

Bad Matches Last Longer – Unobserved Heterogeneity across Firm-Owner Matches

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First draft: 11 December 2013

Abstract

Most of the recent studies on the value impact of ownership concentration have considered firm heterogeneity as a potential source of endogeneity. This paper suggests ownership concentration to be additionally correlated with unobserved firm-owner match characteristics that affect firm valuation. Using a sample of CDAX firms for 2000-2009, we find the emergence of a good – value enhancing – matches to be more likely at low ownership concentration. At the same time, stable matches are characterized by high ownership concentration of the controlling owner. We use the variation of ownership concentration over a given firm-owner spell as instrumental variable. This variation is uncorrelated by construction with the fixed firm as well as firm-owner match component of the error term of the firm value equation. Our main finding is that neglecting unobserved match effects understates the positive effect of control ownership in Germany.

Keywords and Classification *JEL classification*: G32, G34

Key words: Unobserved heterogeneity · firm-owner match · ownership concentration · agency conflicts

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1 Introduction

It has been an old and long time discussion whether ownership concentration in the hands of a controlling blockholder is value increasing or destroying. The theoretical background is briefly told, it is the story about a double edged sword often encountered in fairy tales. There is the light side of ownership concentration coming from the proposition that large shareholders have greater power and incentives to ensure shareholder value maximization. That is done by monitoring the management, which is beneficial to all shareholders (Jensen and Meckling, 1976; Zeckhouser and Pound, 1990; Burkart, 1997). On the flip side, controlling shareholders may misuse their power to consume private benefits at the expense of minority shareholders which eventually leads to a discount of the firm value (Fama and Jensen, 1983; Shleifer and Vishny, 1997). As things get even more complicated when testing the impact of control ownership empirically, retrieving a causal relationship between ownership structure and firm value is found to be rather challenging in the presence of severe endogeneity concerns. The seminal papers by Demsetz (1983), and Demsetz and Lehn (1985) suspect ownership and firm value to be determined simultaneously. Himmelberg et al. (1999), however, argue in favor of unobservable heterogeneity (i.e. omitted variable bias) to be the major source of endogeneity. They stress fixed firm-effects as the once to be blamed for the spurious correlation between ownership and firm performance.¹ But critique did not take long to emerge in the subsequent literature. Zhou (2001) raised concerns over the fixed effects (within-group) estimator as variation in ownership concentration is usually rich in across-firm variation, but small within firms when tracking ownership in a panel dataset. He concludes by promoting instrumental variable estimators to be more appropriate when accounting for firm heterogeneity. Beyond that, other sources of unobserved heterogeneity were neglected at this time. However, Cronquist and Fahlenbrach (2008) started to additionally consider blockholder fixed effects suggesting controlling shareholders to differ systematically in their skills and

¹In the case of Himmelberg et al. (1999), the positive effect of managerial blockholder ownership disappears once firm fixed-effects are taken into account.

preferences – everything else being equal. This heterogeneity among controlling owners becomes of interest as it implies differences in their beliefs on what constitutes ‘good policies’ towards firm value and utility maximization. This argumentation is in line with other studies (e.g. Giannetti and Simonov, 2006) that point towards differences in investors motivation to invest into a firm with respect to monitoring effort and minority shareholder expropriation. Some investor types (e.g. strategic investors) are found to exert a comparably unfavorable impact on firm valuation as they also follow other motives than shareholder value maximization; examples include extraction of private benefits and information, respectively. The opposite is suggested to hold true for institutional investors (Rapp and Trinchera, 2011).

We now extend the idea of blockholder heterogeneity by introducing the notion of unobservable firm-owner match effects, which come about when a firm i is controlled by any owner j . In our econometric exercise we find a negative relationship between ‘quality’ of the firm-owner match and ownership concentration. In other words, good firm-owner matches are more likely to occur at lower ownership concentration levels. This finding feeds in a downward bias of the average effect of ownership concentration on firm value once we do not account for this match heterogeneity. Thanks to our instrumental variable (IV) approach that acts in the spirit of Altonji and Shkotko (1987), we are able to correct for both firm and match specific heterogeneity simultaneously, and beyond that, this approach gives us the opportunity to work out the relative importance of each bias. Eventually, our estimates of the true effect of ownership concentration – free from firm and match specific heterogeneity – suggest a positive effect on firm value in Germany.

At the same time, our descriptive analysis suggest long control spells – that owner j is in control of firm i for many years – to come along with high ownership concentration as the controlling owner primarily comes in with a high control stake or partly buys additional shares over time to defend and strengthen his position.

The remainder of the paper is organized as follows. Section 2 introduces our econometric framework and our identification assumptions that help us to eliminate and to contrast the two major sources of unobserved hetero-

geneity. Section 3 describes the data set, in particular with respect to the relationship between ownership concentration and control duration of the controlling owner. We present and discuss the results of our econometric exercise in Section 4. Section 5 concludes.

2 Estimation Framework

In this section, we introduce various regression estimators that help us to identify and then to eliminate possible bias that stem from unobservable firm-owner match effects.

2.1 Empirical Model

In our empirical model, we assume that the value of a firm i held by with the controlling owner j at time t is determined by the following regression equation:

$$Y_{ijt} = \beta_1 X_{ijt} + W'_{ijt} \delta + \varepsilon_{ijt}. \quad (1)$$

The variable Y_{ijt} denotes Tobin's Q as a measure of firm value, X_{ijt} is the ownership concentration of the controlling owner j in firm i given in percent², W'_{ijt} is a $1 \times k$ vector of observable firm characteristics³ also including the constant. An alternative model specification adds squared ownership concentration (X_{ijt}^2) to the estimation equation in order to control for a non-monotonic relationship between control ownership and firm value.⁴ However, for ease of demonstration, we will discuss our estimation strategy assuming a linear effect of control ownership, but we account for non-linear effects later in our regression analysis.

²In the following also referred to as control ownership or control concentration.

³We include firm size, leverage, EBIT to sales, dividend payments, sales growth, CAPEX to sales; for definitions please refer to the appendix.

⁴In particular, a non-linear relation was documented for insider ownership concentration (e.g. Morck et al., 1988; McConnell and Servaes, 1990). They find an inverted U-shaped relation between Tobin's Q and managerial ownership with an 'inflection' point between 40% and 50%.

Regression estimation aims at inferring causality between control ownership X_{ijt} and firm value Y_{ijt} ; hence the key parameter of interest in our study is β_1 , which is the partial average effect of one percent additional shares in the hand of the controlling owner. However, using pooled least squares to estimate β_1 is accused to be inappropriate as severe unobserved heterogeneity is likely to distort the estimation of the effect of ownership concentration.

2.2 Error Decomposition

Thus, in order to illustrate the potential sources of unobserved heterogeneity, we decompose the compound error term ε_{ijt} into:

$$\varepsilon_{ijt} = \mu_i + \phi_{ij} + \eta_{ijt}, \quad (2)$$

where μ_i is a fixed firm-specific error component, ϕ_{ij} is a fixed firm-owner match-specific error component, and η_{ijt} is a transitory component accounting for idiosyncratic shocks and random measurement error.

Fixed Firm-Effect (μ_i)

In our context, one may think of ‘good agent quality’ firms – those having a positive fixed firm-effect (μ_i) – to possess a given ‘technology’ that enables firms to hire managers with above-average integrity. This sort of managers is less likely to pursue an empire building (Jensen, 1986) and self-entrenching agenda (Shleifer and Vishny, 1989) that usually causes inefficient allocation of resources, and consequently value destruction. Expressed more technically, the famous manager-shareholder conflict is less pronounced for firms with positive fixed firm-effects, therefore the required extent of costly monitoring activities is considerably lower. Generally, OLS estimation of the effect of control ownership will not be biased as long as the unobservable ‘agent quality’ is equally distributed over the range of observed ownership concentration levels, i.e. as long as $Cov(\mu_i, X_{ijt}) = 0$. Though, to further scrutinize the potential estimation bias arriving from the violation of the conditional mean independence, we specify a theoretical auxiliary equation that regresses the

unobserved fixed firm-effect (μ_i) on control ownership concentration (X_{ijt}), which looks the following:⁵

$$\mu_i = c_1 X_{ijt} + \vartheta_{ijt} \quad (3)$$

At this point, we are not able to unambiguously sign c_1 ; a positive sign would indicate ‘good agent quality’ firms to be rather characterized by high control ownership, a negative c_1 speaks for low ownership concentration. Both directions are thinkable, though a possible linkage between a less pronounced manager-shareholder conflict (reflected in a positive c_1) and low control concentration seems to be more appealing with respect to the theory, which suggests $Cov(\mu_i, X_{ijt}) < 0$, and thus c_1 to be negative.

Fixed Firm-Owner Match Effect (ϕ_{ij})

The notion of a ‘good firm-owner match’ – reflected by a positive match-specific error component (ϕ_{ij}) – refers to a high alignment of interests between the controlling owner j and the firm i , and can be thought of as mutual understanding and goodwill favoring value creation. In contrast, ‘bad matches’ come to happen once investors that rather seek for private benefits extraction encounter firms in which they can easily do so, which is particularly conceivable in firms with little minority shareholder protection. In this scenario, the controlling owner may feel invited to extract private benefits at the expense of the minority shareholders. The question to be raised again is whether ‘good firm-owner matches’ are more likely to occur at high or low ownership concentration, or whether $Cov(\phi_{ij}, X_{ijt}) = 0$, which would lead to unbiased least square estimations. Again, the case of firm-owner match heterogeneity can be analyzed similarly by the following auxiliary regression:

$$\phi_{ij} = b_1 X_{ijt} + \xi_{ijt}, \quad (4)$$

while b_1 may take on any sign. In case that ‘bad matches’ are more likely to emerge at high (low) ownership concentration, the sign will be negative

⁵For our illustration purpose, it is of no harm to ignore the other firm characteristics (included in the vector W); we further assume ϑ_{ijt} to have a mean equalling zero .

(positive).

2.3 The OLS Estimator

Summarizing the potential distortions due to the sources of unobservable heterogeneity introduced above, least squares estimation applied to equation (1) will yield biased estimates β_1^{OLS} of the true β_1 as of the following:

$$\beta_1^{OLS} - \beta_1 = b_1 + c_1 \quad (5)$$

The total potential estimation bias – consisting of b_1 and c_1 – of the true effect β_1 of control ownership X_{ijt} cannot be unambiguously determined beforehand since the bias caused by firm-owner match heterogeneity (b_1) may either offset or reinforce the assumed downward bias in β_1^{OLS} from firm heterogeneity (c_1). For instance, if c_1 is large and negative and b_1 is either negative or small and positive, the estimated effect of ownership concentration on firm value will be understated by OLS regressions.

2.4 The Instrumental Variable (IV)-Approach

2.4.1 The IV1 Estimator – Correcting for Firm- and Match Heterogeneity

Following the approach of Altonji and Shkotko (1987)⁶, we use an instrumental variable estimator (IV_1) that is able to eliminate both the bias induced by firm- and match heterogeneity while yielding an undistorted estimate β_1^{IV1} of the true effect of control ownership β_1 :

$$\beta_1^{IV1} - \beta_1 = 0. \quad (6)$$

⁶This estimator was first applied in the field of Labor Economics studying the the problem of appropriately estimating the returns on work experience and tenure as both variables are suspected to suffer from unobserved individual and job-match effects. Altonji and Shkotko's (1987) estimator gave rise to further advancements in this strand of literature, as e.g. done by Topel and Ward (1992), Altonji and Williams (2005) and Dustmann and Pereira (2008).

The appeal of this approach is that this instrument variable is simultaneously uncorrelated by construction with both the fixed firm specific error component μ_i and the permanent firm-owner match component ϕ_{ij} . It works as follows: given a firm i is observed to be held by the controlling owner $j = 1$ during the years 2003-2005 with a share of 40%, 42% and 50%, respectively. Furthermore, firm i is controlled by $j = 2$ in 2006 (50%) and 2007 (54%). Then, we compute the average control concentration for each firm-owner spell ij , which is in our example $\bar{X}_{i,j=1} = 44\%$ ⁷ and $\bar{X}_{i,j=2} = 52\%$. After that, we define the instrumental variable $\tilde{X}_{ij} = X_{ijt} - \bar{X}_{ij}$ as the deviation of the controlling owner's block share j of i at time t from his average stake he is holding during his entire control spell ij . The instrument's expected value is zero⁸ and thus uncorrelated with the unobserved firm-owner match component, i.e. $Cov(\phi_{ij}, \tilde{X}_{ij}) = 0$. We therefore consider \tilde{X}_{ij} a valid instrumental variable for X_{ijt} . At the same time, this instrumental variable is also, by construction, orthogonal to the fixed firm-effect ('agent quality'), so that $Cov(\mu_i, \tilde{X}_{ij}) = 0$. To make this instrumental variable work, both unobservable effects are required to remain unchanged over the control spell of the owner j . Finally, we assume \tilde{X}_{ij} to be also orthogonal to the transitory error component η_{ijt} , which implies no further endogeneity issues to be present, neither through additional omitted variable bias nor by reverse causality. To sum it up, β_1^{IV1} is suggested to be an unbiased estimate of the real effect of control ownership.

2.4.2 The IV2 Estimator – Correcting for Firm Heterogeneity

In order to contrast the relevance of both bias, we construct another instrumental variable \tilde{X}_i which only removes the fixed firm-specific error component μ_i , but keeps alive the bias from the firm-owner match-specific error ϕ_{ij} . This instrumental variable uses the deviation of the owner j 's block share at time t from the average control concentration of firm i , in technical terms we have $\tilde{X}_i = X_{ijt} - \bar{X}_i$. By construction, the expected value of \tilde{X}_i is zero over the entire firm spell, and in turn uncorrelated with the fixed firm-effect,

⁷For $j = 1$: $(40\% + 42\% + 50\%)/3 = 44\%$

⁸For $j = 1$: $(40\% - 44\%) + (42\% - 44\%) + (50\% - 44\%) = 0$

hence $Cov(\mu_i, \tilde{X}_i) = 0$. However, this instrument may still be correlated with the match effect ($Cov(\phi_{ij}, \tilde{X}_i) \neq 0$), so that the IV_2 estimator still produces the bias b_1 in the estimated effect of control concentration β_1^{IV2} :

$$\beta_1^{IV2} - \beta_1 = b_1. \quad (7)$$

2.5 Prediction of Bias Direction and Relevance

Applying our identification procedure, we are now able to retrieve evidence on the parameters b_1 and c_1 , thus the relative importance of firm and firm-owner match heterogeneity. To be more precise, the different estimates of the effect of control ownership (β_1^{OLS} , β_1^{IV1} , β_1^{IV2}) allow us to draw inference whether there is any heterogeneity issue, and if so, whether the two unobserved effects go in the same direction, or if we have the case of mixed unobserved effects.

Please insert Table 1 approximately here

Table 1 provides an overview of possible scenarios of estimates with corresponding inference on the unobserved effects. It is self-explanatory is that if we come across alike estimates (row 2), we do not have to worry about any heterogeneity concerns. However, if we find $\beta_1^{OLS} > \beta_1^{IV2} > \beta_1^{IV1}$, thus a twofold upward biased OLS estimator, we can infer that both, the firm specific error ('agent quality') μ_i as well as the match-specific error ϕ_{ij} are positively correlated with control ownership (row 3). If the opposite holds (row 4), i.e. if we have a negative correlation between ownership concentration and both the heterogeneity sources, we will end up with $\beta_1^{OLS} < \beta_1^{IV2} < \beta_1^{IV1}$, which is a consistently downward biased OLS estimator. Mixed heterogeneity effects are also conceivable; taking the most commonly assumed case of fixed firm-effects with respect to control concentration, thus $c_1 \neq 0$, but no firm-owner match effects ($b_1 = 0$), we expect both instruments to deliver equal results ($\beta_1^{IV1} = \beta_1^{IV2}$) while deviating from the OLS estimate (row 6 and 7). Row 8 and 9 depict the case when both effects are present but perfectly offset each other; then β_1^{OLS} will be equal to β_1^{IV1} , but at the same time higher (upward bias) or lower (downward) than β_1^{IV2} . Both unobserved

effects may further differ in direction and magnitude. Once the fixed firm-effect is stronger than the match effect (row 10 and 12), considering only firm heterogeneity (β_1^{IV2}) will still provide the right direction of the bias, though overstate the effect. However, following the conventional wisdom of only controlling for firm effects will be strongly misleading once the unobserved match effect is stronger and at odds with the firm effect (row 11 and 13). For example, in case of a strong negative match-effect and a slightly positive firm-effect (row 11), β_1^{IV2} will indicate an upward biased OLS estimate β_1^{OLS} , though this estimate is actually suffering from an overall downward bias as shown when exploring the difference with respect to β_1^{IV1} .

3 Data and Sample Description

3.1 Sample

The starting point of our study is a sample of all CDAX-listed firms in Germany comprising the years 2000-2009. The ownership data used in this study come from the "Wer gehoert zu wem?" database published by Commerzbank. All financial data matched to the ownership data are retrieved from Worldscope / Datastream. We exclude all financial firms (SIC 6000-6999) and utilities (SIC 4900-4949) from our sample as well as those firms with missing or incomplete ownership information, ending up with a total sample size of 3831 firm-year observations comprising 499 different CDAX firms (see Table 2).

In order to account for the effects of the various firm-owner matches ij , we need to identify the appropriate spell length of owner j he is in control of firm i . At this point, we make the simplifying assumption that the owners' differences in beliefs and preferences are chiefly manifested by their legal form, since individuals, for instance, (e.g. families) follow in general a different agenda than foreign investors. The appendix entails the assignment rules used to determine whether a controlling owner is a corporation, a non-incorporated firm, an individual, a state owner or a foreign investor.⁹ Thus,

⁹This rather broad identification assumption is also needed as owners names stated

once a change in the legal form of the controlling owner is observed (e.g. from family to corporation), we infer a change in the controlling owner. Alternative definitions of controlling owners – e.g. by type (institutional investor, strategic investor, etc.) as well as by name – are found to also hold, but corresponding analysis are not yet included in this first draft of our study. Further, we define owner j to control i in a row of years even if there are disruptions of control ownership of one or two years. The measure of control ownership refers to voting rights at the direct ownership level while implicitly assuming the ‘one share-one vote’ principle to hold.¹⁰

3.2 Summary Statistics

Table 2 presents the development of average control ownership in Germany over the time span of 2000-2009. In accordance with other studies (e.g. Facio and Lang, 2002), we find strong evidence for a pronounced ownership concentration in the hands of the controlling owner with an across-year average of 48.8%. Ownership concentration decreased slightly over time with an ownership concentration of 50.88% recorded in 2000 compared to 48.16% in 2009.

Please insert Table 2 approximately here

Up to this point, these are all well explored findings. What comes surprisingly to the reader, however, is the relationship between average control concentration and length of the control spell. Table 3 shows that the average control stake of owner j is higher the longer he is in control of firm i . While an average owner holds a share block of 43.25% in his first year of control ownership, the control stake is 51.48% in his fifth year, and further increases to 58.07% in his 10th year of control ownership.¹¹

in the database are partly vague, or changes in the owners’ names do not appropriately reflect a change of owners.

¹⁰In fact, dual class shares are only found for less than 7% of firm-year observations in Germany (Brendel et al., 2013) and are thus considered negligible in our analysis.

¹¹Please note that each firm may have been held by multiple owners j_k with the same number of years of controlling ownership, e.g. firm i may have been owned three years

Please insert Table 3 approximately here

However, this naive plotting is rather unable to answer the question of whether the average controlling owner j with a long control spell in i comes in with a relatively high share block, or whether he increases his stake over time in order to defend his leading position. In this light, Table 4 contrasts the average ownership concentration at the beginning (t_0) and at the end (T) of a control spell between short term (1-3 years), mid term (4-6 years) and long term (7-10 years) matches. Both suggestions turn out to apply; in particular, those matches with a short spell are characterized by a significantly lower control concentration at the first time of appearance (38%) compared to mid-term (44%) and long term matches (49%). In addition but of less importance, long term owners gradually increase their control stake over time; we find an average increase of 3.62% for those owners with 7 and more years of control, 1.95% for spells of 4-6 years, and only a negligible increase (0.73%) for short term matches. However, our data encounters one major problem that imposes some limitations on our interpretation; we only observe firm-owners matches from 2000-2009 and are therefore exposed to potential truncation with respect to firm-owner spells that started prior to 2000, and those that lasted longer than 2009.¹²

At least, we find by now a tentative relationship between average control concentration and the time span an owner j is in control of firm i . Or to put it in sharper terms, we suggest entering blockholders (at t_0) to be aware of their own type, i.e. whether the investor aims to stay in for a rather short or long while. The remaining question is now, whether those controlling owners – who possess a comparably higher share block from the beginning on, and who are more likely to maintain their control over a long spell – produce better or worse match effects than those owners with lower initial control ownership concentration. This question is connected with the assertion that controlling owners consciously decide – by following their unobserved preferences on their

by first by j_1 from 2000 to 2002, and then j_2 from 2003 to 2005. Firm-owner matches observed in their third year of collaboration are found to have an average level of 48.78% of ownership concentration.

¹²Additional evidence is about to be provided. Please note that this study is still work in progress.

trade-off between value enhancing monitoring and destroying expropriation – on the volume of the initial ownership stake and thus on the potential control spell length.

Please insert Table 4 approximately here

4 Results

This section aims at shedding light on the question to which extent OLS estimates of the effect of ownership concentration are biased through firm and match heterogeneity. Therefore, Table 5 reports the estimated effects (β_1^{OLS} , β_1^{IV1} , β_1^{IV2}) of control ownership concentration (*Conc.*) on firm value for all estimators introduced above (OLS, *IV1*, *IV2*). Accordingly, we further consider a possible non-monotonic relationship between firm performance and control ownership by adding squared ownership concentration to our analysis (*Conc.*²). All regression specifications control for additional firm characteristics, period and industry effects.

Please insert Table 5 approximately here

It can be seen at first glance that the estimates of the pooled OLS regressor (columns 1-2), the *IV1* (columns 3-4) and the *IV2* estimator (columns 5-6) tell different stories about the effect of control ownership. The least squares estimate – presuming a linear effect (column 1) – is slightly positive (0.0021) but insignificant. If we account for a non-monotonic relationship (column 2), the coefficient estimates (-0.0153 for X_{ijt} , 0.0017 for X_{ijt}^2) propose an overall negative significant effect of control concentration diminishing with increasing concentration levels. Thus, the OLS estimation that accounts for neither heterogeneity source suggest the negative expropriation effect to dominate over the positive monitoring effect in Germany.

However, if we take account of firm heterogeneity by applying our *IV2* estimator (column 5), the marginal effect is estimated to be positive and significant at 0.0045. In contrast to the least squares results, we can infer a predominating positive monitoring effect of control ownership. Using

a quadratic specification (column 6) turns the corresponding coefficients insignificant pointing to a rather linear relationship between firm valuation and ownership concentration. Although the *IV2* estimator is free from distorting fixed firm-effects μ_i , it still allows for correlation between control ownership and the unobserved firm-owner match effects ϕ_{ij} . If we now control for both, firm and match heterogeneity by using our *IV* estimator, column 3 reports a positive and highly significant point estimate of the effect of control ownership of 0.0059. According to our estimation strategy, this is the unbiased estimate of β_1 .

Comparing the estimates of OLS, *IV1* and *IV2*, we find the OLS estimate of the effect of control ownership to be the lowest (0.0021 and insignificant); *IV2*, in contrast, yields a significant positive effect of 0.0045, and *IV1* an even stronger positive effect of 0.0059. This means that the OLS estimate is consistently downward biased confirming $\beta_1^{OLS} < \beta_1^{IV2} < \beta_1^{IV1}$; i.e. the match-effect amplifies the firm-effect. Even though appearing to constitute the major bias, considering only fixed-firm effects – as conventionally done in recent empirical studies – still understates the true effect of control ownership, a finding that underlines the need to account for heterogeneous firm-owner match productivities. Following our estimation strategy, we now infer that control concentration X_{ijt} is negatively correlated with both, the firm fixed effect μ_i and the firm-owner match effect ϕ_{ij} . In other words, ‘bad agency quality’ ($\mu_i < 0, c_1 < 0$) as well as ‘bad firm-owner matches’ ($\phi_{ij} < 0, b_1 < 0$) are more likely to occur in firms with high control concentration of owner j . Since long term firm-owner matches are characterized by high ownership concentration from the first year on, we suggest long-term investments to be less favorable with respect to firm valuation than those collaborations between controlling owner j and firm i that last only for a rather short while.

5 Discussion and Conclusion

The instrumental variables estimates of our firm value equation indicate that ownership concentration in the hands of the largest blockholder has a posi-

tive effect on firm value in Germany. We provide novel evidence that least squares estimates suffer from substantial downward bias and should not be used as they suggest an even negative effect. This is due to both firm heterogeneity as well as firm-owner match heterogeneity. With respect to the latter unobserved effect, the higher propensity of unfavorable firm-owner matches at high concentration levels may come to happen as private benefits seeking investors coincide with firms with little minority protection, i.e. firms lacking effective control of the controlling owner by the minority shareholders. This constellation is arguably more likely to occur the higher the concentration of the controlling owner is. Thus, only correcting for fixed firm-effects is not sufficient in order to retrieve the true effect of ownership concentration. This in turn may partly explain the mixed results in previous studies on the value effect of ownership concentration. At the same time, we find long lasting firm-owner matches to come along with comparably high ownership concentration levels of the controlling owner. This, and our exploration of the differences between OLS and IV results provide tentative evidence consistent with better firm-owner matches lasting only for a relatively short time span compared to ‘bad matches’. Bohren et al. (2005) support this view finding a negative relationship between ownership duration and firm’s performance. However, the majority of other studies (e.g. Lardon et al., 2013) promote stable blockholder ownership to have a positive effect on firm valuation – at least during the financial crisis.

Tables

Table 1: Direction and relevance of bias stemming from firm and match heterogeneity.

	Bias	Sign of bias	Direction and relevance of bias
(1)	Consistent heterogeneity		
(2)	No bias	$b_1 = 0, c_1 = 0$	$\beta_1^{OLS} = \beta_1^{IV2} = \beta_1^{IV1}$
(3)	Upward bias	$b_1 > 0, c_1 > 0$	$\beta_1^{OLS} > \beta_1^{IV2} > \beta_1^{IV1}$
(4)	Downward bias	$b_1 < 0, c_1 < 0$	$\beta_1^{IV1} > \beta_1^{IV2} > \beta_1^{OLS}$
(5)	Mixed heterogeneity		
(6)	Upward bias	$b_1 = 0, c_1 > 0$	$\beta_1^{OLS} > (\beta_1^{IV1} = \beta_1^{IV2})$
(7)	Downward bias	$b_1 = 0, c_1 < 0$	$(\beta_1^{IV1} = \beta_1^{IV2}) > \beta_1^{OLS}$
(8)	Offsetting effect	$b_1 < 0, c_1 > 0$	$(\beta_1^{OLS} = \beta_1^{IV1}) > \beta_1^{IV2}$
(9)	Offsetting effect	$b_1 > 0, c_1 < 0$	$\beta_1^{IV2} > (\beta_1^{OLS} = \beta_1^{IV1})$
(10)	Upward bias	$b_1 < 0, c_1 \gg 0$	$\beta_1^{OLS} > \beta_1^{IV1} > \beta_1^{IV2}$
(11)	Downward bias	$b_1 \ll 0, c_1 > 0$	$\beta_1^{IV1} > \beta_1^{OLS} > \beta_1^{IV2}$
(12)	Downward bias	$b_1 > 0, c_1 \ll 0$	$\beta_1^{IV2} > \beta_1^{IV1} > \beta_1^{OLS}$
(13)	Upward bias	$b_1 \gg 0, c_1 < 0$	$\beta_1^{IV2} > \beta_1^{OLS} > \beta_1^{IV1}$

Table 2: Average ownership concentration of the controlling owner over time. Dispersed ownership is considered.

Year	Obs	Conc. (%)
2000	369	50.88
2001	390	50.51
2002	400	49.63
2003	407	48.31
2004	397	49.80
2005	390	48.37
2006	390	47.66
2007	379	46.83
2008	365	47.79
2009	344	48.16
Total	3.831	48.79

Table 3: Average ownership concentration and control spell length. Please note that this presentation scheme inherently features multiple counting of owners, e.g. all controlling owners found to be in control for a total of 8 years are also considered in all preceding years (year 1-7).

Control spell (yrs)	Obs.	Conc. (%)
1	833	43.25
2	688	45.65
3	538	48.78
4	437	50.34
5	356	51.48
6	298	52.75
7	246	52.77
8	192	53.52
9	138	57.20
10	105	58.07
Total	3.831	51.38

Table 4: Average ownership concentration of the controlling owner j by length of control spell (in years). *Change* is measured as the difference in the controlling owners' average concentration between his first year of control (t_0) and his last observed year of control (T). Each firm can experience more than one controlling owner over the time of observation.

Control spell length	Obs	Conc. % (t_0)	Conc. % (T)	Change % (t_0 to T)
1-3 years	396	38.26	38.99	0.73
4-6 years	191	44.32	46.27	1.95
7-10 years	246	49.38	53.01	3.62

Table 5: Effects of ownership concentration of the controlling owner on the firm value (Tobin's Q). Statistical significance levels are reported at *** p<0.0, **p< 0.05, * p<0.10. Cluster-robust standard errors are reported in parenthesis.

<i>Variable</i>	<i>OLS</i>		<i>IV1</i>		<i>IV2</i>	
	(1)	(2)	(3)	(4)	(5)	(6)
Conc.	0.0021 (0.002)	-0.0153*** (0.006)	0.0059*** (0.002)	0.0052 (0.005)	0.0045*** (0.001)	0.0022 (0.004)
Conc. ²		0.0017*** (0.001)		0.0001 (0.001)		0.0002 (0.000)
Firm size	-0.0809*** (0.029)	-0.0906*** (0.030)	-0.0750** (0.030)	-0.0754** (0.030)	-0.0770** (0.030)	-0.0782** (0.030)
EBIT / sales	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)	-0.0006*** (0.000)
Leverage	-0.0002 (0.000)	-0.0002 (0.000)	-0.0002 (0.000)	-0.0002 (0.000)	-0.0002 (0.000)	-0.0002 (0.000)
CAPEX / sales	0.0000* (0.000)	0.0000* (0.000)	0.0000** (0.000)	0.0000** (0.000)	0.0000** (0.000)	0.0000** (0.000)
Sales growth	-0.0000 (0.000)	-0.0000 (0.000)	-0.0000 (0.000)	-0.0000 (0.000)	-0.0000 (0.000)	-0.0000 (0.000)
Dividend payout	0.1112 (0.074)	0.1473* (0.077)	0.1007 (0.076)	0.1021 (0.077)	0.1042 (0.076)	0.1089 (0.077)
Constant	2.5181*** (0.374)	2.9375*** (0.432)	2.2435*** (0.378)	2.2602*** (0.398)	2.3408*** (0.386)	2.3942*** (0.409)
Period effects	yes	yes	yes	yes	yes	yes
Industry effects	yes	yes	yes	yes	yes	yes
Observations	3255	3255	3255	3255	3266	3266

Appendix

Table 6: Variable definitions
The table summarizes the definitions of variables used in the descriptive statistics and empirical analyses.

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

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