Owner type and investment of private firms

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Abstract

Using detailed ownership and financial information from a large sample of private firms from 24 European countries over the period from 2001 to 2018, we examine the relationship between the type of the owner and firm investment decisions. We find that family-owned firms exhibit higher investment rates and substantially higher sensitivity to investment opportunities, profitability, cash flow and value-added growth compared to corporate and institutional owners. To demonstrate the robustness of our results we employ matching samples complemented by analysis of owner type transitions from family owners to corporate and institutional owners.

Keywords:

Private firms; panel data; Europe; ownership types; investments; cash flow sensitivity; profitability; business opportunities.

JEL Classification: G31, G32, D22

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1 Introduction

It's well-established that both ownership structure and the identity of the owners are very important for corporate performance and governance (Thomsen and Pedersen, 2000). In terms of the identity of the owners, scholars often focus on a specific type. Most notably, family ownership has received substantial attention (Villalonga and Amit, 2006; Miller et al., 2007; Xia and Walker, 2015) and, more recently, driven by the rise of institutional ownership in the US and generally all over the world, scholars focus on the motives and effectiveness of institutional investors (Appel, Gormley, and Keim, 2016; McCahery, Sautner, and Starks, 2016; Bebchuk et al, 2017; Kang, Luo, and Na, 2018; Lewellen and Lewellen, 2018). Notably, scholars usually focus on one owner type at the time (except Thomsen and Pedersen, 2000) and mainly examine public firms (Boyd and Solarino, 2016).

This paper aims to study investment decisions of different owner types by comparing their investment levels and sensitivities to investment opportunities, ROA, cash flow, and value-added growth in a large sample of European private firms. Focusing on private firms has several advantages. First, private firms tend to be less of a subject to short-termist pressures that have been shown to distort investment decisions of public firms (Asker et al., 2015). Second, owners of private firms often hold a large stake in the company and likely to be major decision makers. Restricting the attention to owners with a large stake in a company (95% of the control) also has an advantage of limiting agency problems that could potentially contaminate our results.

For the analysis we construct a large sample of European privately-owned firms spanning over the period from 2001 to 2018. Using the Amadeus owner type classification, we differentiate between Family, Corporate, Active, State, Institutional, Anonymous Corporate, and Anonymous Private owner types. For each category we estimate the effect of the ownership type on the firm investment levels as well as sensitivities to investment opportunities, profitability, cash flow and value-added growth.

Our results suggest that family-owner firms have substantially higher investment levels, and higher sensitivities to investment opportunities, profitability, cash flow and value-added growth compared to other owner types, including corporate and institutional owners. State-owned firms consistently show even higher sensitivity to profitability, cash flows and business opportunities than family-owned firms. Further analyzing results obtained in matching samples and focusing on ownership transitions from family owners to either corporate or institutional owners, we confirm that this investment behavior could be attributed to owner preferences.

2 Data

2.1 Sample Construction

We start by collecting the data from the Amadeus database maintained by Bureau van Dijk (BvD), a Moody's Analytics company. While this database is the most comprehensive source of financial and ownership information on public and private companies across Europe, it also has several limitations. Specifically, BvD eliminates firm financial information after ten years, or for firms which are inactive, merge, or change identification. More critically, each version of the Amadeus database contains only the latest available ownership structure. We therefore create our dataset using special historical queries and seven bi-annual versions of Amadeus. Using information about the starting date of the ownership and the release date in each update, we trace the ownership structure over time. We retain only those firms for which we have ownership information and exclude firms for which we are unable to identify at least 95% of the reported shareholders and micro firms because they do not systematically report the information on the number of employees and total assets.[1] We further focus our attention on firms controlled by a single owner. After excluding firms operating in financial services and insurance industries (NACE codes 64–66) due to their extensive oversight by government regulatory authorities and fundamental differences in financial data presentation, we have ownership information for 242,536 unique private firms. Our final sample consists of 672,016 firm-year observations representing firms from 24 European countries over the period 2001–2018.

2.2 Ownership Type Classification

To estimate a clean effect of the owner type on corporate outcomes, we require firms in our sample to be controlled by a single owner holding at least 95% of company shares. We refer to this control as supermajority control throughout the paper. We use a 95% cutoff rather than 100% because a small portion of shares could be used as a motivational tool for employees.

When assigning owners in different type categories, we use the variable shareholder type (*SH_TYPE*) in Amadeus as a starting point. We differentiate between the following types:[2]

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[1] According to Eurostat, micro firms are firms with less than 10 employees. Following existing literature, we also consider firms with total asset value lower than 4,000 USD to be micro firms. This filter comes from rounded requirement for the minimum capital in registering an Ltd. Company across EU.

[2] The aggregated ownership types use the ownership classification from the Amadeus (variable SH_TYPE): A = Insurance company, B = Bank, C = Trade & Industry organization, D = Nameless private stockholders,

- *Family*: (Type 1) Individual/ family owners that belong to category I ("Named individuals or families") in Amadeus. This is our base category.

- *Corporate*: (Type 2) Corporate owners that are denoted by the letter C in Amadeus ("Trade & Industry organization").

- *Active*: (Type 3) Active investors, which include private equity firms, labeled as P ("Private Equity firms"), and venture capitalists, labeled as V ("Venture Capital") in Amadeus.

- *State*: (Type 4) Ownership by the state, labeled as S ("Public authority/ State/ Government") in Amadeus.[3]

- *Institutional*: (Type 5) Institutional owners category includes the following Amadeus shareholder types — B ("Bank"), F ("Financial Companies"), J ("Foundations"), Y ("Hedge funds") and E ("Mutual/Pension fund/Nominee /Trust").[4]

- *Anonymous corporate:* (Type 6) This category pools all corporate shareholders with missing identification, labeled by L ("Other named Shareholders") in Amadeus.

- *Anonymous individual:* (Type 7) Anonymous private investors that are labeled by D ("Anonymous Private Stockholders").

In addition to the type of the owner, we also differentiate between firms that are stand-alone and firms that belong to business groups. The detailed sorting mechanism identifying stand-alone and business group firms could be found in the Appendix. Note that for business group firms we retain only those subsidiaries which are owned with at least a 95% majority.

2.3   Descriptive Statistics

Table 1 presents summary statistics for the main variables we use in our analysis. These variables are carefully selected based on prior literature because they are informative about investments; they capture financial constraints (Fazzari, Hubbard, and Petersen, 1988; Hadlock and Pierce, 2010), profitability (Blanchard, Rhee, and Summers, 1993; Asker, Farre-Mensa, &

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aggregated, E = Mutual & Pension fund / Nominee / Trust / Trustee, F = Financial company, I = One or more named individuals or families, J = Foundation / Research Institute, L = Other named shareholders, aggregated, M = Employees/Managers/Directors, P = Private Equity firms, S = Public authority/ State/ Government, V = Venture Capital, Y = Hedge funds, Z = Public (Publicly listed companies)

[3] Let us note that by its feature, all companies owned by State form a business group (in each country we have either zero or at least two state-owned companies).

[4] Note that we do not differentiate between *independent* and *grey* institutional investors (see Ferreira and Matos (2008), Brickley, Lease, and Smith (1988), Almazan, Hartzell, and Starks (2005), and Chen, Harford, and Li (2007)) mainly because the majority of institutional investors, with few exceptions, fall into grey category and because they have a full shareholder control over the firms in our sample.

Ljungqvist 2015; Erel, Jang, and Weisbach, 2015) and investment opportunities (Lehn and Poulsen, 1989; Shin and Stulz, 1998; Bloom, Bond, and van Reenen, 2007; Michaely and Roberts, 2012).

In the Table 1, Panel A, we present basic descriptive statistics for all firms in our sample. It shows that average firm in our sample has USD 3.5 million of total assets, a gross investment of 0.051, a profitability ratio (ROA) of 0.063, a leverage ratio of 0.188 and about 37 years old. Table 1, Panel B shows summary statistics by owner type. It is clear that *Active, Anonymous Corporate*, and *Anonymous Private* owner types do not have enough observations for a meaningful analysis. We will include them only in the first set of the exploratory regressions, but then focus our analysis on owner types that represent the majority of observations in our sample, namely, *Family*, *Corporate*, *State*, and *Institutional* categories.

Overall, *Family* ownership is linked to smaller firms with a higher cash flow ratio, and higher value-added growth. Mean risk avoidance of the family-owned firms is comparable with the state-owned enterprises, but much lower than for corporates. In terms of value-added growth, the family firm on average shows the higher numbers, being followed by the corporate owners, state, and institutional owners. For the firm size measured by the number of employees the ranking is different; family-owned firms are smallest, followed by firms owned by institutional owners and by the corporate-owned firms with the state-owned firms being the largest, as expected.

Panel C, D and E of the Table 1 show the distribution of owner type in our sample across countries, by industry and over time.

2.3 Matching

To control for observable differences between firms with different owner types, we follow prior literature and use a matching procedure (Michaely and Roberts, 2012; Gao, Harford, and Li, 2013; Asker et al., 2015). Ideally, we should compare two firms that are identical on dimensions affecting their investment behavior but differ by the type of their majority owner.

Firm investment behavior is likely dependent on firm size, specific industry, and the structure of its assets. We therefore first use the exact matching on country, industry (NACE2 alphabet classification), time period (with 2000, 2005, 2008, 2010, 2013, and 2016 being the cut off point for similar time period), and firm structure (stand-alone and business groups). We further complement the exact matching with the nearest neighbor matching on *ln(total assets)*, *tangibility* and *leverage*. We keep only firms that satisfy the common support requirement and

those for which we have similar caliper <0.005, i.e., probability of being classified as contrafactual. For each firm we add up to five nearest neighbors; removing the duplicates result roughly in similar size of the control group.[5]

3 Empirical Results

3.1 Owner type and level of gross investment

To study the effect of owner type on firm investment in our sample of private firms we build on the work of Erel, Jang and Weisbach (2015).[6] Specifically, we augment Erel et al. (2015) model with a set of dummy variables that aim to capture the effect of the identity of different owners on firm investment as follows:

$$
\begin{aligned}
Gross\ Investment_{it} = \alpha_0 + \boldsymbol{\beta}X_{it} + \sum_{k=2}^{K}\gamma_k Ownership\ Type_{it} + \\
\delta BGroup_{it} + \boldsymbol{\lambda_c}Macro_{ct} + \tau_t + f_i + \varepsilon_{it},
\end{aligned}
\tag{1}
$$

for all $i = 1,\dots, N$ (firm index); $t = 2001,\dots, 2018$ (time index, year); $k = 2,\dots, K$ (ownership type, $K = 7$, omitted category ($k = 1$) is *Family*); $c = 1,\dots, C$ (country index); $BGroup$ is the dummy variable that equals to unity if the firm is part of a business group (omitted category is a stand-alone firm).[7] Vector X_{it} contains firm-specific control variables of firm size, tangibility, cash flow, number of employees, sales growth, leverage, profitability, cash, and firm age for firm i at time t.[8] *Macro* is a set of country-level variables that account for variation in external finance availability, country level income, and the development of the local markets: total private credit to GDP, stock market capitalization to GDP, nominal GDP growth, GDP in constant 2010 USD, and GDP per capita. For the detailed definitions of variables, see Table A.1 in Appendix.

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[5] For the interest of the space, the technical results for matching samples are not presented here, they are included in the technical part of the On-line Appendix or available upon a request.

[6] Erel, Jang, and Weisbach (2015) analyze European private firms and their investment behavior around their acquisition. They also employ the same database, Amadeus, to examine more than 5,000 acquisitions from 2001 to 2008 in Europe.

[7] As a sensitivity and robust analysis, we disentangle business group and analyze effects of Horizontal pyramid (subsidiary structure) and Vertical (complex) pyramid in all specifications.

[8] These variables are selected based on prior literature because they are informative about investments; they capture financial constraints (Fazzari, Hubbard, and Petersen, 1988; Hadlock and Pierce, 2010), profitability (Blanchard, Rhee, and Summers, 1993; Asker, Farre-Mensa, & Ljungqvist 2015; Erel, Jang, and Weisbach, 2015) and investment opportunities (Lehn and Poulsen, 1989; Shin and Stulz, 1998; Bloom, Bond, and van Reenen, 2007; Michaely and Roberts, 2012).

In some specifications, we also control for risk-avoidance, which helps us to assess whether risk-avoidance is associated with lower investment levels by firms. Risk-avoidance index is constructed by adding 1 when (1) a firm's leverage is in the bottom 20% of the distribution; (2) the volatility of firm-level profitability is in the bottom 20% of the distribution; and (3) if the firm survives at least 5 years. The index ranges from 0 to 3, with higher scores denoting greater risk-avoidance (Faccio et al., 2016).

We also include a set of time (τ_t) and firm (f_i) fixed effects to control for changing macroeconomic conditions and (unobserved) time-invariant firm-level heterogeneity. Standard errors (ε_{it}) are robust to arbitrary heteroskedasticity.

Note that the estimated coefficients γ in specification (1) capture the "transitory" effect of owner type on firm investment (the effect in firms with changes in type of the owner). As the ownership structure of fully controlled firms is rather stable, we also estimate the "permanent" effect (the effect in firms with no changes in type of the owner) by regressing the estimated fixed effect ($\widehat{f_i}$) from (1) on ownership type categories.

$$\widehat{f_i} = \sum_{k=1}^{K} \gamma_k^* Ownership\ Type_i + \delta^* BGroup_{it} + \kappa_c + \iota_P + \xi_i \tag{2}$$

for all $i = 1,…, N$ (firm index); $k = 1,…, K$ (ownership type); $c = 1,…, C$ (country index); and $p = 1,…, P$ (industry index). $BGroup$ is the dummy variable that equals to unity if the firm is part of a business group (omitted category is a stand-alone firm). We also control for a set of industry (ι_P) and country (κ_c) fixed effects to capture the time-invariant legal and financial environment (see for example Francis et al., 2013). Standard errors (ξ_{it}) are robust to arbitrary heteroscedasticity. The estimated coefficients γ^* in specification (2) would then capture the "permanent" effect of owner type on firm investment.

We also control if our initial results would hold in the matched samples by comparing investment levels in sub-samples representing pairs of ownership type (*Corporate, State, Institutional*) and a control group of *Family*-owned firms.

We start exploring the effect of a specific owner type on the level of firm investment by estimating baseline regressions (1) and (2). Table 3 presents these regression estimation results. Columns 1, 3, 5, 7, and 9 show the effect of type of the owner for firm investment in firms with changes in type of the owner or "transitory" effect. Notably, we don't observe any significant "transitory" effect that could be attributed to the type of the owner in the full sample of firms (columns 1 and 3). Similarly, no significant "transitory" effect is found in the matched samples

(columns 5,7, and 9). The owner type effects on firm investment are significantly more pronounced in "permanent" specifications reported in Columns 2, 4, 6, 8 and 10. This is to some extent expected as the changes in the ownership type are rather infrequent and therefore would be captured by firm fixed effects. Decomposing firm fixed effects, as outlined in specification (2), yields a set of significantly negative coefficients for ownership type controls, suggesting that family owners invest significantly more than any other owner type in our sample. These results hold in the matched samples.

3.2 Investment Sensitivity to Growth Opportunities, Profitability and Cash Flow

We observe clear differences in investment levels between owner types in firms with no changes in type of the owner. Our analysis shows that family owners invest more than other owner types. This is a bit surprising because corporate and institutional owners could potentially have access to cheaper investment capital. To understand why these patterns are observed, we further explore how firms with different owner types respond to changes in investment opportunities by estimating investment sensitivity to profitability and cash flow. The model is defined as follows.

$$
\begin{aligned}
Gross\ Investment_{it} = {} & \alpha_0 + \beta X_{it} + \mu InvOppr_{it} + \sum_{k=2}^{K} \gamma_k Ownership\ Type_{it} + \\
& + \sum_{k=2}^{K} \rho_k InvOppr_{it} \times Ownership\ Type_{it} + \\
& + \sum_{k=2}^{K} \varphi_k Z_{it} \times Ownership\ Type_{it} + \zeta Z_{it} + \lambda_c Macro_{ct} + \\
& + \tau_t + f_i + \varepsilon_{it},
\end{aligned}
\tag{3}
$$

As in all specifications above, the vector X_{it} contains firm-specific control variables. In this case proxies for size *Ln(Employees)* and *Ln(Total Assets)*, profitability (*ROA*), *leverage*, *cash flows* (and *cash*), and *firm age* for firm *i* at time *t*. As before, we control for firm fixed effects (f_i), as well as for standard macroeconomic variables ($Macro_{ct}$) and year effects (τ_t).

Investment opportunities (*InvOppr*) are measured by the sales growth as it is argued by the literature to be the best proxy of business opportunities for privately held firms (see e.g., Lehn and Poulsen, 1989; Shin and Stulz, 1998; Bloom, Bond, and van Reenen, 2007; Michaely and Roberts, 2012, among others).

Z_{it} stands either for *ROA* or for *cash flow* (to total assets) depending on the specification. As a part of these effects, we also explore sensitivity of ownership type to firm profitability, interaction with *ROA* and/or interaction to firm cash flow. The interaction term of ROA (or

cash flow) with the owner type captures the effect of firm profitability on the size of the investment; to what extent different owners use their profit to finance their investment.

Table 4 and Table 5 present results of investment sensitivity regressions to growth opportunities as well as to ROA and cash flow, respectively. The results in columns 1 and 2 of Table 4 and Table 5 suggest that firms with corporate owners are less sensitive to changes in growth opportunities than firms owned by families (base category). This result though is only significant in the full sample of firms and doesn't hold in the matched sample. At the same time, state-owned firms reveal substantially larger (and more robust) sensitivity to growth opportunities compared to family-owned firms.

In terms of investment sensitivity to profitability and cash flow, the results are remarkably similar – firms with corporate and institutional owners are less sensitive to changes in profitability and cash flow, while state-owned firms have much larger sensitivity to profitability and cash flow than firms own by families. These results are somewhat expected due to an easier and likely cheaper access to external financing for the firms controlled by (financial) institutions, as well as the higher dividend payouts to institutional investors (Gugler, 2003; Gugler and Yurtoglu, 2003; Bena and Hanousek, 2008).

3.3 Investment efficiency

While differences in investment levels and investment sensitivities offer an insight into investment decisions by different types of owners, it is also important to understand whether invested capital is allocated efficiently. Efficient allocation is achieved by investing in growing industries, while investment in declining industries should be reduced (Wurgler, 2000). The quality of investment opportunities at the firm level could be proxied by the value-added growth. To capture the sensitivity of investment to the growth in value added, we follow Faccio at al. (2016) and estimate the investment efficiency model augmented to account for the owner type.

$$
\begin{aligned}
Gross\ Investment_{it} = {} & \alpha_0 + \boldsymbol{\beta}X_{it} + \sum_{k=2}^{K}\gamma_k Ownership\ Type_{it} + \\
& + \sum_{k=2}^{K}\rho_k VA_{it} \times Ownership\ Type_{it} + \\
& + \mu VA_{it} + \eta VA_{it} \times BGroup_{it} + \\
& + \delta BGroup_{it} + \nu RA_{it} + \boldsymbol{\lambda_c}Macro_{ct} + \tau_t + f_i + \varepsilon_{it},
\end{aligned}
\tag{4}
$$

for all $i = 1,…, N$ (firm index); $t = 2001,…, 2018$ (time index, year); $k = 2,…, K$ (ownership type, $K = 7$, omitted category ($k = 1$) is *Family); c = 1,…, C* (country index). *BGroup* is the dummy variable that equals to unity if the firm is part of a business group (omitted category is a stand-alone firm).

VA_{it} is the growth in value added defined as $\ln \frac{Value\ Added_{it}}{Value\ Added_{it-1}}$, which reflects the quality of the firm's investment opportunities. Then, μ represents the sensitivity of investments to growth opportunities and ρ indicates how relevant ownership type for investment efficiency ($\rho = 0$ if irrelevant). Similarly, *VA* is interacted with *BGroup* capturing the effect of business group affiliation on investment efficiency ($\eta = 0$ if irrelevant). We also control for risk-avoidance (RA_{it}) defined earlier.

Vector X_{it} and vector $Macro_{ct}$ contain sets of firm-specific and country-level control variables respectively, as discussed above. τ_t and f_i are time and firm fixed effects. ε_{it} is the error term robust to arbitrary heteroskedasticity.

The results are presented in Table 6 and show that investment of state-owned firms have higher efficiency than investment of family-owned firms. For the corporate owners we observe a lower investment efficiency compared to family owners. Also, in general (in pooled data) the business group firms *ceteris paribus* show higher contribution to the value-added growth.

3.4 Change in the Ownership Type as an Identification of Investment Behavior

Despite careful sample construction using matched samples as a robust test in all previous analyses we are aware that we cannot be fully confident that we completely disentangle the influence of the type of the supermajority owner and the unobserved firm-level characteristics. It could be the case that unobserved latent parts of the firm characteristics could be responsible for the substantial part of the observed effect(s).

While changes in owner type are rather infrequent, we are able to identify a sufficient number of changes between major ownership types (family, corporate, institutional) to conduct a meaningful analysis. We use the "shock" introduced by the owner type change to assess change in the level of investment, change in sensitivity to business opportunities, profitability, and cash flows.

To properly capture the effect of change in the owner type, we use several matched samples. For example, if a firm is transitioning from family ownership to corporate ownership, we compare its investment levels and sensitivities to the matched sample of family-owned

firms and also to the matched sample of firms owned by corporates. This strategy allows us better map the transition and its implications for firm investment. As before, matched samples are constructed by identifying firms of similar size and asset structure, operating in exactly the same industry (letter NACE2), country, and time period and the same firm structure (stand-alone versus business group).

Table 7 presents the results. Panel A focuses on the ownership transfers from family to corporate owners. Note that a dummy variable *After* captures the change in investment levels and sensitivities after the owner type change. When firms transitioning from family to corporate ownership are compared against the control sample of family owners (Columns 1-3), the decrease in the level of firm investment, the decrease of ROA, cash flow and value-added growth sensitivities are observed. Interestingly, when transitioning firms are compared against a control sample of firms with corporate owners, no significant *after* changes in investment levels, ROA, cash flow and value-added growth sensitivities are observed. These results suggest that transfer of ownership from family owners to corporate owners triggers the change in firm investment behavior, which becomes less family-like and more corporate-like.

Panel B of Table 7 focuses on the transitions from family ownership to institutional ownership. Similarly to Panel A, the investment levels and sensitivities are assessed against the control sample of family firms and against the control sample of institutional owners. We do not observe any significant changes in investment levels for transitioning firms. Lack of changes in investment levels could be attributed to the majority of institutional investors being passive in our sample. There are however clear changes in sensitivities. Specifically, ROA, cash flow and value-added growth sensitivities decrease when compared against the control sample of family firms with no owner type changes. No significant after changes in sensitivities are observed when transitioning firms are compared against the control sample of firms with institutional owners.

4   Conclusion

We examine the impacts of different types of the owners on investment decisions of private firms. In order to eliminate agency problem, we consider firms with the share of largest owner above 95 percent. In particular, we document how owner type affects firm investment levels and whether different types of owners have different sensitivities to business opportunities, profitability, cash flows and value-added growth. We also control for a firm structure and include identification of stand-alone firms and business groups, respectively.

For the analysis we construct a large sample of European privately owned firms covering the period from 2001 to 2018. The advantage of our sample is that identified owner types are the major decision makers. We focus on family (base category), corporate, institutional and state owners. Our methodology is designed to overcome methodological shortcomings of previous studies. To this end, we capture the effect of the change in the ownership type ("transitory" effect) as well as the effect of ownership type in firms with no change of ownership ("permanent" effect) in the sample. Prior studies (See e.g., Thomsen and Pedersen, 2000) focus only the so-called transitory effect.

Finally, address the potential endogeneity by using matching samples and examining transitions from one owner type to another. Overall, our main results confirm substantially higher sensitivity of the family-owned firms to investment opportunities, profitability, cash flows and value-added growth compared to corporate and institutional owners. State-owned firms consistently show even higher sensitivity to ROA, cash flows and business opportunities than family-owned firms.

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Table 1
Summary statistics

This table contains summary statistics for our sample. Firm-level data were retrieved from eight biannual updates of Amadeus (Bureau van Dijk) database. Macroeconomic indicators use the WDI (World Bank) data. Firms operating in financial industries are excluded (NACE codes 64 – 66). Panel A reports the summary statistics for the variables used in the analysis. All firm level variables are measured in the USD. GDP is in constant 2010 USD and expressed here in trillions. GDP per capita is also in constant 2010 USD. Panel B reports the number of observations by industry and owner type; Panel C by country; Panel D by year. Finally, Panel E provides selective descriptive statistics by the type of the owner. Definition of variables in available in Table A.1 in the Appendix.

Panel A: Descriptive statistics

				Distribution				
	N	*Mean*	*St Dev*	*p5*	*P25*	*P50*	*p75*	*p95*
Firm-level variables								
Gross Investment	672,016	0.051	1.010	-0.072	0.001	0.030	0.094	0.288
Ln (Total Assets)	672,016	15.077	1.557	12.456	14.000	15.091	16.223	17.602
Ln (Employees)	672,016	3.611	0.986	2.398	2.773	3.401	4.290	5.517
Cash Flow	672,016	0.084	0.130	-0.085	0.030	0.073	0.136	0.285
Sales Growth	672,016	0.116	0.468	-0.322	-0.091	0.042	0.217	0.707
Value Added growth	368,521	0.055	0.321	-0.421	-0.099	0.044	0.206	0.566
ROA	671,781	0.063	0.143	-0.131	0.012	0.051	0.116	0.286
Leverage	672,016	0.188	0.222	0.000	0.002	0.109	0.302	0.625
Age	671,438	37.850	17.521	6.000	19.000	50.000	50.000	50.000
Tangibility	672,016	0.259	0.239	0.009	0.062	0.184	0.400	0.757
Risk Avoidance	672,016	1.172	0.638	0.000	1.000	1.000	2.000	2.000
Macro variables								
GDP (in trillions)	672,016	1.365	1.085	0.052	0.247	1.418	2.505	3.191
GDP per Capita	672,016	33,059	18,063	6,710	22,444	32,283	41,249	87,770
GDP Growth	672,016	1.728	2.627	-3.439	0.623	1.706	2.917	6.247
Private Credit/GDP	672,016	97.230	40.574	31.203	67.728	96.020	119.835	171.188
Market Cap/GDP	672,016	59.686	30.832	14.624	34.148	58.352	81.858	116.683

Panel B: Observations by industry and owner type

Industry (Alphabet, NACE 2)	Family	Corporate	Active	State	Institutional	Anonymous Corporate	Anonymous Private	Total
A. Agriculture, Forestry and Fishing	7,924	3,466	0	1,255	452	13	14	13,124
B. Mining and Quarrying	886	1,492	0	79	176	0	0	2,633
C. Manufacturing	77,309	83,754	72	1,200	10,395	177	100	173,007
D. Electricity, Gas, Steam and Air Conditioning Supply	580	2,308	0	1,284	73	2	3	4,250
E. Water Supply; Sewerage, Waste Management and Remediation Activities	2,271	4,853	0	1,950	277	2	8	9,361
F. Construction	54,707	21,675	12	644	4,469	63	51	81,621
G. Wholesale and Retail Trade; Repair of Motor Vehicles	83,320	75,350	55	324	10,075	282	174	169,580
H. Transportation and Storage	19,149	15,177	4	1,286	1,937	18	17	37,588
I. Accommodation and Food Service Activities	16,076	10,264	11	196	2,014	9	13	28,583
J. Information and Communication	5,617	14,237	26	377	1,566	11	28	21,862
L. Real Estate Activities	3,268	3,989	2	1,135	1,199	1	13	9,607
M. Professional, Scientific and Technical Activities	10,530	15,861	31	1,534	2,210	4	48	30,218
N. Administrative and Support Service Activities	12,373	10,480	20	465	2,008	23	16	25,385
P. Human Health and Social Work Activities	2,118	1,863	3	150	451	8	14	4,607
Q. Arts, Entertainment and Recreation	4,658	8,307	28	1,719	1,617	4	251	16,584
R. Other Service Activities	2,030	3,020	4	616	503	3	30	6,206
S. Activities of Households	2,691	1,953	2	281	303	3	8	5,241
X. Other	10,189	20,441	10	231	1,644	26	18	32,559
Total	315,696	298,490	280	14,726	41,369	649	806	672,016

Panel C: Observations by country

Country	Family	Corporate	Active	State	Institutional	Anonymous Corporate	Anonymous Private	Total
Austria	985	2,884	0	87	558	0	0	4,514
Belgium	254	24,387	59	12	3,389	7	10	28,118
Bulgaria	20,932	3,562	1	796	261	0	2	25,554
Czech Republic	11,698	5,975	3	4	531	0	0	18,211
Germany	12,183	19,310	10	2,148	2,076	8	29	35,764
Spain	109,302	52,810	33	1,362	8,547	18	4	172,076
Finland	1	986	0	0	12	0	0	999
France	35,785	81,313	81	20	15,658	507	47	133,411
Great Britain	1,812	29,154	9	17	958	0	66	32,016
Greece	9,496	5,670	0	108	439	36	0	15,749
Croatia	22,198	6,820	2	632	218	13	25	29,908
Hungary	111	1,634	6	3	181	0	2	1,937
Ireland	339	1,228	1	11	199	0	1	1,779
Italy	1,765	14,898	14	249	1,586	0	3	18,515
Netherlands	0	1,342	0	6	164	0	0	1,512
Norway	16,979	11,873	4	678	4,322	0	448	34,304
Poland	9,961	13,608	48	3,306	663	0	0	27,586
Portugal	22,025	7,689	6	157	810	33	14	30,734
Romania	20,903	3,582	0	78	104	23	153	24,843
Serbia	5,608	740	0	28	42	0	0	6,418
Sweden	3	2,678	0	0	41	0	0	2,722
Slovenia	7,520	1,893	1	44	250	0	2	9,710
Slovakia	1,503	883	0	5	71	4	0	2,466
Ukraine	4,333	3,571	2	4,975	289	0	0	13,170
Total	315,696	298,490	280	14,726	41,369	649	806	672,016

Panel D: Observations by year

Year	Family	Corporate	Active	State	Institutional	Anonymous Corporate	Anonymous Private	Total
2000	99	746	0	5	17	1	0	868
2001	1,283	9,685	0	220	303	12	0	11,503
2002	1,759	11,693	0	260	391	6	1	14,110
2003	3,589	13,345	2	277	524	11	3	17,751
2004	8,573	16,678	3	388	874	14	9	26,539
2005	21,873	24,752	8	518	1,602	52	92	48,897
2006	28,305	26,455	11	567	2,553	104	26	58,021
2007	23,520	26,832	12	689	3,281	80	39	54,453
2008	27,548	28,064	30	809	4,023	22	48	60,544
2009	21,634	18,350	27	800	2,931	11	7	43,760
2010	21,794	15,773	17	2,226	2,379	17	31	42,237
2011	17,316	10,053	15	1,213	1,584	41	29	30,251
2012	3,477	2,256	5	71	493	37	2	6,341
2013	5,178	8,938	19	80	1,835	49	4	16,103
2014	23,410	17,901	35	569	3,669	59	64	45,707
2015	25,136	17,833	30	640	4,274	50	177	48,140
2016	25,641	18,166	25	886	3,963	35	175	48,891
2017	28,534	16,586	23	2,357	3,666	24	60	51,250
2018	27,027	14,384	18	2,151	3,007	24	39	46,650
Total	315,696	298,490	280	14,726	41,369	649	806	672,016

Panel E: Selective Descriptive Statistics by Ownership Type

Variables	N	Mean	St Dev	p5	p25	p50	p75	p95
Family								
Gross Investment	315,541	0.065	0.890	-0.071	0.000	0.035	0.110	0.324
Cash Flow	315,541	0.094	0.129	-0.055	0.035	0.077	0.143	0.303
Value Added growth	169,006	0.069	0.397	-0.429	-0.097	0.051	0.225	0.639
Ln (Employees)	315,541	3.211	0.790	2.303	2.639	2.996	3.638	4.868
Risk Avoidance	315,541	1.160	0.620	0.000	1.000	1.000	2.000	2.000
Corporate								
Gross Investment	283,817	0.045	0.532	-0.070	0.002	0.027	0.081	0.248
Cash Flow	283,817	0.076	0.131	-0.111	0.026	0.071	0.131	0.270
Value Added growth	161,044	0.049	0.420	-0.459	-0.102	0.044	0.203	0.565
Ln (Employees)	283,817	3.974	1.006	2.485	3.135	3.871	4.727	5.749
Risk Avoidance	283,817	1.154	0.646	0.000	1.000	1.000	2.000	2.000
Active								
Gross Investment	380	0.047	0.128	-0.123	-0.005	0.021	0.085	0.268
Cash Flow	380	0.069	0.168	-0.201	0.007	0.072	0.143	0.294
Value Added growth	191	-0.015	0.355	-0.405	-0.131	-0.021	0.160	0.404
Ln (Employees)	380	4.246	1.028	2.674	3.466	4.227	5.081	5.979
Risk Avoidance	380	1.082	0.682	0.000	1.000	1.000	2.000	2.000
State								
Gross Investment	17,989	-0.081	4.423	-0.101	-0.005	0.045	0.132	0.312
Cash Flow	17,989	0.054	0.122	-0.111	0.018	0.056	0.100	0.214
Value Added growth	7,049	0.041	0.376	-0.368	-0.077	0.041	0.174	0.443
Ln (Employees)	17,989	4.413	1.027	2.639	3.664	4.477	5.215	5.999
Risk Avoidance	17,989	1.675	0.667	1.000	1.000	2.000	2.000	3.000
Institutional								
Gross Investment	52,802	0.039	0.216	-0.079	0.000	0.023	0.071	0.227
Cash Flow	52,802	0.079	0.128	-0.094	0.028	0.072	0.133	0.272
Value Added growth	33,910	0.023	0.385	-0.440	-0.114	0.018	0.166	0.487
Ln (Employees)	52,802	3.768	0.949	2.398	2.996	3.638	4.407	5.541
Risk Avoidance	52,802	1.169	0.615	0.000	1.000	1.000	2.000	2.000
Anonymous Corporate								
Gross Investment	661	0.043	0.090	-0.051	0.004	0.033	0.070	0.165
Cash Flow	661	0.058	0.095	-0.041	0.026	0.050	0.084	0.200

Value Added growth	406	0.021	0.277	-0.329	-0.088	0.024	0.154	0.351
Ln (Employees)	661	3.679	0.942	2.398	2.890	3.555	4.317	5.389
Risk Avoidance	661	1.234	0.686	0.000	1.000	1.000	2.000	2.000
Anonymous Private								
Gross Investment	826	0.008	0.160	-0.144	-0.042	0.010	0.045	0.188
Cash Flow	826	0.072	0.130	-0.080	0.021	0.052	0.102	0.266
Value Added growth	455	-0.018	0.268	-0.308	-0.133	-0.025	0.075	0.328
Ln (Employees)	826	3.712	1.018	2.398	2.944	3.434	4.394	5.778
Risk Avoidance	826	1.184	0.857	0.000	1.000	1.000	2.000	3.000

Table 2
Correlation matrices for selected variables

This table contains the selected correlations for the entire sample. See Appendix I for variable definitions.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Gross Investment	1.000							
(2) Cash Flow	0.017***	1.000						
(3) Ln (Employees)	0.001	-0.002	1.000					
(4) Ln (Total Assets)	0.004***	-0.082***	0.592***	1.000				
(5) Sales Growth	0.031***	0.137***	0.028***	-0.019***	1.000			
(6) Ln (Age)	0.009***	-0.013***	0.105***	0.114***	0.029***	1.000		
(7) ROA	0.020***	0.798***	-0.016***	-0.034***	0.146***	-0.008***	1.000	
(8) Risk Avoidance	-0.004***	0.043***	0.030***	0.013***	0.000	-0.005***	0.047***	1.000

Table 3
Impact of Ownership type on Firm investment: Simple Augmented Model

This table presents regression results of augmented investment equation. Macro-variables consist of private credit to GDP, stock market capitalization to GDP, GDP growth, GDP in constant USD, and GDP per capita (constant USD). Firm specific control variables are ln (Total Assets) and its square, cash flow, ln(number of employees), sales growth, leverage, firm age, and a dummy variable for the missing age of the firm. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Heteroskedasticity consistent standard errors are in brackets Full estimation results are provided in the Online Appendix Table IA.3.

	Dependent Variable = Gross Investment									
	Pooled				Corporate		State		Institutional	
	Transitory	Permanent	Transitory	Permanent	Transitory	Permanent	Transitory	Permanent	Transitory	Permanent
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Ownership Type (vs Family)										
Corporate	0.004	-0.188***	0.004	-0.188***	0.002	-0.053***				
	(0.012)	(0.003)	(0.012)	(0.003)	(0.005)	(0.001)				
Active	0.038	-0.302***	0.039	-0.312***						
	(0.100)	(0.053)	(0.100)	(0.053)						
State	-0.034	-0.272***	-0.034	-0.258***			-0.056	-0.230***		
	(0.030)	(0.009)	(0.030)	(0.009)			(0.132)	(0.013)		
Institutional	0.011	-0.182***	0.011	-0.182***					0.014	-0.049***
	(0.017)	(0.005)	(0.017)	(0.005)					(0.008)	(0.001)
Anonymous Individual	-0.000	-0.290***	-0.001	-0.291***						
	(0.102)	(0.035)	(0.102)	(0.035)						
Anonymous Corporate	-0.009	-0.301***	-0.009	-0.309***						
	(0.095)	(0.031)	(0.095)	(0.031)						
Structure Type (vs Stand-alone)										
Business Group	-0.002	-0.084***	-0.002	-0.053***	-0.004**	-0.021***	-0.003	-0.159***	-0.002	-0.020***
	(0.004)	(0.002)	(0.012)	(0.006)	(0.002)	(0.001)	(0.009)	(0.005)	(0.002)	(0.001)
Risk-avoidance score vs 0 (=lowest risk avoidance)										
Risk-avoidance score =1			0.005	-0.073***	-0.011	-0.012***	0.033	-0.181***	-0.023*	-0.004***
			(0.017)	(0.004)	(0.007)	(0.002)	(0.041)	(0.007)	(0.013)	(0.001)
Risk-avoidance score =2			0.026	-0.102***	0.000	-0.032***	0.059	-0.221***	-0.017	-0.021***
			(0.018)	(0.004)	(0.007)	(0.002)	(0.043)	(0.008)	(0.013)	(0.001)
Risk-avoidance score =3			0.049*	-0.260***	0.003	-0.063***	0.106*	-0.536***	-0.015	-0.041***
			(0.025)	(0.010)	(0.011)	(0.005)	(0.060)	(0.020)	(0.017)	(0.004)
Constant	-12.214***	0.053	-12.221***	0.03	-1.151***	0.014	-16.040***	-0.128	-0.244	-0.031
	(0.275)	(0.034)	-0.275	-0.034	(0.137)	(0.016)	(0.560)	(0.125)	(0.210)	(0.024)
Macro Variables	Yes		Yes		Yes		Yes		Yes	
Firm-level controls	Yes		Yes		Yes		Yes		Yes	
Firm & Time FE	Yes		Yes		Yes		Yes		Yes	
Country & Industry FE		Yes		Yes		Yes		Yes		Yes
R-squared	0.019	0.182	0.019	0.175	0.038	0.142	0.023	0.271	0.075	0.608
N	672,016	672,016	672,016	672,016	473,997	473,997	145,132	145,132	162,467	162,467

Table 4
Investment sensitivity to Investment Opportunities and Profitability

Control firm-level variables, macro includes the standard set of variables used in previous tables. Base (omitted) category is Family-owned firm. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Heteroskedasticity consistent standard errors are in brackets.

	Dependent Variable = *Gross Investment*							
	Original sample		Matched samples					
	Pooled		Corporate		State		Institutional	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inv. Opportunities	0.029***	0.029***	0.025***	0.025***	0.019***	0.019***	0.018***	0.018***
	(0.004)	(0.004)	(0.002)	(0.002)	(0.006)	(0.006)	(0.002)	(0.002)
Interactions with Ownership Type (vs Family)								
Inv. Opportunities x *Corporate*	-0.016***	-0.016***	-0.003	-0.003				
	(0.006)	(0.006)	(0.002)	(0.002)				
Inv. Opportunities x *Active*	-0.026	-0.026						
	(0.151)	(0.151)						
Inv. Opportunities x *State*	0.293***	0.293***			0.291***	0.291***		
	(0.016)	(0.016)			(0.023)	(0.023)		
Inv. Opportunities x *Institutional*	-0.016	-0.016					-0.002	-0.002
	(0.013)	(0.013)					(0.003)	(0.003)
Inv. Opportunities x *Anonymous Individual*	-0.008	-0.008						
	(0.115)	(0.115)						
Inv. Opportunities x *Anonymous Corporate*	-0.013	-0.013						
	(0.085)	(0.085)						
Structure Type (vs Stand-alone)								
Business Group	-0.003	-0.003	-0.004**	-0.004**	-0.004	-0.004	-0.001	-0.001
	(0.004)	(0.004)	(0.002)	(0.002)	(0.009)	(0.009)	(0.002)	(0.002)
Profitability (ROA)	-0.090***	-0.091***	-0.095***	-0.095***	-0.039	-0.040	-0.072***	-0.072***
	(0.024)	(0.024)	(0.011)	(0.011)	(0.046)	(0.046)	(0.014)	(0.014)
Interactions with Ownership Type (vs Family)								
Profitability x *Corporate*	0.026	0.025	-0.027**	-0.027**				
	(0.023)	(0.023)	(0.011)	(0.011)				
Profitability x *Active*	0.077	0.077						
	(0.456)	(0.456)						

Profitability x *State*	3.152***	3.152***			3.336***	3.336***		
	(0.084)	(0.084)			(0.121)	(0.121)		
Profitability x *Institutional*	-0.008	-0.009					-0.050***	-0.050***
	(0.046)	(0.046)					(0.014)	(0.014)
Profitability x	-0.041	-0.034						
Anonymous Individual	(0.494)	(0.494)						
Profitability x	0.121	0.121						
Anonymous Corporate	(0.391)	(0.391)						
Risk-avoidance score vs 0 (=lowest risk avoidance)								
Risk-avoidance score =1		0.004	-0.014**			0.032		-0.029**
		(0.017)	(0.007)			(0.041)		(0.013)
Risk-avoidance score =2		0.018	-0.010			0.051		-0.031**
		(0.018)	(0.008)			(0.043)		(0.013)
Risk-avoidance score =3		0.034	-0.013			0.090		-0.039**
		(0.025)	(0.011)			(0.060)		(0.017)
Constant	-12.174***	-12.199***	-1.310***	-1.303***			-0.566***	-0.534**
	(0.276)	(0.277)	(0.138)	(0.138)	(0.560)	(0.125)	(0.212)	(0.212)
Macro Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm & Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.019	0.019	0.029	0.029	0.023	0.023	0.055	0.055
N	671,781	671,781	473,824	473,824	145,083	145,083	162,430	162,430

Table 5
Investment sensitivity to Investment Opportunities and Cash Flow

Control firm-level variables, macro includes the standard set of variables used in previous tables. Base (omitted) category is Family-owned firm. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Heteroskedasticity consistent standard errors are in brackets.

Independent Variables	Dependent Variable = *Gross Investment*							
	Original sample		Matched samples					
	Pooled		Corporate		State		Institutional	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inv. Opportunities	0.026***	0.026***	0.022***	0.022***	0.014**	0.014**	0.017***	0.017***
	(0.004)	(0.004)	(0.002)	(0.002)	(0.006)	(0.006)	(0.002)	(0.002)
Interactions with Ownership Type (vs Family)								
Inv. Opportunities x *Corporate*	-0.014***	-0.014**	-0.002	-0.002				
	(0.006)	(0.006)	(0.002)	(0.002)				
Inv. Opportunities x *Active*	-0.022	-0.022						
	(0.151)	(0.151)						
Inv. Opportunities x *State*	0.390***	0.390***			0.393***	0.393***		
	(0.016)	(0.016)			(0.023)	(0.023)		
Inv. Opportunities x *Institutional*	-0.014	-0.015					-0.003	-0.003
	(0.012)	(0.012)					(0.003)	(0.003)
Inv. Opportunities x *Anonymous Individual*	-0.014	-0.014						
	(0.114)	(0.114)						
Inv. Opportunities x *Anonymous Corporate*	-0.011	-0.011						
	(0.085)	(0.085)						
Structure Type (vs Stand-alone)								
Inv. Opportunities x *Business Group*	-0.003	-0.003	-0.004**	-0.004**	-0.004	-0.004	-0.001	-0.001
	(0.004)	(0.004)	(0.002)	(0.002)	(0.009)	(0.009)	(0.002)	(0.002)
Cash flow	-0.069***	-0.070***	0.018*	0.018*	-0.096***	-0.098***	0.023**	0.023**
	(0.018)	(0.018)	(0.010)	(0.010)	(0.026)	(0.026)	(0.011)	(0.011)
Interactions with Ownership Type (vs Family)								
Cash flow x *Corporate*	0.012	0.011	-0.048***	-0.048***				
	(0.025)	(0.025)	(0.012)	(0.012)				
Cash flow x *Active*	0.054	0.054						
	(0.468)	(0.468)						

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash flow x *State*	0.318***	0.317***			0.341***	0.341***		
	(0.090)	(0.090)			(0.129)	(0.129)		
Cash flow x *Institutional*	-0.030	-0.030					-0.062***	-0.062***
	(0.051)	(0.051)					(0.015)	(0.015)
Cash flow x *Anonymous Individual*	0.235	0.241						
	(0.469)	(0.469)						
Cash flow x *Anonymous Corporate*	0.122	0.121						
	(0.378)	(0.378)						
Risk-avoidance score vs 0 (=lowest risk avoidance)								
Risk-avoidance score =1		0.002		-0.015**		0.030		-0.029**
		(0.017)		(0.007)		(0.041)		(0.013)
Risk-avoidance score =2		0.017		-0.011		0.050		-0.032**
		(0.018)		(0.008)		(0.043)		(0.013)
Risk-avoidance score =3		0.033		-0.015		0.090		-0.039**
		(0.025)		(0.011)		(0.060)		(0.017)
Constant	-12.274***	-12.297***	-1.267***	-1.258***	-16.068***	-16.135***	-0.512**	-0.479**
	(0.276)	(0.277)	(0.137)	(0.138)	(0.557)	(0.560)	(0.212)	(0.212)
Macro Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm & Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.016	0.016	0.028	0.028	0.02	0.02	0.054	0.054
N	672,016	672,016	473,997	473,997	145,127	145,127	162467	162467

Table 6
Investment Efficiency and Owner Type

This table presents regression results for investment efficiency using value-added growth. Base categories are Family-owned firm, the stand-alone firm, and firm with lowest risk-avoidance score. For definition of macro and firm -level variables see Table 3 or Table A.1 in the appendix. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively. Heteroskedasticity consistent standard errors are in brackets.

Independent Variables	Dependent Variable = Gross Investment							
	Original sample		Matched samples					
	Pooled		Corporate		State		Institutional	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Investment Efficiency	0.047***	0.034***	0.046***	0.032***	0.044***	0.036***	0.033***	0.016
(proxied by VA Growth)	(0.003)	(0.007)	(0.002)	(0.005)	(0.004)	(0.013)	(0.006)	(0.014)
Interactions with Ownership Type (vs Family)								
Value added x *Corporate*	-0.019***	-0.019***	-0.024***	-0.024***				
	(0.003)	(0.003)	(0.002)	(0.002)				
Value added x *Active*	0.145	0.146						
	(0.115)	(0.115)						
Value added x *State*	0.179***	0.179***			0.178***	0.177***		
	(0.015)	(0.015)			(0.019)	(0.019)		
Value added x *Institutional*	-0.009	-0.009					-0.002	-0.002
	(0.007)	(0.007)					(0.006)	(0.006)
Value addeds x *Anonymous Individual*	-0.004	-0.004						
	(0.062)	(0.062)						
Value added x *Anonymous Corporate*	0.033	0.035						
	(0.066)	(0.066)						
Interactions with Structure Type (vs Stand-alone)								
Value added x *Business Group*	0.007**	0.007**	0.002	0.002	0.006	0.005	0.004	0.004
	(0.003)	(0.003)	(0.002)	(0.002)	(0.006)	(0.006)	(0.006)	(0.006)
Risk-avoidance score 0 (=lowest risk avoidance)								
Risk-avoidance score =1		0.013*		0.013***		0.009		0.017
		(0.007)		(0.004)		(0.013)		(0.013)
Risk-avoidance score =2		0.013*		0.020***		0.009		0.019
		(0.007)		(0.005)		(0.014)		(0.014)
Risk-avoidance score =3		0.008		0.009		0.005		0.094**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		(0.019)		(0.012)		(0.040)		(0.042)
Constant	-2.586***	-2.578***	-1.936***	-1.927***		-3.004***	-2.976***	-0.445
	(0.149)	(0.150)	(0.112)	(0.112)		(0.269)	(0.271)	(0.370)
Macro Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Ownership, Structure & Risk avoidance dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm & Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.038	0.038	0.097	0.097	0.039	0.039	0.040	0.040
N	368,521	368,521	261,826	261,826	80,181	80,181	95,959	95,959

Table 7. Sensitivity to Investment Opportunities and Profitability After Owner Type Change

Panel A. Changes from Family to Corporate Owner

	Dependent Variable = Gross Investment					
	Control group = Family			Control group = Corporate		
	(1)	(2)	(3)	(4)	(5)	(6)
After	-0.005	-0.007*	-0.006***	-0.006	-0.003	0.003
	(0.005)	(0.004)	(0.002)	(0.005)	(0.004)	(0.003)
Investment Opportunities	0.027***	0.029***	0.013*	0.033***	0.036***	0.028***
(proxied by Sales Growth)	(0.003)	(0.003)	(0.007)	(0.003)	(0.004)	(0.005)
Sales Growth x *After*	0.005	0.005	0.014	0.001	-0.001	-0.001
	(0.009)	(0.010)	(0.011)	(0.010)	(0.010)	(0.011)
Casf flow	0.133***			0.067***		
	(0.009)			(0.009)		
Cash flow x *After*	-0.052**			0.037		
	(0.024)			(0.041)		
ROA		0.063***			0.010	
		(0.008)			(0.022)	
ROA x *After*		-0.038**			0.026	
		(0.018)			(0.030)	
Efficiency			0.044***			0.046**
			(0.006)			(0.020)
Efficiency x *After*			-0.024*			-0.016
			(0.014)			(0.024)
Business group	-0.004**	-0.004***	-0.006***	-0.006**	-0.008***	-0.006
	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Constant	-0.090	-0.057	-0.080	-0.067	-0.580	-0.281
	(0.103)	(0.103)	(0.124)	(0.114)	(0.494)	(0.269)
Macro Variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Country, Industry & Time FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.185	0.176	0.203	0.046	0.036	0.034
N	38,185	38,274	21,773	44,150	44,692	25,342

Panel B. Changes from Family to Institutional Owner

Independent Variables	Dependent Variable = Gross Investment					
	Control group = Family			Control group = Institutional		
	(1)	(2)	(3)	(4)	(5)	(6)
After	0.005	0.002	-0.006	0.004	0.005	0.005
	(0.004)	(0.004)	(0.004)	(0.005)	(0.004)	(0.006)
Investment Opportunities	0.021***	0.022***	-0.005	0.040**	0.041**	0.037**
(proxied by Sales Growth)	(0.007)	(0.007)	(0.021)	(0.016)	(0.016)	(0.017)
Sales Growth x *After*	-0.010	-0.009	0.018	-0.026	-0.025	-0.010
	(0.012)	(0.011)	(0.025)	(0.023)	(0.023)	(0.022)
Casf flow	0.117***			0.035		
	(0.020)			(0.022)		
Cash flow x *After*	-0.098***			-0.002		
	(0.036)			(0.037)		
ROA		0.054***			-0.004	
		(0.012)			(0.015)	
ROA x *After*		-0.071***			-0.010	
		(0.027)			(0.029)	
Efficiency			0.039***			0.101
			(0.011)			(0.085)
Efficiency x *After*			-0.048**			-0.104
			(0.020)			(0.085)
Business group	-0.002	-0.002	0.002	-0.008	-0.008	-0.010
	(0.002)	(0.002)	(0.003)	(0.006)	(0.006)	(0.008)
Constant	-0.389	-0.338	0.117	-0.041	0.000	0.612
	(0.319)	(0.317)	(0.211)	(0.590)	(0.585)	(0.625)
Macro Variables	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level controls	Yes	Yes	Yes	Yes	Yes	Yes
Country, Industry & Time FE	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.192	0.186	0.216	0.034	0.033	0.032
N	11,564	11,586	7,111	10,327	10,399	6,475

Appendix I

Table A.1. Definitions of variables and sources of data

| Variable	Definition
Firm-level control variables	
Cash Flow	Profits/loss plus depreciation (=*CF*) scaled by total assets (*TOAS*). Source: Amadeus database provided by the Bureau van Dijk
Ln (Employees)	Natural logarithm of the number of employees (*EMPL*). Source: Amadeus database provided by the Bureau van Dijk
Ln (Total Assets)	Natural logarithm of total assets (*TOAS*) in million USD. Source: Amadeus database provided by the Bureau van Dijk
Sales Growth	Sales $(TURN)_t$ minus lagged sales $(TURN)_{t-1}$ scaled by lagged sales $(TURN)_{t-1}$. Source: Amadeus database provided by the Bureau van Dijk
Value Added Growth	Value Added $(VA)_t$ minus lagged value added $(VA)_{t-1}$ scaled by lagged value added $(VA)_{t-1}$. Source: Amadeus database provided by the Bureau van Dijk
Leverage	Long-term debt (*LTDB*) plus bank loans (*BL*) scaled by total assets (*TOAS*). Source: Amadeus database provided by the Bureau van Dijk
Ln (Age)	Firm age, since the (local) incorporation. Computed as year minus year of incorporation plus 1. Source: Amadeus database provided by the Bureau van Dijk
Missing Age	If age is missing, then missing age is equal to 1, otherwise 0.
Risk Avoidance	Risk-avoidance is an index ranges from 0 to 3, with higher scores denoting greater risk avoidance. It is constructed by adding 1 when (1) a firm's leverage is in the bottom 20% of the distribution; (2) the volatility of firm-level profitability is in the bottom 20% of the distribution; and (3) if the firm survives at least 5 years. The index Source: Definition taken from (Faccio et al, 2016)
Country-level macroeconomic variables	
Private Credit/GDP	Private credit scaled by GDP. Private credit is the deposit by money banks and other financial institutions. Source: WDI (World Bank)
Market Cap/GDP	Total value of all listed shares on the national stock exchange as a percentage of GDP. Source: WDI (World Bank)

GDP Growth	The annual percentage nominal growth rate of GDP denominated in the local currency. Source: WDI (World Bank)
GDP Per Capita	Real GDP per capita in 2010 USD (a proxy for country income) Source: WDI (World Bank)
GDP	Real GDP in 2010 USD (a proxy for country size) Source: WDI (World Bank)

Pyramid (Business Group) Construction

We start with the panel of annual direct ownership links between firms in Amadeus and employ the algorithm described in Figure 1 of the Appendix to create the unique identification for owners without the tax/business ID in the Amadeus database. Because of excessive data size, we identify and create the business groups using top-down approach.[9] Potential top of the pyramids are the subjects listed as firm owners for which we do not have an ownership report. Therefore, as the first step we identify the ultimate owners as either individuals or firms that are not owned directly or indirectly by other firms and/or individuals. As a result, we either have individuals/families or widely held firms at the top of a pyramid. From the top, we repeat a searching algorithm that identify firms owned by the ultimate owner — level 1 firms that are directly owned by top of the pyramid (level 0), level 2 firms that are directly owned by level 1 firms, etc. The procedure is repeated until we are left only with firms that are never recorded as owners. Figure A.2 in the Appendix illustrates the algorithm schematically and Figure A.3 provides visualization of a complex (vertical) pyramidal structure.

Using the algorithm, we sort each firm into the following structural ownership categories: 1) Stand-alone firms and business groups. To account for possible effect of the complexity of the pyramidal structure, we distinguish between 2) horizontal pyramid or subsidiary structure and 3) vertical pyramid or complex business group. For horizontal pyramid we assume that all controlled firms are located in the level 1, while vertical pyramid represents a more complex structure with more levels that vary in shape. See Figure 1 and Figure 2 for typical examples.

Figure 1: Visualization of the ownership links for the horizontal pyramid (subsidiary-type structure)

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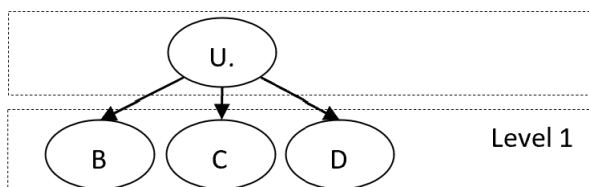
[9] Alternatively, ownership chain in pyramids could be constructed from the bottom-up (e.g., Belenzon and Berkovitz (2010)).

Figure 2: Visualization of the ownership links for a complex pyramid
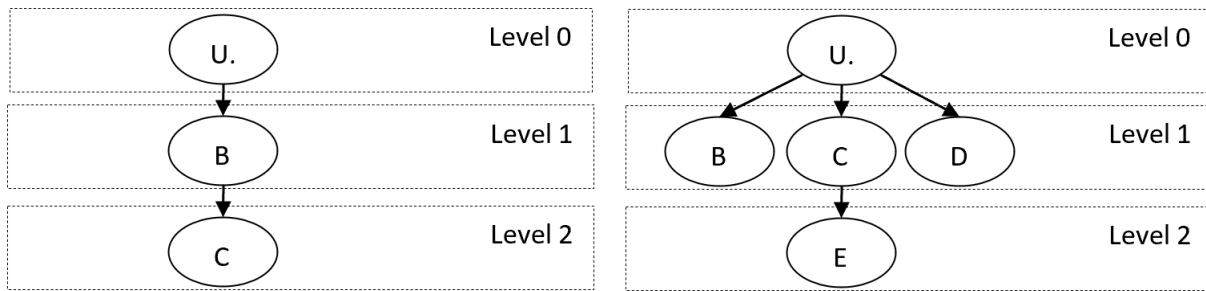
While we keep identification of different business group structures, we will primarily distinguish between stand-alone firms and firms that belong to a business group.

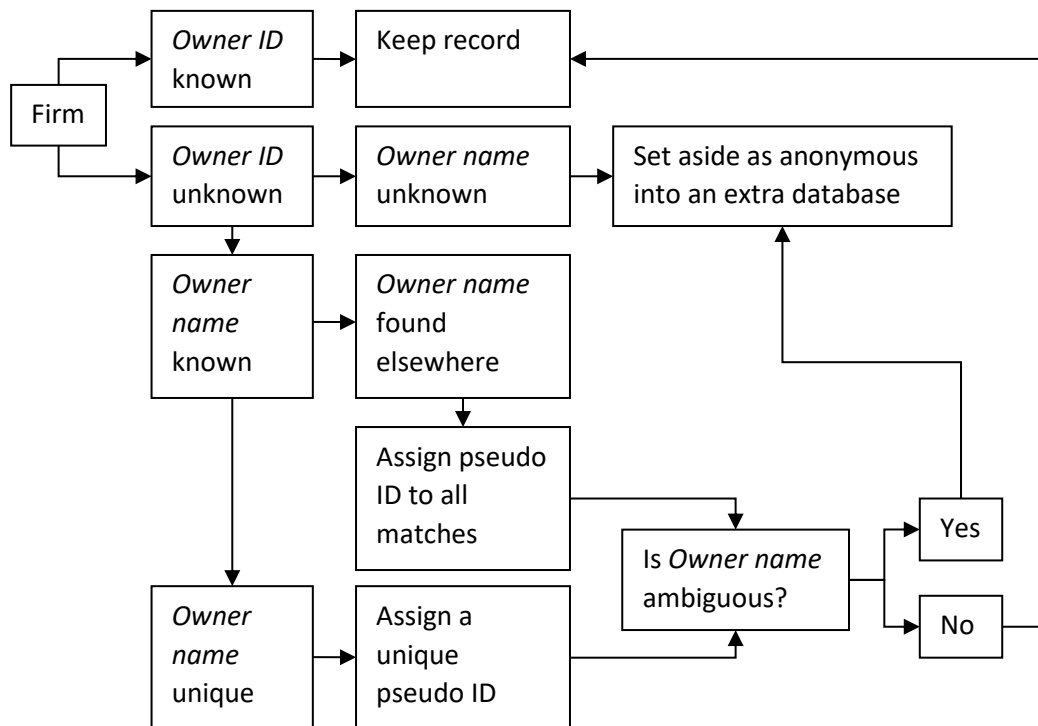Figure A.1: Scheme of the data preparation algorithm
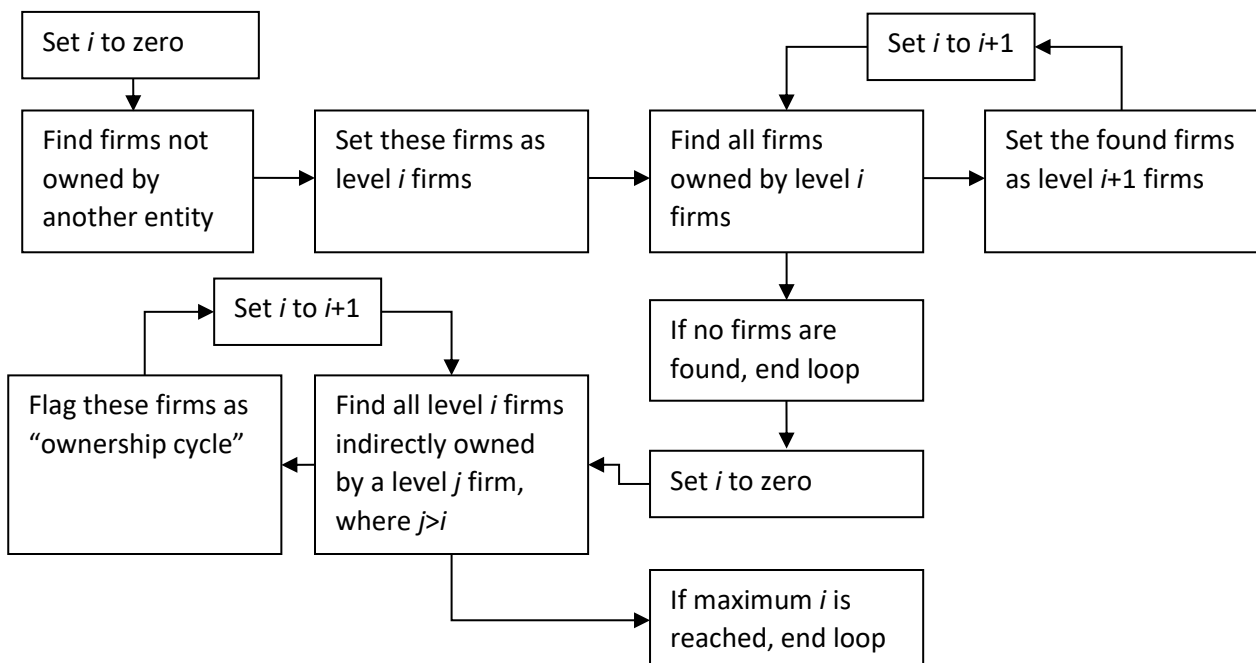

Figure A.2: Scheme of the pyramid construction algorithm, year-by-year

Figure A.3: Visualization of a complex pyramidal structure