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Family control and investment–cash flow sensitivity: Empirical evidence from the Euro zone

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ABSTRACT

This paper considers the ownership structure of family firms to determine whether family control alleviates or exacerbates investment–cash flow sensitivity in the Euro zone. We find that family-controlled corporations have lower investment–cash flow sensitivities. Further, our results show that this reduced sensitivity is mainly attributable to family firms with no deviations between cash flow and voting rights and to family firms in which family members hold managerial positions. We also find that second largest shareholders affect family firms' sensitivity and are associated with either monitoring (non-family second blockholders) or collusion (family second blockholders). Overall, family control seems to mitigate investment inefficiencies that derive from capital market imperfections.

1. Introduction

The recent sharp economic downturn demonstrates that financial markets are far from perfect and that the constraints that characterize them can be severe deterrents to the ability of companies to implement value-adding projects (Campello et al., 2010). In fact, the recent financial crisis is likely to have long-term economic consequences because financially constrained corporations may decide to sacrifice long-term value in exchange for short-term cash flow. The consequence of such behavior is lower future economic growth. In this context interest in the family business as an organizational form has been revived (Byrne, 2009). Indeed, some of the specificities inherent to the family business model, such as longer investment horizons, may give family firms an advantage in tough economic times such as those we recently experienced (Stern, 2009).

Considering the importance of firm-level capital allocation decisions to the overall economy, the literature has paid particular attention to corporate investment decision-making and, most notably, to the sensitivity of investment to financial factors such as internal cash flow. Previous studies have also identified other firm-level characteristics that affect investment spending, including a firm's capital structure, Tobin's *q*, and sales (Aivazian et al., 2005a, 2005b; Cleary et al., 2007; Pawlina, 2010). In addition, several recent studies investigate whether a firm's ownership structure is an important determinant of corporate investment decision-making (Fahlenbrach, 2009) and whether it can explain the sensitivity of investment to fluctuations in cash flow (see, e.g., Goergen and Renneboog, 2001; Hadlock, 1998; Pindado and de la Torre, 2009).

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Family owners are the predominant type of controlling shareholders in many developing countries as well as in some of the most developed economies of the world. In fact, family control is found in many geographical regions with varying legal and financial systems, including the United States, Western Europe, and East Asia (Anderson and Reeb, 2003a; Claessens et al., 2000; Dahya et al., 2008; Faccio and Lang, 2002; Kim, 2010; La Porta et al., 1999; Morck et al., 2005).

Based on the important role played by a firm's ownership structure in explaining investment spending and the investment–cash flow relation and given the global prevalence of family control around the world, we empirically investigate whether the presence of a controlling family in the company either mitigates or exacerbates the sensitivity of investment to internal funds. We then analyze whether different types of family control influence the relation between investment and cash flow differently. First, we examine whether the impact of family control on the investment–cash flow relation is nonlinear by considering deviations between cash flow rights and voting rights in some family-controlled corporations. Second, we take into account the possibility that the active involvement of the family in a company's management may affect the firm's investment–cash flow sensitivity. Third, we control for the moderating role of a general blockholder (as opposed to family control). Finally, we investigate whether and, if so, how a second large shareholder in family businesses affects the investment–cash flow relation.

We estimate our proposed empirical models using a sample of listed corporations from nine Euro zone countries. Stock information and financial statements of companies are extracted from the Worldscope database, and data related to the ownership structure of firms are obtained from the database developed by Faccio and Lang (2002). We choose the estimation method carefully to avoid serious econometric problems highlighted in previous literature. Specifically, we use panel data methodology to eliminate unobservable heterogeneity, and we estimate our models using the generalized method of moments (GMM) to control for the endogeneity problem.

Our results show that family control helps mitigate the sensitivity of investment to cash flow, which is consistent with the potential benefits associated with family ownership. However, two factors affect this relation. First, we find that when the potential for controlling families to expropriate wealth from minority shareholders is high (as proxied by the use of control-enhancing mechanisms that separate cash flow from voting rights), the mitigating effect of family firms on investment–cash flow sensitivities disappears. Second, our empirical evidence suggests that the benefits related to family control, in terms of a lower dependence on internal funds for investment, are limited to family firms in which the family actively participates in the company's management. In addition, the results of several robustness analyses show that the reduced investment–cash flow sensitivity of family firms is not driven by a general blockholder effect and that the presence of second large shareholders plays a vital role in the investment decision-making process by either monitoring (in the case of non-family second blockholders) or colluding with (in the case of family second blockholders) the controlling family.

Our empirical research extends the work by Wei and Zhang (2008) along the following dimensions. Wei and Zhang investigate the positive and negative effects that ownership concentration have on the relation between investment and cash flow. Although their sample consists of East Asian firms, which are predominantly family owned, they do not specifically examine family control of corporations. Therefore, we go a step forward by accounting for the largest shareholders' identity and examining how a firm's level of investment and its investment–cash flow sensitivity are affected by family control, which is a unique type of concentrated ownership structure. Additionally, our study covers the institutional environment of Western European countries, which differs substantially from the East Asian setting (see Faccio et al., 2001).

We contribute to the finance and family business literature in several ways. First, we investigate whether the widely reported investment–cash flow sensitivity is moderated by the ownership structure of the firm. More precisely, we attempt to disentangle whether the presence of a controlling family in the company attenuates or exacerbates the investment–cash flow sensitivity. This issue is of particular interest because previous studies have not adequately examined the role of families in the corporate investment process or, specifically, the role of family ownership in the relation between corporate investment and firms' cash flow. In addition, controversy remains concerning the advantages and disadvantages attributable to family control relative to other types of organizational forms. By paying specific attention to the family control of corporations, we go a step forward and complement prior research that only considers the level of ownership concentration but not the type of large shareholder (Wei and Zhang, 2008). Notably, we differentiate between the general blockholder effect and the specific family influence, as Andres (2008) points out, because several characteristics associated with family control, such as the longer investment horizons and reputation concerns of family owners, are not necessarily applicable to other types of large investors.

Second, we account for the extensively supported nonlinearities of the value–ownership relation by controlling for the monitoring and expropriation phenomena associated with certain ownership structures. Although previous studies report a nonlinear impact of a firm's ownership structure on the investment–cash flow sensitivity, their focus has been mainly on insider ownership (Hadlock, 1998; Pawlina and Renneboog, 2005). However, we are interested in the effect of family ownership concentration; therefore, rather than applying ownership concentration (and its square) as an explanatory variable within our model as in prior research that accounts for the monitoring and expropriation effects simultaneously (see, e.g., Gedajlovic and Shapiro, 1998; Miguel et al., 2004; Thomsen and Pedersen, 2000), we proxy for the nonlinearity effects. Specifically, we control for the presence of an owner family in the company and proxy for the monitoring effect exercised by this type of investor. To measure the possibility of expropriation of minority shareholders' wealth by this dominant shareholder, we sort family firms according to whether they use control structures that violate the one share–one vote rule. Consequently, we account for the possibility that in some cases family control positively mitigates the dependence of investment on internal cash flow whereas in other cases family control exacerbates the problem due to the expropriation incentives of the controlling family.

Third, we advance previous literature that investigates the impact of corporate ownership structure on the investment–cash flow sensitivity by considering other dimensions related to a firm's organizational form apart from ownership concentration and

excess control by large shareholders. In particular, we provide evidence on the influence that family participation in management has on the relation between investment spending and cash flow. The active involvement of family members in top management positions can be regarded as one specific type of mechanism used by large owners to assure tight control of the business. However, contrary to other control mechanisms that lead to deviations between ownership and control, we find that family management is related to a decrease in investment–cash flow sensitivities. This finding indicates that having controlling family members actively involved in management benefits the firm because of the knowledge they accumulate about the business itself and the industry in which the company operates. Another aspect that we consider, which is often ignored in prior literature related to our study (e.g., Wei and Zhang, 2008), is the presence and identity of second blockholders in family firms. As highlighted by Faccio et al. (2001), other blockholders beyond the controlling shareholder can serve as a corporate governance mechanism that effectively monitors the owner family. In fact, Faccio et al. suggest that in the context of the dividend policy in Western European family firms, the mere presence of multiple large shareholders may be beneficial to the company. However, our results support the need to account for the identity of second blockholders in family firms in relation to investment spending because we find that different types of second blockholders have unique motivations to either monitor or collude with the firm's controlling owner.

Finally, we use panel data methodology, which allows us to control for individual heterogeneity. In other words, every company can be attached to a particular corporate behavior that is unobservable to the researcher but that can manifest itself in the investment decision-making process. Consequently, we reduce the risk of obtaining biased results. Moreover, we address the endogeneity problem that arises in our analysis by using the system GMM estimator. The GMM estimator is a key component to our study as failing to control for endogeneity is likely to yield inconsistent estimates (Blundell et al., 1992; Florackis and Ozkan, 2009). In addition, we contribute to the literature on the relation between ownership structure and corporate investment by showing that after controlling for endogeneity, the family nature of a business seems to have no direct effect on investment spending. By contrast, family control significantly affects the relation between investment and cash flow, even after addressing the endogeneity problem, which supports the notion that family control plays an important moderating role in the firm's investment policy.

The remainder of the paper is organized as follows. Section 2 reviews previous literature on the investment–cash flow sensitivity and the family control of corporations and presents our hypotheses. The data and estimation method are described in Section 3. Section 4 discusses the empirical approach adopted and the main results of the investigation, and Section 5 presents the robustness tests. Finally, Section 6 highlights our main findings.

2. Theory and hypotheses development

The widely reported influence of cash flow on a firm's investment spending stems mainly from the understanding that capital markets are imperfect. As a result of the extant imperfections in the financial markets, corporate investments are not only determined by a firm's investment opportunities but also by firms' ability to finance these opportunities or, more precisely, by the availability of internally generated funds.[1] Extensive research, beginning with Fazzari et al. (1988), finds a positive and strong relation between investment spending and cash flow and thus supports this conclusion. Yet controversy remains regarding the investment–cash flow sensitivity (Hovakimian, 2009; Hovakimian and Hovakimian, 2009).

Given this positive relation between investment and cash flow, prior literature investigates whether the ownership structure of the firm, taken as a corporate governance mechanism that can control the problems that characterize imperfect capital markets, plays a moderating role in the investment–cash flow sensitivity. Since the pioneering work by Fazzari et al. (1988), some researchers have considered insider ownership and ownership concentration when analyzing the relation between investment and cash flow. Hadlock (1998) is among the first to show that the sensitivity of investment to cash flow can be alleviated by insider ownership when the interests of managers and investors converge. Complementing this study, Goergen and Renneboog (2001) find that large institutional investors effectively contribute to reducing the link between investment spending and cash flow in the United Kingdom.

With respect to the particular case of family-controlled corporations, the literature is scarce, and few studies provide insight regarding whether this type of organizational form either attenuates or exacerbates the dependence of corporations on internally generated funds when undertaking new investments. Of the studies that are available, a recent paper by Wei and Zhang (2008) concludes that ownership concentration reduces the investment–cash flow sensitivity in East Asia, where family control is widespread.

Indeed, family ownership is associated with notable potential benefits that may mitigate the imperfections of capital markets. First, the long-term presence of the family in the company provides incentives for controlling shareholders to maximize firm value over a longer horizon (James, 1999; McVey and Draho, 2005), thus reducing to some extent the deviation from the optimal investment level (Morgado and Pindado, 2003). As recent research suggests, longer decision horizons can lead to an alignment of managers' and shareholders' interests and, consequently, to higher valuations, because managers (and, alternatively, controlling owners) have less incentive to make investments that offer faster paybacks at the expense of value creation in the long run (Antia et al., 2010). Second, as suggested by Anderson et al. (2003), family owners help to alleviate the agency costs between bondholders and shareholders. They have a lower cost of debt financing, which, in turn, leads to a reduction in the wedge between the cost of internal and external finance, thereby reducing the financial constraints faced by family firms. Third, previous studies show that

[1] Supporting the idea that market imperfections affect corporate investment policies, Almeida et al. (2011) develop a model in which future financing constraints lead firms to prefer certain types of investments to ensure funding for present and future investment projects.

the long-term presence of a family shareholder and the concern for the family name's reputation leads to higher earnings quality (Ali et al., 2007; Wang, 2006), which might be related to lower information asymmetries between current and prospective investors.

Consequently, the propensity to over- and underinvestment (so often blamed for the investment–cash flow sensitivity) may possibly be reduced in family-controlled corporations. Supporting this argument, Caprio et al. (2010) suggest that family firms adopt a very conservative approach toward acquisitions and do not find evidence that European family firms destroy value when they acquire other companies; these findings indicate that family companies are less likely to overinvest by means of merger and acquisition activity. In addition, Franks et al. (2010) argue that in countries where family businesses are the predominant form (as is the case in Western Europe), institutions adapt to the needs of these companies, and, as a result, family firms are not at a disadvantage even in sectors with high dependence on external capital; this line of reasoning suggests that family control could reduce the likelihood of underinvestment.

Considering these arguments, we expect that family firms have a lower dependence on internal funds when they undertake new investments, and thus we pose the following hypothesis:

H1. *The investment–cash flow sensitivity is lower in family firms than non-family firms.*

As previously pointed out, ownership concentration can be an effective mechanism to alleviate the investment–cash flow sensitivity. However, extensive research shows that the relation between ownership and firm value is nonlinear as a result of the monitoring and expropriation effects associated with ownership concentration (see, e.g., Gedajlovic and Shapiro, 1998; Miguel et al., 2004; Thomsen and Pedersen, 2000). Some studies account for such nonlinearities when investigating how ownership concentration affects the investment–cash flow sensitivity. Particularly, Pindado and de la Torre (2009) show that when large shareholders have the ability to expropriate minority investors' wealth, over- and underinvestment problems are more likely. Conversely, these problems are less likely when large shareholders are properly monitored.

Focusing now on family ownership concentration, we anticipate that its impact on the investment–cash flow sensitivity is also nonlinear. That is, family owners may effectively mitigate the dependence of investment spending on internal funds in some cases, and they may exacerbate such dependence in other cases. Indeed, prior research shows that family control impacts firm value and profitability nonlinearly, which can be explained by the monitoring and expropriation hypotheses (Anderson and Reeb, 2003a; Maury, 2006).

As suggested in previous finance literature, although family ownership solves much of the classic owner–manager agency problem, it creates conflicts between the controlling family and minority shareholders (Villalonga and Amit, 2006, 2009). This new agency problem results mainly from the risk of expropriation of minority shareholders' wealth by the owner family under specific circumstances. In fact, families have both the incentive and the ability to expropriate and to take actions that benefit themselves at the expense of firm performance when their stake in the company is substantial and when their voting rights exceed their cash flow rights (Anderson and Reeb, 2003a; Bae and Goyal, 2010). For instance, family owners may make investment decisions that are inefficient from minority shareholders' point of view but that are beneficial to the family. By contrast, when control structures are in place that do not allow deviations between cash flow and voting rights, agency conflicts between the family and minority investors are reduced, and such investment inefficiencies can be avoided.

Another important type of control structure frequently used by family firms is the active involvement of family members in management positions. In fact, previous family business literature shows that active and passive family control influences corporate performance differently (see, e.g., Anderson and Reeb, 2003a; Maury, 2006; Villalonga and Amit, 2006). Consequently, family involvement in managerial activities is likely to affect the company's investment policy.

Given this discussion, we propose that the alleviation of the sensitivity of investment spending with respect to cash flow due to family control is likely to differ depending on the way family owners assure their control of the company. Specifically, we take into account whether family firms use or refrain from using control structures that separate cash flow from voting rights and whether family members hold managerial positions in the company. Consequently, we formulate our second hypothesis as follows:

H2. *The lower investment–cash flow sensitivity in family firms as compared to non-family firms is attributable to family firms with certain control structures.*

3. Data and estimation method

3.1. Data sources and sample

We need three different types of information to estimate our empirical models. First, we need the financial statements of companies to calculate the investment and cash flow variables as well as to compute the control variables included in the models. Second, we need stock data to calculate Tobin's *q*, which is used as a proxy for the investment opportunities and future prospects of corporations. Finally, we need detailed information on the ownership structure of companies to test our hypotheses on the impact of family ownership on investment–cash flow sensitivity. Therefore, we employ two different sources of information: We extract financial and stock data from the Worldscope database, and we obtain the information related to the firms' ownership structure from the database developed by Faccio and Lang (2002). In addition, we obtain some macroeconomic data (such as the growth of capital goods prices and the rates of interest of short- and long-term debt) necessary to calculate the variables as explained in Appendix A from the Organization for Economic Cooperation and Development's *Main Economic Indicators*.

From the 13 Western European countries in Faccio and Lang's (2002) data set, we focus on the nine Euro zone nations: Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, and Portugal. We merge the ownership data of corporations that operate in these countries with the financial information from Worldscope. Then, following the literature on corporate investment and other financial decisions (see, e.g., Wei and Zhang, 2008; Whited, 2006), we exclude from the sample financial companies (SIC codes 6000–6999) as well as regulated utilities (SIC codes 4900–4999).

Faccio and Lang's (2002) database only provides ownership information for each company for one single year. Nevertheless, this limitation is not important to our study because, as highlighted in previous research (La Porta et al., 1999; Zhou, 2001), the ownership structure of corporations tends to be relatively stable over time and typically changes slowly from year to year.[2] Moreover, we only use Faccio and Lang's data to classify corporations into different categories. In any case, to reduce further the possible bias that might arise as a consequence of combining the ownership information from one specific year with financial data from several consecutive years, we only include in the final sample firms whose first year of financial information is between 1996 and 1999, which are the years covered by Faccio and Lang.[3]

The time period of our study is also restricted by the availability of the information needed to test our hypotheses, namely, from 1996 to 2006. Finally, our methodology imposes an additional restriction to account for the unobservable heterogeneity and endogeneity problems. That is, we need at least four consecutive years of information per company to test for the absence of second-order serial correlation because our estimation method, the GMM, is based on this assumption. Therefore, the final sample is an unbalanced panel comprised of 684 companies (6024 observations) for which information is available for at least four consecutive years between 1996 and 2006. Nevertheless, the models are not estimated using all observations due to our inclusion of the lag of some variables in the right-hand side of the models.[4] The structure of the total and family firm samples, by number of companies and observations per country, is provided in Table 1.

Following previous literature and taking into account the availability of data related to companies' ownership structure, we consider a firm to be family controlled if the ultimate owner at the 10% (alternatively 20%) threshold is an individual, a family, or an unlisted company. Faccio and Lang (2002) first propose this family firm definition, which has subsequently been used in other studies (Holderness, 2009; Laeven and Levine, 2008; Maury, 2006). About 75% (510/684 ≈ 75%) of the companies included in the sample are family firms when we use the 10% threshold to define family control. If we adopt a more restrictive 20% threshold for our definition, the percentage of family companies in the sample decreases to about 66% (451/684 ≈ 66%). Although these percentages may seem high, they are quite reasonable when we consider that we exclude financial institutions and UK companies from the analysis.[5] Table 2 presents the distribution of the sample by industry, and Panels A and B of Table 3 provide the main summary statistics (mean, standard deviation, minimum, median, and maximum) of the variables included in the models and the correlations between them.

3.2. Descriptive analysis

To investigate the differences that exist between family firms and their non-family counterparts in Euro zone countries, we carry out several difference of means tests for all variables used in the multivariate analyses. Panels C and D of Table 3 presents the results of these univariate tests. In Panel C, we simply differentiate between family and non-family businesses, and in Panel D we go a step further by splitting the family firm sample in two groups depending on the likelihood that controlling families are able to expropriate minority shareholders' wealth based on the use of control mechanisms that result in deviations between cash flow and voting rights.

As Panel C of Table 3 shows, family-controlled corporations differ from their non-family counterparts in several aspects (see *t*-statistics in column 4). First, family firms in our sample have a lower level of cash flow but, at the same time, face higher investment opportunities, as proxied by Tobin's *q*. These findings suggest that family firms in Euro zone countries are more likely to be financially constrained, whereas non-family companies may be potential overinvestors. Second, we find that both the debt and dividends ratios are significantly lower in family firms. The other firm-level characteristic that is different between subsamples is sales, which are significantly higher in family-controlled corporations.

The univariate tests presented in Panel D of Table 3 (see *t*-statistics in column 5) show that family companies are heterogeneous. In fact, the findings in this panel support the view that expropriating and non-expropriating family firms differ from each other in terms of investment–cash flow sensitivities.[6] As highlighted in the panel, family firms with no deviations between cash flow and voting rights own less internal funds but have higher investment opportunities. Overall, these findings point to potential problems of overinvestment in family firms that make use of at least one control-enhancing mechanism and are consistent with H2, which posits that family firms' expected lower investment–cash flow sensitivities may be attributable to family businesses with specific control structures. The other *t*-statistics (i.e., columns 6 and 7) reported in Panel D compare the two

[2] Fan and Wong (2002) also merge ownership data from one single year (i.e., 1996) with stock return and financial data from several years (i.e., 1991–1995).

[3] Although Faccio and Lang (2002) only provide ownership information for each company for a single year, the information does not come from the same year for all companies. Depending on the countries in which firms operate, the data can come from 1996, 1997, 1998, or 1999.

[4] In particular, the models are estimated using 6024 − 684 = 5340 observations.

[5] As noted by Faccio and Lang (2002), family-controlled firms are least prevalent in the United Kingdom and among financial institutions.

[6] As explained in Section 4.2, expropriating family firms are those firms that use at least one control-enhancing mechanism to enable controlling families to own voting rights in excess of their cash flow rights.

Table 1
Distribution of the sample by country and ownership structure. This table shows the number and percentage of firms and observations by country and ownership structure. Data are extracted for companies for which information was available for at least four consecutive years between 1996 and 2006. Following Faccio and Lang (2002), the family firm sample includes all corporations whose ultimate owner either at the 10% or 20% threshold is an individual, a family, or an unlisted company. Of the total sample, 74.56% (65.94%) are family businesses using the 10% (20%) threshold family firm definition. The percentage of family firms by country using the 10% (20%) threshold family firm definition is as follows: 58.33% (58.33%) family firms in Austria, 70.97% (64.52%) family firms in Belgium, 79.41% (72.69%) family firms in Germany, 70.73% (48.78%) family firms in Spain, 56.52% (39.13%) family firms in Finland, 80.85% (71.28%) family firms in France, 30.77% (23.08%) family firms in Ireland, 84.91% (84.91%) family firms in Italy, and 72.00% (56.00%) family firms in Portugal.

Panel A: Distribution of the full sample by country

Country	Firms		Observations	
	n	%	*n*	%
Austria	36	5.26	333	5.53
Belgium	31	4.53	293	4.86
Germany	238	34.80	2036	33.80
Spain	41	5.99	373	6.19
Finland	46	6.73	398	6.61
France	188	27.49	1634	27.12
Ireland	26	3.80	240	3.98
Italy	53	7.75	510	8.47
Portugal	25	3.65	207	3.44
Total	684	100.00	6024	100.00

Panel B: Distribution of the sample by ownership structure: 10% threshold family firm definition

Country	Type of firm							
	Family				Non-family			
	Firms		Observations		Firms		Observations	
	n	%	*n*	%	*n*	%	*n*	%
Austria	21	4.12	176	3.91	15	8.62	157	10.30
Belgium	22	4.31	209	4.64	9	5.17	84	5.51
Germany	189	37.06	1643	36.51	49	28.16	393	25.79
Spain	29	5.69	249	5.53	12	6.90	124	8.14
Finland	26	5.10	207	4.60	20	11.49	191	12.53
France	152	29.80	1362	30.27	36	20.69	272	17.85
Ireland	8	1.57	72	1.60	18	10.34	168	11.02
Italy	45	8.82	443	9.84	8	4.60	67	4.40
Portugal	18	3.53	139	3.09	7	4.02	68	4.46
Total	510	100.00	4500	100.00	174	100.00	1524	100.00

Panel C: Distribution of the sample by ownership structure: 20% threshold family firm definition

Country	Type of firm							
	Family				Non-family			
	Firms		Observations		Firms		Observations	
	n	%	*n*	%	*n*	%	*n*	%
Austria	21	4.66	176	4.45	15	6.44	157	7.58
Belgium	20	4.43	191	4.83	11	4.72	102	4.93
Germany	173	38.36	1499	37.91	65	27.90	537	25.94
Spain	20	4.43	163	4.12	21	9.01	210	10.14
Finland	18	3.99	128	3.24	28	12.02	270	13.04
France	134	29.71	1193	30.17	54	23.18	441	21.30
Ireland	6	1.33	56	1.42	20	8.58	184	8.89
Italy	45	9.98	443	11.20	8	3.43	67	3.24
Portugal	14	3.10	105	2.66	11	4.72	102	4.93
Total	451	100.00	3954	100.00	233	100.00	2070	100.00

family firm subsamples with non-family corporations. They confirm that family firms are heterogeneous in the sense that, although non-expropriating family businesses are significantly different from non-family firms with respect to certain characteristics, the same differences do not hold when comparing expropriating family corporations with the non-family firm subsample (see, e.g., cash flow and Tobin's q).

3.3. Baseline specification and estimation method

Our investment model derives from Fazzari et al.'s (1988) specification, in which the key explanatory variables are cash flow and Tobin's q. We extend their model by incorporating the interaction between cash flow and different dummy variables,

Table 2
Distribution of the sample by industry. This table contains the number and percentage of observations and firms by primary two-digit SIC code. This industry classification has been used to compute the industry-adjusted investment measure. Following prior literature, financial companies (SIC codes 6000–6999) and regulated utilities (SIC codes 4900–4999) are excluded from the sample.

SIC Code	Industry description	Firms		Observations		% family firms
		n	%	*n*	%	
01	Agricultural production — crops	1	0.15	11	0.18	100.00
08	Forestry	2	0.29	15	0.25	50.00
10	Metal mining	2	0.29	12	0.20	50.00
12	Coal mining	2	0.29	16	0.27	100.00
13	Oil and gas extraction	3	0.44	21	0.35	100.00
14	Nonmetallic minerals, except fuels	6	0.88	52	0.86	100.00
15	General building contractors	16	2.34	126	2.09	75.00
16	Heavy construction, except buildings	12	1.75	116	1.93	75.00
17	Special trade contractors	2	0.29	22	0.37	50.00
20	Food and kindred products	71	10.38	585	9.71	77.46
22	Textile mill products	11	1.61	104	1.73	90.91
23	Apparel and other textile products	14	2.05	126	2.09	92.86
24	Lumber and wood products	9	1.32	75	1.25	66.67
25	Furniture and fixture	4	0.58	22	0.37	100.00
26	Paper and allied products	20	2.92	175	2.91	70.00
27	Printing and publishing	8	1.17	67	1.11	100.00
28	Chemicals and allied products	32	4.68	308	5.11	71.88
29	Petroleum and coal products	8	1.17	79	1.31	37.50
30	Rubber and misc. plastics products	23	3.36	217	3.60	69.57
31	Leather and leather products	6	0.88	52	0.86	50.00
32	Stone, clay, and glass products	38	5.56	366	6.08	73.68
33	Primary metal industries	17	2.49	152	2.52	41.18
34	Fabricated metal products	25	3.65	206	3.42	68.00
35	Industrial machinery and equipment	53	7.75	444	7.37	73.58
36	Electronic and other electronic equipment	37	5.41	324	5.38	75.68
37	Transportation equipment	32	4.68	305	5.06	81.25
38	Instruments and related products	11	1.61	94	1.56	90.91
39	Miscellaneous manufacturing industries	10	1.46	93	1.54	70.00
41	Local and interurban passenger transit	6	0.88	46	0.76	83.33
42	Trucking and warehousing	4	0.58	32	0.53	75.00
44	Water transportation	11	1.61	104	1.73	81.82
45	Transportation by air	6	0.88	54	0.90	50.00
47	Transportation services	2	0.29	22	0.37	50.00
48	Communications	10	1.46	98	1.63	40.00
50	Wholesale trade — durable goods	32	4.68	287	4.76	84.38
51	Wholesale trade — nondurable goods	37	5.41	337	5.59	70.27
52	Building materials and garden supplies	8	1.17	71	1.18	75.00
53	General merchandise stores	6	0.88	46	0.76	83.33
54	Food stores	9	1.32	90	1.49	77.78
55	Automotive dealers and service stations	2	0.29	10	0.17	50.00
56	Apparel and accessory stores	3	0.44	24	0.40	100.00
57	Furniture and home furnishings stores	2	0.29	15	0.25	100.00
58	Eating and drinking places	3	0.44	24	0.40	66.67
59	Miscellaneous retail	8	1.17	76	1.26	100.00
70	Hotels and other lodging places	10	1.46	89	1.48	80.00
73	Business services	25	3.65	207	3.44	80.00
75	Auto repair, services and parking	4	0.58	27	0.45	75.00
78	Motion pictures	1	0.15	5	0.08	100.00
79	Amusement and recreation services	5	0.73	43	0.71	80.00
80	Health services	5	0.73	53	0.88	100.00
84	Museums, botanical, zoological gardens	2	0.29	16	0.27	0.00
87	Engineering and management services	7	1.02	53	0.88	42.86
96	Administration of economic programs	1	0.15	10	0.17	100.00
	Total	684	100.00	6024	100.00	74.56

depending on the hypothesis to be tested. Specifically, our baseline specification, which allows us to test the basic proposition that family and non-family firms differ from each other in terms of the investment–cash flow sensitivity, is:

$$IAI_{it} = \beta_0 + \beta_1 IAI_{it-1} + \beta_2 CF_{it} + \beta_3 FD_{it} + \gamma_2 (CF_{it}{}^{*} FD_{it}) + \beta_4 Q_{it-1} + \varphi X_{it-1} + \varepsilon_{it}. \quad (1)$$

The dependent variable in our models is an industry-adjusted measure of investment (IAI_{it}). The importance of accounting for industry effects in our study is highlighted in Franks et al. (2010), who find that family ownership is diluted more quickly in sectors

Table 3
Summary statistics and descriptive analyses. This table provides the means, standard deviations, minimums, medians, and maximums of the variables used in the paper as well as the correlations between them; the table also shows the difference of means tests between family and non-family firms in their financial characteristics. The sample comprises 684 listed companies (6024 observations) that are present in Faccio and Lang's (2002) data set and for which stock and financial data are available for at least four consecutive years between 1996 and 2006 in the Worldscope database. Nine Euro zone countries (Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, and Portugal) are represented in the sample. The IAI_{it} is the firm's industry-adjusted investment, CF_{it} denotes cash flow, Q_{it} stands for Tobin's q, $DEBT_{it}$ is the debt ratio, DIV_{it} is the dividends ratio, and $SALES_{it}$ denotes scaled net sales. These variables are defined in Appendix A. The firms are classified either as family or non-family according to the family firm definition proposed by Faccio and Lang (2002). *, **, and *** indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Summary statistics

Variable	Mean	Std. dev.	Minimum	Median	Maximum
IAI_{it}	0.005	0.072	−1.486	0.000	0.931
CF_{it}	0.039	0.066	−0.742	0.042	0.495
Q_{it}	0.789	0.649	0.010	0.610	8.425
$DEBT_{it}$	0.106	0.112	0.000	0.074	0.764
DIV_{it}	0.014	0.022	0.000	0.009	0.468
$SALES_{it}$	1.014	0.583	0.000	0.928	7.378

Panel B: Correlation matrix

		(1)	(2)	(3)	(4)	(5)	(6)
IAI_{it}	(1)	1.000					
CF_{it}	(2)	0.143	1.000				
Q_{it}	(3)	0.071	0.338	1.000			
$DEBT_{it}$	(4)	−0.017	−0.230	−0.340	1.000		
DIV_{it}	(5)	0.001	0.365	0.359	−0.235	1.000	
$SALES_{it}$	(6)	0.005	0.054	0.004	−0.172	0.057	1.000

Panel C: Family firms versus non-family firms

	All	Family	Non-family	t-statistic (2)–(3)
	(1)	(2)	(3)	(4)
No. obs.	6024	4500	1524	
IAI_{it}	0.005	0.005	0.004	0.469
CF_{it}	0.039	0.038	0.042	−1.904**
Q_{it}	0.789	0.797	0.765	1.672**
$DEBT_{it}$	0.106	0.103	0.117	−4.231*
DIV_{it}	0.014	0.013	0.014	−1.889**
$SALES_{it}$	1.014	1.051	0.905	8.526*

Panel D: Accounting for different family firm categories

	All	Non-expropr. family	Expropr. family	Non-family	t-statistic (2)–(3)	t-statistic (2)–(4)	t-statistic (3)–(4)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
No. obs.	6024	3142	1358	1524			
IAI_{it}	0.005	0.006	0.003	0.004	1.269	0.829	−0.359
CF_{it}	0.039	0.036	0.043	0.042	−3.482*	−2.808*	0.673
Q_{it}	0.789	0.817	0.753	0.765	2.985*	2.475*	−0.561
$DEBT_{it}$	0.106	0.100	0.108	0.117	−2.146**	−4.729*	−2.038**
DIV_{it}	0.014	0.013	0.013	0.014	1.035	−1.390***	−2.235**
$SALES_{it}$	1.014	1.096	0.948	0.905	7.478*	10.232*	2.402*

that are more dependent on external capital. We include in the right-hand side of our empirical specifications the lag of the dependent variable (IAI_{it-1}) to account for the dynamics of the investment policy and to capture the accelerator effect of this corporate decision (Aivazian et al., 2005a). The cash flow measure (CF_{it}) enters the model as an explanatory variable to investigate the dependence of investment on internal funds due to market imperfections. Similarly, in the right-hand side of the model, we include Tobin's q (Q_{it-1}) as a proxy for the availability of investment opportunities inside the company and other firm-level characteristics usually considered in the literature on corporate investment (X_{it-1} represents a vector of control variables). Specifically, we control for the effect of debt, dividends, and sales on investment.

Our main objective is to analyze the effect of cash flow on investment spending and determine how this effect differs between family and non-family corporations and across family firm categories. For this reason, we extend Fazzari et al.'s (1988) investment model to include in the right-hand side of our specification a family dummy (FD_{it}) that equals 1 for family firms, and zero otherwise. Appendix B provides a description of all dummy variables used in this study. The stand-alone family dummy allows us to account for the direct effect of family control on corporate investment decisions (Anderson and Reeb, 2003b). More important,

we include as an explanatory variable the interaction between cash flow and the family dummy to disentangle the moderating effect of family control on the investment–cash flow sensitivity.

We use panel data methodology in the estimation of the models. We select this methodology to avoid obtaining biased estimates due to the unobservable heterogeneity problem and the potential endogeneity of the regressors. The importance of accounting for these two problems when estimating investment models is highlighted in recent literature (see, e.g., Almeida et al., 2010; Carpenter and Guariglia, 2008; Guariglia, 2008). First, given that we are comparing the investment–cash flow sensitivity across types of corporations, we must account for unobservable individual heterogeneity. More precisely, we must taken into account that every company has a series of characteristics, such as the strategy and corporate culture, that remain constant over time but are unobservable to the researcher (Chi, 2005) and that may affect the investment decision-making process as well as the explanatory variables in our models. Therefore, to eliminate the risk of obtaining biased results, we control for the individual heterogeneity by modeling it as a firm-specific effect, η_i, which is then eliminated by taking the first differences of the variables. This step also allows us to alleviate the omitted variable bias (Chi, 2005; Mura, 2007). Consequently, the error term in our models, ε_{it}, is split into four different components. The first component is the individual or firm-specific effect, η_i. The second component, d_t, measures the temporal or time-specific effect with the corresponding time dummy variables so that we can control for the effect of macroeconomic variables on investment. The third component, c_i, consists of country dummy variables included to control for country-specific effects. Finally, v_{it} is the random disturbance.

Second, we need an instrumental variable method that controls for the possible endogeneity of our explanatory variables. In this respect, the best option is a GMM estimator because it embeds all other instrumental variable methods as special cases (Ogaki, 1993). Moreover, the GMM is particularly suitable for our study given the dynamic nature of the investment policy, which requires that we include lagged investment as an explanatory variable in our empirical models. Prior research shows that in the context of dynamic models several estimation techniques lead to biased estimates. Specifically, ordinary least squares (OLS) provides an estimated coefficient that is biased upward in the presence of individual heterogeneity (Hsiao, 1986). Conversely, the within-groups estimator is seriously biased downward (Nickell, 1981). More recently, Alonso-Borrego and Arellano (1999) show that the first difference GMM estimator is subject to a weak instruments problem. As a result, Blundell and Bond (1998) propose the system GMM in the context of dynamic models, as occurs in our case.[7]

To verify that the system GMM is the most appropriate method for our study and to ensure that the econometric theory holds in our particular case, we compare the results obtained from the estimation of our baseline specification using the different estimators previously discussed. Our findings are reported in Table 4. The estimated coefficient of lagged investment using the benchmark estimation method (system GMM) is 0.137 (column 4). As Hsiao (1986) suggests, the coefficient obtained using the OLS estimator, which in our case is 0.196 (column 1), is biased upward. The coefficient from the within-groups estimation, 0.020 (column 2), is clearly biased downward, in line with Nickell (1981). Contrary to the OLS and within-groups estimators, no clear pattern dictates the relation between the first difference GMM and the system GMM. According to Blundell and Bond (1998), the first difference GMM estimator may be biased downward because of the weak instruments problem. As shown in Table 4 (column 3), the coefficient of lagged investment obtained from the first difference GMM estimation is 0.122, which is lower than the coefficient from the system GMM estimation (0.137). In addition, the t value of the coefficient from the first difference estimation (11.34) is lower than the t value of the same coefficient obtained using the system GMM (20.41). This result shows that the instruments of the first difference GMM estimator are weaker than those of the system GMM estimator. In addition, in line with Almeida et al.'s (2010) discussion on investment equations and their empirical evidence, the results presented in Table 4 show that the OLS coefficients on cash flow and Tobin's q (column 1) are seriously biased upward and downward, respectively, as compared to the system GMM regression results (column 4).

Given the findings presented in Table 4, which corroborate that the econometric theory holds in our specific setting, we conclude that the system GMM estimator is the most appropriate method for our study. Therefore, we estimate all our empirical models using this estimator.[8] An important advantage of using this estimation method is that it allows us to control for the endogeneity of all firm-level financial characteristics that are included as explanatory variables in the investment models. This advantage is especially noteworthy because previous literature shows that investment impacts on several of the corporate financial dimensions included in the right-hand side of the models (Pindado and de la Torre, 2006). Consequently, to avoid the endogeneity problem, we use all the right hand-side variables in the models lagged from $t-1$ to $t-3$ as instruments for the equations in differences (except for the lagged variables included in the right-hand side of the models, whose instruments are lags from $t-2$ to $t-4$) and only one instrument for the equations in levels as suggested by Blundell and Bond (1998) when deriving the system estimator used in our study.

As occurs in most corporate finance studies, most of the variables included in the right-hand side of our models may suffer from the endogeneity problem, and it is extremely complicated, if not impossible, to find enough instrumental variables that comply with the conditions that are required to any instrument.[9] Therefore, according to the solution adopted by the GMM estimation method, we use the lagged values of the explanatory variables as instruments because these lags are highly correlated with the

[7] In a recent paper on corporate investment models, Almeida et al. (2010) also point out that GMM estimators entail gains in efficiency compared to other instrumental variable techniques.

[8] Previous studies closely related to ours also conclude that the system GMM is the most appropriate estimation method for investigating the main determinants of corporate investment (see Goergen and Renneboog, 2001).

[9] As Larcker and Rusticus (2010) explain, any instrumental variable should be correlated with the endogenous regressor but uncorrelated with the error in the structural equation.

Table 4
Family control and the investment–cash flow sensitivity: The choice of estimation method. Regressions results from: $IAI_{it}=\beta_0+\beta_1 IAI_{it-1}+(\beta_2+\gamma_2 FD_{it})CF_{it}+\beta_3 FD_{it}+\beta_4 Q_{it-1}+\varphi X_{it-1}+\varepsilon_{it}$. All of the variables are defined in Appendices A and B. The results are based on the 10% cutoff point definition of family firm proposed by Faccio and Lang (2002). The sample comprises 684 listed companies (6024 observations) that are present in Faccio and Lang's (2002) data set and for which stock and financial data are available for at least four consecutive years between 1996 and 2006 in the Worldscope database. Nine Euro zone countries (Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, and Portugal) are represented in the sample. The rest of the information needed to read this table is: (i) heteroskedasticity consistent asymptotic standard error in parentheses; (ii) *, **, and *** indicate significance at the 1%, 5%, and 10% level, respectively; (iii) t_1 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\gamma_2=0$; (iv) z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as χ^2 under the null of no relationship, degrees of freedom in parentheses; z_2 is a Wald test of the joint significance of the time dummies, asymptotically distributed as χ^2 under the null of no relationship, degrees of freedom in parentheses; z_3 is a Wald test of the joint significance of the country dummies, asymptotically distributed as χ^2 under the null of no relationship, degrees of freedom in parentheses; (v) m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation; and (vi) Hansen is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of no correlation between the instruments and the error term, degrees of freedom in parentheses.

Estimation method	Ordinary least squares estimator	Within-groups estimator	First difference GMM	System GMM
Dep. var.: IAI_{it}	(1)	(2)	(3)	(4)
β_1 (IAI_{it-1})	0.196* (0.014)	0.020 (0.015)	0.122* (0.011)	0.137* (0.007)
β_2 (CF_{it})	0.222* (0.029)	0.158* (0.037)	−0.010 (0.031)	0.144* (0.026)
γ_2 (FD_{it}*CF_{it})	−0.146* (0.033)	−0.099** (0.044)	−0.039 (0.041)	−0.108* (0.029)
β_3 (FD_{it})	0.007** (0.003)	0.002** (0.001)	−0.007 (0.049)	0.000 (0.004)
β_4 (Q_{it-1})	0.002 (0.002)	0.008* (0.003)	0.008* (0.002)	0.005* (0.001)
β_5 ($DEBT_{it-1}$)	−0.040* (0.009)	−0.119* (0.015)	−0.039** (0.017)	−0.049* (0.007)
β_6 (DIV_{it-1})	−0.008 (0.052)	0.161** (0.072)	0.098* (0.037)	0.133* (0.026)
β_7 ($SALES_{it-1}$)	0.000 (0.002)	0.011*** (0.006)	−0.019** (0.009)	0.006** (0.003)
β_0 (Constant)	0.009 (0.007)	0.049* (0.012)	No constant	0.033* (0.006)
t_1	4.197	2.451		2.746
z_1	43.12 (8)	17.96 (8)	21.61 (8)	78.03 (8)
z_2	10.66 (9)	5.16 (8)	12.00 (8)	17.90 (8)
z_3	2.38 (8)	5.78 (9)	5.99 (9)	11.53 (9)
m_1			−6.46	−6.56
m_2			−0.42	−0.21
Hansen			199.45 (165)	292.44 (248)

regressors that they instrument.[10] Moreover, we use the Hansen J statistic of overidentifying restrictions to test for the absence of correlation between the instruments and the error term and find that the instruments used are valid in all models. The system GMM estimator thus provides an adequate solution for the endogeneity problem of the explanatory variables in our investment models that change from one year to the next.

However, this estimation method does not solve the endogeneity problem inherent in the stand-alone family dummy that enters the right-hand side of our empirical specifications because this firm-level characteristic remains relatively stable over time. In this respect, the argument could be made that owner families decide to invest only in those corporations that adopt certain investment policies and that family members' superior knowledge of the company enables them to retain links to only those firms with specific investment strategies. This argument highlights the notion that causation in the relation between family control and investment could go in both directions, hence giving rise to an endogeneity problem.

To assure that our GMM regression results with respect to the effect of the stand-alone family dummy on investment are not driven by the endogeneity problem, we proceed as follows. Instead of simply including the stand-alone family dummy as an explanatory variable in our specifications, we run first-stage logit regressions to predict the probability of being family controlled and then include the predicted probability of family control from these regressions in the right-hand side of the investment models.[11] Specifically, we run cross-sectional logit regressions for each year considered in the study. In these regressions, the dependent variable is a family dummy that equals 1 for family firms, and zero otherwise. The explanatory variables that determine the likelihood of being controlled by a family are ownership concentration, the separation between ownership and control, the size of the company, the standard deviation of the firm's earnings, and sales growth.

Based on prior research, these variables are good candidates for predicting family control. In particular, we expect ownership concentration to increase the probability of being controlled by a family, given that families usually own a large stake in their companies. Further, we anticipate a positive relation between ownership–control separation and the family nature of a company given that owner families frequently resort to different mechanisms to assure control of the business (see, e.g., Claessens et al., 2000; Faccio and Lang, 2002; La Porta et al., 1999; Villalonga and Amit, 2009). Firm size is another important determinant of family ownership as most previous literature consistently shows that family firms are relatively small compared to their non-family counterparts (see, e.g., Anderson and Reeb, 2003a; Andres, 2008; Claessens et al., 2000). We therefore expect firm size to decrease the probability of being family controlled. Another relevant firm-level characteristic that might influence family control is the risk of the business, captured by the standard deviation of the company's earnings. We anticipate a negative relation between family control and firm risk because of controlling families' risk aversion and undiversified portfolios. Finally, we take into account that family members may only hold the stakes in those companies with the best economic outlooks (Anderson and Reeb, 2003a), a

[10] The use of lagged variables as instruments is a solution to the endogeneity problem adopted in prior research (see, e.g., Almeida et al., 2010; Andres, 2008).
[11] A similar approach has already been used in previous literature in the context of financial distress likelihood (see Pindado et al., 2008).

corporate dimension proxied by the growth in business sales. If this assumption is correct, we expect to find a positive impact of sales growth on the probability of being classified as a family firm when estimating the logit models.

Therefore, we conclude that all variables considered in our first-stage logit regressions are likely to determine whether a company is controlled by a family. Indeed, some of these variables have already been used as instruments for corporate ownership structure and family control in previous studies (see, e.g., Anderson and Reeb, 2003a; Demsetz and Lehn, 1985; Fahlenbrach, 2009; Maury, 2006; Villalonga and Amit, 2006). We find that our results support these relations, thus corroborating our expectations that the selected variables are good predictors of the likelihood of being family controlled.[12]

Interestingly, the coefficients obtained from the estimation of our baseline investment specification using different methods, which are reported in Table 4, reveal that controlling for the endogeneity of the stand-alone family dummy has an impact on the estimation results. The results of the OLS regression suggest that family control has a positive impact on investment spending, as the estimated coefficient of the binary variable is 0.007 (column 1). This finding indicates that family firms should be associated with higher investment levels as compared to their non-family counterparts in the Euro zone. A likely explanation for this result is that family owners face fewer difficulties when raising new funds given that they can use their personal wealth as collateral. Along the same lines, the lower agency costs between bondholders and shareholders in family firms (Anderson et al., 2003) can also explain the easier access to external financing in family companies and, in turn, their higher levels of investment.

However, the OLS regression results fail to take into account the endogeneity problem of our family dummy, and, consequently, this interpretation may be incorrect. In fact, the estimated coefficient of the family dummy is different when we estimate our investment models using the preferred system GMM estimator and when we control for the endogenous nature of the family dummy by estimating first-stage logit regressions. In this case, as shown in Table 4 (column 4), family control seems to have no direct effect on investment spending. In other words, the positive coefficient of the family dummy obtained when using the OLS method turns out to be non-significant when we control for endogeneity. This lack of significance is in line with Demsetz and Lehn (1985) and Demsetz and Villalonga (2001), who analyze the effect of ownership structure on firm performance and find no relation between ownership and performance after controlling for the endogeneity of ownership structure.

Given that we use the system GMM to estimate our empirical specifications, we perform several tests to check for the potential misspecification of the models. First, as previously discussed, we use the Hansen *J* statistic of overidentifying restrictions to check for the validity of the instruments chosen. Second, we use the m_2 statistic, developed by Arellano and Bond (1991), to test for the lack of second-order serial correlation in the first-difference residual and find no such problem in our models. Finally, we obtain good results for three Wald tests: z_1 is a test of the joint significance of the reported coefficients, z_2 is a test of the joint significance of the time dummy variables, and z_3 is a test of the joint significance of the country dummy variables.

4. Multivariate analysis

In this section, we present the regression results, focusing mainly on the moderating role of family control in the investment–cash flow relation. These results are obtained using the 10% threshold family firm definition. In the robustness test section, we employ the 20% threshold to examine whether our main conclusions are valid.

4.1. The moderating role of family control in the investment–cash flow sensitivity

To test the first hypothesis and disentangle whether family control reduces the sensitivity of investment to cash flow fluctuations, we estimate the following empirical model:

$$IAI_{it} = \beta_0 + \beta_1 IAI_{it-1} + (\beta_2 + \gamma_2 FD_{it})CF_{it} + \beta_3 FD_{it} + \beta_4 Q_{it-1} + \varphi X_{it-1} + \varepsilon_{it}. \quad (2)$$

This empirical model is the same as our baseline specification, presented in Section 3.3, after rearranging terms. In this model, the effect of cash flow on investment is β_2 for non-family firms (given $FD_{it}=0$) and $(\beta_2+\gamma_2)$ for family firms. A summary of the coefficients of interest in each empirical specification is provided in Appendix C. We, therefore, expect $\left(\hat{\beta}_2 + \hat{\gamma}_2\right) < \hat{\beta}_2$.

The results of estimating Eq. (2) are presented in Table 4 (column 4). The positive effect of cash flow on investment is weaker for family firms ($\hat{\beta}_2 + \hat{\gamma}_2 = 0.144 - 0.108 = 0.036$, statistically significant, see t_1) than for non-family firms ($\hat{\beta}_2 = 0.144$). We, therefore, conclude that although cash flow continues to affect investment positively and significantly in family firms, the effect is considerably lower in comparison with their non-family counterparts. These results thus support H1 and complement previous studies that find that insider ownership under specific circumstances and ownership concentration in the hands of some investor categories facilitate a reduction in investment–cash flow sensitivities (Goergen and Renneboog, 2001; Hadlock, 1998; Pindado and de la Torre, 2009). In our particular case, the results suggest that family control—and the potential advantages attached to it, such as the longer investment horizons and the reputation concerns of owner families—facilitate less dependence of investment spending on internally generated funds. This conclusion is consistent with Andres (2009), who finds that founding family ownership in Germany is associated with lower agency costs and diminishes information asymmetries with external suppliers of finance. Our findings advance Wei and Zhang's (2008) study in that we specifically focus on family control whereas their interest is in ownership concentration in general without regard for the largest shareholder's identity. As Andres (2008) suggests, the

[12] The results of the logit regressions are not reported but are available from the authors on request.

distinction between the specific family influence and a more general blockholder effect is important, given the peculiarities inherent in the family business model, which differentiate owner families from other types of large investors.

4.2. Family firms' control structures and the investment–cash flow sensitivity

Despite the results as previously discussed, different types of family control are likely to have a different impact on the relation between investment and cash flow, as we posit in H2. That is, the moderating role of family control in the investment–cash flow sensitivity is likely to depend on how family members assure their control of the company. The use of control structures that result in violations of the one share–one vote rule is likely to lead to a higher risk of expropriation by the owner family and, as a result, to higher investment inefficiencies. Therefore, in these cases family control might not contribute to reduce the investment–cash flow sensitivity.

To test this proposition, we modify the model in (2). Specifically, we replace the family dummy with two new dummy variables that split family firms in two different categories according to the likelihood of expropriation on the part of the controlling family:

$$IAI_{it} = \beta_0 + \beta_1 IAI_{it-1} + (\beta_2 + \lambda_2 NON{-}EXPROPR.FD_{it} + \delta_2 EXPROPR.FD_{it})CF_{it} + \beta_3 FD_{it} + \beta_4 Q_{it-1} + \varphi X_{it-1} + \varepsilon_{it}. \quad (3)$$

The non-expropriating family dummy is a dummy variable for family firms with less potential for expropriation that equals 1 for family firms with no control-enhancing mechanisms in place,[13] and zero otherwise. The expropriating family dummy is a dummy variable for family firms with more potential for expropriation that equals 1 for family-controlled corporations that make use of at least one control-enhancing mechanism, and zero otherwise. Consequently, in this model, β_2 measures the influence of cash flow on investment for non-family firms (given both *NON-EXPROPR. FD*$_{it}$ and *EXPROPR. FD*$_{it}$ = 0), and $(\beta_2+\lambda_2)$ captures the effect for family firms with less potential for expropriation; for the remaining family businesses, the impact is measured by $(\beta_2+\delta_2)$. We thus expect $\left(\hat{\beta}_2 + \hat{\lambda}_2\right) < \left(\hat{\beta}_2 + \hat{\delta}_2\right)$.

The results from estimating Model (3) are presented in Table 5 (column 1). The estimated coefficients reveal that the moderating effect of family control on the investment–cash flow sensitivity is nonlinear. That is, family control effectively contributes to reducing the dependence of investment on internal funds, but when the discretion of the controlling family to act in its own best interest is high (as proxied by the use of control structures that lead to deviations between cash flow and voting rights), the monitoring role of the family as dominant shareholder vanishes, thus pointing to the possible expropriation of minority investors' wealth. As highlighted in Table 5 (column 1), the investment–cash flow sensitivity is not reduced in the case of family firms that use at least one control-enhancing mechanism. Therefore, these findings support our second hypothesis, and we conclude that the monitoring and expropriation phenomena usually associated with ownership concentration also apply to family firms in our sample. Specifically, whereas the impact of cash flow on our measure of investment is lower in family firms that do not resort to control-enhancing mechanisms to increase its voting rights above its cash flow rights ($\hat{\beta}_2 + \hat{\lambda}_2 = 0.159 - 0.128 = 0.031$, statistically significant, see t_1), the same relation does not hold for family-controlled corporations that make use of at least one such control-enhancing mechanism ($\hat{\beta}_2 + \hat{\delta}_2 = \hat{\beta}_2 = 0.159$, statistically significant; $\hat{\delta}_2$ statistically non-significant).

In addition, family owners frequently participate in the company management as a way of assuring their control of the corporation (see, e.g., Anderson et al., 2009; Claessens et al., 2000; La Porta et al., 1999). Therefore, we examine whether a different effect exists for family ownership on the investment–cash flow sensitivity depending on the degree of family involvement in the management of the company. Specifically, we investigate whether the lower dependence of investment spending on internal funds due to more efficient investment decisions is only present in family firms in which the controlling family holds managerial positions. In these cases, the classic owner–manager agency conflict is more likely to be alleviated (James, 1999). Moreover, as highlighted in recent literature, families may only be able to induce positive effects as long as they have a close relation with their businesses and are acting as stewards of the firm (Andres, 2008).

To test our argument empirically, we construct two new dummies, using Faccio and Lang's (2002) data that identify whether the controlling family is in management,[14] and interact them with the cash flow measure as in the following model:

$$IAI_{it} = \beta_0 + \beta_1 IAI_{it-1} + (\beta_2 + \alpha_2 MANAGER\ FD_{it} + \psi_2 NON{-}MANAGER\ FD_{it})CF_{it} + \beta_3 FD_{it} + \beta_4 Q_{it-1} + \varphi X_{it-1} + \varepsilon_{it}. \quad (4)$$

The manager family dummy variable equals 1 for family firms in which the family is actively involved in the management of the company, and zero otherwise, and the non-manager family dummy variable equals 1 for the remaining family firms (i.e., those in which the family does not directly participate in the firm's management), and zero otherwise. Now $(\beta_2+\alpha_2)$ measures the effect of cash flow on corporate investment for family businesses with active family involvement in the company's management, and $(\beta_2+\psi_2)$ captures this effect for the family-controlled corporations without active family management; β_2

[13] The specific control-enhancing mechanisms that can be used by owner families in our sample are dual-class share structures, pyramids, holdings through multiple control chains, and cross-holdings.

[14] Faccio and Lang (2002) identify whether a member of the controlling family is the CEO, honorary chairman, chairman, or vice-chairman of the firm.

Table 5
Family control and the investment–cash flow sensitivity: Different control structures. GMM regressions results from: $IAI_{it}=\beta_0+\beta_1 IAI_{it-1}+(\beta_2+\lambda_2 NON\text{-}EXPROPR.\ FD_{it}+\delta_2 EXPROPR.\ FD_{it})CF_{it}+\beta_3 FD_{it}+\beta_4 Q_{it-1}+\varphi X_{it-1}+\varepsilon_{it}$, $IAI_{it}=\beta_0+\beta_1 IAI_{it-1}+(\beta_2+\alpha_2 MANAGER\ FD_{it}+\psi_2 NON\text{-}MANAGER\ FD_{it})CF_{it}+\beta_3 FD_{it}+\beta_4 Q_{it-1}+\varphi X_{it-1}+\varepsilon_{it}$, and $IAI_{it}=\beta_0+\beta_1 IAI_{it-1}+(\beta_2+\alpha_2 MANAGER\ FD_{it}+\zeta_2 STRICT\ NON\text{-}MANAGER\ FD_{it}+\pi_2 FAM.\ UNLISTED\ CO.\ DUMMY_{it})CF_{it}+\beta_3 FD_{it}+\beta_4 Q_{it-1}+\varphi X_{it-1}+\varepsilon_{it}$. All of the variables are defined in Appendices A and B. The results are based on the 10% cutoff point definition of family firm proposed by Faccio and Lang (2002). The sample comprises 684 listed companies (6024 observations) that are present in Faccio and Lang's (2002) data set and for which stock and financial data are available for at least four consecutive years between 1996 and 2006 in the Worldscope database. Nine Euro zone countries (Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, and Portugal) are represented in the sample. The rest of the information needed to read this table is: (i) heteroskedasticity consistent asymptotic standard error in parentheses; (ii) *, **, and *** indicate significance at the 1%, 5%, and 10% level, respectively; (iii) t_1 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\lambda_2=0$; t_2 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\alpha_2=0$; t_3 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\psi_2=0$; t_4 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\zeta_2=0$; t_5 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\pi_2=0$; (iv) z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as χ^2 under the null of no relationship, degrees of freedom in parentheses; z_2 is a Wald test of the joint significance of the time dummies, asymptotically distributed as χ^2 under the null of no relationship, degrees of freedom in parentheses; z_3 is a Wald test of the joint significance of the country dummies, asymptotically distributed as χ^2 under the null of no relationship, degrees of freedom in parentheses; (v) m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation; and (vi) Hansen is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of no correlation between the instruments and the error term, degrees of freedom in parentheses.

Dep. var.: IAI_{it}	(1)	(2)	(3)
β_1 (IAI_{it-1})	0.140* (0.006)	0.139* (0.006)	0.140* (0.005)
β_2 (CF_{it})	0.159* (0.026)	0.141* (0.025)	0.140* (0.024)
λ_2 ($NON\text{-}EXPROPR.\ FD_{it}{}^{*}CF_{it}$)	−0.128* (0.030)		
δ_2 ($EXPROPR.\ FD_{it}{}^{*}CF_{it}$)	−0.044 (0.032)		
α_2 ($MANAGER\ FD_{it}{}^{*}CF_{it}$)		−0.092* (0.029)	−0.093* (0.028)
ψ_2 ($NON\text{-}MANAGER\ FD_{it}{}^{*}CF_{it}$)		−0.092* (0.029)	
ζ_2 ($STRICT\ NON\text{-}MANAGER\ FD_{it}{}^{*}CF_{it}$)			0.108* (0.029)
π_2 ($FAM.\ UNLISTED\ CO.\ DUMMY_{it}{}^{*}CF_{it}$)			−0.116* (0.028)
β_3 (FD_{it})	0.002 (0.003)	0.001 (0.003)	0.001 (0.003)
β_4 (Q_{it-1})	0.006* (0.001)	0.005* (0.001)	0.004* (0.001)
β_5 ($DEBT_{it-1}$)	−0.049* (0.007)	−0.048* (0.006)	−0.053* (0.005)
β_6 (DIV_{it-1})	0.148* (0.024)	0.154* (0.025)	0.169* (0.022)
β_7 ($SALES_{it-1}$)	0.005*** (0.003)	0.003 (0.002)	0.003 (0.002)
β_0 (Constant)	0.033* (0.005)	0.041* (0.006)	0.043* (0.005)
t_1	2.067		
t_2		3.429	3.455
t_3		3.371	
t_4			15.140
t_5			1.743
z_1	109.44 (9)	102.82 (9)	152.71 (10)
z_2	20.34 (8)	26.38 (8)	32.78 (8)
z_3	14.63 (9)	16.68 (9)	18.94 (9)
m_1	−6.63	−6.60	−6.60
m_2	−0.16	−0.18	−0.11
Hansen	316.89 (283)	320.61 (283)	348.51 (318)

measures the effect for non-family firms (given both $MANAGER\ FD_{it}$ and $NON\text{-}MANAGER\ FD_{it}=0$). Consistent with our proposition, we expect $\left(\hat{\beta}_2+\hat{\alpha}_2\right)<\left(\hat{\beta}_2+\hat{\psi}_2\right)$.

The estimated coefficients of Model (4), presented in Table 5 (column 2), point to a similar relation between cash flow and investment in family firms with active involvement of the family in the company's top management ($\hat{\beta}_2+\hat{\alpha}_2=0.141-0.092=0.049$, statistically significant, see t_2) and in the remaining family businesses ($\hat{\beta}_2+\hat{\psi}_2=0.141-0.092=0.049$, statistically significant, see t_3). Although these results do not totally support our previous arguments, we must be cautious when interpreting these findings because the non-manager family firm sample includes all corporations ultimately owned by a family unlisted company. Faccio and Lang (2002) do not provide information on active or passive family control (i.e., whether the ultimate owner holds a top management position) for family corporations ultimately controlled by unlisted firms. Thus, whenever the ultimate owner of a family firm is an unlisted company, the firm is classified as passively controlled. Consequently, in Model (4), the non-manager family dummy equals 1 for all family firms whose ultimate owner is an unlisted company as well as for those controlled by an individual or a family that is not involved in managerial activities.

To avoid the risk that the results from estimating Eq. (4) are driven by the family firm subsample in which the ultimate owner is a family unlisted company, we split the non-manager family dummy into a strict non-manager family dummy and a family unlisted company dummy:

$$IAI_{it}=\beta_0+\beta_1 IAI_{it-1}+(\beta_2+\alpha_2 MANAGER\ FD_{it}+\zeta_2 STRICT\ NON-MANAGER\ FD_{it}+\pi_2 FAM.UNLISTED\ CO.DUMMY_{it})CF_{it}+\beta_3 FD_{it}+\beta_4 Q_{it-1}+\varphi X_{it-1}+\varepsilon_{it}. \quad (5)$$

The strict non-manager family dummy equals 1 for family firms in which the ultimate owner is a family or an individual that does not actively participate in the company management, and zero otherwise, and the family unlisted company dummy equals 1 for family firms whose ultimate owner is an unlisted company, and zero otherwise. Consequently, the relation between cash flow and investment for non-family firms and for family firms with active family involvement in managerial activities is evaluated by the same coefficients as before. However, in this model, the impact of cash flow on the dependent variable for the remaining family firms is captured by $(\beta_2+\zeta_2)$ or $(\beta_2+\pi_2)$, depending on whether the controlling shareholder is a family or an individual with no active participation in the firm management or a family unlisted company, respectively. We therefore expect $\left(\hat{\beta}_2+\hat{\alpha}_2\right)<\left(\hat{\beta}_2+\hat{\zeta}_2\right)$.

The results obtained from the estimation of Model (5) are provided in Table 5 (column 3). Interestingly, we find that the alleviation of investment–cash flow sensitivities is only present in family firms with active family participation in management ($\hat{\beta}_2+\hat{\alpha}_2=0.140-0.093=0.047$, statistically significant, see t_2) and those firms in which the ultimate owner is a family unlisted company ($\hat{\beta}_2+\hat{\pi}_2=0.140-0.116=0.024$, statistically significant, see t_5). By contrast, when the ultimate owner is an individual or a family that simply owns a large stake in the firm, the positive effect of cash flow on the dependent variable is stronger ($\hat{\beta}_2+\hat{\zeta}_2=0.140+0.108=0.248$, statistically significant, see t_4). Therefore, we conclude that when we adjust Eq. (4) to make it more suitable to analyze the participation of family members in the company's management, namely Model (5), we find support for our line of reasoning. That is, family owners are only able to exert a significant influence in the investment decision-making process and, in turn, to reduce the sensitivity of investment with respect to cash flow when they are directly involved in managerial activities. A likely explanation for this finding is that the experience and better knowledge of the industry and the company on the part of controlling families, which are a consequence of long-term involvement of the family in the business, provide them with the necessary skills to avoid overly risky and unprofitable investment projects. This finding is also consistent with the notion that family owners are only able to induce positive performance effects when they have a close relation with their businesses and are acting as stewards of the firm (Andres, 2008).

In light of this empirical evidence, we confirm H2 in that the reduction in the investment–cash flow sensitivity in family firms is primarily explained by those family companies with certain control structures. Particularly, family firms with no deviations between the family's cash flow and voting rights and family firms with active family participation in management are responsible for the lower dependence on internal financing to fund new investment projects that characterizes the family business category.

The estimated coefficients of the control variables included in the right-hand side of the models are stable across all specifications and have the expected signs. On the one hand, lagged industry-adjusted investment, Tobin's q, dividends, and sales exhibit a positive impact on investment. A positive correlation of current investment rate with last-period investment spending confirms that an accelerator effect exists (Aivazian et al., 2005a), and the positive influence of Tobin's q (which measures growth opportunities), dividends, and sales on investment is consistent with previous studies that analyze the determinants of investment spending (see, e.g., Aivazian et al., 2005b; Fazzari et al., 1988). On the other hand, the negative effect of debt on the dependent variable has already been found in prior research (Aivazian et al., 2005a, 2005b; Lang et al., 1996) and can be explained in that leverage acts as a mechanism that alleviates incentives to invest in poor projects.

5. Robustness tests

5.1. The general blockholder effect

Although in H1 we posit that family presence inside the company is likely to lead to lower dependence of investment spending with respect to cash flow, the lower investment–cash flow sensitivity may only be driven by a general blockholder effect and not by the specific family influence in which we are interested. This argument may be valid because our non-family firm subsample includes firms with a non-family ultimate owner as well as widely held companies. In a recent work, Andres (2008) points out this problem when analyzing the relation between family ownership and corporate performance. To assure that his family blockholder variable captures the family effect rather than a general blockholder effect, Andres includes as explanatory variables in his model other dummies that equal 1 for the respective blockholder types, and zero otherwise. Following Andres, we extend Eq. (2):

$$IAI_{it}=\beta_0+\beta_1 IAI_{it-1}+(\beta_2+\gamma_2 FD_{it}+\chi_2 MISC.DUMMY_{it})CF_{it}+\beta_3 FD_{it}+\beta_4 Q_{it-1}+\varphi X_{it-1}+\varepsilon_{it}. \quad (6)$$

The miscellaneous dummy equals 1 for corporations with a non-family ultimate owner at the 10% (alternatively 20%) threshold, and zero otherwise. The effect of cash flow on investment for family firms is the same as in Eq. (2), but now the relation between both variables for non-family firms is evaluated by different coefficients depending on whether they are widely held or controlled by an ultimate owner. In the case of corporations with dispersed ownership, the impact of cash flow on investment is captured by β_2 (given both FD_{it} and $MISC.\ DUMMY_{it}=0$), and for companies with a non-family ultimate owner, this impact is evaluated by $(\beta_2+\chi_2)$ (because $FD_{it}=0$). To retain support for H1, the estimated coefficient $\hat{\gamma}_2$ should be negative and significant, even after controlling for the general blockholder effect as suggested by Andres (2008).

The estimated coefficients of this specification are presented in Table 6 (column 1). The results suggest that although corporations with other categories of ultimate owners exhibit lower investment–cash flow sensitivities ($\hat{\beta}_2+\hat{\chi}_2=0.166-0.127=0.039$, statistically significant, see t_2) in relation to widely held firms ($\hat{\beta}_2=0.166$), family control continues to be associated with reductions in the impact of cash flow on investment spending ($\hat{\beta}_2+\hat{\gamma}_2=0.166-0.125=0.041$, statistically significant, see t_1).

Table 6
Family control and the investment–cash flow sensitivity: Robustness tests. GMM regressions results from: $IAI_{it}=\beta_0+\beta_1 IAI_{it-1}+(\beta_2+\gamma_2 FD_{it}+\chi_2 MISC.\ DUMMY_{it})CF_{it}+\beta_3 FD_{it}+\beta_4 Q_{it-1}+\varphi X_{it-1}+\varepsilon_{it}$, $IAI_{it}=\beta_0+\beta_1 IAI_{it-1}+(\beta_2+\theta_2 NO\ 2ND\ SHAREH.\ FD_{it}+\omega_2 2ND\ SHAREH.\ FD_{it})CF_{it}+\beta_3 FD_{it}+\beta_4 Q_{it-1}+\varphi X_{it-1}+\varepsilon_{it}$, and $IAI_{it}=\beta_0+\beta_1 IAI_{it-1}+(\beta_2+\theta_2 NO\ 2ND\ SHAREH.\ FD_{it}+\mu_2 FAM.\ 2ND\ SHAREH.\ FD_{it}+\eta_2 NON\text{-}FAM.\ 2ND\ SHAREH.\ FD_{it})CF_{it}+\beta_3 FD_{it}+\beta_4 Q_{it-1}+\varphi X_{it-1}+\varepsilon_{it}$. All variables are defined in Appendices A and B. The results are based on the 10% cutoff point definition of family firm proposed by Faccio and Lang (2002). The sample comprises 684 listed companies (6024 observations) that are present in Faccio and Lang's (2002) data set and for which stock and financial data are available for at least four consecutive years between 1996 and 2006 in the Worldscope database. Nine Euro zone countries (Austria, Belgium, Germany, Spain, Finland, France, Ireland, Italy, and Portugal) are represented in the sample. The rest of the information needed to read this table is (i) heteroskedasticity consistent asymptotic standard error in parentheses; (ii) *, **, and *** indicate significance at the 1%, 5%, and 10% level, respectively; (iii) t_1 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\gamma_2=0$; t_2 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\chi_2=0$; t_3 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\theta_2=0$; t_4 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\mu_2=0$; t_5 is the t-statistic for the linear restriction test under the null hypothesis H_0: $\beta_2+\eta_2=0$; (iv) z_1 is a Wald test of the joint significance of the reported coefficients, asymptotically distributed as χ^2 under the null of no relationship, degrees of freedom in parentheses; z_2 is a Wald test of the joint significance of the time dummies, asymptotically distributed as χ^2 under the null of no relationship, degrees of freedom in parentheses; z_3 is a Wald test of the joint significance of the country dummies, asymptotically distributed as χ^2 under the null of no relationship, degrees of freedom in parentheses; (v) m_i is a serial correlation test of order i using residuals in first differences, asymptotically distributed as N(0,1) under the null of no serial correlation; and (vi) Hansen is a test of the over-identifying restrictions, asymptotically distributed as χ^2 under the null of no correlation between the instruments and the error term, degrees of freedom in parentheses.

Dep. var.: IAI_{it}	(1)	(2)	(3)
β_1 (IAI_{it-1})	0.136* (0.006)	0.140* (0.006)	0.148* (0.005)
β_2 (CF_{it})	0.166* (0.026)	0.147* (0.025)	0.155* (0.023)
γ_2 (FD_{it}*CF_{it})	−0.125* (0.029)		
χ_2 (MISC. $DUMMY_{it}$*CF_{it})	−0.127* (0.028)		
θ_2 (NO 2ND SHAREH. FD_{it}*CF_{it})		−0.133* (0.029)	−0.132* (0.027)
ω_2 (2ND SHAREH. FD_{it}*CF_{it})		0.007 (0.034)	
μ_2 (FAM. 2ND SHAREH. FD_{it}*CF_{it})			0.066** (0.032)
η_2 (NON-FAM. 2ND SHAREH. FD_{it}*CF_{it})			−0.095* (0.028)
β_3 (FD_{it})	0.003 (0.003)	−0.002 (0.004)	−0.001 (0.003)
β_4 (Q_{it-1})	0.005* (0.001)	0.005* (0.001)	0.004* (0.001)
β_5 ($DEBT_{it-1}$)	−0.049* (0.006)	−0.055* (0.007)	−0.059* (0.006)
β_6 (DIV_{it-1})	0.127* (0.025)	0.120* (0.024)	0.128* (0.023)
β_7 ($SALES_{it-1}$)	0.003 (0.002)	0.011* (0.003)	0.009* (0.002)
β_0 (Constant)	0.040* (0.005)	0.028* (0.006)	0.029* (0.005)
t_1	3.443		
t_2	4.014		
t_3		0.996	1.703
t_4			9.575
t_5			4.257
z_1	85.35 (9)	91.72 (9)	162.05 (10)
z_2	34.93 (8)	22.33 (8)	25.01 (8)
z_3	21.61 (9)	13.83 (9)	17.23 (9)
m_1	−6.60	−6.58	−6.67
m_2	−0.21	−0.17	−0.07
Hansen	329.51 (283)	331.07 (283)	365.78 (318)

Consequently, we confirm that the results from estimating Eq. (2) related to the moderating role of family control in the investment–cash flow sensitivity are not driven by a general blockholder effect and thus find support for H1.

5.2. The role of second blockholders in family firms' investment–cash flow sensitivity

La Porta et al. (1999) argue that large shareholders in companies with concentrated ownership may monitor each other; however, they find, using a sample of large corporations, that family control appears to be typically unchallenged by other investors. Conversely, subsequent literature shows that firm value increases when firms have a second large shareholder due to the second blockholder's ability to monitor and contest the largest owner (Jara-Bertin et al., 2008; Maury and Pajuste, 2005).

Furthermore, in a recent study, Attig et al. (2008) show that multiple large shareholders, used as a proxy for a firm's internal governance, may reduce the agency problems and information asymmetries that increase a firm's cost of equity financing. In the same vein, Chen et al. (2009) find that ownership concentration, measured by the Herfindahl index of the five largest shareholders, is significantly and negatively associated with the cost of equity capital.

Given this discussion, we investigate whether family businesses exhibit lower investment–cash flow sensitivities when a second large shareholder (in addition to the controlling family) is present. If the disciplining role exercised by other large investors leads family firms to invest more efficiently, family companies with a second blockholder should be less dependent on internal funds.

To investigate this issue, we initially estimate the following specification:

$$IAI_{it} = \beta_0 + \beta_1 IAI_{it-1} + (\beta_2 + \theta_2 NO\ 2ND\ SHAREH.FD_{it} + \omega_2 2ND\ SHAREH.FD_{it})CF_{it} + \beta_3 FD_{it} + \beta_4 Q_{it-1} + \varphi X_{it-1} + \varepsilon_{it}. \quad (7)$$

The no second shareholder family dummy equals 1 for family firms without a second blockholder, and zero otherwise, and the second shareholder family dummy equals 1 for family firms with a second large shareholder, and zero otherwise. As a result, for family firms without a second large investor, the influence of cash flow on investment is measured by $(\beta_2+\theta_2)$ and for family firms with a second large shareholder, it is evaluated by $(\beta_2+\omega_2)$. As in previous models, for non-family businesses, the relation between cash flow and investment is captured by β_2 (given both *NO 2ND SHAREH. FD*$_{it}$ and *2ND SHAREH. FD*$_{it}=0$). We therefore expect $\hat{\beta}_2 > \left(\hat{\beta}_2+\hat{\omega}_2\right)$.

The results of estimating Model (7) are provided in Table 6 (column 2). Contrary to our predictions, we find that only family firms with no second large investor exhibit a weaker relation between investment and internal funds ($\hat{\beta}_2+\hat{\theta}_2 = 0.147-0.133 = 0.014$, statistically non-significant, see t_3). In the cases in which a second equity holder with a significant stake is present in the company, family firms are not distinguishable from non-family firms in terms of investment–cash flow sensitivities ($\hat{\beta}_2+\hat{\omega}_2 = \hat{\beta}_2 = 0.147$, statistically significant; $\hat{\omega}_2$ statistically non-significant).

These unexpected findings are likely caused by our failure to account for the identity of the second large shareholders. Failing to do so can give rise to confounding results because, while certain types of second blockholders are likely to have a particular interest in monitoring the controlling family, others may collude with the family to enjoy the private benefits of control (Maury and Pajuste, 2005).[15] As a consequence of these phenomena, the estimated coefficient $\hat{\omega}_2$ is non-significant.

Therefore, we extend the model in (7) by replacing the second shareholder family dummy with two new dummies that account for the identity of the second blockholder in the subsample of family businesses with a second large shareholder. Specifically, we investigate whether a second large shareholder in family firms is a mechanism that effectively monitors the controlling family and lowers the dependence of investment on internally generated funds with the following specification:

$$IAI_{it} = \beta_0 + \beta_1 IAI_{it-1} + (\beta_2 + \theta_2 NO\ 2ND\ SHAREH.FD_{it} + \mu_2 FAM.2ND\ SHAREH.FD_{it} + \eta_2 NON-FAM.2ND\ SHAREH.FD_{it})CF_{it} + \beta_3 FD_{it} + \beta_4 Q_{it-1} + \varphi X_{it-1} + \varepsilon_{it}. \quad (8)$$

The family second shareholder family dummy equals 1 for family firms with a second family large shareholder, and zero otherwise, and the non-family second shareholder family dummy equals 1 for family-controlled corporations in which a non-family investor owns a large stake, and zero otherwise. The distinction between family and non-family second large shareholders is based on prior empirical evidence on the relation between multiple large investors and value in family firms that concludes that only when the second large blockholder is non-family does firm value increase. By contrast, when two families own a large stake in the company, they act opportunistically in the detriment of corporate performance (Jara-Bertin et al., 2008; Maury and Pajuste, 2005). Also, Attig et al. (2008) find that in East Asian and Western European family-controlled firms, the identity of the second largest shareholder is important in shaping the risk of expropriation. Consistent with these findings, we expect $\hat{\beta}_2 > \left(\hat{\beta}_2+\hat{\eta}_2\right)$, and if both the monitoring and the collusion phenomena discussed in the literature emerge in the investment decision-making process, then $\hat{\beta}_2 < \left(\hat{\beta}_2+\hat{\mu}_2\right)$.

The estimated coefficients of Model (8), presented in Table 6 (column 3), are as expected. Family firms with no second large equity holder continue to enjoy lower investment–cash flow sensitivities ($\hat{\beta}_2+\hat{\theta}_2 = 0.155-0.132 = 0.023$, statistically significant, see t_3). In family businesses with a second blockholder, if that second investor is a family, then the sensitivity of investment with respect to cash flow is higher ($\hat{\beta}_2+\hat{\mu}_2 = 0.155+0.066 = 0.221$, statistically significant, see t_4), and if the second blockholder is non-family, the sensitivity is lower ($\hat{\beta}_2+\hat{\eta}_2 = 0.155-0.095 = 0.060$, statistically significant, see t_5). These results suggest that the collusion and the monitoring phenomena commonly associated with multiple large shareholders in prior literature (Jara-Bertin et al., 2008; Maury and Pajuste, 2005) are also important in the investment decision-making process.

5.3. Family control and the investment–cash flow sensitivity: 20% threshold family firm definition

The regression results discussed in previous sections are based on the 10% threshold family firm definition, which we adopt following prior research (see, e.g., Faccio and Lang, 2002; Holderness, 2009; Laeven and Levine, 2008; Maury, 2006). According to this definition, a company is defined as family controlled when the ultimate owner at the 10% threshold is an individual, a family, or an unlisted company. Nevertheless, Faccio and Lang (2002) also identify ultimate owners of Western European corporations at the 20% threshold and make this information available. Thus, we check the robustness of our previous findings using a more restrictive family firm definition; that is, we redefine a company as being family controlled if the ultimate owner at the 20% cutoff point is an individual, a family, or an unlisted company. As expected, when we use the 20% threshold to define family control, the proportion of family businesses in the sample decreases, whereas the percentage of widely held corporations and, consequently, non-family firms increases (see Panels B and C of Table 1).

Using this new family firm definition, we rerun all regressions. The estimated coefficients are not presented for the sake of brevity but are available from the authors on request. All findings as previously discussed still hold when we use the 20% threshold to identify the family firms in the sample and we continue to find support for both H1 and H2. Therefore, we conclude that our findings are robust to the stricter definition of family control.

[15] As suggested in recent research, different types of blockholders are likely to differ from each other in their monitoring incentives, mainly due to difference in their investment horizons (Kim, 2010) and, as in our case, the interactions between multiple large shareholders and the nature of the controlling owner in the company.

6. Conclusions

We posit and find that family firms in the Euro zone enjoy lower investment–cash flow sensitivities. Given that previous finance literature has associated the sensitivity of investment to internal funds as a sign of either information or incentive problems, we interpret this result as a positive aspect of family-controlled corporations. In particular, we suggest that as a result of family firms' lower dependence on internally generated funds when undertaking new investment projects, this type of company is able to reach an investment level closer to the optimum, thus being less likely to suffer from overinvestment and underinvestment problems. This conclusion is consistent with the benefits generally associated with family firms. Particularly, the ability of family owners to alleviate the agency problems between bondholders and shareholders (Anderson et al., 2003) as well as the conflicts between managers and investors allow family firms to invest more efficiently, which, in turn, may lead to better corporate performance with respect to non-family corporations (Andres, 2008; Maury, 2006).

Although we find that the investment–cash flow sensitivity in family firms is lower, we also provide empirical evidence that when the family's scope for expropriating minority shareholders is high, the potential benefits of family control are, in part, counteracted by the costs attributed to this organizational form. This finding suggests that the moderating role of family control in the investment–cash flow relation is nonlinear. Our results also point to the requirement of family presence in top management positions to alleviate effectively investment–cash flow sensitivities, which is consistent with the idea that family owners are only able to exert a significant influence inside the company when they are acting as stewards of the firm.

Overall, the lower dependence of family firms' investment spending on internally generated funds in Euro zone countries suggests that family control is an organizational form that reduces the propensity of corporations to undertake inefficient investments. We, therefore, conclude that family businesses, so prevalent in Western Europe, are in a better position to weather the consequences of the global financial crisis that dates back to July 2007 and that deepened in September 2008. Although obtaining external financing in capital markets has become undeniably more difficult since the beginning of the crisis for the whole economy, including all types of corporations, the long-term investment horizons of owner families and the close link of this type of shareholders to their companies may provide them with more room to maneuver during the current economic turmoil than their non-family counterparts.

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Appendix A. Definition of financial variables used in the analyses

A.1. Investment

$$I_{it} = (NF_{it} - NF_{it-1} + BD_{it}) / K_{it}, \tag{A.1}$$

where NF_{it} denotes net fixed assets of the firm in year t and BD_{it} is the book depreciation expense of the firm corresponding to year t. This variable is calculated according to Lewellen and Badrinath (1997). The K_{it} denotes the replacement value of total assets, which is obtained as follows:

$$K_{it} = RF_{it} + (TA_{it} - BF_{it}), \tag{A.2}$$

where RF_{it} is the replacement value of tangible fixed assets, TA_{it} is the book value of total assets, and BF_{it} is the book value of tangible fixed assets. The latter two are obtained from the firm's balance sheet, and the first is calculated according to the proposal by Perfect and Wiles (1994):

$$RF_{it} = RF_{it-1}\left[\frac{1+\phi_t}{1+\delta_{it}}\right] + I_{it}, \tag{A.3}$$

for $t>t_0$ and $RF_{it_0}=BF_{it_0}$, where t_0 is the first year of the chosen period, in our case 1996. On the other hand, $\delta_{it}=BD_{it}/BF_{it}$ and $\varphi_t=(GCGP_t-GCGP_{t-1})/GCGP_{t-1}$, where BD_{it} is the book depreciation expense of the firm in year t and $GCGP_t$ is the growth of capital goods prices extracted from the *Main Economic Indicators*, published by the Organization for Economic Cooperation and Development (OECD).

A.2. Industry-adjusted investment

IAI_{it} is calculated by subtracting the industry mean I from the firm's I_{it}. Industry means are computed at the most precise SIC level for which a minimum of five companies is found.

A.3. Cash flow

$$CF_{it} = (NI_{it} + BD_{it}) / K_{it}, \tag{A.4}$$

where NI_{it} denotes net income of the firm corresponding to year t.

A.4. Tobin's q

$$Q_{it} = (MVE_{it} + MVD_{it}) / K_{it}, \tag{A.5}$$

where MVE_{it} denotes the market value of equity and $MVD_{it}=MVLTD_{it}+BVSTD_{it}$ is the market value of debt, being $MVLTD_{it}$ and $BVSTD_{it}$ the market value of long-term debt and the book value of short-term debt, respectively.

A.5. Debt ratio

$$DEBT_{it} = \frac{MVLTD_{it}}{BVSTD_{it} + MVLTD_{it} + MVE_{it}}, \tag{A.6}$$

where $BVSTD_{it}$ is the book value of short-term debt, and $MVLTD_{it}$ is the market value of long-term debt obtained from the following formula:

$$MVLTD_{it} = \left[\frac{1+l_{it}}{1+i_l}\right] BVLTD_{it}, \tag{A.7}$$

where $BVLTD_{it}$ is the book value of the long-term debt, i_l is the rate of interest of the long-term debt reported in the OECD's *Main Economic Indicators*, and l_{it} is the average cost of long-term debt that is defined as:

$$l_{it} = \frac{IPLTD_{it}}{BVLTD_{it}}, \tag{A.8}$$

where $IPLTD_{it}$ is the interest payable on the long-term debt, which has been obtained by distributing the interest payable between the short- and long-term debt depending on the interest rates. That is:

$$IPLTD_{it} = \frac{i_l BVLTD_{it}}{i_s BVSTD_{it} + i_l BVLTD_{it}} IP_{it}, \tag{A.9}$$

where IP_{it} is the interest payable and i_s is the rate of interest of the short-term debt, also reported in the OECD's *Main Economic Indicators*. The debt ratio is calculated as in Miguel and Pindado (2001).

A.6. Dividends

$$DIV_{it} = CDIV_{it} / K_{it}, \tag{A.10}$$

where $CDIV_{it}$ is the total cash dividends paid by the firm in year t.

A.7. Sales

$$SALES_{it} = REV_{it} / K_{it}, \tag{A.11}$$

where REV_{it} denotes net sales or revenues of the firm in year t.

Appendix B. Definition of dummy variables used in the analyses

B.1. Family dummy

The FD_{it} is a dummy variable that equals 1 if the firm has an ultimate owner at the 10% (alternatively 20%) threshold that is a family, an individual, or an unlisted company, and zero otherwise. This family firm definition is based on previous studies (see, e.g., Faccio and Lang, 2002; Holderness, 2009; Laeven and Levine, 2008; Maury, 2006).

B.2. Expropriating family dummy

The *EXPROPR.* FD_{it} is a dummy variable that equals 1 if the firm is family controlled by using at least one control-enhancing mechanism (i.e., dual-class share structures, pyramids, holdings through multiple control chains, or cross-holdings), and zero otherwise.

B.3. Non-expropriating family dummy

The *NON-EXPROPR.* FD_{it} is a dummy variable that equals 1 if the firm is family controlled through no control-enhancing mechanism, and zero otherwise.

B.4. Manager family dummy

The *MANAGER* FD_{it} is a dummy variable that equals 1 if the firm is family controlled and a member of the controlling family is the CEO, honorary chairman, chairman, or vice-chairman of the company, and zero otherwise.

B.5. Non-manager family dummy

The *NON-MANAGER* FD_{it} is a dummy variable that equals 1 if the firm is family controlled and no member of the controlling family is the CEO, honorary chairman, chairman, or vice-chairman of the company, and zero otherwise.

B.6. Strict non-manager family dummy

The *STRICT NON-MANAGER* FD_{it} is a dummy variable that equals 1 if the family firm's ultimate owner is an individual or a family and no member of the controlling family is the CEO, honorary chairman, chairman, or vice-chairman of the company, and zero otherwise.

B.7. Family unlisted company dummy

The *FAM. UNLISTED CO. DUMMY*$_{it}$ is a dummy variable that equals 1 if the family firm's ultimate owner is a family unlisted company, and zero otherwise.

B.8. Miscellaneous dummy

The *MISC. DUMMY*$_{it}$ is a dummy variable that equals 1 if the firm has an ultimate owner at the 10% (alternatively 20%) threshold that is neither a family, an individual, nor an unlisted company, and zero otherwise.

B.9. No second shareholder family dummy

The *NO 2ND SHAREH. FD*$_{it}$ is a dummy variable that equals 1 for family firms with no second large shareholder, and zero otherwise.

B.10. Second shareholder family dummy

The *2ND SHAREH. FD*$_{it}$ is a dummy variable that equals 1 for family firms with a second large shareholder, and zero otherwise.

B.11. Family second shareholder family dummy

The *FAM. 2ND SHAREH. FD*$_{it}$ is a dummy variable that equals 1 for family firms with a family second blockholder, and zero otherwise.

B.12. Non-family second shareholder family dummy

The *NON-FAM. 2ND SHAREH. FD*$_{it}$ is a dummy variable that equals 1 for family firms with a non-family second blockholder, and zero otherwise.

Appendix C. Summary of coefficients of interest in the investment models

This appendix presents a summary of the coefficients that capture the effect of cash flow on investment for each model and type of corporation. The sums of coefficients in bold are those for which a linear restriction test is performed. The *t*-statistics of the corresponding linear restriction test are reported in the tables in which the regression results are shown.

Model	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Subsample							
***NON-FAMILY*$_{it}$**	β_2	β_2	β_2	β_2		β_2	β_2
WIDELY HELD$_{it}$					β_2		
MISC. DUMMY$_{it}$					$\boldsymbol{\beta_2+\chi_2}$		
***FAMILY DUMMY*$_{it}$**	$\boldsymbol{\beta_2+\gamma_2}$				$\boldsymbol{\beta_2+\gamma_2}$		
EXPROPR. FD$_{it}$		$\beta_2+\delta_2$					
NON-EXPROPR. FD$_{it}$		$\boldsymbol{\beta_2+\lambda_2}$					
MANAGER FD$_{it}$			$\boldsymbol{\beta_2+\alpha_2}$	$\boldsymbol{\beta_2+\alpha_2}$			
NON-MANAGER FD$_{it}$			$\boldsymbol{\beta_2+\psi_2}$				
STRICT NON-MANAGER FD$_{it}$				$\boldsymbol{\beta_2+\zeta_2}$			
FAM. UNLISTED CO. DUMMY$_{it}$				$\boldsymbol{\beta_2+\pi_2}$			
NO 2ND SHAREH. FD$_{it}$						$\boldsymbol{\beta_2+\theta_2}$	$\boldsymbol{\beta_2+\theta_2}$
2ND SHAREH. FD$_{it}$						$\beta_2+\omega_2$	
FAM. 2ND SHAREH. FD$_{it}$							$\boldsymbol{\beta_2+\mu_2}$
NON-FAM. 2ND SHAREH. FD$_{it}$							$\boldsymbol{\beta_2+\eta_2}$

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