.900*
Size	0.079	*0.000*	-0.414	*0.000*	-0.049	*0.000*	-0.076	*0.000*
Age	0.061	*0.000*	0.059	*0.007*	0.002	*0.922*	0.009	*0.420*
Firm leverage	0.070	*0.000*	-0.060	*0.000*	-0.033	*0.000*	0.124	*0.000*
Retained earnings to equity	-0.001	*0.534*	0.001	*0.703*	0.001	*0.435*	-0.002	*0.006*
Change in local real estate prices	0.000	*0.667*	0.000	*0.208*	0.000	*0.527*	0.000	*0.716*
Firm fixed effects	Yes		Yes		Yes		Yes	
Year fixed effects	Yes		Yes		Yes		Yes	
R^2	0.01		0.01		0.01		0.01	
Number of observations	71,684		71,818		71,818		71,807	
Number of firms	28,552		28,582		28,582		28,580	

(Dependent variable spans the four outcome columns.)

This table shows how the controlling owner's tax payments on residential real estate relate to the firm's growth and profitability when we account for the possible effect of market value changes in residential real estate. The sample is all firms where the controlling family has either no residential real estate, experiences the standard regulatory change in the tax value of its residential real estate plus/minus 1% (years 2006–2009) or where the change in tax value is between NOK -100,000 and NOK +500,000 (year 2010). Family-controlled firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. We exclude financials, business groups, holding companies, families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. A family consists of parents and underage children. The sample period is 2006–2010. "Sales growth", "Asset growth", and "Employment growth" are the log of the growth in sales, assets, and employment in the year after the wealth tax shock. "Profitability" is the return on assets the following year. "Family wealth tax to liquid assets" is the family's wealth tax payments divided by its liquid assets. This variable is instrumented by the change in the tax value of the family's residential real estate and by the ratio between residential real estate and the family's total gross assets. "Family gross assets" is the family's assets from the family's tax returns. "Family leverage" is the family's personal debt to gross wealth lagged. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Volatility of sales" is the coefficient of variation of sales over the past three years. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Firm leverage" is the firm's liabilities to assets lagged. "Change in local real estate prices" is the change in the price per square meter for real estate in the county. "Retained earnings to equity" is the firm's retained earnings divided by its equity. Standard errors are clustered at the firm level.

Table A9: Real effects with market value of residential real estate and difference-in-difference estimation

	Sales growth		Asset growth		Employment growth		Profitability	
Independent variable	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*	Coefficient	*p-value*
Family characteristics								
Residential real estate owner	0.011	*0.032*	0.009	*0.000*	-0.002	*0.272*	0.019	*0.000*
After tax shock	-0.008	*0.003*	-0.018	*0.000*	0.000	*0.917*	-0.011	*0.000*
Residential real estate owner * After tax shock	-0.012	*0.000*	-0.002	*0.076*	-0.003	*0.286*	-0.011	*0.000*
Family gross assets	-0.002	*0.038*	0.008	*0.000*	-0.004	*0.000*	0.004	*0.000*
Family leverage	0.001	*0.103*	0.003	*0.000*	0.001	*0.136*	-0.001	*0.027*
Firm characteristics								
Cash to assets	-0.040	*0.000*	-0.042	*0.000*	-0.009	*0.002*	0.114	*0.000*
Return on assets	-0.268	*0.000*	0.092	*0.000*	0.079	*0.000*		
Sales to assets	-0.011	*0.000*	0.024	*0.000*	-0.003	*0.000*	-0.005	*0.000*
Volatility of sales	0.017	*0.000*	0.038	*0.000*	-0.001	*0.641*	-0.022	*0.000*
Size	-0.006	*0.000*	-0.019	*0.000*	0.009	*0.000*	0.017	*0.000*
Age	-0.024	*0.000*	-0.010	*0.000*	-0.012	*0.000*	-0.013	*0.000*
Firm leverage	0.001	*0.103*	-0.043	*0.000*	-0.019	*0.000*	0.041	*0.000*
Change in local real estate prices	0.003	*0.000*	0.002	*0.000*	0.000	*0.841*	0.001	*0.000*
Retained earnings to equity	-0.003	*0.006*	-0.001	*0.971*	-0.003	*0.000*	0.002	*0.001*
Industry fixed effects	Yes		Yes		Yes		Yes	
R^2	0.029		0.026		0.005		0.066	
Number of observations	138,411		138,721		138,724		138,707	
Number of firms	22,032		22,040		22,040		22,038	

This table uses a difference-in-difference approach to compare the effect on firm growth and profitability in family firms where the controlling shareholder is vs. is not affected by a tax shock on personal residential real estate. Family firms are all active limited-liability firms in Norway where a family holds more than 50% of the equity. A family consists of parents and underage children. The sample excludes financials, business groups, holding companies, the families with zero gross wealth, and the smallest 5% of firms by assets, sales, and employment. The sample period is 2001–2010. "Residential real estate owner" equals 1 for firms where the controlling family owns residential real estate and pays wealth tax in 2006, and 0 otherwise. "After tax shock" is 1 for 2006–2010 and 0 otherwise. "Sales growth", "Asset growth", and "Employment growth" are the log of the percentage change the year after the tax shock in sales, assets, and employment, respectively . "Profitability" is the return on assets the year after the tax shock. "Family gross assets" is the controlling family's assets from the family's tax returns. "Family leverage" is the controlling family's personal debt to gross wealth lagged. "Cash to assets" is the ratio between the firm's cash holdings and total assets. "Return on assets" is the firm's operating earnings divided by total assets. "Sales to assets" is the ratio between the firm's sales and total assets. "Size" is the log of the firm's revenues in million NOK as of 2010. "Age" is the log of the number of years since the firm was founded. "Firm leverage" is the firm's liabilities to assets lagged. "Retained earnings to equity" is the firm's retained earnings divided by its equity.