Oxford University
Centre for
Business Taxation

Inter vivos transfers of ownership in family firms

October 2015

WP15/23

James R Hines Jr
University of Michigan and NBER

Marina Riem
Ifo Institute

Niklas Potrafke
Ifo Institute

Christoph Schinke
Ifo Institute

Working paper series | 2015

SAID BUSINESS SCHOOL
UNIVERSITY OF OXFORD

Inter vivos transfers of ownership in family firms

James R. Hines Jr.[1]

University of Michigan and NBER

Niklas Potrafke, Marina Riem, Christoph Schinke[2]

ifo Institute, Munich

June 21, 2015

Abstract

This paper examines the determinants of inter vivos transfers of ownership in German family firms between 2000 and 2013. Survey evidence indicates that owners of larger firms, and firms with strong current business conditions, transfer ownership at higher rates than others. When a firm's self-described business condition improves from "normal" to "good" the chance of an inter vivos transfer increases by 46 percent. Inter vivos transfer rates also rose following a 2009 transfer tax reduction. These patterns suggest that transfer taxes significantly influence rates and timing of inter vivos ownership transfers.

JEL: H24, D31, D22.

Keywords: inter vivos transfers, transfer taxes, family firms

[1] Department of Economics, University of Michigan, Lorch Hall, 611 Tappan Street, Ann Arbor, MI 48109-1220, USA, Phone: +1 734 764 2320, Email: jrhines@umich.edu

[2] Ifo Institute, Ifo Center for Public Finance and Political Economy, Poschingerstr. 5, D-81679 Munich, Germany, Phone: + 49 89 9224 1319, Fax: + 49 89 907795 1319, Email: potrafke@ifo.de

1. Introduction

Successful family firms are commonly transferred from one generation to the next. Succession occurs naturally at an owner's death, but may also be planned in advance with inter vivos (during life) transfers. Business conditions, family considerations, and estate, gift, and inheritance taxes all have the potential to influence the timing and extent of inter vivos transfers. And these transfers, in changing ownership, may affect the operations and productivity of family firms.

This paper considers the determinants of inter vivos transfers of assets in German family firms. The analysis is based on unique survey data covering the years 2000-2013. The evidence indicates that inter vivos ownership transfers are most common in larger firms and those with strong business conditions. Furthermore, inter vivos transfers rose following a German tax reform in 2009 that reduced transfer taxes.

The difficulty of obtaining data has limited the number of empirical studies of inter vivos transfers of family firms. Scholars describe that macroeconomic conditions - especially financial factors such as the inability to find financial resources to liquidate the possible exit of heirs, the market environment or increased competition - may influence succession planning in family firms (De Massis et al. 2008, Vozikis et al. 2012). While firms are typically the focus of the theory and empirical interest, the units of observation in most data sets are households rather than firms. Empirical studies indicate that people react to tax incentives,[3] and that the amount of inter vivos transfers depends on the incomes of parents and children (Bernheim et al. 2004, Joulfaian 2004, 2005, Hrung 2004, Villanueva 2005, McGarry 1999, Arrondel and Laferrère 2001, Stark and Zhang 2002). People forego substantial tax savings by not making inter vivos transfers that fully exploit annual gift tax exemptions (Poterba 2001, McGarry 2001, 2013, Joulfaian and McGarry 2004). Another strand of related literature considers bequest motives (Kotlikoff 1988, Modigliani 1988, Gale and Scholz 1994, Laitner and Ohlsson 2001, Arrondel and Masson 2006, Kopczuk 2007, Ameriks et al. 2011). Wealth transfers from

[3] On inheritance and inter vivos transfer taxation and legislation see e.g. Gale et al. (2001), Ellul et al. (2010), Hines (2010, 2013), Kopczuk (2013), Wrede (2014).

one generation to the next may be accidental or intentional, with inter vivos transfers relatively clear cases of intentional choices.

The owner of a firm has better information on the business situation of his or her firm than do outsiders such as external investors, banks or tax authorities. Information asymmetries can influence a firm's financing and investment decisions (Leland and Pyle 1977, Myers and Majluf 1984, Miller and Rock 1985). In a similar vein, decisions on ownership structure may depend on the firm's business situation as perceived by the firm owner. A firm's self-assessed current business situation is likely to offer information on firm value that is not contained in balance sheet variables. Balance sheets are backward looking, whereas the self-assessment of a firm's business situation by its owner reflects soft information and expectations about future developments that influence decisions of the owner. It is a worthwhile endeavour to investigate how a firm's self-assessed business situation relates to transfers of firm ownership to the next generation.

The paper's analysis of inter vivos transfers of assets in family firms is based on a new dataset that includes evidence from a survey conducted among German family firms on inheritances, inter vivos transfers and taxation. The dataset uses Germany's most important business cycle and firm survey data that serve as the foundation of the Ifo Business Climate Index, Germany's leading business cycle indicator. The new survey data include information on the years when firms made inter vivos ownership transfers. These data are matched with Ifo business survey data, which include information on how firm owners assess the current economic situation, business expectations, whether firm activity is constrained, and many other firm-specific characteristics. The data incorporate balance sheet information from external sources (Amadeus Bureau van Dijk and Hoppenstedt Firmeninformationen GmbH), and cover the years 2000 to 2013. Business survey and balance sheet data are pre-processed and provided by the Economics and Business Data Center (EBDC), Munich.

The results indicate that when a firm's self-described business situation improves from "normal" to "good," then the chance of an inter vivos transfer rises by 46 percent. The reason for this timing may be that owners of firms with strong business situations anticipate higher tax valuations in the future, and therefore accelerate ownership transfers as part of prudent tax planning.

2. Inter Vivos Transfers and Family Firms

Despite the importance of estate planning and the availability of simple methods of tax avoidance, the evidence suggests that wealthy people make surprisingly few inter vivos transfers, thereby foregoing substantial potential tax savings (McGarry 2001, 2013). Empirical studies describe many factors that influence inter vivos transfers. Inheritance and gift taxes affect the timing of transfers, typically encouraging inter vivos transfers compared to bequests (Bernheim et al. 2004, Joulfaian 2004). Capital gain taxes can be offsetting considerations, since the favorable tax treatment of appreciated assets held until death can create some situations in which taxpayers benefit from avoiding inter vivos transfers (Poterba 2001, Joulfaian 2005). The composition of household wealth also influences the chance of making inter vivos transfers. When wealth is held in illiquid forms, such as private business, households are less likely to make inter vivos transfers than when wealth was held in more liquid forms (Poterba 2001). The amount of inter vivos transfers also increases with the lifetime income of parents (Poterba 2001, Hrung 2004): an additional dollar of parental lifetime income appears to increase inter vivos transfers by 0.7 cents in Germany and by 1.2 cents in the United States (Villanueva 2005). Another issue is the allocation of inter vivos gifts among heirs. Empirical studies indicate that parents make greater inter vivos transfers to children with lower incomes than to other children (McGarry 1999). The appeal of this type of redistribution is very intuitive, though as a theoretical matter there are models with the opposite prediction, that parents would make greater inter vivos transfers to children with higher incomes than to children with lower incomes (Stark and Zhang 2002).

Family firms may be special cases due to tacit knowledge on the part of the founder or successor (Cabrera-Suárez et al. 2001). Studies often find that family firms outperform other firms (Anderson and Reeb 2003). Following ownership succession, firms whose

incoming CEOs are related to the departed CEO or firm founder tend to underperform relative to firms with new CEOs who are not related to firm insiders (Pérez-González 2006, Bennedsen et al. 2007, Grossman and Strulik 2010, Molly et al. 2010).

Owners of family firms may make provisions for succession during their lifetimes. In some situations there are incentives to purchase life insurance that will provide liquidity when estate taxes are due (Holtz-Eakin et al. 2001).[4] Several studies examine the succession planning of family businesses (e.g. Sharma et al. 1997, 2003). Sharma et al. (2003) finds that even in cases where owners of family firms wanted to preserve their firms, the need to find successors did not induce succession planning. Succession planning appears to start only when trusted successors are available. Vozikis et al. (2012) predict that financial factors such as limited internal financial resources (high opportunity costs of obtaining external financing, inability to sustain transfer tax burdens, low capital stocks, and high earnings variability) impede succession planning. De Massis et al. (2008) describe potential obstacles to a smooth succession. These obstacles include private family conflicts (e.g. low ability or motivation of potential successors, family rivalries, and absence of mutual trust), financial issues (e.g. tax burdens or financial resources that are inadequate to liquidate possible exit of heirs) or changes in the economic environment of the firm (decline in business performance, loss of key customers, decreasing business scale). The willingness of offspring to join family firms correlates positively with business size (Stavrou 1999).

There are substantial transaction costs associated with transferring ownership of a family firm (Bjuggren and Sund 2005). Rates of ownership transfers are likely to be sensitive to changes in estate, gift and inheritance taxes, such as the 2004 abolition of transfer taxes in Sweden. Bjuggren and Sund (2001) describe the role of the legal system in facilitating smooth transition of family firms from one generation to the next.

[4] Liquidity problems driven by estate tax liabilities may force heirs of family firms to sell business assets (Astrachan and Tutterow 1996, Brunetti 2006, Houben and Maiterth 2011).

3. German Inheritance and Gift Taxes

Germany does not tax estates, but it does tax receipt of inheritances and inter vivos gifts. Tax rates rise with the amount of gift or inheritance received, and rates are conditioned on the closeness of any family connection between those who give and those who receive. The lowest tax rates and highest exempt amounts apply to gifts to spouses, followed by children, grandchildren, other close relatives, and all others. The German government grants special tax relief for transfers of family business assets, the favourable tax treatment intended to preserve jobs in family businesses. For this purpose, business assets include agricultural and forestry assets and privately held shares in corporations when the owner holds more than 25% of the shares. Inter vivos transfers are subject to the same tax rules as inheritances.

Until 2008, business assets were assessed at tax values that were typically considerably lower than market values, the outcome of tax practices rather than explicit exemptions for family firms (Houben and Maiterth, 2011). In addition, there was a statutory tax exemption of €225,000 for transfers of business assets in family firms, and the remaining taxable amount was reduced by 35%.

Since 2009, business assets have been assessed at estimated market values. Firms with fewer than 20 employees can be transferred tax free. Owners of larger firms can choose between two types of tax relief, of which the first reduces the taxable amount of business assets by 85%. To be eligible for this relief, no more than 50 percent of business assets may consist of non-operating assets such as leased real estate, securities or cultural property; firm owners must commit to keeping the firm in business for at least five years; and the sum of wages and salaries over the following five years must be at least 400 percent of an historical average. An additional tax allowance of €150,000 may apply to the remaining 15 percent of business assets if this value is small. The second option is even more generous, exempting 100 percent of business assets, but can be chosen only if non-operating assets constitute no more than 10 percent of total business assets; the firm stays in business for at least seven years; and the sum of wages and sala-

ries over the following seven years are at least 700 percent of an historical average. Firms benefitting from transfer tax relief must wait ten years before again being eligible.

Transfers of any business assets that remain after tax relief and exemptions, together with other assets such as real estate and financial assets, are subject to gift and inheritance taxation. Personal tax exemptions apply, e.g. €400,000 for a transfer from parent to child (€205,000 until 2008). Tax exemptions can be used every ten years, making inter vivos transfers an effective instrument for reducing taxes. Tax rates are progressive and vary between 7% and 50%, depending on the degree of kinship between decedent/donor and heir/donee, and the type of property transferred. Transfers to close relatives such as children are subject to lower rates of tax than transfers to more distant relatives such as cousins, which in turn are subject to lower rates of tax than transfers to unrelated individuals; furthermore, transfers of business assets are taxed at the low rates applicable to transfers to children, regardless of the beneficiary.

For example, consider a firm worth €15 million with over 20 employees that a firm owner transfers inter vivos to his son in 2010. Using the 85% tax relief option, business assets of €2.25 million are subject to taxation at the time of the transfer. Deducting the personal tax exemption of €400,000, the taxable transfer is €1.85 million. At a tax rate of 19%, the gift tax due is €351,500.

4. Analytical Framework

4.1 Timing of Ownership Transfers

Let q_t denote a family firm's true value at time *t*, and s_t denote the signal of firm value observed by the tax authority and other outsiders. The decision maker's (flow) after-tax return at time *t* of maintaining ownership by the original owner is given by $v(q_t)$, whereas the after-tax return is $w(q_t)$ if successors own the firm. These returns can differ if ownership affects firm performance or if the same return is taxed at different rates if received by different potential owners. In the absence of transfer tax considerations

families would choose to transfer ownership in period *t* only if $w(q_t) > v(q_t)$. Transfer taxes complicate this decision.

A family chooses inter vivos transfers to maximize the present value ψ, given by:

$$\psi = \int_0^{t^*} e^{-rt} v(q_t) dt + \int_{t^*}^{\infty} e^{-rt} w(q_t) dt - e^{-rt^*} \tau(s_{t^*}, t^*), \tag{1}$$

in which *r* is the decision maker's discount rate, *t** is the date of ownership transfer, and $\tau(s_t, t)$ is the transfer tax imposed in period *t* on a transfer of a family firm with observable value s_t. Time is an argument of the transfer tax function because tax laws vary over time, so the tax obligation associated with a transfer of a firm with a given observable value is time-dependent.

Differentiating ψ with respect to *t** produces:

$$e^{rt^*} \frac{d\psi}{dt^*} = v(q_{t^*}) - w(q_{t^*}) + r\tau(s_{t^*}, t^*) - \frac{\partial \tau(s_{t^*}, t^*)}{\partial s_{t^*}} \frac{ds_{t^*}}{dt} - \frac{\partial \tau(s_{t^*}, t^*)}{\partial t}. \tag{2}$$

The right side of equation (2) is the (undiscounted) value of slightly delaying ownership transfer at time *t**, so an optimizing decision maker solving for an interior solution with continuous variables transfers the firm at time *t** only if this expression equals zero. The first two terms on the right side of equation (2) are familiar from the transfer decision in the absence of taxation, and have the intuitive property that delaying transfer is more attractive the greater is the difference between $v(q_{t^*})$ and $w(q_{t^*})$. Indeed, if $v(q_{t^*})$ exceeds $w(q_{t^*})$ to a sufficient degree at all times *t*, then the decision maker never transfers ownership of the firm until it becomes absolutely necessary (such as at the death of the original owner). Such situations arise if the original owner is a much more productive owner/manager of the firm than is the potential successor, at least as evaluated by the relevant decision maker (who is commonly the original owner).

The third through fifth terms on the right side of equation (2) capture the tax effects of delaying ownership transfer. The third term is the product of the discount rate and the tax cost of transfer, and reflects simply that delaying the incursion of a given tax liabil-

ity reduces its present value. The fourth term on the right side of equation (2) is the product of the marginal tax rate and the change in the taxable value of a family firm. A rising taxable value reduces the attractiveness of delaying a transfer, since with a positive marginal tax rate it is clearly better to transfer ownership of a firm when it is valued at €50 million than when it is valued at €100 million. Conversely, if a firm is declining in value then there is a tax benefit associated with delaying transfer. Notably, if the taxable value of a firm rises at the discount rate, then the third and fourth terms on the right side of equation (2) sum to zero. Consequently, other considerations equal, taxable firm values that rise faster than the discount rate are associated with accelerated transfers, whereas taxable values that rise more slowly than the discount rate are associated with delayed transfers.

The fifth term on the right side of equation (2) is the change over time in the tax due on the transfer of a firm of given taxable value. If tax rates are rising, then this term reflects that it is costly to delay ownership transfers; and conversely, if tax rates falling, then it is beneficial to delay transfers.

Optimal ownership transfers incorporate all of these considerations. A local maximum at time t^* is characterized by a positive value of $\frac{d\psi}{dt}$ just prior to t^*, a zero value at t^*, and a negative value immediately following t^*. These properties reflect changing relative productivities of original owners and successors together with changing degrees to which tax liabilities evolve over time. One of the tax considerations may be that the decision maker anticipates that the taxable value of the firm will rise more or less slowly than the discount rate.

4.2 Taxable and Market Values of Family Business Property

Taxable values need not coincide exactly with actual values as understood by firm owners. The tax authority obtains signals of firm value that are largely accurate but may not incorporate recent information that has not yet been revealed in profitability or other objective measures. In order to capture the tax authority's information acquisition pro-

cess it is useful to consider a model in which the true value of a family firm at time $\hat{t}$ is given by:

$$q_{\hat{t}} = z_{\hat{t}}\theta_{\hat{t}} + \int_0^{\hat{t}} u_t dt \,, \tag{3}$$

in which $z_{\hat{t}}$ is a vector of observable variables at time $\hat{t}$, $\theta_{\hat{t}}$ is a date-specific coefficient vector, and u_t is a random variable with mean zero that is independently drawn at time *t*. $z_{\hat{t}}$ and $\theta_{\hat{t}}$ are assumed to be common knowledge. In the formulation of equation (3), true firm value is a function of observable considerations captured in *z* and also a function of unobserved factors that evolve in a random walk fashion.

The signal of firm value available to the tax authority at time $\hat{t}$ is $s_{\hat{t}}$, given by:

$$s_{\hat{t}} = z_{\hat{t}}\theta_{\hat{t}} + \int_0^{\hat{t}-\gamma} u_t dt + \int_{\hat{t}-\gamma}^{\hat{t}} u_t \left(\frac{\hat{t}-t}{\gamma} \right) dt \,. \tag{4}$$

In this formulation $s_{\hat{t}}$ differs from the true value $q_{\hat{t}}$ in that the calculation of $s_{\hat{t}}$ attaches linearly declining weight to more recent draws of u_t, starting a period of time γ prior to the present. This corresponds to the tax authority not having the same information as taxpayers about recent developments that affect firm value, with the least weight attaching to the most recent developments.

In the model expressed by equation (4), and for unchanging values of z and θ, the tax authority's signal of firm value evolves according to:

$$\frac{ds_t}{dt} = \frac{1}{\gamma} \int_{\hat{t}-\gamma}^{\hat{t}} u_t dt \,. \tag{5}$$

Equation (5) implies that if recent draws of u_t are positive, then s_t increases over time, reflecting that the tax authority only gradually incorporates the most recent information in its valuation of the firm. This most recent information, the cumulative draws of u_t between time $\hat{t}-\gamma$ and time $\hat{t}$, might also be described as the current business conditions of the firm. When current business conditions are favorable then the tax authority will gradually revise upward its valuation of the firm, whereas when current business condi-

tions are unfavorable the tax authority will gradually revise downward its valuation of the firm.

It is useful to consider the application of the model of firm valuation in equations (3)-(5) to optimal ownership transfer characterized in equation (2). If tax laws are unchanging then $\frac{\partial \tau(s_{t^*}, t)}{\partial t} = 0$ and the fifth term on the right side of (2) disappears. It follows from (5) that if current business conditions are favorable, $\frac{ds_t}{dt} > 0$, which, given that $\frac{\partial \tau(s_{t^*}, t)}{\partial s_{t^*}} > 0$, should encourage earlier transfers of ownership. It is worth bearing in mind that $\frac{d\psi}{dt} = 0$ characterizes local optima, of which there may be more than one, and that discrete changes in tax laws or business conditions may produce situations in which there are discrete jumps in the value of ownership transfers.

5. Data and Descriptive Statistics

5.1 Data

We conducted a survey on inheritances, inter vivos transfers, and transfer taxation (the Inheritance and Gift Tax Survey – IGTS) among owners of family firms in February and March 2014. We first asked participants in the monthly Ifo business survey whether they considered themselves to be family firms.[5] The Ifo business survey is conducted every month among 7,000 German firms, and provides the basis for the Ifo Business Climate Index, Germany's leading business cycle indicator. 4,660 firms identified themselves as family firms. We then sent out the IGTS to the family firms. The response rate was quite high at about 36%.[6] Among other things, respondents gave information on the year in which they made inter vivos transfers (the exact amount of trans-

[5] A firm is defined as a family firm if most voting capital is held by one or several interconnected families.

[6] See Seiler (2010) on nonresponse in business surveys.

fers is unknown) and the year in which they paid the gift tax.[7] Understanding the determinants of this measure of inter vivos transfer is the focus of this study.

The IGTS data on transfers of business ownership are matched to Ifo business survey data. The Ifo business survey includes information on the current state of business,[8] the expected development of employment, and credit conditions. Survey measures based on the self-assessment of managers may contain more information than that embedded in financial statement data. Survey responses related to the current state of business, for example, may reflect not only current turnover and profit figures (Abberger et al. 2009), but also new information, especially when requested in the second half of the year when balance sheet information is old (Hönig 2012). Similarly, self-reported firm credit conditions capture financial restrictions more comprehensively than do standard measures such as leverage, credit ratings, and liquidity. Since our sample consists of firms that are not quoted on the stock exchange, financial restrictions can be quite important (Hönig 2012). The business survey data also includes firm characteristics such as numbers of employees, broad industry (construction, retail, manufacturing or services), the founding year and the legal form of each firm. In addition to the survey-based data, we use balance sheet data such as total assets and total equity, based on the Amadeus Bureau van Dijk and Hoppenstedt Firmeninformationen GmbH data bases.[9] Business survey and balance sheet data are pre-processed and provided by the Economics & Business Data Center (EBDC) at the University of Munich and the Ifo Institute, Munich.[10]

The study uses annual data. In cases where monthly data are available, for instance from the business survey, these data are converted to yearly frequency by computing yearly averages. Balance sheet data are not available for all firms, and not for the year 2013.

[7] The survey questions are "Have there been inter vivos transfers of assets in your firm since the year 2000? Yes, in the year…/ no," and "Have you paid the gift tax since the year 2000? Yes, in the year …/no."

[8] The survey statement is "We evaluate our present state of business as good/satisfactory/bad." Complete questionnaires are available at doi: 10.7805/ebdc-bep-2012.

[9] See Hoenig (2009, 2010) on how survey and balance sheet data are linked.

[10] See Seiler (2012) for more information on the data the EBDC provides.

The sample size therefore decreases considerably when including balance sheet control variables in some regressions.

5.2 Descriptive Statistics

Table 1 shows descriptive statistics for the subsamples of firms that did not, and those that did, make inter vivos transfers. The total sample includes 13,706 observations of 1,654 firms. 316 firms reported one or more inter vivos transfers (358 inter vivos transfers in total) since 2000. The share of firms making inter vivos transfers is thus quite small.[11] Since business assets are an illiquid form of wealth, the small share of observed inter vivos transfers in our sample is reasonable (Poterba 2001). Two of the variables in Table 1 are reported in categorical form. The first is firm employment, which is measured as an integer from 0-5, with 0 corresponding to 0-19 employees, 1 corresponding to 20-49 employees, 2 corresponding to 50-249 employees, 3 correspdonging to 250-999 employees, 4 corresponding to 1000-4999 employees, and 5 corresponding to 5000 or more empoyees. The second is the legal form of firm organization, measured as an integer from 1-3, with 1 corresponding to proprietorships (firms owned by single individuals), 2 corresponding to partnerships (firms owned by multiple individuals who bear liability for firm debts), and 3 corresponding to corporations (whose owners have limited liability). Table 2 shows pairwise correlations of the variables.

Figures 1, 2, and 3 describe the distribution of inter vivos transfers, depending on industry, legal form, and the number of employees. The sample includes firms in the construction (45 inter vivos transfers), retail (88 transfers), manufacturing (184 transfers) and services industries (41 transfers). The rhombi in Figure 1 show that relative to the whole sample, inter vivos transfers are more likely to occur in the manufacturing, construction, and retail industries than in services. Figure 2 shows that inter vivos transfers mostly occurred in firms operating as partnerships (46 transfers) or corporations (44 transfers), but rarely in proprietorships (one transfer).[12] Figure 3 shows that most inter

[11] Presumably, even fewer transfers would have been reported if the survey question had asked about received transfers instead of given transfers (Gale and Scholz 1994).

[12] Data on the legal form and the number of employees is not available for the entire sample. The sum of inter vivos transfers is therefore not identical across Figures 1 to 3.

vivos transfers in the sample (126 transfers) are made by firms with between 50 and 249 employees. The rhombi indicate that the likelihood of making inter vivos transfers increases with numbers of employees. While inter vivos transfers occur in only 1.46% of firm-year observations of firms with fewer than 19 employees, they do so in 8% of the cases of firms with more than 5000 employees.

Figure 4 shows the average current state of business of firm-year observations with and without inter vivos transfers. The red, dashed line describes for each year the average current state of business for the sample of firms that made inter vivos transfers in the given year (left scale). The grey, solid line describes the average current state of business for the sample of firms that did not make inter vivos transfers in the given year (left scale). The bars in the background show the number of inter vivos transfers made in a given year (right scale). The number of inter vivos transfers is higher toward the end of the observation period than at the beginning. Figure 4 shows that firms making inter vivos transfers in most years had better current business states than firms that not making inter vivos transfers (i.e. the red line is above the grey line). The years 2000-2001, 2003, and 2005-2006 are exceptions, though the relatively small numbers of inter vivos transfers in these years makes inference potentially more sensitive to outliers. The figure also shows that the current state of business and numbers of inter vivos transfers are positively correlated. For example, when the financial and economic crisis hit in 2009 and the business situation deteriorated, firms made fewer inter vivos transfers than in preceding or subsequent years.

Most reported transfers took place since 2010. It is impossible to rule out recall bias, in which survey respondents are less apt to remember inter vivos transfers made years earlier – though these ownership transfers are so important to owners of family firms that it is difficult to imagine that they could possibly forget even the details of transfers during the preceding 15 years. In a similar vein, some family firms in the sample might not have been in existence at the start of the observation period. Another source of potential bias is sample selection, because, by construction, the sample includes only firms that

still operated in 2014. Unsuccessful family firms disappeared from the market and cannot be included.

6. Empirical Analysis

6.1. Empirical Strategy

The theory sketched in section 4 implies the following baseline empirical model of the ownership transfer decision:

$$T_{it} = \beta_1 c_{it} + \beta_2 x_{it} + \varepsilon_{it}, \quad (6)$$

in which T_{it} takes the value one if firm *i* reports an inter vivos transfer in year *t*, and is zero otherwise. The variable c_{it} in equation (6) is the yearly average of firm *i*'s perception of the current business situation, measured on a scale between one (bad) and three (good). The variable x_{it} is a vector of firm *i* and year *t* characteristics, and β_1 a scalar and β_2 a vector of coefficients to be estimated. Control variables include the size of each firm as measured by numbers of employees, and a dummy variable for the time period before the 2009 reform of inheritance and gift taxation. It is reasonable to expect inter vivos transfers to occur more frequently among larger firms with better current business conditions, and in years when the tax regime favors inter vivos transfers relative to inheritances. Additional control variables include firm assets, firm equity, firm age, dummy variables for a firm's legal form of organization, a firm's self-reported credit status, and its expected future development of employment. Equation (6) is estimated as a random-effects logit model with classical standard errors.

6.2. Results

Table 3 shows results of estimating equation (6), displayed in odds ratios, for which an odds ratio of 1.0 implies that the associated variable has no effect on the dependent variable, and the p-values reported in Table 3 correspond to tests of the hypotheses that the odds ratios equal unity. The regression reported in the first column includes the current business situation as an explanatory variable; the associated 1.439 odds ratio implies that improving business conditions from "normal" to "good" increases the likelihood of

an inter vivos transfer by 43.9 percent. The odds ratio is statistically significant at the 1% level. The regressions reported in columns (2) to (4) include industry fixed effects, and sequentially add a dummy variable for the period before 2009, and numbers of employees (measured in six categories). The 1.456 odds ratio in column (4) implies that when the current business situation increases by one point (from normal to good), the chance of making an inter vivos transfer increases by 45.6 percent. The 0.499 odds ratio of the dummy variable for the period before 2009 in column (4) is smaller than one and statistically significant at the 1% level, indicating that firms were less likely to make inter vivos transfers before the inheritance and gift tax reform in 2009 than after the reform. The odds ratio of the current business situation remains statistically significant at the 1% level. The odds ratio of the number of employees is larger than one and statistically significant at the 1% level in column (4).

The regressions presented in columns (5) and (6) add control variables for the firm's expected development of employment and credit conditions. The odds ratio of the credit conditions variable is statistically significant at the 1% level, its magnitude implying that when credit conditions are difficult, the chance of making an inter vivos transfer decreases by 36.6%. The regressions in columns (7) to (9) control for other firm specific characteristics: firm age (in years), a firm's legal form of organization, total assets (in logs, column 8), and total equity (in logs, column 9). The odds ratio of firm age (a variable, it might be noted, that has a maximum value of 882 years) is statistically significant at the 5% level only in the regression reported in column (7). The odds ratio of total assets is statistically significant at the 1% level, and similarly, the odds ratio of total equity is statistically significant at the 5% level; together they indicate that inter vivos transfers are more common among larger and more valuable firms.[13] Inclusion of these firm size and value variables somewhat diminishes the statistical signficiance of the the effect of the current business situation, reflecting the collinearity of these variables as well as smaller sample sizes. As noted in section 4.2, good current business situations affect expected future firm value but may not be yet captured in current taxable value.

[13] These specifications, and indeed the available data, do not distinguish between wealth effects (Poterba 2001, Hrung 2004, Villanueva 2005) and ownership effects (more valuable firms have more owners and therefore more potential donors).

Because firm characteristics are not available for the full sample, the number of observations drops considerably between the regressions reported in columns (1)-(6) of Table 3 and those including firm age and size reported in columns (7)-(9). The regression reported in column (10) includes a linear and quadratic time trend to control for whether firms made inter vivos transfers more frequently in recent years. The estimated odds ratio of the squared trend is statistically significant at the 5% level, suggesting that transfers have been more frequent recently; inclusion of time trend variables does not change the estimated positive effects of firm size and the current state of business.

The regression results indicate that better current business situations are associated with greater likelihoods of inter vivos transfers. The association persists when controlling for the 2009 tax reform, industry, firm size, and firm value. This pattern is consistent with firm owners having inside knowledge about a firm's current business situation that is not yet fully captured in taxable value for transfer tax purposes. As a result, when the current business situation is good, a firm's valuation for transfer tax purposes is likely to increase in the future, creating an incentive to accelerate asset transfers. In addition, when a firm's business situation is good, the firm owner perceives the firm to be more successful in the future than when the business situation is bad, and possibly less needy of the value provided by maintining original ownership. Anticipating the need at some point to pass on a successful firm to the next generation is likely to influence tax planning and encourage immediate transfers of business assets.

6.3. Robustness Tests

Table 4 presents the results of additional reregression specifications intended to explore the robustness of the results appearing in Table 3.

Unobserved firm-specific characteristics (such as the presence of a qualified successor or the age of the owner) may be correlated with the regressors. It is possible to control for unobserved firm-specific characteristics by estimating fixed effects models that exploit only the within variation of the explanatory variables. Fixed effects estimation of nonlinear panel data is possible for the logit model, but not for the probit model. Col-

umn (1) of Table 4 reports the results of a fixed-effects logit model, which are consistent with inferences based on the results reported in Table 3. Among firms making at least one inter vivos transfer during the observation period, inter vivos transfers are 46.1 percent more likely to occur when the current state of business is good than when the current state of business is normal.

Columns (2) and (3) of Table 4 present the results of estimating random-effects probit and OLS models, instead of the baseline random-effects logit model. The results remain qualitatively unchanged. Columns (4) and (5) display the results of logit estimation of the determinants of inter vivos transfers before and after the 2009 reform; in both time periods the likelihood of asset transfer is positively associated with the current state of business. The regression reported in column (6) restricts the sample to firms making at most one inter vivos transfer over the observation period, with results that closely resemble those for the whole sample reported in column (4) of Table 3. The regression reported in column (7) of Table 4 uses data only for firms not older than 250 years, thereby dropping seven of the observations used in the regression reported in column (7) of Table 3. The results are almost identical, with the current state of business continuing to be associated with asset transfers, but the odds ratio of firm age now statistically insignificant.

The regression reported in column (8) addresses the potential endogeneity of the current state of business variable by using its first lag rather than the contemporaneous value. The estimated odds ratio diminishes in magnitude but remains statistically significant. The regression reported in column (9) drops this lagged variable and instead uses the first lead, as a result of which the estimated odds ratio becomes statistically insignificant. Several other specification checks produced results consistent with those reported in Tables 3 and 4.[14]

[14] Replacing the current state of business variable with 0-1 dummies for either good or bad business conditions (two separate specifications) produces results very similar to those reported in Table 3, as does estimation of standard errors in the Table 3 baseline regressions using bootstrap and jackknife procedures.

Because the study relies on survey data, response behavior may raise sample selection issues. Firms making inter vivos transfers could be overrepresented in our sample since the topic of the questionnaire is inheritance, inter vivios gifts, and their taxation. Firms unfamiliar with the inheritance and gift tax law because they did not experience a succession or did not make inter vivos transfers may have been less likely to participate because they did not consider themselves to have anything to contribute to the survey. Table 5 compares family firms responding to the IGTS to firms not responding. T-tests reported in Table 5 indicate that the means of credit conditions and firm age are not statistically different in the two subsamples. Firms responding to the survey had a somewhat worse current state of business and expected development of employment than firms not responding (2.07 and 2.10; 1.98 and 2.00). Firms responding to the survey tend to be somewhat smaller than non-response firms as measured by log total assets and log total equity (14.58 and 14.87; 13.12 and 13.41). A chi-squared test does not reject the null hypothesis that response behavior is independent of federal state within Germany (p-value of 0.51, see Figure 5), but chi-squared tests indicate that response behavior varies with numbers of employees, industry and legal form. Firms responding to the survey tend to have fewer employees than firms choosing not to respond.[15] The results of the chi-squared tests and t-tests notwithstanding, there is little evidence that sample selection is an important issue in interpreting the results, since differences between the subsamples are small and the categorical variables assume multiple values in both of the subsamples. Furthermore, there is little reason to expect that self-classification as a family firm in the Ifo Business Climate Survey to be prone to sample selection, since firms answered this question prior to learning the topic of the IGTS.

7. Conclusion

Policymakers are understandably concerned about the potential effect of transfer taxes on the liquidity of family firms and the resulting viability of ongoing business operations. One way to address liquidity issues is to encourage inter vivos giving, so that

[15] Firm size is correlated with industry and legal form: firms in the retail and the services industries have, on average, fewer employees than firms in the construction and manufacturing industries, and firms operating as proprietorships have, on average, fewer employees than firms operating as corporations or partnerships.

firms choose when to transfer ownership rather than relying on mortality. The results in this paper indicate that ownership succession is more likely when market conditions are good, which is consistent with tax avoidance and with a desire to transfer ownership of better-performing assets. It may also be the case that when the business situation is good, firm owners have the time and resources to tackle the (not urgent) problem of succession planning.

These patterns suggest that, for a given firm value, intergenerational transfer taxation imposes greater burdens on underperforming firms than on firms that perform well. Well performing firms are more likely to make inter vivos transfers of business assets, which are generally tax favored and can be timed to maximize tax advantage. If an underperforming firm does not manage to prepare for succession in advance, the inheritance tax burden at the moment of the owner's death will be larger than the tax burden of an otherwise-similar well performing firm, the assets of which were transferred during lifetime. The desirability of distinguishing tax burdens in this way may depend on the impact of transfer taxes on the activities of well performing and poorly performing firms, about which currently very little is known.

References

Abberger, K., Birnbrich, M., and C. Seiler (2009). Der "Test des Tests" im Handel - eine Metaumfrage zum ifo Konjunkturtest. *ifo Schnelldienst* 62 (21), 34-41

Ameriks, J., Caplin, A., Laufer, S., Van Nieuwerburgh, S. (2011). The Joy of Giving or Assisted Living? Using Strategic Surveys to Separate Public Care Aversion from Bequest Motives. *Journal of Finance* 66(2): 519-561.

Anderson, R.C., Reeb, D.M. (2003). Founding-Family Ownership and Firm Performance: Evidence from the S&P 500. *Journal of Finance* 58(3): 1301-1328.

Arrondel, L., Laferrère, A. (2001). Taxation and Wealth Transmission in France. *Journal of Public Economics* 79(1): 3-33.

Arrondel, L., Masson, A. (2006). Altruism, Exchange or Indirect Reciprocity: What Do the Data on Family Transfers Show? In: Kolm, S. and Ythier, M. (ed.): *Handbook of the Economics of Giving, Altruism and Reciprocity*. Elsevier.

Astrachan, J.H., Tutterow, R. (1996). The Effect of Estate Taxes on Family Business: Survey Results. *Family Business Review* 9(3): 303-314.

Bennedsen, M., Meisner Nielsen, K., Perez-Gonzalez, F., Wolfenzon, D. (2007). Inside the Family Firm: The Role of Families in Succession Decisions and Performance. *Quarterly Journal of Economics* 122(2): 647-691.

Bernheim, B.D., Lemke, R.J., Scholz, J.K. (2004). Do Estate and Gift Taxes Affect the Timing of Private Transfers? *Journal of Public Economics* 88(12): 2671-2634.

Bjuggren, P., & Sund, L. (2001). Strategic Decision Making in Intergenerational Successions of Small and Medium-Size Family-Owned Businesses. *Family Business Review*, 14, 11-23.

Bjuggren, P., & Sund, L. (2005). Organization of Transfers of Small and Medium-Sized Enterprises within the Family: Tax Law Considerations. *Family Business Review*, 18, 305-319.

Brunetti, M.J. (2006). The Estate Tax and the Demise of the Family Business. *Journal of Public Economics* 90(10-11): 1975-1993.

Cabrera-Suárez, K., De Saà-Pérez, P., García-Almeida, D. (2001). The Succession Process from a Resource- and Knowledge-Based View of the Family Firm. *Family Business Review* 14(1): 37-48.

De Massis, A., Chua, J. H., & Chrisman, J. J. (2008). Factors Preventing Intra-Family Succession. *Family Business Review*, 21, 183-199.

Ellul, A., Pagano, M., Panunzi, F. (2010). Inheritance Law and Investment in Family Firms. *American Economic Review* 100(5): 2414-2450.

Gale, W.G, Scholz, J.K. (1994). Intergenerational Transfers and the Accumulation of Wealth. *Journal of Economic Perspectives* 8(4): 145-160.

Gale, W.G., Hines, J.R., Jr., Slemrod, J.B. (2001). Rethinking Estate and Gift Taxation. *Brookings Institution Press*, Waschington, D.C.

Grossmann, V., Strulik, H. (2010). Should Continued Family Firms Face Lower Taxes than Other Estates? *Journal of Public Economics* 94(1-2):87-101.

Hines, J.R., Jr. (2010). Taxing Inheritances, Taxing Estates. *Tax Law Review* 63(1): 189-207.

Hines, J.R., Jr. (2013). Income and Substitution Effects of Estate Taxation. *American Economic Review: Papers & Proceedings* 103(3): 484-488.

Holtz-Eakin, D., Phillips, J.W.R., Rosen, H.S. (2001). Estate Taxes, Life Insurance, and Small Business. *Review of Economics and Statistics* 83(1): 52-63.

Hönig, A. (2009). The New EBDC Dataset: An Innovative Combination of Survey and Financial Statement Data. *CESifo Forum* 10(4): 62-63.

Hönig, A. (2010). Linkage of Ifo Survey and Balance-Sheet Data: The EBDC Business Expectations Panel & the EBDC Business Investment Panel. *Schmollers Jahrbuch – Journal of Applied Social Science Studies* 130(4): 635-642.

Hönig, A. (2012). Financing Restrictions Revisited - Is there a Role for Taxation and Internal Funds?. *mimeo*, University of Nuremberg.

Houben, H., Maiterth, R. (2011). Endangering of Businesses by the German Inheritance Tax? An Empirical Analysis. *Business Research* 4(1): 32-46.

Hrung, W.B. (2004). Parental Net Wealth and Personal Consumption. *Journal of Economic Behavior & Organization* 54(4): 551-560.

Joulfaian, D. (2004). Gift Taxes and Lifetime Transfers: Time Series Evidence. *Journal of Public Economics* 88(9-10): 1917-1929.

Joulfaian, D. (2005). Choosing between Gifts and Bequests: How Taxes Affect the Timing of Wealth Transfers. *Journal of Public Economics* 89(11-12): 2069-2091.

Joulfaian, D., McGarry, K. (2004). Estate and Gift Tax Incentives and Inter Vivos Giving. *National Tax Journal* 57(2): 429-444.

Kopczuk, W. (2007). Bequest and Tax Planning: Evidence from Estate Tax Returns. *Quarterly Journal of Economics* 122(4): 1801-1854.

Kopczuk, W. (2013). Incentive Effects of Inheritances and Optimal Estate Taxation. *American Economic Review: Papers & Proceedings* 103(3): 472-477.

Kotlikoff, L.J. (1988). Intergenerational Transfers and Savings. *Journal of Economic Perspectives* 2(2): 41-58.

Laitner, J., Ohlsson, H. (2001). Bequest Motives: A Comparison of Sweden and the United States. *Journal of Public Economics* 79(1): 205-236.

Leland, H.E., Pyle, D.H. (1977). Informational Asymmetries, Financial Structure, and Financial Intermediation. *Journal of Finance* 32(2): 371-387.

McGarry, K. (1999). Inter Vivos Transfers and Intended Bequests. *Journal of Public Economics* 73(3): 321-351.

McGarry, K. (2001). The Cost of Equality: Unequal Bequests and Tax Avoidance. *Journal of Public Economics* 79(1): 179-204.

McGarry, K. (2013). The Estate Tax and Inter Vivos Transfers over Time. *American Economic Review: Papers & Proceedings* 103(3): 478-483.

Miller, M.H., Rock, K. (1985). Dividend Policy under Asymmetric Information. *Journal of Finance* 40(4): 1031-1051.

Modigliani, F. (1988). The Role of Intergenerational Transfers and Life Cycle Saving in the Accumulation of Wealth. *Journal of Economic Perspectives* 2(2): 15-40.

Molly, V., Laveren, E., Deloof, M. (2010). Family Business Succession and Its Impact on Financial Structure and Performance. *Family Business Review* 23(2): 131-147.

Myers, S.C., Majluf, N.S. (1984). Corporate Financing and Investment Decisions when Firms Have Information that Investors Do Not Have. *Journal of Financial Economics* 13(2): 187-221

Pérez-González, F. (2006). Inherited Control and Firm Performance. *American Economic Review* 96(5): 1559-1588.

Poterba, J. (2001). Estate and Gift Taxes and Incentives for Inter Vivos Giving in the US. *Journal of Public Economics* 79(1): 237-264.

Seiler, C. (2010). Dynamic Modelling of Nonresponse in Business Surveys. *Ifo Working Paper* No. 93.

Seiler, C. (2012). The Data Sets of the LMU-ifo Economics & Business Data Center – A Guide for Researchers. *Schmollers Jahrbuch – Journal of Applied Social Science Studies* 132(4): 609-618.

Sharma, P., Chrisman, J. J., & Chua, J. H. (1997). Strategic Management of the Family Business: Past Research and Future Challenges. *Family Business Review*, 10(1).

Sharma, P., Chrisman, J. J., & Chua, J. H. (2003). Succession Planning as Planned Behavior: Some Empirical Results. *Family Business Review*, 16(1).

Stark, O., Zhang, J. (2002). Counter-Compensatory Inter-Vivos Transfers and Parental Altruism: Compatibility of Orthogonality? *Journal of Economic Behavior & Organization* 47(1): 19-25.

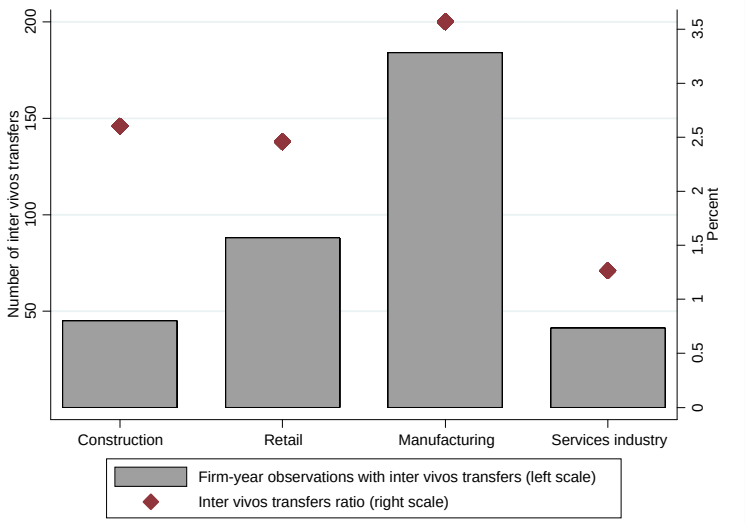
Villanueva, E. (2005). Inter Vivos Transfers and Bequests in Three OECD Countries. *Economic Policy* 20(43): 505-565.

Vozikis, G. S., Liguori, E. W., Gibson, B. & Weaver, K. M. (2012). Reducing the Hindering Forces in Intra-Family Business Succession. *American Journal of Economics and Business Administration*, 4(1), 94-104.

Wrede, M. (2014). Fair Inheritance Taxation in the Presence of Tax Planning. *Journal of Behavioral and Experimental Economics*, forthcoming.

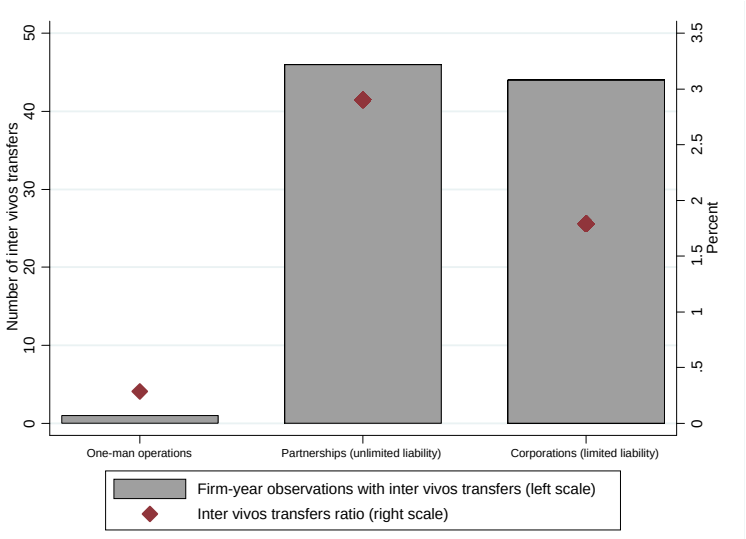
Appendix

Figure 1: Manufacturing firms make more inter vivos transfers (absolute and relative) than service firms



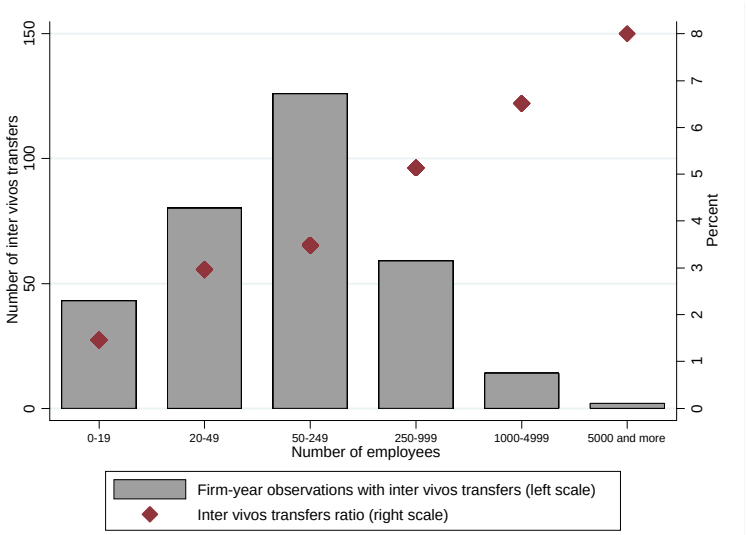
Note: The inter vivos transfers ratio describes the ratio of firm-year observations with inter vivos transfers over all firm-year observations in the sample.

Figure 2: Partnerships and Corporations make more inter vivos transfers (absolute and relative) than one-man operations



Note: The inter vivos transfers ratio describes the ratio of firm-year observations with inter vivos transfers over all firm-year observations in the sample.

Figure 3: Medium-sized firms make more inter vivos transfers than small or large firms, but large firms are more likely to make inter vivos transfers than smaller firms



Note: The inter vivos transfers ratio describes the ratio of firm-year observations with inter vivos transfers over all firm-year observations in the sample.

Figure 4: Firms are more likely to make inter vivos transfers the better the current state of business is

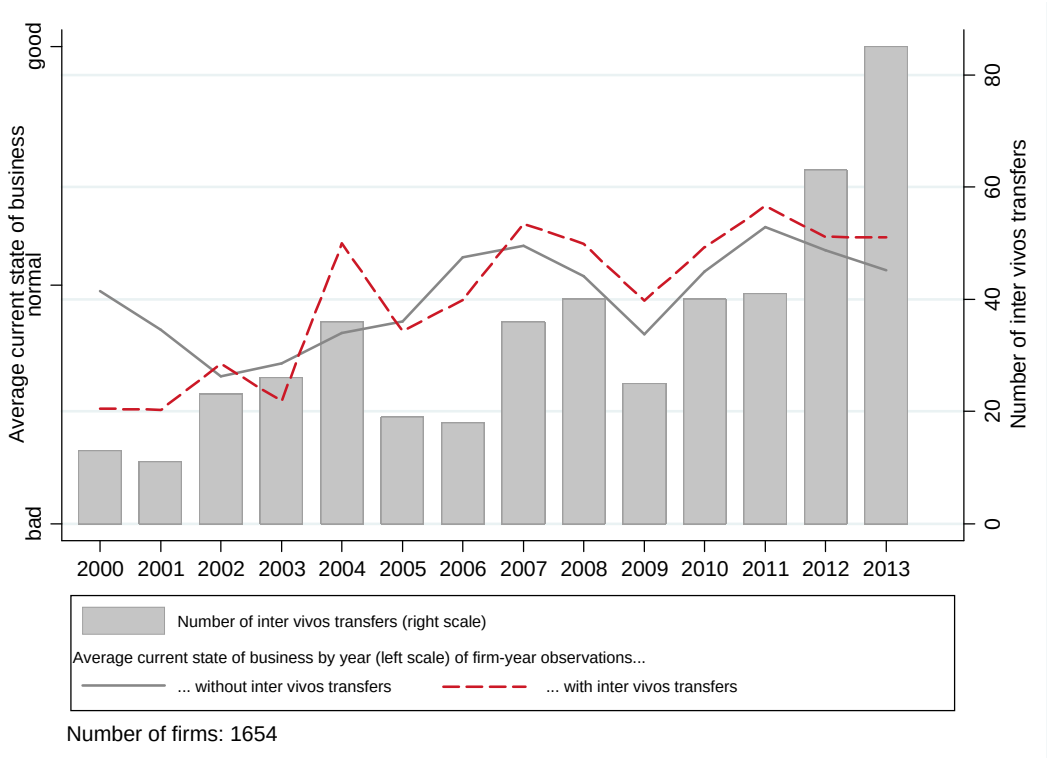
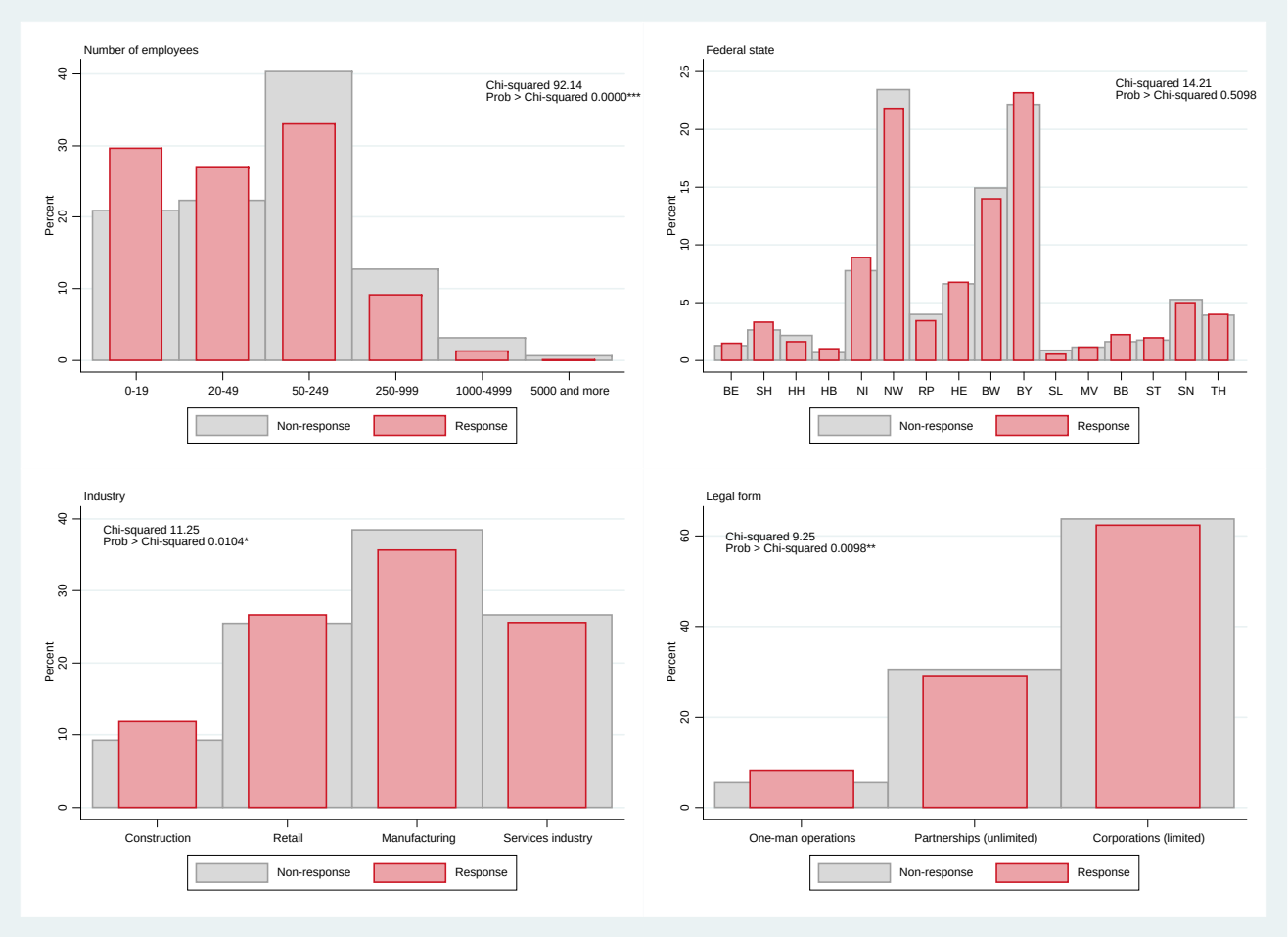


Figure 5: Response behaviour depends on the number of employees, industry, and legal form, but not on the federal state. The differences are numerically small.



Note: The null hypothesis of Pearson's chi-squared test is that response behaviour is independent of the number of employees / federal state / industry / legal form.

Table 1: Descriptive statistics (firm-year observations without and with inter vivos transfers)

	Obs.	Mean	Std. Dev.	Min.	Max.	Source
No inter vivos transfers						
Inter vivos transfers	13348	0.00	0.00	0	0	- see below -
Current state of business	13348	2.01	0.57	1	3	
Industry	13348	2.73	0.96	1	4	
Expected development of employment	13341	1.95	0.34	1	3	
Number of employees (cat.)	10337	1.33	1.07	0	5	
Credit conditions	8259	0.31	0.46	0	1	
Legal form (cat.)	4301	2.48	0.64	1	3	
Firm age	3792	40.01	45.59	0	882	
Total assets (log)	3025	14.86	1.87	7	21	
Total equity (log)	2797	13.57	2.10	6	21	
Inter vivos transfers						
Inter vivos transfers	358	1.00	0.00	1	1	
Current state of business	358	2.13	0.56	1	3	
Industry	358	2.62	0.85	1	4	
Expected development of employment	358	2.00	0.34	1	3	
Number of employees (cat.)	324	1.77	1.07	0	5	
Credit conditions	278	0.17	0.38	0	1	
Legal form (cat.)	91	2.47	0.52	1	3	
Firm age	87	56.74	98.87	0	880	
Total assets (log)	68	15.75	2.12	8	21	
Total equity (log)	67	14.36	2.56	8	21	
Total sample						
Inter vivos transfers	13706	0.03	0.16	0	1	Own collection (Inheritance and Gift Tax Survey)
Current state of business	13706	2.01	0.57	1	3	Ifo business survey
Industry	13706	2.72	0.96	1	4	Ifo business survey
Expected development of employment	13699	1.95	0.34	1	3	Ifo business survey
Number of employees (cat.)	10661	1.35	1.07	0	5	Ifo business survey
Credit conditions	8537	0.30	0.46	0	1	Ifo business survey
Legal form (cat.)	4392	2.48	0.64	1	3	Amadeus/ Hoppenstedt
Firm age	3879	40.38	47.48	0	882	Amadeus/ Hoppenstedt
Total assets (log)	3093	14.88	1.88	7	21	Amadeus/ Hoppenstedt
Total equity (log)	2864	13.58	2.12	6	21	Amadeus/ Hoppenstedt

Table 2: Correlation matrix

	Inter vivos	Current state of business	Industry	Expected development of employment	Number of employees (cat.)	Credit conditions	Legal form (cat.)	Firm age	Total assets (log)
Current state of business	0.033***								
Industry	-0.018*	0.248***							
Expected development of employment	0.024**	0.548***	0.155***						
Number of employees (cat.)	0.071***	0.116***	0.186***	0.022*					
Credit conditions	-0.054***	-0.286***	-0.135***	-0.215***	-0.087***				
Legal form (cat.)	-0.002	0.143***	0.169***	0.113***	0.134***	-0.025			
Firm age	0.052**	-0.117***	-0.097***	-0.077***	0.201***	-0.018	-0.195***		
Total assets (log)	0.069***	0.072***	-0.164***	0.024	0.793***	-0.150***	-0.206***	0.403***	
Total equity (log)	0.057**	0.073***	-0.104***	0.049**	0.705***	-0.172***	-0.079***	0.350***	0.880***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Firms are more likely to make inter vivos transfers the better the current state of business is

	(1) Inter vivos transfers	(2) Inter vivos transfers	(3) Inter vivos transfers	(4) Inter vivos transfers	(5) Inter vivos transfers	(6) Inter vivos transfers	(7) Inter vivos transfers	(8) Inter vivos transfers	(9) Inter vivos transfers	(10) Inter vivos transfers
Current state of business	1.439*** (0.000)	1.516*** (0.000)	1.420*** (0.000)	1.456*** (0.000)	1.374** (0.012)	1.444*** (0.002)	2.212*** (0.001)	1.495* (0.097)	1.538* (0.079)	1.359*** (0.004)
Pre estate and gift tax reform 2009			0.543*** (0.000)	0.499*** (0.000)	0.502*** (0.000)	0.568*** (0.000)	0.630* (0.064)	0.962 (0.885)	0.940 (0.816)	1.385 (0.200)
Number of employees (cat.)				1.453*** (0.000)	1.451*** (0.000)	1.498*** (0.000)	1.148 (0.269)			1.472*** (0.000)
Expected development of employment					1.187 (0.400)					
Credit conditions						0.634*** (0.007)				
Firm age							1.003** (0.018)	1.000 (0.909)	1.001 (0.730)	
Proprietorships							0.165* (0.080)	0.000 (1.000)	0.000 (1.000)	
Corporations (limited liability)							0.694 (0.149)	0.797 (0.406)	0.715 (0.216)	
Total assets (log)								1.284*** (0.003)		
Total equity (log)									1.183** (0.020)	
Linear time trend										0.971 (0.735)
Squared time trend										1.011** (0.027)
Industry Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	13706	13706	13706	10661	10659	8407	2798	2590	2378	10661
Groups	1654	1654	1654	1639	1639	1222	625	748	706	1639
Pseudo R2	0.00437	0.0187	0.0276	0.0351	0.0354	0.0419	0.0492	0.0458	0.0386	0.0434
Chi-squared	14.48	62.09	91.41	101.9	102.6	101.9	31.85	27.47	22.43	125.9
Prob > Chi-squared	0.000141	1.05e-12	3.40e-18	9.89e-20	3.11e-19	1.02e-19	0.0000990	0.00117	0.00762	1.97e-23
Log likelihood	-1650.3	-1626.5	-1611.9	-1399.7	-1399.3	-1163.4	-307.7	-285.9	-279.3	-1387.7

Random-effects logit models with classical standard errors; Odds ratios; *p*-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Alternative specifications

Dependent variable: Inter vivos transfers

	(1) FE Logit	(2) RE Probit	(3) RE OLS	(4) RE Logit: before tax reform	(5) RE Logit: after tax reform	(6) RE Logit: Inter vivos<=1	(7) RE Logit: Firm age<250	(8) RE Logit: Lag state of business	(9) RE Logit: Lead state of business
Current state of business	1.461**	0.161***	0.010***	1.394*	1.522***	1.429***	2.209***		
	(0.010)	(0.000)	(0.000)	(0.090)	(0.001)	(0.003)	(0.001)		
Pre estate and gift tax reform 2009	0.497***	-0.286***	-0.019***			0.519***	0.625*	0.492***	0.582***
	(0.000)	(0.000)	(0.000)			(0.000)	(0.062)	(0.000)	(0.000)
Number of employees (cat.)		0.161***	0.011***	1.138	1.611***	1.373***	1.151	1.475***	1.357***
		(0.000)	(0.000)	(0.233)	(0.000)	(0.000)	(0.278)	(0.000)	(0.000)
Firm age							1.003		
							(0.332)		
Proprietorships							0.166*		
							(0.081)		
Corporations (limited liability)							0.699		
							(0.164)		
Lagged current state of business								1.444***	
								(0.001)	
Lead current state of business									1.166
									(0.220)
Industry Fixed Effects	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3255	10661	10661	4501	6160	10309	2791	9600	9038
Groups	316	1639	1639	769	1639	1607	624	1614	1612
Pseudo R2	0.0264	0.0344		0.00613	0.0405	0.0264	0.0454	0.0381	0.0221
Within R2			0.00334						
Chi-squared	40.66	99.76	82.14	5.555	79.68	62.99	29.03	101.1	49.29
Prob > Chi-squared	1.48e-09	2.81e-19	1.29e-15	0.235	9.80e-16	1.11e-11	0.000313	1.47e-19	6.52e-09
Log likelihood	-748.9	-1400.8		-450.0	-944.2	-1160.0	-305.2	-1277.3	-1089.7

Classical standard errors in columns (1)-(2) and (4)-(9), Huber/White/sandwich standard errors in column (3); Odds ratios (except columns 2 and 3); *p*-values in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Response behaviour depends on the current state of business, expected development of employment, total assets and total equity, but not on credit conditions and firm age. The differences are numerically small.

	Non-response	Response	Test statistic (difference)
Current state of business	2.10	2.07	0.03*
N	3003	1657	(0.042)
Expected development of employment	2.00	1.98	0.02**
N	3003	1657	(0.009)
Credit conditions	0.26	0.27	-0.01
N	2180	1224	(0.347)
Firm age	40.16	38.09	2.07
N	1983	1113	(0.187)
Total assets (log)	14.87	14.58	0.29***
N	1812	1020	(0.000)
Total equity (log)	13.41	13.12	0.29***
N	1733	975	(0.001)

Note: "Response" indicates that the firm participated in the Inheritance and Gift Tax survey; "Non-response" indicates that the firm did not participate in the survey. Test statistics and p-values are drawn from standard t-tests for the difference in means.

Oxford University Centre for Business Taxation
Working Paper series recent papers

WP 15/22 Céline Azémar and Dhammika Dharmapala *Tax sparing agreements, territorial tax reforms, and foreign direct investment*

WP 15/21 Wei Cui *A critical review of proposals for destination-based cash-flow corporate taxation as an international tax reform option*

WP 15/20 Andrew Bird and Stephen A Karolyi *Governance and taxes: evidence from regression discontinuity*

WP 15/19 Reuven Avi-Yonah *Reinventing the wheel: what we can learn from the Tax Reform Act of 1986*

WP 15/18 Annette Alstadsæter, Salvador Barrios, Gaetan Nicodeme, Agnieszka Maria Skonieczna and Antonio Vezzani *Patent boxes design, patents,location and local R&D*

WP 15/17 Laurent Bach *Do better entrepreneurs avoid more taxes?*

WP 15/16 Nadja Dwenger, Frank M Fossen and Martin Simmler *From financial to real economic crisis: evidence from individual firm–bank relationships in Germany*

WP 15/15 Giorgia Maffini and John Vella *Evidence-based policy-making? The Commission's proposal for an FTT*

WP 15/14 Clemens Fuest and Jing Xing *How can a country 'graduate' from procyclical fiscal policy? Evidence from China?*

WP 15/13 Richard Collier and Giorgia Maffini *The UK international tax agenda for business and the impact of the OECD BEPS project*

WP 15/11 Irem Guceri *Tax incentives and R&D: an evaluation of the 2002 UK reform using micro data*

WP 15/10 Rita de la Feria and Parintira Tanawong *Surcharges and penalties in UK tax law*

WP 15/09 Ernesto Crivelli, Ruud de Mooij, Michael Keen *Base erosion, profit-shifting and developing countries*

WP 15/08 Judith Freedman *Managing tax complexity: the institutional framework for tax policy-making and oversight*

WP 15/07 Michael P Devereux, Giorgia Maffini and Jing Xing *Corporate tax incentives and capital structure: empirical evidence from UK tax returns*

WP 15/06 Li Liu and Ben Lockwood *VAT notches*

WP 15/05 Clemens Fuest and Li Liu *Does ownership affect the impact of taxes on firm behaviour? Evidence from China.*

WP 15/04 Michael P Devereux, Clemens Fuest and Ben Lockwood *The taxation of foreign profits: a unified view*

WP 15/03 Jitao Tang and Rosanne Altshuler *The spillover effects of outward foreign direct investment on home countries: evidence from the United States*

WP 15/02 Juan Carlos Suarez Serrato and Owen Zidar *Who benefits from state corporate tax cuts? A local labour markets approach with heterogeneous firms*

WP 15/01 Ronald B Davies, Julien Martin, Mathieu Parenti and Farid Toubal *Knocking on Tax Haven's Door: multinational firms and transfer pricing*

WP 14/27 Peter Birch Sørensen *Taxation and the optimal constraint on corporate debt finance*

WP 14/26 Johannes Becker, Ronald B Davies and Gitte Jakobs *The economics of advance pricing agreements*

WP 14/25 Michael P Devereux and John Vella *Are we heading towards a corporate tax system fit for the 21st century?*

WP 14/24 Martin Simmler *Do multinational firms invest more? On the impact of internal debt financing on capital accumulation*

WP 14/23 Ben Lockwood and Erez Yerushalmi *Should transactions services be taxed at the same rate as consumption?*

WP 14/22 Chris Sanchirico *As American as Apple Inc: International tax and ownership nationality*

WP 14/19 Jörg Paetzold and Hannes Winner *Taking the High Road? Compliance with commuter tax allowances and the role of evasion spillovers*

WP 14/18 David Gamage *How should governments promote distributive justice?: A framework for analyzing the optimal choice of tax instruments*

WP 14/16 Scott D Dyreng, Jeffrey L Hoopes and Jaron H Wilde *Public pressure and corporate tax behaviour*

WP 14/15 Eric Zwick and James Mahon *Do financial frictions amplify fiscal policy? Evidence from business investment stimulus*

WP 14/14 David Weisbach *The use of neutralities in international tax policy*

WP 14/13 Rita de la Feria *Blueprint for reform of VAT rates in Europe*

WP 14/12 Miguel Almunia and David Lopez Rodriguez *Heterogeneous responses to effective tax enforcement: evidence from Spanish firms*

WP 14/11 Charles E McLure, Jack Mintz and George R Zodrow *US Supreme Court unanimously chooses substance over form in foreign tax credit*

WP 14/10 David Neumark and Helen Simpson *Place-based policies*

WP 14/09 Johannes Becker and Ronald B Davies *A negotiation-based model of tax-induced transfer pricing*

WP 14/08 Marko Koethenbuerger and Michael Stimmelmayr *Taxing multinationals in the presence of internal capital markets*

WP 14/07 Michael Devereux and Rita de la Feria *Designing and implementing a destination-based corporate tax*

WP 14/05 John W Diamond and George R Zodrow *The dynamic economic effects of a US corporate income tax rate reduction*

WP 14/04 Claudia Keser, Gerrit Kimpel and Andreas Oesterricher *The CCCTB option – an experimental study*

WP 14/03 Arjan Lejour *The foreign investment effects of tax treaties*

WP 14/02 Ralph-C. Bayer Harald Oberhofer and Hannes Winner *The occurrence of tax amnesties: theory and evidence*

WP14/01 Nils Herger, Steve McCorriston and Christos Kotsogiannisz *Multiple taxes and alternative forms of FDI: evidence from cross-border acquisitions*

WP13/25 Michael Devereux, Niels Johannesen and John Vella *Can taxes tame the banks? Evidence from European bank levies*

WP13/24 Matt Krzepkowski *Debt and tax losses: the effect of tax asymmetries on the cost of capital and capital structure*

WP13/23 Jennifer Blouin, Harry Huizinga, Luc Laeven, Gaëtan Nicodème *Thin capitalization rules and multinational firm capital structure*

WP13/22 Danny Yagan *Capital tax reform and the real economy: the effects of the 2003 dividend tax cut*

WP13/21 Andreas Haufler and Christoph Lülfesmann *Reforming an asymmetric union: on the virtues of dual tier capital taxation*

WP13/20 Michael Blackwell *Do the haves come out ahead in tax litigation? An empirical study of the dynamics of tax appeals in the UK*

WP13/19 Johannes Becker and Ronald B Davies *Learning and international policy diffusion: the case of corporate tax policy*

WP13/18 Reuven S Avi-Yonah *And yet it moves: taxation and labour mobility in the 21st century*

WP13/17 Anne Brockmeyer *The investment effect of taxation: evidence from a corporate tax kink*

WP13/16 Dominika Langenmayr and Rebecca Lesterz *Taxation and corporate risk-taking*

WP13/15 Martin Ruf and Alfons J Weichenrieder *CFC legislation, passive assets and the impact of the ECJ's Cadbury-Schweppes decision*

WP13/14 Annette Alstadsæter and Martin Jacob *The effect of awareness and incentives on tax evasion*

WP13/13 Jarkko Harju and Tuomos Matikka *The elasticity of taxable income and income-shifting between tax bases: what is "real" and what is not?*

WP13/12 Li Liu and Andrew Harper *Temporary increase in annual investment allowance*

WP13/11 Alan J Auderbach and Michael P Devererux *Consumption and cash-flow taxes in an international setting*

WP13/10 Andreas Haufler and Mohammed Mardan *Cross-border loss offset can fuel tax competition*

WP13/09 Ben Lockwood *How should financial intermediation services be taxed?*

WP13/08 Dominika Langenmayr, Andreas Haufler and Christian J bauer *Should tax policy favour high or low productivity firms?*

WP13/07 Theresa Lohse and Nadine Riedel *Do transfer pricing laws limit international income shifting? Evidence from European multinationals*

WP13/06 Ruud de Mooij and Jost Heckemeyer *Taxation and corporate debt: are banks any different?*

WP13/05 Rita de la Feria *EU VAT rate structure: towards unilateral convergence?*

WP13/04 Johannes Becker and Melaine Steinhoff *Conservative accounting yields excessive risk-taking - a note*

WP13/03 Michael P.Devereux, Clemens Fuest, and Ben Lockwood *The Taxation of Foreign Profits: a Unified View*

WP13/02 Giorgia Maffini *Corporate tax policy under the Labour government 1997-2010*

WP13/01 Christoph Ernst, Katharina Richter and Nadine Riedel *Corporate taxation and the quality of research & development*