



## Family control and dilution in mergers

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### ABSTRACT

We analyze the influence of the level as well as the change in family ownership on value creation in mergers involving newly public firms. Our findings suggest that acquirers with low levels of family ownership earn lower abnormal returns than do those with high levels of ownership. In addition, families with low ownership in their firm are more likely to use cash as the medium of exchange, thus avoiding dilution and maintaining their control. Further, acquisitions of targets with low levels of family ownership are associated with greater value creation. Our results are consistent with the entrenchment of families at low levels of ownership and a better alignment of their interests with those of minority shareholders at high levels of ownership. Finally, we find that dilution of the family's ownership, due to the use of stock as the medium of exchange, alters the family's incentives and thus influences firm value.

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### 1. Introduction

Families represent a unique group of active, long-term owners, holding substantial equity positions in their firms. First, the control of the firm is usually concentrated in the hands of a single individual. Second, families are usually actively involved in the management and governance of their firms. Third, families maintain a long-term investment horizon since the intergenerational transfer of managerial control is an objective of most family firms. Despite their significant presence, even in mature public firms, and their unique characteristics, the influence of families on firm value has only recently started receiving attention in academic literature. While most of the emerging literature has focused on mature and index-listed family firms (see e.g., Anderson and Reeb, 2003; Villalonga and Amit, 2006), newly public family firms have received very little attention.

The costs and benefits of family ownership, however, are likely to be more pronounced in newly public firms. First, as pointed out by Schwert (1985), the founder is probably the most important asset of the firm in its formative stage. Second, a newly public firm does not have an established reputation and has to rely heavily on that of its founder. Third, in a newly public firm, the founder (and his family) is likely to own a significant fraction of its equity. Therefore, the family is likely to exert a more significant and direct influence on the firm (either positive or negative) than it would in the mature stage. Fourth, as shown by Paeglis and Tirtiroglu

(2005), newly public family firms are less likely to be the subject of monitoring and scrutiny by various financial market participants such as financial analysts and institutional investors. This allows the family more unhindered control over the firm.

In this paper, we examine the relationship between family control and value creation in mergers that involve newly public firms as either acquirers or targets. Since mergers affect family ownership and control, they provide a unique opportunity to examine the effects of not only the level of, but also the change in family ownership on firm value. Stock-financed acquisitions, unlike cash-financed ones, result in dilution of family ownership and therefore control. Thus, cash-financed acquisitions allow us to observe the direct influence of family ownership on value gains in mergers. Stock-financed acquisitions, on the other hand, allow us to examine the relationship between value creation and the dilution of family ownership. Finally, upon acquisition of a family-controlled target, the family is left with little or no ownership in the merged entity. Therefore, acquisitions of such firms allow us to observe the influence of family ownership on pre-merger firm value.

We find that family ownership is indeed an important determinant of value creation in mergers. Overall, we find a negative (positive) relationship between acquirer abnormal returns and acquiring family's ownership if the latter is low (high).<sup>1</sup> For

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<sup>1</sup> The observed quadratic relationship between family ownership and value creation in mergers implies two distinct ranges of family ownership. For ease of exposition, we will refer to the levels of ownership above (below) the turning point in the relationship between family ownership and value as "high" ("low") ownership. Also, we will refer to the ownership of the acquirer's (target's) founder and his family in their firm as "acquiring (target) family's ownership".

stock-financed acquisitions, this relationship is mitigated by the impact of dilution working in the opposite direction. In particular, our results suggest that dilution is beneficial at low levels of ownership since it potentially reduces the entrenchment of the acquiring family. It is detrimental at high levels of family ownership since it reduces the incentive alignment. On the whole, our results are consistent with the entrenchment of the family at low levels of ownership and a better alignment of the interests of the family with those of the minority shareholders at high levels of family ownership. This conjecture is further supported by the following two findings. First, acquirers with low levels of family ownership are more likely to choose cash as the medium of exchange, thus avoiding any dilution of their ownership and protecting their benefits of control. Second, the market perceives an acquisition of a family-controlled target as a value-creating (value-destroying) event if family ownership in the target is low (high).<sup>2</sup>

Our paper is related to and contributes to several areas of research. First, a number of studies have examined the unique valuation and control issues associated with family firms.<sup>3</sup> Most of this literature, however, has focused on mature and index-listed family firms. We fill this gap in the family firm literature by examining newly public family firms.

Second, an even larger body of literature has studied the influence of managerial ownership on value creation in mergers (see e.g., Lewellen et al., 1985; Hubbard and Palia, 1995). This literature has so far focused almost exclusively on established firms. Since these firms have relatively low levels of insider ownership, we have an incomplete understanding of the effect of high levels of insider ownership on value gains in mergers. In addition, there is limited evidence on the relationship between family ownership and value creation in mergers.<sup>4</sup> Our sample includes a relatively large number of firms with high levels of family ownership.<sup>5</sup> This allows us to provide a more complete picture of the costs and benefits of highly concentrated ownership.

Finally, another branch of the literature on mergers focuses on issues related to ownership and control. In particular, Amihud et al. (1990) and Martin (1996) have examined the relationship between insider ownership and the likelihood of using stock as the medium of exchange. The use of stock and the resulting changes in control, in turn, should also influence firm value. However, to our knowledge, this relationship has not been studied in the literature. We provide evidence that changes in ownership, resulting from the use of stock as the medium of exchange, have a significant impact on the value creation in mergers.

The rest of the paper is organized as follows. Section 2 develops the hypotheses that will serve as the basis for our empirical tests. Section 3 reviews the characteristics of our sample. Section 4 describes our methodology and reports the results. Section 5 concludes.

## 2. Theory and hypotheses

Family ownership can influence firm value in two offsetting ways. First, increasing family ownership is expected to better align the interests of the family with those of minority shareholders, and thus enhance firm value. In particular, Jensen and Meckling (1976) argue that increased managerial ownership decreases the agency costs of equity by reducing managers' consumption of perquisites. Second, increasing ownership may also lead to the family's entrenchment and the use of value-destroying policies without the fear of shareholder activism (see e.g., Stulz, 1988; McConnell and Servaes, 1990; and Morck et al., 1988).<sup>6</sup> Which of the two effects dominates at a particular level of family ownership is an empirical issue.

### 2.1. Acquiring family's ownership

Since cash-financed acquisitions result in no change in acquiring family's control, the returns earned by acquirers in these transactions are expected to depend only on the value generated by the transaction. This, in turn, is influenced by the relative importance of the incentive alignment and entrenchment effects at various levels of family ownership. In particular, a positive relationship between abnormal returns and family ownership over a certain range of ownership implies a dominance of the incentive alignment effect, while a negative relationship implies a dominance of the entrenchment effect. This leads to our hypothesis regarding cash-financed acquisitions by family firms.

**Hypothesis 1:** Over the range of family ownership for which the incentive alignment effect dominates (is dominated by) the entrenchment effect, there will be a positive (negative) relationship between abnormal returns and acquiring family's ownership.

In stock-financed acquisitions, there is some loss of control due to the dilution of acquiring family's ownership.<sup>7</sup> Further, the market reaction to this dilution is expected to depend on the dominance of either the incentive alignment effect or the entrenchment effect at any given level of family ownership. In particular, over the range of ownership for which the incentive alignment effect dominates, dilution is detrimental since it leads to a poorer alignment of incentives. Over the range of family ownership, for which the entrenchment effect dominates, however, dilution can have a beneficial influence on firm value for two reasons. First, any reduction in the level of acquiring family's entrenchment leads to an increase in firm value. Second, choice of stock as the medium of exchange can, by itself, signal the family's intention not to expropriate wealth from minority shareholders. In particular, a reduction in the family's control over the firm increases the likelihood of the family's ouster (by either minority shareholders or other players in the market for corporate control). As a result, only families that are less likely to expropriate wealth from minority shareholders would choose stock as the medium of exchange. Therefore, dilution credibly signals that the family's presence in the firm is not motivated primarily by the private benefits of control. Thus, our hypothesis regarding stock-financed acquisitions by family firms is as follows.

**Hypothesis 2:** The relationship between abnormal returns and acquiring family's ownership, hypothesized for cash-financed

<sup>2</sup> Our results are robust to the correction for potential biases due to the endogenous choice of the medium of exchange. They are also unaffected when we control for the ownership by other types of blockholders and firm's insiders.

<sup>3</sup> In addition to those cited above, see also King and Santor (2008), Maury and Pajuste (2005), and Faccio and Lang (2002).

<sup>4</sup> The only study on mergers of family firms that we are aware of is by Ben-Amar and André (2006). They examine the differences in the market reaction upon the acquisition announcements made by Canadian family and non-family firms. Ben-Amar and André (2006), however, do not examine the relationship between abnormal returns upon the merger announcement and family ownership (and the resulting changes in control). In addition, their focus is on family firms as acquirers (i.e., they do not study acquisitions of family-controlled targets).

<sup>5</sup> The 80th percentile of insider ownership for firms used by Lewellen et al. (1985) and Hubbard and Palia (1995) is between 10 and 12%. In contrast, the 80th percentile of family ownership for firms in our sample is 47.5%.

<sup>6</sup> From now on, we will refer to the positive influence of ownership on firm value as the "incentive alignment effect" and to the negative influence as the "entrenchment effect".

<sup>7</sup> From now on, we will refer to the impact of the loss of control due to the dilution of family ownership as the "dilution effect".

acquisitions, will be at least partially reversed by the dilution effect working in the opposite direction.

## 2.2. Target family's ownership

We now turn to our hypotheses on the target side. A cash-financed acquisition of a family-controlled target results in a complete loss of target family's control. Therefore, it sheds light on the impact of target family's ownership on *pre-merger* firm value. If the family uses their influence over the firm primarily to derive private benefits of control, their loss of control would be seen by the market as a value-creating event. If, on the other hand, the family is an asset to the pre-merger firm, their exit would be viewed by the market as a value-destroying event.<sup>8</sup> Therefore, our hypothesis regarding cash-financed acquisitions of family firms is as follows.

**Hypothesis 3:** Over the range of ownership for which the incentive alignment effect dominated (was dominated by) the entrenchment effect in the pre-merger firm, there will be a negative (positive) relationship between abnormal returns and target family's ownership.

Finally, there are two possible reasons for the differences in the market's reactions to stock- and cash-financed acquisitions of family-controlled targets. First, in a stock-financed acquisition, the family can become a blockholder in the merged firm and thus improve the monitoring of the acquiring firm's management ("blockholder effect"). Second, as discussed by Chang (1998), the family is likely to evaluate the acquirer's future prospects carefully because a significant proportion of their wealth would be invested in the acquirer's shares after the merger. Therefore, the family's acceptance of the acquirer's stock can be seen as a certification of the value of the offer ("certification effect"). Both of these effects (blockholder and certification) are likely to increase the value of the acquirer's shares, which the target's family will own after the merger. Further, the importance of both of these effects is increasing with the level of family ownership in the target, *ceteris paribus*. This, in turn, implies that the use of stock would mitigate the impact of complete loss of control observed in the case of cash-financed acquisitions of family-controlled targets. Thus, our hypothesis regarding stock-financed acquisitions of family firms is as follows.

**Hypothesis 4:** For stock-financed acquisitions of family-controlled targets, the impact of the loss of control, hypothesized for cash-financed ones, will be mitigated by either the blockholder effect, the certification effect, or both.

## 3. Data and sample selection

Since the focus of this paper is newly public firms, we start with all US IPOs of common equity between 1993 and 2000, obtained from the SDC/Platinum New Issue database. We eliminate REITs, closed-end funds, unit offerings, equity carve-outs, financial (all firms with SIC codes between 6000 and 6999) and foreign firms. This screening leaves us with a sample of 2764 firms. We then exclude leveraged buyouts and roll-ups. There are 19 firms, which are not found in the Center for Research in Security Prices (CRSP) database. For an additional six firms, the CRSP and the SDC databases show different first dates of trading. Eliminating these 25 firms leaves us with a total of 2613 firms.

<sup>8</sup> For possible reasons why an entrenched or an incentive-aligned family would decide to exit, see Klasa (2007). He reports that exits of founding families are largely motivated by personal characteristics, such as the age of the founder and the absence of family successors, rather than by firm characteristics.

Venture capitalists have been shown to influence (1) the replacement of founders (Hellman and Puri, 2002); (2) the market's perception of surviving founders in venture-backed firms (Paeglis and Tirtiroglu, 2005); and (3) the post-IPO merger decisions of the venture-backed firms (see e.g., Masulis and Nahata, 2006). Therefore, to examine the direct influence of family ownership on the value creation in mergers, we exclude venture-backed firms from our sample. Of the 2613 IPOs identified from SDC, 1891 had received pre-IPO funding from either venture capitalists or corporate investors. The remaining 722 firms with no institutional shareholders at the time of going public make up our initial sample.

We then use the SDC Mergers & Acquisitions database to identify all mergers involving our sample firms that occurred between the time of the IPO and December 31, 2004. We exclude transactions where our sample firms acquire or are acquired by financial firms. Also, we require both the targets and the acquirers in each transaction to be publicly traded. The acquisition announcement dates are confirmed by searching Factiva for up to a year before the announcement date reported in the SDC Mergers & Acquisitions database. This ensures that we have identified the first announcement of a particular merger. Our final sample, described in Table 1, consists of 103 acquirers and 118 targets.

We define a family firm as a firm in which the founder or his/her descendants either hold at least 5% of the firm's outstanding shares or are actively involved in the management (or governance) of the firm.<sup>9</sup> We identify founders of our sample firms using the information in the management sections of IPO prospectuses. The data on the family's pre-merger ownership is collected from the proxy statement preceding and closest to the acquisition announcement.<sup>10</sup>

Appendix lists variables used in this study, while Panel A of Table 2 provides relevant summary statistics. Our hypotheses above suggest a potential variation in the value creation across different levels of family ownership. To allow for this variation, we report statistics for the full sample and the following sub-samples: non-family firms, firms with low levels of family ownership, and those with high levels of family ownership. "Low family" firms

<sup>9</sup> Securities and Exchange Commission (SEC) regulations require the disclosure of ownership positions of (1) all officers and directors and (2) all shareholders holding more than 5% of any class of shares. Several studies have argued that a 5% ownership may not be sufficient to ensure a family's control over the firm (see e.g., Faccio and Lang, 2002). The use of 5% ownership threshold, instead of a 10% threshold, however, is unlikely to significantly influence our results. First, only a relatively small number of our sample firms fall in the lower end of the family ownership spectrum. For example, only four acquirers and 12 targets have family ownership below 10%. Second, the use of (continuous) family ownership, rather than a family firm dummy, as a basis of our analysis minimizes the influence of the choice of the threshold on our results. In particular, by using continuous family ownership we are allowing a firm with very low family ownership (e.g., below 5%) to be very similar to a non-family firm since the levels of family ownership in the two are not very different. Third, we have replicated our results using a 10% ownership threshold (i.e., we have reclassified all firms with less than 10% family ownership as non-family firms). Our results are qualitatively unchanged with this higher threshold. Family control over the firm can also be influenced by the presence of blockholders whose ownership stake exceeds that of the family and who can therefore influence firm value (see e.g., Maury and Pajuste, 2005). The presence of such blockholders, however, is unlikely to have a significant influence on our results. First, they are present in only a relatively small number of cases in our sample (seven for acquirers and 12 for targets). Second, we have replicated our results excluding all cases where significant blockholders are present and find that the results are qualitatively unchanged. Further, we have also tested the robustness of our results to the identity of these significant blockholders (another family versus a financial institution). We find that our results are robust to the exclusion of cases in which either of these groups of blockholders is present.

<sup>10</sup> Several recent studies (see e.g., Villalonga and Amit, 2006) have pointed out that family firms run by their founders create more value than do those run by subsequent generations of the family. Fifty-one of the 60 family-owned acquirers and 81 of the 86 family-owned targets in our sample have the founder as the CEO. Since descendant CEOs form a small minority of our sample, we do not distinguish between them and founder CEOs.

**Table 1**  
Number of acquisitions by year, medium of exchange, and family presence

Year	Acquirer				Total acquirers	Target				Total targets
	Family		Non-family			Family		Non-family		
	Cash	Stock	Cash	Stock		Cash	Stock	Cash	Stock	
1993	1	0	0	0	1	0	0	0	0	0
1994	1	0	1	2	4	0	0	0	0	0
1995	2	4	0	0	6	3	4	0	2	9
1996	7	4	1	2	14	5	5	0	2	12
1997	7	5	2	3	17	1	11	2	5	19
1998	3	9	3	6	21	7	4	2	2	15
1999	1	2	2	5	10	4	10	2	2	18
2000	1	3	1	3	8	4	5	2	4	15
2001	1	2	3	2	8	7	4	1	3	15
2002	0	1	1	0	2	3	0	0	1	4
2003	4	1	0	3	8	1	1	0	0	2
2004	1	0	1	2	4	5	2	2	0	9
Total	29	31	15	28	103	40	46	11	21	118

are those with family ownership less than or equal to 50%, while “high family” firms are the remaining family firms.<sup>11</sup> Mean (median) family ownership in our full sample is 21.8% (11.2%) for acquirers and 22.1% (18.6%) for targets. Mean (median) family ownership for the family firm sub-sample of acquirers varies from 28% (26.6%) in the low family sub-sample to 63.1% (59.7%) in the high family sub-sample. For targets, the corresponding values range from 23.1% (21.2%) to 61.7% (59.5%). The mean (median) market capitalization for acquirers is \$919 (\$296) million, while the corresponding amount for targets is \$217 (\$94) million.<sup>12</sup> The mean (median) firm age at the time of the acquisition is 29.23 (18) years for acquirers and 17.42 (15) years for targets.

Overall, we find few significant differences between family and non-family firms.<sup>13</sup> For acquirers, we find that family firms tend to be significantly younger and have smaller boards of directors relative to their non-family counterparts. We also find that family firms tend to have less independent boards (only at low levels of ownership, however, is the difference statistically significant). Finally, targets with low levels of family ownership are acquired by larger acquirers and tend to hold higher cash balances than do their non-family counterparts.

Panel B of Table 2 reports pairwise Pearson correlation coefficients between various control variables and their statistical significance. Consistent with prior research, acquirer abnormal returns are higher for tender offers and are negatively correlated with the level of merger activity in the target industry. In addition, the insignificant correlation between family ownership and abnormal returns seems to imply a non-linear relationship.

#### 4. Empirical tests and results

This section describes the testing methodology and reports results for acquirers and targets in Sections 4.1 and 4.2, respectively.

<sup>11</sup> Our choice of the 50% cut-off is based on a framework similar to Stulz (1988). Beyond that point there is no additional entrenchment of the insiders and any increase in ownership can only better align the interests of majority and minority shareholders. We have also replicated all of our results involving an ownership dummy (see e.g., Eq. (2)) using 45% and 55% ownership cut-offs. The results are qualitatively unchanged in these alternative specifications.

<sup>12</sup> In comparison, Anderson and Reeb (2003), who study the valuation of mature and S&P 500-listed family firms, report average family ownership of 17.88% and average total assets of \$9.6 billion for their sample firms. The mean (median) total assets for acquirers in our sample is \$850 (\$152) million, while the corresponding amount for targets is \$151 (\$79) million.

<sup>13</sup> While the test statistics reported in Table 2 are based on the differences in means, the results are qualitatively similar for the differences in medians. These unreported results are available from the authors upon request.

Section 4.3 compares the influence of family and other blockholders on abnormal returns.

##### 4.1. Abnormal returns and acquiring family's ownership

###### 4.1.1. Univariate comparisons

In Table 3, we report the cumulative abnormal returns (CARs) earned by our sample firms over a two-day event window starting on the announcement date.<sup>14</sup> The market model parameters are calculated over 250 trading days ending on the 46th trading day before the acquisition announcement. Our findings for the full sample are consistent with prior research: on average, acquirers earn insignificant CARs and acquirers in cash-financed acquisitions earn higher CARs than do those in stock-financed ones.<sup>15</sup>

A comparison of CARs earned by family and non-family acquirers reveals interesting differences. In a cash-financed acquisition by an average non-family firm, CARs are 5% higher than those earned by acquirers with low levels of family ownership. This suggests that families with low levels of ownership are entrenched and therefore may not make the most value-creating merger decisions. Non-family acquirers in stock-financed transactions, on the other hand, earn CARs that are, on average, 5.2% lower than those earned by acquirers with low levels of family ownership. This seems to suggest that the dilution of family's stake has a positive influence on the value creation in acquirers with low levels of family ownership. The comparable results for family firms with high levels of ownership are not significant, possibly due to small sample sizes. In the following sections, we provide further evidence using various regression techniques.

###### 4.1.2. The influence of family ownership

To better understand the influence of acquiring family's ownership on value gains in mergers, we estimate the following regression:

$$\begin{aligned}
 CAR_i = & \beta_0 + \beta_1 FAMOWN_i + \beta_2 FAMOWNSQ_i + \beta_3 STOCK_i \\
 & + \beta_4 FAMSTOCK_i + \beta_5 FAMSTOCKSQ_i \\
 & + \sum_j \beta_j \text{Control variable}_{ji} + \varepsilon_i
 \end{aligned} \quad (1)$$

The dependent variable is the acquirer's CAR over a two-day event window starting on the announcement date. To allow for non-line-

<sup>14</sup> We have also used cumulative abnormal returns over various other event windows in our univariate and multivariate tests. The results are qualitatively unchanged.

<sup>15</sup> See e.g., Jensen and Ruback (1983) and Andrade et al. (2001).

arity in the relationship between value creation and acquiring family's ownership, we use a quadratic specification.<sup>16</sup> FAMOWN is the family ownership in the acquiring firm, as reported in the proxy statement preceding and closest to the acquisition announcement.<sup>17</sup> FAMOWNSQ is FAMOWN squared. STOCK is a dummy variable that takes on a value of one if the medium of exchange is stock, and zero otherwise. FAMSTOCK and FAMSTOCKSQ are constructed by multiplying STOCK with FAMOWN and FAMOWNSQ, respectively.<sup>18</sup>

Cash-financed acquisitions provide direct evidence about the influence of acquiring family's ownership on value gains in mergers since the counteracting dilution effect is not present. Therefore, the signs of coefficients  $\beta_1$  and  $\beta_2$  will depend only upon the relationship between family ownership in the acquiring firm and value created or destroyed by the merger. In particular, as described in Section 2, increasing family ownership could be associated with either a better alignment of incentives or a greater extent of entrenchment. If the entrenchment effect dominates at low levels of family ownership and the opposite is true at high levels of ownership, we expect  $\beta_1$  to be negative and  $\beta_2$  to be positive. If, on the other hand, the incentive alignment effect dominates at low levels of ownership and the opposite is true at high levels of ownership, we expect  $\beta_1$  to be positive and  $\beta_2$  to be negative.

Any stock-financed merger, on the other hand, will result in a dilution of the acquiring family's control. The coefficients  $\beta_4$  and  $\beta_5$  are, therefore, expected to capture the market's perception of the value of the dilution. In particular, this dilution effect is expected to have a positive (negative) influence on the value creation over the range of ownership for which the entrenchment (incentive alignment) effect dominates. Thus, the signs of the coefficients  $\beta_4$  and  $\beta_5$  are expected to be opposite of those of  $\beta_1$  and  $\beta_2$ , respectively.

As discussed in Section 2, there are two interrelated sources of value gains from dilution when the family is entrenched. First, dilution reduces the extent of the acquiring family's entrenchment and thus increases firm value. Second, dilution can be seen as a credible signal of the family's intentions not to engage in value-destroying activities. The first source of value creation should be present for all stock-financed acquisitions as any value gains are directly related to the level of dilution resulting from a particular merger. The second source, however, is likely to be more pronounced for the very first acquisition announced by the firm after going public. By the time of subsequent acquisitions, any signaling benefits should be at least partially reflected in the stock price and

therefore have a minimal impact on value creation. To distinguish between these two sources of value gains from dilution, in Tables 4 and 5, we report the results for the full sample (columns 1 through 9), as well as for the sub-sample of first acquisitions (column 10).

The results of the empirical tests of Eq. (1) are reported in Table 4. We find that the coefficient estimate for  $\beta_1$  is negative, while the coefficient estimate for  $\beta_2$  is positive. Both coefficient estimates are statistically significant at the 1% level. This implies a convex relationship between the market reaction upon an announcement of a cash-financed acquisition and acquiring family's ownership. At its lowest point, the difference in the CARs between family and non-family firms reaches negative 7.6%.<sup>19</sup> Our results suggest that at low levels of acquiring family's ownership, the entrenchment effect dominates the incentive alignment effect. In contrast, at high levels of family ownership, the incentive alignment effect dominates the entrenchment effect.

The signs of the coefficient estimates for  $\beta_4$  and  $\beta_5$ , consistent with our predictions, are opposite to those for  $\beta_1$  and  $\beta_2$ . They are statistically significant at the 1% level. Our results suggest that, in stock-financed acquisitions by firms with low levels of family ownership, the value destruction due to acquiring family's entrenchment is offset by the benefits of dilution. At the same time, the value creation due to the alignment of incentives (observed for cash-financed acquisitions by firms with high levels of family ownership) is offset by the reduction in the incentive alignment resulting from the dilution.

A concern with the above results may arise if the decision to become an acquirer is not exogenous. In such a situation, our sample of acquiring firms could no longer be considered a random sample and the estimates reported above could, therefore, be biased. In order to correct for this potential bias we use Heckman's (1976) correction for endogenous self-selection.<sup>20</sup> The corrected coefficient estimates corresponding to Eq. (1) are reported in column 11 of Table 4.<sup>21</sup> The coefficient estimates for  $\beta_1$ ,  $\beta_2$ ,  $\beta_4$ , and  $\beta_5$  remain statistically significant and are similar to those reported in columns 1 to 9. This suggests that the relationship between acquiring family's ownership and the returns earned by acquirers is not caused by an endogenous censoring of the sample. Further, the Wald-test suggests that the censoring of our sample is not a significant factor and is unlikely to bias our results.<sup>22</sup>

#### 4.1.3. The impact of dilution

Our findings suggest that dilution can potentially explain the difference in the influence of family ownership on the abnormal

<sup>16</sup> We have also replicated the results reported below using a piecewise specification with the Morck et al. (1988) cut-offs of 5% and 25%. The results are qualitatively unchanged in this alternative specification.

<sup>17</sup> Our measure of family ownership is the percentage of voting rights controlled by the family. A concern about such a measure may arise from the potential influence of dual class share structures on firm value. These structures are unlikely to have a significant influence on our results since only 15 of the 103 acquirers and 6 of the 118 targets in our sample have multiple classes of shares. Further, in these and subsequent tests we have also used the difference between cash flow rights and voting rights as an additional control variable. Finally, we have also replicated all the results excluding firms with dual class share structures. The results are qualitatively unchanged in these alternative specifications and suggest that our conclusions are not influenced by the presence of dual class share structures.

<sup>18</sup> In all specifications, we control for the firm size (LMKT) and firm age (LFAGE), since these variables have been used as control variables in the examination of the relationship between firm performance and family ownership (see e.g., Anderson and Reeb, 2003). We also use the following additional control variables one at a time (all defined in the Appendix): RELSIZE, RSD, NTRANS, CASHB, DIVERS, TENDER, TDIR, and PODIR. These variables are suggested by the works of Bennedsen et al. (2008), Moeller et al. (2007), Ben-Amar and André (2006), Moeller et al. (2004), Harford (1999), Morck et al. (1990), Huang and Walking (1987), and Jensen and Ruback (1983). The expected signs of the control variables are reported in the tables. We have also used year dummies as additional control variables to control for the variation in the merger activity across years (see Martynova and Renneboog, 2008). The results are qualitatively unchanged in this alternative specification.

<sup>19</sup> The estimated relationship reaches its minimum at around 28% family ownership. At this level of ownership, predicted CARs equal negative 7.6%. Since non-family firms serve as benchmarks (i.e., the influences of both FAMOWN and FAMOWNSQ on CARs for these firms equal zero), the negative 7.6% represents the largest absolute difference in the CARs between family and non-family firms.

<sup>20</sup> We implement the correction as follows. We start with a sample of all non-venture-backed firms that went public between 1993 and 2000. Using a panel dataset of these firms from 1993 to 2004, we estimate each firm's propensity of becoming an acquirer. Following Harford (1999), we use the following independent variables: FAMOWN, FAMOWNSQ, the growth in sales, the ratio of cash-to-sales, leverage, the market-to-book ratio, the price-to-earnings ratio, non-cash working capital, the natural logarithm of market capitalization, and year dummies. Nawata (1994) and Puhani (2000) have suggested that a one-step maximum likelihood estimation is more efficient than the two-stage estimator which uses the inverse Mills ratio to correct for the potential bias. Based on their suggestion, we estimate Eq. (1) jointly (in one-step) with the selection equation, using full-information maximum likelihood estimation procedure. The results are qualitatively unchanged when we use the two-stage estimation.

<sup>21</sup> For the sake of brevity, we do not report the results for the selection equation (they are available from the authors upon request). The sample size in column 11 is lower due to the lack of various accounting variables needed for the estimation of the selection equation.

<sup>22</sup> In addition, the results of the unreported selection equation suggest that family ownership is not a statistically significant predictor of the propensity to become an acquirer.

**Table 2**  
Summary statistics

Acquirers	Full sample (N = 103)			Non-family (N = 43)			Low family (N = 44)			High family (N = 16)			Test statistics for the differences in means	
	(A)			(B)			(C)			(D)			(B)–(C)	(B)–(D)
	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median	St. Dev.	Mean	Median	St. Dev.		
<i>Panel A: Summary statistics of independent variables</i>														
FAMOWN	0.218	0.112	0.246	0.000	0.000	0.000	0.280	0.266	0.156	0.631	0.597	0.113		
DILUTION	–0.128	0.000	0.246	0.000	0.000	0.000	–0.221	–0.039	0.287	–0.153	0.000	0.231		
MKT	919	296	2362	1037	281	2178	785	285	2762	969	349	1642	0.47	0.11
RELSIZE	0.523	0.339	0.674	0.571	0.373	0.665	0.480	0.197	0.726	0.514	0.261	0.574	0.61**	0.30**
FAGE	29.233	18.000	30.593	38.140	20.000	37.086	24.386	16.000	26.270	18.625	17.500	10.893	2.00	2.06**
RSD	0.037	0.034	0.016	0.035	0.030	0.020	0.039	0.038	0.014	0.039	0.037	0.009	–1.09	–0.72
NTRANS	0.075	0.050	0.104	0.078	0.050	0.149	0.077	0.062	0.058	0.061	0.037	0.045	0.04	0.45
CASHB	0.078	0.031	0.204	0.079	0.057	0.180	0.075	–0.006	0.235	0.084	0.051	0.182	–0.09	–0.11
DIVERS	0.359	0.000	0.482	0.349	0.000	0.482	0.341	0.000	0.479	0.438	0.000	0.512	0.08	–0.62
TENDER	0.155	0.000	0.364	0.163	0.000	0.374	0.091	0.000	0.291	0.313	0.000	0.479	1.00	–1.27*
CDEAL	0.717	0.180	1.462	0.437	0.180	0.743	0.857	0.179	1.784	1.084	0.221	1.856	–1.43***	–1.93**
TDIR	6.845	7.000	2.408	7.860	7.000	2.633	6.295	6.000	1.837	5.625	5.000	2.217	3.22***	3.02***
PODIR	0.510	0.556	0.237	0.573	0.583	0.206	0.452	0.500	0.255	0.499	0.500	0.237	2.43**	1.18
<i>Targets</i>	Full sample (N = 118)			Non-family (N = 32)			Low family (N = 70)			High family (N = 16)			Test statistics for the differences in means	
FAMOWN	0.221	0.186	0.215	0.000	0.000	0.000	0.231	0.212	0.126	0.617	0.595	0.131		
MKT	217	94	342	257	80	464	195	96	285	231	135	295	0.83**	0.21
RELSIZE	0.331	0.161	0.437	0.469	0.255	0.562	0.270	0.113	0.357	0.321	0.139	0.442	2.17**	0.90
FAGE	17.424	15.000	15.086	19.875	14.500	22.393	16.614	14.500	12.045	16.063	15.000	7.325	0.96*	0.66
RSD	0.047	0.044	0.020	0.042	0.042	0.013	0.049	0.044	0.021	0.048	0.045	0.023	–1.73*	–1.30
NTRANS	0.095	0.066	0.113	0.082	0.056	0.075	0.109	0.082	0.134	0.063	0.073	0.048	–1.08**	0.88
CASHB	0.100	0.020	0.214	0.034	–0.018	0.185	0.124	0.041	0.222	0.122	0.008	0.217	–2.02**	–1.48
DIVERS	0.441	0.000	0.499	0.438	0.000	0.504	0.414	0.000	0.496	0.563	1.000	0.512	0.22	–0.81
TENDER	0.220	0.000	0.416	0.125	0.000	0.336	0.271	0.000	0.448	0.188	0.000	0.403	–1.65	–0.57
TDIR	6.517	6.000	1.801	6.844	6.000	2.316	6.457	6.000	1.594	6.125	6.000	1.455	0.98	1.13
PODIR	0.549	0.571	0.156	0.581	0.600	0.160	0.541	0.571	0.162	0.518	0.500	0.114	1.16	1.40
<i>Acquirers</i>	CAR	FAMOWN	MKT	RELSIZE	FAGE	RSD	NTRANS	CASHB	DIVERS	TENDER	CDEAL	TDIR	PODIR	
<i>Panel B: Correlation matrix</i>														
CAR	1.000													
FAMOWN	0.102	1.000												
MKT	–0.048	0.033	1.000											
RELSIZE	0.060	–0.038	–0.153	1.000										
FAGE	–0.015	–0.260***	0.167*	–0.102	1.000									
RSD	–0.132	0.106	–0.054	0.129	–0.297***	1.000								
NTRANS	–0.280***	–0.050	0.090	–0.004	0.185**	–0.113	1.000							
CASHB	0.048	0.158	0.129	–0.026	–0.301***	0.207*	–0.152	1.000						
DIVERS	–0.068**	0.084	0.062	–0.037	0.079	–0.095	0.142	0.097	1.000					
TENDER	0.235	0.079	–0.049	–0.106***	–0.006	–0.160	–0.089	0.027***	–0.042**	1.000				
CDEAL	0.107	0.200	0.119	–0.282***	–0.076	0.014	–0.070	0.411***	0.232**	0.194*	1.000			
TDIR	–0.052	–0.383***	0.178*	–0.042	0.499***	–0.076	0.149	–0.083	0.065	–0.129	0.027	1.000***		
PODIR	0.067	–0.125	–0.015	–0.193*	0.046	0.084	–0.031	0.050	0.038	0.172*	0.136	0.318***	1.000	
<i>Targets</i>	CAR	FAMOWN	MKT	RELSIZE	FAGE	RSD	NTRANS	CASHB	DIVERS	TENDER	TDIR	PODIR		
CAR	1.000													
FAMOWN	0.135**	1.000												
MKT	–0.187*	–0.079	1.000*											
RELSIZE	–0.165**	–0.136	0.180**	1.000										
FAGE	0.246	–0.073	0.188**	–0.089	1.000**									
RSD	0.095***	0.108	–0.138	–0.084	–0.210**	1.000								
NTRANS	–0.300***	–0.116	–0.021	–0.041	–0.139**	0.013	1.000							
CASHB	–0.115	0.059	0.196**	0.016	–0.196**	–0.025	–0.022	1.000						
DIVERS	0.008	0.089	0.079	–0.280***	0.136	0.071	–0.050	0.048	1.000					
TENDER	0.121	0.041	–0.046	–0.035	0.132	–0.061*	–0.112	–0.151	–0.019	1.000				
TDIR	–0.060	–0.126*	0.120	–0.075	0.280***	–0.165*	0.037	–0.079	–0.056	–0.051	1.000			
PODIR	–0.044	–0.178*	0.156*	0.193**	0.055	–0.179*	0.131	0.149	–0.052	–0.034	0.152	1.000		

The sample consists of 221 mergers, 103 of which involved a newly public firm as an acquirer and 118 of which involved a newly public firm as a target. "Low family" firms are those with family ownership less than or equal to 50%, while "high family" firms are the remaining family firms. All variables are as described in the Appendix. Panel B reports pairwise Pearson correlation coefficients and their statistical significance. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

returns between cash- and stock-financed acquisitions. Hence, we expect to observe a statistically significant relationship between the abnormal returns earned by the acquirer upon the acquisition

announcement and the dilution of the acquiring family's ownership. We examine this conjecture by estimating the following regression:

**Table 3**  
Univariate tests

	Acquirers				Targets			
	Mean	Median	St. Dev.	N	Mean	Median	St. Dev.	N
<i>Full sample</i>								
All	-0.004 <sub>*</sub>	-0.005	0.095	103	0.214 <sup>***</sup>	0.207 <sup>***</sup>	0.247	118
Cash	0.022 <sub>*</sub>	-0.001	0.079	44	0.282 <sup>***</sup>	0.277 <sup>***</sup>	0.250	51
Stock	-0.023 <sub>*</sub>	-0.029 <sup>**</sup>	0.101	59	0.162 <sup>***</sup>	0.106 <sup>***</sup>	0.234	67
<i>Non-family</i>								
All	-0.013 <sub>**</sub>	-0.005 <sub>*</sub>	0.093	43	0.171 <sup>***</sup>	0.108 <sup>***</sup>	0.251	32
Cash	0.041 <sub>**</sub>	0.029 <sub>**</sub>	0.065	15	0.200 <sup>***</sup>	0.267 <sup>***</sup>	0.132	11
Stock	-0.042 <sub>**</sub>	-0.027 <sub>**</sub>	0.093	28	0.156 <sup>*</sup>	0.082 <sup>**</sup>	0.297	21
<i>Low family</i>								
All	0.001	-0.004	0.088	44	0.236 <sup>***</sup>	0.211 <sup>***</sup>	0.241	70
Cash	-0.009	-0.010	0.055	21	0.340 <sup>***</sup>	0.278 <sup>***</sup>	0.247	29
Stock	0.010	0.013	0.111	23	0.162 <sup>***</sup>	0.117 <sup>***</sup>	0.208	41
<i>High family</i>								
All	0.011	-0.029	0.118	16	0.201 <sup>***</sup>	0.174 <sup>***</sup>	0.273	16
Cash	0.069	0.017	0.121	8	0.209 <sup>*</sup>	0.129 <sup>**</sup>	0.317	11
Stock	-0.046	-0.071	0.087	8	0.184 <sup>*</sup>	0.247 <sup>*</sup>	0.164	5
<i>Non-family less low family</i>								
All	-0.014 <sub>**</sub>	-0.001 <sub>**</sub>			-0.065 <sub>*</sub>	-0.103		
Cash	0.050 <sub>*</sub>	0.039 <sub>*</sub>			-0.141	-0.011		
Stock	-0.052 <sub>*</sub>	-0.040 <sub>*</sub>			-0.006	-0.035		
<i>Non-family less high family</i>								
All	-0.025	0.024			-0.003	-0.066		
Cash	-0.028	0.012			-0.009	-0.138		
Stock	0.004	0.044			-0.027	-0.165		

The table reports cumulative abnormal returns, measured over a two-day event window starting on the announcement date. The market model parameters are calculated over 250 trading days ending on the 46th trading day before the acquisition announcement. “Low family” firms are those with family ownership less than or equal to 50%, while “high family” firms are the remaining family firms. The results of *t*-tests of differences in means and nonparametric Wilcoxon signed rank tests of differences in medians are reported. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

$$CAR_i = \beta_0 + \beta_1 DILUTION_i + \beta_2 HIGH_i + \beta_3 DILUTION\_HIGH_i + \beta_4 STOCK_i + \sum_j \beta_j Control\ variable_{ji} + \varepsilon_i \quad (2)$$

DILUTION is the ratio of the difference between acquiring family’s pre- and post-merger ownership to their pre-merger ownership.<sup>23</sup> The post-merger ownership is obtained from the first proxy statement following the effective date of the merger. Since the influence of dilution is expected to vary with the level of family ownership, we first create a dummy variable, HIGH, that takes on a value of one if the family controls more than 50% of the voting rights before the merger, and zero otherwise. We then create an interactive dummy, DILUTION\_HIGH, a product of DILUTION and HIGH. All control variables are as described for Eq. (1).

Dilution either reduces acquiring family’s entrenchment or signals that the family’s presence in the firm is not motivated primarily by the private benefits of control. Thus, at low levels of family ownership, it is likely to have a positive influence on the abnormal returns. Consequently, we expect the sign of coefficient  $\beta_1$  to be positive. At high levels of family ownership, on the other hand, dilution is expected to have a negative influence on abnormal returns since it weakens the alignment of incentives. Therefore, the sign of coefficient  $\beta_3$  is expected to be negative.

The results are reported in Table 5. As expected, the coefficient estimate for  $\beta_1$  is positive. However, only the sub-sample of first acquisitions (column 10) yields statistically significant results. Our results suggest that the relationship between acquirer returns and the dilution of family ownership at low levels of ownership is driven primarily by the signal inherent in the choice of stock as the medium of exchange.

The coefficient estimate for  $\beta_3$  is negative and statistically significant at the 1% level. The magnitude of the coefficient estimate for  $\beta_3$  is also economically meaningful. In particular, for firms with high levels of pre-merger family ownership, a 5% dilution leads to about 1.5% decline in abnormal returns. This decline represents about 65% of the average abnormal return for a stock-financed acquisition in our sample (65% is computed as 1.5%/2.3%). Our findings suggest that dilution of high levels of ownership, due to the use of stock as the medium of exchange, results in a negative market reaction. This is consistent with the reduced alignment of the acquiring family’s incentives with those of minority shareholders.

#### 4.1.4. The medium of exchange

Since the choice of the medium of exchange has a direct influence on the acquiring family’s control over the post-merger firm, we expect this choice to be related to family ownership in the acquiring firm in the following manner. Entrenched families, who are interested in preserving their control over the firm, are less likely to choose stock as the medium of exchange. Families, whose incentives are aligned with those of minority shareholders, on the other hand, are more likely to do what is best for the firm, even if it results in some loss of control.<sup>24</sup> We, therefore, examine the relationship between acquiring family’s ownership and the choice of the medium of exchange by estimating the following logit regression:

$$STOCK_i^* = \beta_0 + \beta_1 FAMOWN_i + \beta_2 FAMOWNSQ_i + \sum_j \beta_j Control\ variable_{ji} + \varepsilon_i \quad (3)$$

<sup>23</sup> We have also used the absolute difference between acquiring family’s pre- and post-merger ownership as our measure of dilution. The results are qualitatively unchanged in this alternative specification.

<sup>24</sup> The choice of stock as the medium of exchange in this case indicates that the benefits of using stock (due to, for example, asymmetric information about both the acquirer and the target, or tax considerations) exceed the value loss due to the reduced alignment of the family’s incentives with those of minority shareholders.

**Table 4**  
Acquirer returns and family ownership

	Expected signs	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS	(8) OLS	(9) OLS	(10) OLS	(11) Heckman
FAMOWN	+/-	-0.541 (3.85)	-0.544 (4.05)	-0.561 (3.93)	-0.519 (3.69)	-0.544 (3.77)	-0.544 (3.74)	-0.503 (3.41)	-0.546 (3.81)	-0.518 (3.59)	-0.753 (3.22)	-0.573 (3.49)
FAMOWNSQ	-/+	0.969 (4.13)	0.976 (4.33)	1.029 (4.23)	0.932 (4.01)	0.979 (3.93)	0.981 (4.04)	0.902 (3.69)	0.975 (4.10)	0.933 (3.84)	1.414 (3.12)	1.001 (3.98)
STOCK	-	-0.087 (3.82)	-0.087 (3.86)	-0.078 (3.34)	-0.077 (3.50)	-0.086 (3.77)	-0.087 (3.83)	-0.079 (3.01)	-0.086 (3.77)	-0.085 (3.71)	-0.101 (3.51)	-0.087 (3.58)
FAMSTOCK	-/+	0.913 (4.12)	0.915 (4.17)	0.923 (4.16)	0.883 (3.99)	0.920 (3.90)	0.909 (3.97)	0.874 (3.84)	0.913 (4.09)	0.902 (4.20)	1.187 (3.36)	0.907 (3.78)
FAMSTOCKSQ	+/-	-1.480 (4.59)	-1.486 (4.69)	-1.522 (4.60)	-1.436 (4.45)	-1.497 (4.17)	-1.479 (4.45)	-1.413 (4.26)	-1.487 (4.55)	-1.459 (4.67)	-2.045 (3.39)	-1.467 (4.35)
LMKT	-	-0.001 (0.19)	-0.001 (0.21)	-0.004 (0.92)	0.001 (0.18)	-0.001 (0.14)	-0.001 (0.11)	-0.001 (0.24)	-0.001 (0.12)	-0.001 (0.22)	-0.006 (1.06)	-0.008 (0.86)
LFAGE	-	-0.001 (0.12)	-0.001 (0.13)	-0.004 (0.41)	0.000 (0.04)	-0.002 (0.18)	-0.001 (0.11)	-0.001 (0.09)	0.000 (0.05)	-0.002 (0.20)	-0.004 (0.39)	0.003 (0.28)
RELSIZE	+		-0.002 (0.12)									
RSD	-			-0.938 (1.77)								
NTRANS	-				-0.208 (3.15)							
CASHB	-					-0.009 (0.21)						
DIVERS	-						-0.015 (0.72)					
TENDER	+							0.017 (0.75)				
TDIR	-								-0.001 (0.31)			
PODIR	+									0.019 (0.52)		
Intercept		0.058 (0.99)	0.063 (0.86)	0.139 (1.81)	0.042 (0.73)	0.057 (0.98)	0.058 (0.98)	0.052 (0.89)	0.059 (1.01)	0.051 (0.86)	0.140 (1.74)	0.219 (0.99)
N		103	103	103	103	103	103	103	103	103	80	89
Adj R <sup>2</sup>		0.13	0.12	0.14	0.17	0.12	0.13	0.12	0.12	0.12	0.12	0.12
Wald-test												0.58

Sample includes 103 mergers in which newly public firms are involved as acquirers. The dependent variable is the cumulative abnormal return earned by the acquirer over a two-day event window starting on the announcement date. All variables are as described in the Appendix. All family ownership variables refer to the family ownership in the acquiring firm. The results for the full sample with different control variables are reported in columns 1 through 9. The results for the sub-sample that includes only the first acquisition by each acquirer are reported in column 10. The results of the second stage estimation of the Heckman selection model are reported in column 11. The first stage includes the following independent variables: FAMOWN, FAMOWNSQ, sales growth, the ratio of cash-to-sales, leverage, market-to-book ratio, price-to-earnings ratio, non-cash working capital, and the natural log of market capitalization. All variables are as of the end of the preceding fiscal year. The model is estimated in one-step using full-information maximum likelihood method. The results of a Wald-test for the independence of equations are reported in column 11. Heteroskedasticity-adjusted (White) standard errors are used in calculation of *t*-statistics that are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

STOCK\* denotes a latent continuous variable that proxies for the propensity to use stock as the medium of exchange. STOCK takes on a value of one if STOCK\* is greater than zero, and zero otherwise.<sup>25</sup> Since our earlier findings imply entrenchment of families with low levels of ownership and incentive alignment of families with high levels of ownership, we expect the coefficient  $\beta_1$  to be negative and the coefficient  $\beta_2$  to be positive.

The results are reported in Table 6. As expected, the coefficient estimate for  $\beta_1$  is negative and the coefficient estimate for  $\beta_2$  is positive. Both coefficient estimates are statistically significant at the 10% level or better. Panel B reports the implied probabilities of observing stock as the medium of exchange for various levels of family ownership in the acquiring firm.<sup>26</sup> We find that the likelihood of stock as the medium of exchange is around 70% for non-family firms. It declines to a minimum of around 49% for firms in which the family owns 35% of the equity, and then increases. Our results suggest that control considerations influence the choice of the medium of exchange in acquisitions. In particular, families with low lev-

<sup>25</sup> In all specifications, we control for the firm size (LMKT), firm age (LFAGE), and acquirer's holdings of cash (CDEAL). We also use the following additional control variables one at a time: RELSIZE, TDIR, and PODIR.

<sup>26</sup> Probabilities are calculated using the results reported in column 1 of Panel A of Table 6. Variables other than family ownership are held constant at their respective medians.

els of ownership in the acquiring firm are more likely to avoid dilution and therefore choose cash as the medium of exchange. This is consistent with our earlier results, which suggest that acquiring families with low levels of ownership are more likely to be entrenched. A better alignment of incentives at high levels of family ownership, on the other hand, leads to a lower likelihood of using cash as the medium of exchange.

#### 4.1.5. Correction for self-selection bias

Since, as shown above, the choice of the medium of exchange is a function of acquiring family's ownership (and therefore endogenous), the coefficient estimates for STOCK (and interactive dummies based on it) in Eq. (1) may be inconsistent. To correct for this potential self-selection bias, we use the switching regression model with endogenous switching.<sup>27</sup> In particular, we estimate the following model:

$$\text{STOCK}_i^* = Z_i'\gamma + \varepsilon_i \quad (4.1)$$

$$\text{CAR}_{\text{cash},i} = X_i'\beta_1 + u_{1i} \quad (4.2)$$

$$\text{CAR}_{\text{stock},i} = X_i'\beta_2 + u_{2i} \quad (4.3)$$

<sup>27</sup> For a detailed discussion of this model, see Maddala (1983). This model has been used by, among others, Fang (2005).



**Table 5**  
Acquirer returns and the dilution of family ownership

	Expected signs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
DILUTION	+/-	0.066 (1.46)	0.066 (1.44)	0.066 (1.49)	0.064 (1.43)	0.068 (1.50)	0.067 (1.49)	0.065 (1.43)	0.067 (1.47)	0.082 (1.61)	0.117* (1.89)
HIGH	+/-	0.059 (1.76)*	0.059 (1.75)*	0.061 (1.80)*	0.053 (1.59)	0.058 (1.75)	0.061 (1.82)	0.052 (1.57)	0.059 (1.73)*	0.062 (1.94)*	0.066* (1.81)
DILUTION_HIGH	-/+	-0.299*** (3.53)	-0.300*** (3.49)	-0.302*** (3.53)	-0.284*** (3.26)	-0.293*** (3.44)	-0.304*** (3.56)	-0.284*** (3.38)	-0.299*** (3.52)	-0.326*** (3.56)	-0.369*** (3.05)
STOCK	-	-0.043** (2.29)	-0.042** (2.28)	-0.037 (1.89)	-0.035* (1.98)	-0.044* (2.29)	-0.044* (2.36)	-0.032 (1.52)	-0.043** (2.30)	-0.043** (2.32)	-0.053** (2.46)
LMKT	-	-0.002 (0.50)	-0.001 (0.27)	-0.005 (1.04)	-0.000 (0.08)	-0.003 (0.64)	-0.002 (0.38)	-0.003 (0.59)	-0.002 (0.50)	-0.003 (0.64)	-0.005 (1.05)
LFAGE	-	0.003 (0.37)	0.003 (0.38)	0.001 (0.11)	0.005 (0.56)	0.005 (0.53)	0.004 (0.40)	0.003 (0.38)	0.003 (0.30)	0.001 (0.12)	0.007 (0.70)
RELSIZE	+		0.004 (0.26)								
RSD	-			-0.802 (1.41)							
NTRANS	-				-0.208** (2.58)						
CASHB	-					0.025 (0.69)					
DIVERS	-						-0.018 (0.86)				
TENDER	+							0.031 (1.33)			
TDIR	-								0.000 (0.07)		
PODIR	+									0.052 (1.35)	
Intercept		0.028 (0.54)	0.016 (0.22)	0.097 (1.27)	0.014 (0.27)	0.029 (0.55)	0.028 (0.55)	0.023 (0.44)	0.028 (0.53)	0.015 (0.29)	0.051 (0.90)
N		103	103	103	103	103	103	103	103	103	80
Adj R <sup>2</sup>		0.07	0.07	0.08	0.12	0.07	0.07	0.08	0.06	0.08	0.09

Sample includes 103 mergers in which newly public firms are involved as acquirers. The dependent variable is the cumulative abnormal return earned by the acquirer over a two-day event window starting on the announcement date. All variables are as described in the Appendix. All family ownership variables refer to the family ownership in the acquiring firm. The results for the full sample with different control variables are reported in columns 1 through 9. The results for the sub-sample that includes only the first acquisition by each acquirer are reported in column 10. Heteroskedasticity-adjusted (White) standard errors are used in calculation of *t*-statistics that are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

Eq. (4.1) is the selection equation as specified by Eq. (3). The sample is then split into two groups based on the medium of exchange. The second stage equations, Eqs. (4.2) and (4.3), estimated separately for the cash- and stock-financed acquisitions, respectively, are specified as follows:

$$\text{CAR}_i = \beta_0 + \beta_1 \text{FAMOWN}_i + \beta_2 \text{FAMOWNSQ}_i + \beta_3 \text{LMKT}_i + \beta_4 \text{LFAGE}_i + \beta_5 \text{RELSIZE}_i + u_i \quad (5)$$

We use CDEAL as an instrumental variable.<sup>28</sup> The model is estimated using full-information maximum likelihood.

The results of the estimation of Eqs. (4.2) and (4.3) are reported in Table 7. We find that for cash-financed acquisitions, even after controlling for the self-selection bias, there is a negative (positive) and statistically significant relationship between family ownership in the acquiring firm and acquirer CARs at low (high) levels of ownership. For stock-financed acquisitions, however, neither of the coefficient estimates for  $\beta_1$  and  $\beta_2$  is statistically significant. We test for the equality of the coefficient estimates for  $\beta_1$  and  $\beta_2$  across the two equations using a Wald-test and find that they are statistically significantly different. In addition, the likelihood ratio (LR) test fails to reject the independence of the two equations. Our findings suggest that the OLS results reported in previous sub-sections are not driven by this self-selection bias.

<sup>28</sup> We have also used the target's market-to-book ratio as an instrument (see Carleton et al., 1983, who argue that this ratio is positively correlated with the potential capital gains tax liability of target firm's shareholders). Our results are qualitatively unchanged in this alternative specification.

#### 4.2. Family ownership and target returns

We now turn to the relationship between abnormal returns earned by targets and family ownership in the target firms.<sup>29</sup> We do so by estimating Eq. (1) for target firms. All variables are target side counterparts of those defined for Eq. (1).<sup>30</sup>

As discussed earlier, a cash-financed acquisition of a family-controlled target results in a complete loss of the family's control. This implies that the market reaction upon such acquisitions will reveal the nature of the influence of the family on the pre-merger value of the target. In particular, an exit of an entrenched family will be seen more favorably by the market than an exit of a family whose incentives are aligned with those of minority shareholders. If the entrenchment effect dominates at low levels of family ownership and the opposite is true at high levels of ownership, we expect  $\beta_1$  to be positive and  $\beta_2$  to be negative. If, on the other hand, the incentive alignment effect dominates at low levels of ownership and the opposite is true at high levels of ownership, we expect  $\beta_1$  to be negative and  $\beta_2$  to be positive.

For stock-financed acquisitions of family-controlled targets, as discussed in Section 2, the impact of the loss of control in the case of cash-financed acquisitions can be mitigated by either the blockholder effect, the certification effect, or both. Since the magnitude

<sup>29</sup> Our univariate results on the target side (reported in Table 3) are consistent with the findings of previous studies: CARs for target firms are positive and significantly different from zero (see e.g., Andrade et al., 2001).

<sup>30</sup> We have also used the bid premium as a control variable. The results remain qualitatively unchanged in this alternative specification.

**Table 6**  
The choice of the medium of exchange and family ownership

	Expected signs	(1)	(2)	(3)	(4)	(5)							
<i>Panel A: Results of logistic regressions</i>													
FAMOWN	-/+	-4.966 (1.87)*	-5.489 (2.00)**	-4.581 (1.73)*	-5.542 (2.01)**	-6.758 (1.99)**							
FAMOWNSQ	+/-	6.699 (1.76)*	7.551 (1.90)*	6.592 (1.75)*	7.461 (1.90)*	10.206 (1.93)*							
LMKT	+/-	0.193 (1.31)	0.102 (0.66)	0.174 (1.17)	0.196 (1.34)	0.129 (0.75)							
LFAGE	+/-	-0.135 (0.57)	-0.151 (0.61)	-0.274 (1.02)	-0.095 (0.39)	-0.180 (0.68)							
CDEAL	-	-0.369 (2.61)***	-0.439 (2.78)***	-0.393 (2.79)***	-0.345 (2.48)**	-0.211 (1.35)							
RELSIZE	+/-		-0.603 (1.83)*										
TDIR	+/-			0.116 (0.89)									
PODIR	+/-				-0.759 (0.83)								
Intercept		-1.100 (0.62)	0.477 (0.24)	-1.294 (0.71)	-0.828 (0.43)	-0.171 (0.08)							
N		103	103	103	103	80							
Pseudo R <sup>2</sup>		0.08	0.10	0.08	0.08	0.06							
		Family ownership											
		0%	10%	20%	30%	35%	40%	50%	60%	70%	80%	90%	100%
<i>Panel B: Implied probabilities of observing stock as the medium of exchange</i>													
Implied probability of stock (%)		70.6	60.9	53.7	49.7	48.9	49.0	51.7	57.6	66.4	76.7	86.2	93.1

Sample includes 103 mergers in which newly public firms are involved as acquirers. In Panel A the dependent variable takes on a value of one if stock is the medium of exchange, and zero otherwise. The estimation is done using a logistic regression. All variables are as described in the Appendix. All family ownership variables refer to the family ownership in the acquiring firm. The results for the full sample are reported in columns 1 to 4, while the results for the sub-sample that includes only the first acquisition by each acquirer are reported in column 5. Panel B reports the implied probabilities of observing stock as the medium of exchange for various levels of family ownership. Probabilities are calculated using the results reported in column 1 of Panel A. Variables other than family ownership are held constant at their respective medians. Heteroskedasticity-adjusted (White) standard errors are used in calculation of *t*-statistics that are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

**Table 7**  
Acquirer returns and the dilution of family ownership controlling for self-selection

	(1) Cash acquisitions	(2) Stock acquisition	(3) <i>p</i> -value
FAMOWN	-0.499 (2.97)***	0.175 (0.97)	0.004
FAMOWNSQ	0.869 (3.24)***	-0.277 (1.07)	0.001
LMKT	0.009 (0.94)	-0.004 (0.37)	
RELSIZE	0.016 (1.06)	-0.060 (1.79)*	
LFAGE	0.012 (1.13)	-0.019 (1.26)	
Intercept	-0.085 (0.66)	0.040 (0.31)	
LR-test			0.101
N	44	59	

Sample includes 103 mergers in which newly public firms are involved as acquirers. The reported results are for the two second stage equations, one for the cash-financed acquisitions and the other for stock-financed ones. The dependent variable is the cumulative abnormal return earned by the acquirer over a two-day event window starting on the announcement date. All variables are as described in the Appendix. All family ownership variables refer to the family ownership in the acquiring firm. The *p*-values for the coefficient equality based on Wald-test as well as the Likelihood Ratio (LR) test of the independence of the two equations are reported in column 3. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

of both of these effects is likely to be increasing with the level of target family's ownership, we expect the signs of coefficients  $\beta_4$  and  $\beta_5$  to be opposite of those of  $\beta_1$  and  $\beta_2$ , respectively.

The results are reported in Table 8.<sup>31</sup> We find that the coefficient estimate for  $\beta_1$  is positive, while the coefficient estimate for  $\beta_2$  is negative. Both coefficient estimates are statistically significant at

<sup>31</sup> For one of the targets in our sample, the transaction was for an "undisclosed amount". Since for this firm we are not able to calculate RELSIZE, the sample size in column 2 is lower.

the 5% level. At its highest point, the difference in the abnormal returns between family and non-family firms reaches approximately 15.7%.<sup>32</sup> This implies a concave relationship between family ownership and the market reaction upon announcement of a cash-financed acquisition of a family-controlled target. Our results suggest that, similar to acquirers, target families with high levels of ownership in their firms are assets to their (pre-merger) firms, while families with low levels of ownership are liabilities.

Consistent with our predictions, the signs of the coefficient estimates for  $\beta_4$  and  $\beta_5$  are opposite of those for  $\beta_1$  and  $\beta_2$ , respectively. Neither of the coefficient estimates, however, is statistically significant. Overall, the results on the target side are consistent with our findings on the acquirer side. They provide additional evidence of entrenchment of families with low levels of ownership and incentive alignment of families with high levels of ownership.

Similar to the earlier discussion on acquirers, the relationship between abnormal returns and family ownership for targets could also be influenced by the endogeneity of the choice to become a target. We address this using Heckman's (1976) correction for self-selection.<sup>33</sup> The results are reported in column 10 of Table 8. The coefficient estimates for  $\beta_1$  and  $\beta_2$  remain statistically significant and are similar to those reported in columns 1 to 9. This suggests that the observed relationship between family ownership in target firms and target abnormal returns is not caused by an endogenous

<sup>32</sup> The estimated relationship reaches its maximum at around 36% family ownership. At this level of ownership, predicted CARs equal 15.7%. Since non-family firms serve as benchmarks (i.e., the influences of both FAMOWN and FAMOWNSQ on CARs for these firms equal zero), the 15.7% represents the largest difference in the CARs between family and non-family firms.

<sup>33</sup> We follow Carleton et al. (1983) and use the following independent variables to predict the probability of a firm becoming a target: FAMOWN, FAMOWNSQ, EBITDA growth, leverage, the market-to-book ratio, the price-to-earnings ratio, non-cash working capital, the natural log of market capitalization, and year dummies. We estimate Eq. (1) jointly (in one-step) with the selection equation, using full-information maximum likelihood.

**Table 8**  
Target returns and family ownership

	Expected signs	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS	(8) OLS	(9) OLS	(10) Heckman
FAMOWN	-/+	0.873 (2.30)**	0.874 (2.39)**	0.875 (2.17)**	0.820 (2.20)**	0.864 (2.26)**	0.897 (2.38)**	0.872 (2.29)**	0.849 (2.23)**	0.881 (2.34)**	0.905 (2.25)**
FAMOWNSQ	+/-	-1.215 (2.15)**	-1.125 (2.10)**	-1.218 (2.05)**	-1.176 (2.09)**	-1.207 (2.14)**	-1.253 (2.23)**	-1.214 (2.12)**	-1.177 (2.08)**	-1.223 (2.18)**	-1.222 (2.01)**
STOCK	-	0.033 (0.43)	0.043 (0.57)	0.034 (0.44)	0.026 (0.35)	0.032 (0.41)	0.034 (0.45)	0.034 (0.44)	0.035 (0.45)	0.034 (0.45)	0.026 (0.34)
FAMSTOCK	+/-	-0.858 (1.44)	-0.920 (1.59)	-0.860 (1.44)	-0.789 (1.34)	-0.870 (1.47)	-0.889 (1.50)	-0.858 (1.44)	-0.838 (1.41)	-0.857 (1.44)	-0.722 (1.19)
FAMSTOCKSQ	-/+	1.288 (1.58)	1.282 (1.61)	1.291 (1.57)	1.209 (1.49)	1.299 (1.61)	1.353 (1.67)*	1.288 (1.57)	1.231 (1.51)	1.289 (1.58)	1.076 (1.31)
LMKT	-	-0.047 (2.64)***	-0.056 (3.69)***	-0.047 (2.90)***	-0.043 (2.47)**	-0.049 (2.74)***	-0.047 (2.66)***	-0.047 (2.67)***	-0.045 (2.44)**	-0.047 (2.67)***	-0.051 (3.19)***
LFAGE	+/-	0.122 (3.50)***	0.125 (3.63)***	0.122 (3.46)***	0.103 (2.97)***	0.126 (3.57)***	0.125 (3.44)***	0.122 (3.48)***	0.126 (3.52)***	0.123 (3.52)***	0.141 (3.68)***
RELSIZE	+/-		-0.022 (0.58)								
RSD	+/-			-0.034 (0.03)							
NTRANS	+				-0.401 (2.57)**						
CASHB	+/-					0.043 (0.39)					
DIVERS	+/-						-0.031 (0.74)				
TENDER	+/-							0.002 (0.04)			
TDIR	-								-0.007 (0.63)		
PODIR	+									0.029 (0.24)	
Intercept		0.367 (1.91)*	0.472 (2.82)***	0.371 (1.99)**	0.423 (2.24)**	0.377 (1.96)**	0.379 (2.00)**	0.367 (1.88)*	0.386 (2.06)**	0.352 (1.71)*	0.455 (0.96)
N		118	117	118	118	118	118	118	118	118	97
Adj R <sup>2</sup>		0.18	0.22	0.17	0.20	0.17	0.18	0.17	0.17	0.17	
Wald-test											0.06

Sample includes 118 mergers in which newly public firms are involved as targets. The dependent variable is the cumulative abnormal return earned by the target over a two-day event window starting on the announcement date. All variables are as described in the Appendix. All family ownership variables refer to the family ownership in the target firm. The results for the full sample with different control variables are reported in columns 1–9. The results of the second stage estimation of the Heckman selection model are reported in column 10. The first stage regression includes the following independent variables: FAMOWN, FAMOWNSQ, EBITDA growth, leverage, market-to-book ratio, price-to-earnings ratio, non-cash working capital, and the natural log of market capitalization. All variables are as of the end of the preceding fiscal year. The model is estimated in one-step using full-information maximum likelihood method. The results of a Wald-test for the independence of equations are reported in column 11. Heteroskedasticity-adjusted (White) standard errors are used in calculation of *t*-statistics that are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

censoring of the sample. Further, the Wald-test suggests that this censoring is unlikely to bias our results.<sup>34</sup>

### 4.3. Blockholder ownership, insider ownership, and abnormal returns

The results reported so far indicate that family ownership is an important determinant of the abnormal returns earned by acquirers and targets in mergers. It could, however, be argued that families are not different from other blockholders. Therefore, they may have a similar impact on firm value. To address this concern, we estimate the following regression:

$$\begin{aligned}
 CAR_i = & \beta_0 + \beta_1 FAMOWN_i + \beta_2 FAMOWNSQ_i + \beta_3 STOCK_i \\
 & + \beta_4 FAMSTOCK_i + \beta_5 FAMSTOCKSQ_i \\
 & + \beta_6 BLOCKOWN_i + \beta_7 BLOCKOWNSQ_i \\
 & + \beta_8 BLOCKSTOCK_i + \beta_9 BLOCKSTOCKSQ_i \\
 & + \sum_j \beta_j Control\ variable_{ji} + \varepsilon_i \quad (6)
 \end{aligned}$$

BLOCKOWN is defined as family ownership in family firms and the ownership of the largest individual blockholder in non-family firms. BLOCKOWNSQ is BLOCKOWN squared. BLOCKSTOCK and BLOCK-

STOCKSQ are constructed by multiplying STOCK with BLOCKOWN and BLOCKOWNSQ, respectively.<sup>35</sup>

If families influence abnormal returns in the same way as do other types of blockholders, we would expect the coefficients  $\beta_1$ ,  $\beta_2$ ,  $\beta_4$ , and  $\beta_5$  to be insignificant. If, on the other hand, our results are driven by the unique nature of family ownership, we would expect the coefficients  $\beta_1$ ,  $\beta_2$ ,  $\beta_4$ , and  $\beta_5$  to be significant. The results, reported in columns 1 and 2 of Table 9, indicate that the impact of family ownership reported in the earlier tests are, in fact, unique to families and are not observed for other blockholders. In particular, the coefficient estimates for  $\beta_1$ ,  $\beta_2$ ,  $\beta_4$ , and  $\beta_5$  all remain significant, while the coefficient estimates for blockholder related variables are not statistically significant either for acquirers or for targets.

We also test whether our results remain significant after controlling for insider ownership. We define INSOWN as the ownership of the firm's insiders. As before, we define INSOWNSQ as INSOWN squared. INSSTOCK and INSSTOCKSQ are constructed by multiplying STOCK with INSOWN and INSOWNSQ, respectively. The results are reported in columns 3 and 4 of Table 9. The coefficient estimates for  $\beta_1$ ,  $\beta_2$ ,  $\beta_4$ , and  $\beta_5$  remain significant, while the coefficient estimates for variables related to insider ownership are not statistically significant either for acquirers or for targets.

<sup>34</sup> Also, unreported results of the selection equation suggest that family ownership is not a statistically significant predictor of the propensity to become a target.

<sup>35</sup> In all specifications, we control for the firm size (LMKT) and firm age (LFAGE).

**Table 9**

Abnormal returns and family ownership, controlling for blockholder and insider ownership

	Expected signs	(1)	(2)	(3)	(4)
		Acquirers	Targets	Acquirers	Targets
FAMOWN	+/-	-0.467 (2.11)**	1.058 (2.58)**	-0.515 (3.17)***	1.091 (2.89)***
FAMOWNSQ	-/+	0.815 (2.16)**	-1.383 (2.34)**	0.910 (3.32)***	-1.405 (2.73)***
STOCK	-	-0.105 (2.80)***	-0.125 (1.31)	-0.084 (1.66)*	-0.174 (1.44)
FAMSTOCK	-/+	0.857 (2.94)***	-1.124 (1.70)*	0.861 (3.59)***	-1.047 (1.69)
FAMSTOCKSQ	+/-	-1.442 (3.14)***	1.263 (1.42)	-1.397 (3.97)***	1.282 (1.57)
BLOCKOWN	+/-	-0.056 (0.21)	-0.274 (0.60)		
BLOCKOWNSQ	-/+	0.133 (0.34)	0.252 (0.58)		
BLOCKSTOCK	-/+	0.132 (0.42)	1.183 (1.81)*		
BLOCKSTOCKSQ	+/-	-0.106 (0.24)	-0.988 (1.55)		
INSOWN	+/-			0.180 (0.94)	-0.197 (0.43)
INSOWNSQ	-/+			-0.169 (0.67)	-0.047 (0.10)
INSSTOCK	-/+			0.013 (0.04)	0.648 (1.11)
INSSTOCKSQ	+/-			-0.017 (0.05)	-0.147 (0.24)
LMKT	-	-0.001 (0.26)	-0.039 (2.16)**	0.001 (0.21)	-0.044 (2.49)**
LFAGE	-	-0.000 (0.02)	0.127 (3.40)***	-0.004 (0.41)	0.123 (3.38)***
Intercept		0.057 (0.89)	0.292 (1.22)	0.003 (0.04)	0.403 (1.76)*
N		103	118	103	118
Adj R <sup>2</sup>		0.11	0.19	0.10	0.20

The dependent variable is the cumulative abnormal return over a two-day event window starting on the announcement date. All variables are as described in the Appendix. Family ownership variables refer to the family ownership in the acquiring firm for columns (1) and (3) and to the family ownership in the target for columns (2) and (4). Heteroskedasticity-adjusted (White) standard errors are used in calculation of *t*-statistics that are reported in parentheses. \*\*\*, \*\*, and \* indicate significance at the 1%, 5%, and 10% levels, respectively.

## 5. Conclusions

Families represent a unique group of active, long-term owners, holding concentrated equity positions in their firms. Using a sample of newly public family firms, this paper examines their influence on value creation in mergers. Our findings can be summarized as follows. First, we provide evidence of a significant and convex relationship between acquirer abnormal returns and family ownership in the acquirer. This suggests the family's entrenchment at low levels and better alignment of incentives at high levels of ownership. Moreover, acquirers with low levels of family ownership are more likely to choose cash as the medium of exchange and thus preserve the family's benefits of control. In addition, the market perceives a full loss of control by the family as a value-creating event if the family ownership is low and as a value-destroying event if the family ownership is high. Second, we find that the dilution of the acquiring family's ownership in a stock-financed acquisition has a significant influence on value creation in mergers.

Our study improves the understanding of family firms in several ways. First, the impact of family ownership on value gains documented in this paper provides further evidence that the ownership by the family is an important determinant of the value of such firms. Second, we provide evidence that newly public family firms

differ in significant ways from their mature and index-listed counterparts. In particular, the entrenchment of the family and the alignment of their interests with those of minority shareholders occur at different ownership levels in these two groups of family firms. A detailed study of the sources of this difference could advance our understanding of the influence of family ownership on firm value.

Our findings also have implications for the merger literature. Although the change in ownership and control is a natural outcome of stock-financed mergers, the relationship between value creation in mergers and changes in ownership has not, to our knowledge, received any attention in the literature. A further examination of this relationship may prove to be a fruitful area for future research.

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## Appendix

### Variable description

VARIABLE	DESCRIPTION
CAR	<i>Measure of value creation</i> Cumulative abnormal return over a two-day event window starting on the announcement date
FAMOWN	<i>Family ownership variables</i> Family ownership (as reported in the proxy statement preceding and closest to the acquisition announcement) in either the acquiring or target firm (as specified in the table heading)
FAMOWNSQ	FAMOWN squared
STOCK	Dummy variable that takes on a value of one if the medium of exchange is stock, and zero otherwise
FAMSTOCK	Product of STOCK and FAMOWN
FAMSTOCKSQ	Product of STOCK and FAMOWNSQ
DILUTION	Ratio of the difference between the family's pre- and post-merger ownership to their pre-merger ownership
HIGH	Dummy variable, that takes on a value of one if before the merger the family controls more than 50% of the voting rights, and zero otherwise
DILUTION_HIGH	Product of DILUTION and HIGH
BLOCKOWN	<i>Other ownership variables</i> Equals FAMOWN for family firms and the holdings of the largest individual blockholder for non-family firms
BLOCKOWNSQ	BLOCKOWN squared
BLOCKSTOCK	Product of STOCK and BLOCKOWN
BLOCKSTOCKSQ	Product of STOCK and BLOCKOWNSQ
INSOWN	Ownership of the firm's insiders
INSOWNSQ	INSOWN squared

## Appendix (continued)

VARIABLE	DESCRIPTION
INSTOCK	Product of STOCK and INSOWN
INSTOCKSQ	Product of STOCK and INSOWNSQ
	<i>Control variables</i>
MKT	The market capitalization (in millions of dollars), measured on the 20th trading day preceding the acquisition announcement
LMKT	The natural logarithm of market capitalization (in thousands of dollars), measured on the 20th trading day preceding the acquisition announcement
FAGE	The number of years between either the year of incorporation or the start of operations, whichever is earlier, and the time of the acquisition announcement
LFAGE	The natural logarithm of one plus the number of years between either the year of incorporation or the start of operations, whichever is earlier, and the time of the acquisition announcement
RELSIZE	Value of the target as a fraction of the market capitalization of the acquirer
RSD	Idiosyncratic standard deviation calculated over the 250 trading days ending on the 46th day preceding the acquisition announcement
NTRANS	Ratio of the value of all M&A transactions reported by SDC worth \$1 million or more to the total book value of assets of all firms in Compustat in the same 2-digit SIC code and year
CASHB	Industry-adjusted ratio of cash and short term investments to total assets
DIVERS	Dummy variable that takes on a value of one if the acquirer and the target have different 2-digit SIC codes, and zero otherwise
TENDER	Dummy variable that takes on a value of one for tender offers, and zero otherwise
CDEAL	Ratio of acquirer's holdings of cash and marketable securities at the end of the fiscal year preceding the acquisition announcement to the value of the transaction
TDIR	The number of board members as reported in the proxy statement preceding and closest to the acquisition announcement
PODIR	Ratio of the number of outside directors (as defined by Baker and Gompers, 2003) to TDIR as reported in the proxy statement preceding and closest to the acquisition announcement

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