Are Sophisticated Traders Better Informed When Trading Family Firms?

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ABSTRACT

We investigate whether family ownership as a corporate governance mechanism systematically affects the likelihood of information dissemination to sophisticated traders. In stark contrast to findings in the literature, we provide evidence that trading by short sellers, option traders, and other sophisticated investors better predict subsequent short-term returns in nonfamily firms. Our findings suggest that informed trading occurs mainly in firms without family control and that family ownership effectively guards confidential information from sophisticated traders.

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ABSTRACT

We investigate whether family ownership as a corporate governance mechanism systematically affects the likelihood of information dissemination to sophisticated traders. In stark contrast to findings in the literature, we provide evidence that trading by short sellers, option traders, and other sophisticated investors better predict subsequent short-term returns in nonfamily firms. Our findings suggest that informed trading occurs mainly in firms without family control and that family ownership effectively guards confidential information from sophisticated traders.

The global prominence of family control has resulted in many debates about its advantages and disadvantages (Perez-Gonzalez, 2006; Shleifer and Vishny, 1986; Claessens et al., 2000; Morck et al., 2005; Bertrand and Schoar, 2006). Anderson, Reeb, and Zhao (2012), hereafter ARZ, are first in investigating the capital markets implications of family control and assert that short sellers' main information advantage stems from their trading in family firms. These findings imply that family firm members use their superior information to bet on their firm's demise, either by engaging in short selling themselves, or by leaking private information to other short sellers.

Such illicit, and potentially illegal, behavior would suggest that some members of family firms violate their fiduciary duty, harm investor confidence, and possibly manipulate critical firm decisions to maximize their own trading profits. Exploitation of privileged information threatens the fair and orderly operation of stock markets, which in turn, impedes price efficiency. Brunnemeier (2006) shows that information leakage reduces price informativeness in the long run and decreases prices efficiency in capital markets. Since family-owned firms constitute a large part of overall market capitalization, an accurate assessment of information leakage by family firms matters for market efficiency, market regulation, and for our understanding of family control as a prominent corporate governance structure.

Ali, Chen, and Radhakrishnan (2007) document that family firms report better quality earnings and are more likely to warn about poor earnings through management earnings forecasts. If information asymmetries are lower for family firms, they should be a less attractive target for sophisticated investors, and it is not readily apparent why sophisticated traders can extract more sensitive information from them. The literature proposes family quarrels and lax regulatory oversight as the main explanations. Quarrels among family members and between family members and nonfamily executives might lead disgruntled parties to deliberately leak negative news to

damage the company reputation. Acting out of spite comes at a significant cost, since collaborating with short sellers will likely be considered treasonous by other family members and could jeopardize the family's reputation. If spite is the primary reason why family firms divulge more negative information to short sellers, conflicts must be widespread, grudges must be deep, and leakage should benefit traders who profit from negative news.

Opportunistic trading behavior due to lax oversight might also explain the findings. Family members who are not employees or board members can still access privileged information and might have greater opportunity to profit from it because they face less scrutiny from regulators than family members who are formally involved in the firm. Lower regulatory scrutiny of family members who are connect to, but not directly involved in, could allow them to profit from leaking negative information to short sellers. Yet short selling is risky, collaborating with short sellers has reputational costs, and the potential gains are limited compared to long positions. If lax oversight of some family members explains the purported information advantage of short sellers, we would expect an even more pronounced flow of positive information to sophisticated traders, where the cost of leaking is lower and potentials gains are higher.

Sophisticated traders might have information advantages that are more pronounced in family firms for some types of information and are more pronounced in nonfamily firms for other types of information. Many incentives that motivate illicit trading in family firms also exist in non-family firms: Disgruntled employees that leak negative news exist in every organizational form, and Ali and Hirshleifer (2017) document that many insiders continued to trade on privileged information despite high regulatory scrutiny. If spite is the primary driver of information advantage, then profitable trading should be concentrated among short sellers. If lax oversight of some family firm members matters most, we might see even more information leakage from family firms to

informed traders than documented by ARZ and Sun and Yin (2017) once we also examine traders who benefit from positive and negative news. Such a result would likely have broader implications for capital markets. Conversely, if family firms guard information effectively, we expect more informed trading in nonfamily firms. Examining a wider set of informed traders should help distinguish between these competing channels, improve our understanding of information leakage in family firms, and assess the extant findings in the literature.

To do so, we conduct a detailed analysis of informed trading in family and non-family firms. Specifically, we study possible information transmission from family and nonfamily firms to sophisticated traders by examining the relation between family firm status and the informativeness of trades made by short sellers, option traders and institutional investors. Strikingly, in sharp contrast to ARZ's result, we find no evidence of informed trading in family firms by these sophisticated investors, yet we document strong evidence of informed trading by short sellers and institutional investors in non-family firms. A long-short investment strategy that buys a portfolio of nonfamily firms with low short sales and shorts a corresponding portfolio of nonfamily firms with high short interest generates statistically significant abnormal returns of over eight basis points per day, or 1.77% per month, excluding rebalancing costs. Similarly, a long-short investment strategy formed on weekly Institutional Trading Order Imbalance (OIB) in nonfamily firms generates statistically significant abnormal returns across different asset pricing models, although that strategy is less profitable. Fama-MacBeth regressions reject the claim that short sellers are only informed when trading stocks in family firms. In fact, the interaction of a family firm indicator with measures of trading by sophisticated investors is significant at the 10%-level in two out of three specifications, which suggests more informed trading in nonfamily firms. These results suggest that informed trading by short sellers, option traders, and institutional

investors is limited to non-family firms; we find no evidence of informed trading by these investors groups in family firms.

Why do our results differ from ARZ? The striking difference between our results and ARZ's does not stem from differences in methodology, data, or sample period, as we classify family firms based on ARZ's data, use the REG SHO database for our short selling analysis, and, in a latter test, shorten our sample period to match ARZ's sample from January 2005 to July of 2007. One potential explanation for the discrepancy in results might be an error in their sample construction. ARZ report, in Panel B of their Table II, negative mean and median values for the daily returns in their sample of 1,571 firms whereas we document that mean and median daily returns are positive. We show in Section V that negative mean and median daily returns between January 2005 and July 2007 are close to impossible: ARZ's sample exceeds 90% of Compustat market capitalization and correlates almost perfectly with major market indices that increased by more than 21% over this 31-month-long sample period. More generally, negative average and median daily returns over a 31-month period for the largest U.S. stocks only occurred after the dot-com bust and during the global financial crisis. It seems to us that ARZ made an error in constructing the dataset they describe in their summary statistics.

Our findings contribute to the perennial debate about the costs and benefits of family control. On the one hand, an extensive literature argues that family-controlled firms are disadvantageous to investors (Morck et al., 2000; Angelo and DeAngelo, 2000; Bertrand, Mehta, and Mullainathan, 2002; Bae, Kang, and Kim, 2002; Claessens, Djankov, Fan and Lang, 2002; Cronqvist and Nilsson, 2003; Bertrand et al., 2008). On the other hand, family firms have been shown to outperform in developed markets like the United States (Anderson and Reeb, 2003) and France (Sraer and Thesmar, 2007), in developing countries like India (Khanna and Palepu, 2000)

and Chile (Martínez, Stöhr, and Quiroga, 2007), and to benefit from lower cost of debt (Anderson, Mansi, and Reeb, 2002). Consistent with these articles, we identify another beneficial feature of family ownership: family firms effectively guard sensitive information from sophisticated traders.

Prominent investors argue that family-controlled firms have greater reputational concerns and long-term business focus. Berkshire Hathaway's CEO Warren Buffett said that "family-owned businesses share our long-term orientation, belief in hard work, and a no-nonsense approach and respect for a strong corporate culture." Dyer and Whetten (2006), Berrone et al., (2010), Zellweger, Sieger, and Halter (2011), and Deephouse and Jaskiewicz (2013) document empirically that family firms have higher reputation concerns, and Stein (1988) and Miller and Le Breton-Miller (2005) show that family firms aim to invest in long-term relationships with other stakeholders. Ali, Chen, and Radhakrishnan (2007) document that family firms report better quality earnings and are more likely to warn about poor earnings through management earnings forecasts. Our findings are consistent with greater reputational concerns and long-term focus and with lower information asymmetries in family firms.

Our findings also have regulatory implications. SEC Rule 10b-5 prohibits corporate officers, directors, and other insiders from trading on confidential corporate information and from providing confidential information to third parties. Family members with an ownership stake below 10% can also be considered "constructive insiders" subject to this rule (Dirks v. SEC, 463 U.S. 646, 1983; Seyhun, 1992; ARZ; Fisch, 2016). However, ARZ are concerned that enforcement for those family members is lacking, that they violate insider-trading laws more frequently, and therefore urge the SEC to scrutinize their trades. In contrast, we find no evidence of systematic leakage that would warrant such scrutiny.

Finally, we provide further evidence that firms' organizational structure affects the information environment in which sophisticated investors operate. Previous works shows that these investors trade profitably because they know more about firm fundamentals, process public information better, and receive tips from third parties. ARZ emphasize that firms' organizational structure can also lead to information advantages. Our findings are consistent with that broader point, but we show that informed trading is more prevalent in non-family firms. In a related study, Akbas, Wintoki, and Meschke (2016) link governance structure to sophisticated trading by documenting more informed trading in firms with more connected directors. When investigating alternative explanations for their findings, they report that informed trading is unrelated to family firm status at conventional significance levels. Our results provide strong evidence that family control constrains, rather than facilitates, informed trading by sophisticated investors.

I. Sample Construction, Variables and Descriptive Statistics

A. Samples Construction

Our analysis is based on the 2,000 largest non-utility, non-financial U.S. firms for which ARZ collect family firm ownership data for the decade from 2001 through 2010.[1] We merge these 2,000 firms with daily short-sale data to construct a *short sales sample* of 1,665 firms for which both family ownership and short selling data are available for the period from January 2005 through December 2010. We also construct an *option trading sample* and an *institutional trading sample* for the six-year period from January 2005 through December 2010 by intersecting Ron Anderson's family ownership data with daily options data and, separately, with weekly institutional trading data. The options sample consists of 1,326 firms, and the institutions sample covers 1,682

[1] See the Data Description and Definition tab in the family data file named "family_data_distribute_07may2012.xlsx", posted at www.ronandersonprofessionalpage.net. The file is now available at www.davidreeb.net/cv--data.html

firms. For comparison, we also shorten our sample period to construct a *replication sample* that covers the same period as ARZ from January 2005 through July 2007.

B. Measures of Informed Trading

We use three measures of informed trading in our analysis. The first measure, *Short*, is the daily short-sale volume divided by daily share volume. Diether, Lee, and Werner (2008) show that higher level of this short selling measure predicts subsequent declines in abnormal stock return returns. The second measure, *Option Ratio*, is the ratio of total daily put and call trading volume to stock trading volume. Pan and Poteshman (2006) document evidence of informed trading in proprietary option data from the Chicago Board Options Exchange (CBOE), and Johnson and So (2012) show that option-to-stock volume contains negative information about future stock returns. The third measure of informed trading is *Institutional OIB*, the institutional trading order imbalance. Griffin, Harris, and Topaloglu (2003), Campbell, Ramadorai, and Schwartz (2009), and Puckett and Yan (2011) all find that institutional trading predicts stock returns. We follow Akbas, Meschke, and Wintoki (2016) and construct weekly *Institutional OIB* for each stock as buyer-initiated minus seller-initiated institutional trading over a week, divided by the total number of shares traded.

C. Measure of Family Firms

To identify family firms, we use Ron Anderson's *Family Firm* indicator variable, which equals one for firms where founders or their descendants maintain at least a 5% ownership stake, and zero otherwise. This definition is the same as in ARZ and consistent with the literature (Shleifer and Vishny, 1986; Villalonga and Amit, 2006).

D. Additional Control Variables

In the Fama-MacBeth regressions of future stock returns, we follow ARZ and control for additional factors that might affect informed trading, such as stock momentum, liquidity and share price uncertainty (Diether et al., 2009). The variable $r_{t-5\ to\ t-1}$ measures the past five-period return and captures a momentum effect. To account for a nonlinear relation between past and future returns, we calculate the term $Rank(r_{t-5\ to\ t-1})$, the rank of an individual stock's return based on $r_{t-5\ to\ t-1}$ among all stocks in the sample, normalized to range from zero to one. We also include $Turnover(_{-5,-1})$, the average share trading volume over the past five-periods, divided by shares outstanding, and *Risk*, the difference between the high and low stock price of an individual stock on day *t*, normalized by the high price. Table I shows the variable definitions.

E. Descriptive Statistics

The first three panels of Table II report descriptive statistics for the short sales, option trading, and institutional trading samples from January 2005 through December 2010 for the Fama-MacBeth regressions. Panel A contains 660,457 firm-day observations for family firms and 1,379,622 firm-day observations for nonfamily firms. The average daily short-sale ratio is 0.333, so short sales account for 33.3% of the daily trading volume of shares. Two-day stock returns average 3.7 basis points, with a median value of zero. Difference of mean tests in the last three columns of Panel A show that the average short sales ratio is very similar across family and nonfamily firms, while average two-day returns for nonfamily firms are 4.0 basis points, 0.9 basis points higher than the two-day returns for family firms.

Panels B and C show that the option ratio is somewhat higher, and institutional order imbalances are somewhat more negative, for nonfamily firms, when compared to family firms.

Panels D and E report the summary statistics for the replication sample for the daily and quarterly regressions that cover January 2005 through July 2007, the same period as in ARZ.

II. Informed Trading in Family vs. Nonfamily Firms: Portfolio Analysis

A. Short Sales and Future Stock Returns

We first rank family firms, and separately, nonfamily firms into quintiles based on their daily *Short*, defined as daily short-sale volume divided by daily share volume. We then compute future average stock returns and abnormal returns on day t + 2 for each of the five family firm portfolios and each of the five nonfamily firm portfolios using the Fama–French three- and four-factor models. The portfolios are value-weighted and rebalanced every day. We skip day t+1 to mitigate concerns about bid-ask bounce (Kaul and Nimalendran, 1990). The intercept, α, in the asset pricing models is our measure for abnormal returns on day t + 2.

The first three columns of Panel A of Table III report the day t + 2 average returns and abnormal returns for the five family firm portfolios sorted by short sales on day t. The family firm portfolio with the lowest short sales (Low) generates positive but insignificant abnormal returns ranging about 0.8 basis points. In contrast, the family firm portfolio with the highest short selling (High) delivers negative abnormal returns around -2.5 basis points, which are significant only in the 10% level. More importantly, a long-short investment strategy that buys the family firm portfolio with the lowest short sales and shorts the family firm portfolio with the highest short selling generates abnormal returns about 3.4 basis points that are statistically insignificant. A daily abnormal return of 3.4 basis points is equivalent to 0.72% return per month, excluding rebalancing costs.

The last three columns in Panel A of Table III report the day t + 2 average returns and abnormal returns for the five nonfamily firm portfolios sorted by short sales on day *t*. The nonfamily firm portfolio with the lowest short sales (Low) generates positive and significant abnormal returns ranging around 6.0 basis points, while the nonfamily firm portfolio with the highest short selling (High) delivers negative and significant abnormal returns between -2.4 basis points. We also find a decreasing trend in abnormal returns moving from the Low portfolio to the High portfolio for the nonfamily firms. Importantly, a long-short investment strategy that buys the Low nonfamily firm portfolio and shorts the High nonfamily firm portfolio generates abnormal returns about 8.4 basis points, in which both of the abnormal returns are statistically significant at the 1% level. A daily abnormal return of 8.4 basis points is equivalent to 1.77% return per month, excluding rebalancing costs. In sum, we find that daily short sales predict future stock returns in nonfamily firms, regardless which asset pricing model we use; we find no such evidence in family firms.

B. Option Trading and Future Stock Returns

Short sellers are, of course, but one group of informed traders. Johnson and So (2012) document that daily O*ption Ratio*, the ratio of total daily put and call trading volume to stock trading volume, also contain negative information about future stock returns. In this section, we replace the daily short sales ratios in our analysis with daily option ratios. This lets us investigate whether option traders are more informed when trading family firms compared to nonfamily firms.

To do so, we rank family firms, and separately, nonfamily firms, into quintiles based on their daily option ratio, and compute future average stock returns and abnormal returns on day t + 2 for the five family firm portfolios and the five nonfamily firm portfolios. As before, we value-

weight and rebalance the portfolios every day, skip day t+1 to reduce the effect of bid-ask bounce, and measure abnormal returns on day t + 2 with the intercept term, α, from the Fama–French three- and four-factor models.

The first three columns in Panel B of Table III report day t + 2 average returns and abnormal returns for the five family firm portfolios sorted by option ratios on day *t*. The family firm portfolio with the lowest option ratio (Low) generates insignificantly positive abnormal returns, the one with the highest option ratio (High) generates insignificantly negative returns, and a long-short investment strategy that buys the Low family firm portfolio and shorts the High family firm portfolio also delivers insignificant abnormal returns.

The last three columns in Panel B of Table III show that the three nonfamily portfolios with the lowest option ratio consistently generate statistically significant positive alphas across the two different factor models. In contrast, the two nonfamily portfolios with the highest option ratio generate alphas that are insignificantly different from zero. Due to this outperformance on the long side, a long-short investment strategy that buys the Low nonfamily firm portfolio and shorts the High nonfamily firm portfolio generates positive alphas that are statistically significant in Fama–French four-factor model at the 10% level, which shows that a long-short investment strategy based on option ratios in nonfamily firms generates daily abnormal returns of 2.1 basis points, equivalent to 0.46% per month, excluding rebalancing costs.

C. Institutional Trading and Future Stock Returns

Since Puckett and Yan (2011) find that institutional traders earn significant abnormal returns, we investigate whether institutions trade more profitably in family firms. To do so, we compute *Institutional OIB*, the weekly institutional order imbalances for each stock. Specifically,

we subtract weekly buyer-initiate institutional trading from seller-initiated institutional trading and divide by the total number of shares traded.

We rank family firms, and separately, nonfamily firms, into quintiles based on *Institutional OIB*, their weekly trading order imbalance of institutional traders, and compute future average stock returns and abnormal returns for week + 1 for the five family firm portfolios and the five nonfamily firm portfolios. We measure abnormal returns for week + 1 as the alphas from the Fama–French three- and four-factor models.

The first three columns of Panel C of Table III report the week t + 1 average returns and abnormal returns for the five family firm portfolios sorted by institutional trading on week t. The family firm portfolio with the lowest institutional trading (Low) generates insignificantly negative abnormal returns, the one with the highest institutional trading (High) generates insignificantly positive returns, and a long-short investment strategy that buys the High family firm portfolio and shorts the Low family firm portfolio generates insignificantly negative abnormal returns.

The last three columns in Panel C of Table III report the week t + 1 average and abnormal returns for the five nonfamily firm portfolios sorted by institutional trading on week t. Similar to the family firm portfolios, the nonfamily firm portfolio with the lowest institutional trading (Low) generates insignificantly negative abnormal returns, and the nonfamily firm portfolio with the highest institutional trading (High) generates insignificantly positive returns. Yet, in contrast, a long-short investment strategy that buys the High nonfamily firm portfolio and shorts the Low nonfamily firm portfolio generates positive and significant abnormal returns across both asset pricing models.

III. Informed Trading in Family vs. Nonfamily Firms: Multivariate Regressions

A. Short Sales and Future Stock Returns

We next report results from estimating Fama-MacBeth regressions, which allow us to control for other factors that may affect short selling and let us investigate the interactions between short sales and family-ownership status. To do this, we regress future daily stock returns (for day *t+2*) on current daily short sales (for day *t*) for the family firm sample, the nonfamily firm sample, and the combined sample. We use the same control variables as ARZ, which include $r_{t-5\ to\ t-1}$, *Rank*($r_{t-5\ to\ t-1}$), *Turnover*($_{-5,-1}$), and *Risk*. Columns (1) – (3) of Table IV present the Fama-MacBeth mean coefficients from estimating the panel regressions each day over the period from January 2005 through December 2010; t-ratios are based on Newey-West robust standard errors.

Column (1) of Table IV shows results for family firms, Column (2) for nonfamily firms, and Column (3) displays results for the combined sample of family and nonfamily firms. The coefficient on daily short sales in the family firm sample is -0.0341 with a t-ratio of -1.22, which is still statistically and economically insignificant. The coefficient suggests that a 10-percentage-point increase in the daily short sales ratio for family firms is associated with a decrease of 0.34 basis points in subsequent daily returns, corresponding to a monthly decline of seven basis points.

In contrast, the coefficient on daily short sales in the nonfamily firm sample is -0.0915, or 2.68 times larger, and its t-ratio of -2.73 is statistically significant. It suggests that a 10-percentage-point increase in the daily short sales ratio for nonfamily firms is associated with almost a basis-point decline in subsequent daily returns, corresponding to a monthly decline of 20 basis points. When we include both family firms and nonfamily firms in the same specification, the interaction term between short sales and family-control status in the last column is positive and marginally

significant with a t-ratio of 1.92. The Fama-MacBeth regression results in Table VI indicate that short sales in nonfamily firms forecast future stock returns, but short sales in family firms do not.

B. Option Trading and Future Stock Returns

To estimate Fama-MacBeth regressions for the option sample, we regress daily stock returns from day *t+2* on daily option ratios from day *t* for the family firm sample, the nonfamily firm sample, and the combined sample. We again include $r_{t-5 \text{ to } t-1}$, $Rank(r_{t-5 \text{ to } t-1})$, $Turnover(_{-5,-1})$, and *Risk* as control variables, estimate panel regressions each day over the period from January 2005 through December 2010, and construct t-ratios based on Newey-West robust standard errors.

Columns (4) – (6) of Table IV show results for family firms, nonfamily firms, and the combined sample. Consistent with Johnson and So (2012), the daily option ratio predicts a statistically significant decline in subsequent stock returns in all three samples. The coefficient on daily option ratio is -0.0187 (t-ratio = -1.90) for family firms and -0.0157 (t-ratio = -2.20) for nonfamily firms. For the combined sample in the last column, the interaction term between option trading and family-control status is negative and insignificant with a t ratio of -0.77. We cannot conclude, therefore, that option traders are more informed when trading shares of family firms. To the contrary, family firm portfolios ranked on option ratios do not generate significant alphas, while nonfamily firm portfolios with low option ratios do. To the extent that option trading predicts subsequent returns, it seems to do so for nonfamily firms.

C. Institutional Trading and Future Stock Returns

For our last test in the section, we regress weekly stock returns for week *t+1* on Institutional order imbalances for week *t* for the family firm sample, the nonfamily firm sample, and the

combined sample. We again include $r_{t-5\ to\ t-1}$, *Rank*($r_{t-5\ to\ t-1}$), *Turnover*($_{-5,-1}$), and *Risk* as control variables, estimate panel regressions each day over the period from January 2005 through December 2010, and construct t-ratios based on Newey-West robust standard errors of the mean coefficients.

Columns (7) – (9) of Table IV shows that institutional order imbalance is statistically insignificant for the family firm sample, but it is positive and highly statistically significant for nonfamily firms and the combined sample. The coefficient on weekly institutional trading is 0.0102 (t-ratio = 0.44) in the family firm sample, and 0.0601 (t-ratio = 2.9), almost six times larger, in the nonfamily sample. Importantly, the interaction term between institutional trading and family-control status is negative and significant with a t ratio of 1.80 in the combined sample. Consistent with Puckett and Yan (2011), high levels of weekly institutional trading predict high future stock returns in nonfamily firms, but this positive relation declines by factor six and loses statistical significance for family firms.

IV. Informed Trading in Family vs. Nonfamily Firms: Large Stock Price Declines

To investigate the trading activity of sophisticated investors on days before large stock price declines, we define large price declines similar to Ravina and Sapienza (2010) and Akbas, Jiang, and Koch (2020) and do the following: For our daily short sale and option analysis, we exclude the seven trading days centered on each firm's quarterly earnings announcement [-3, +3] from our sample. Next, we classify a firm's stock return on *day t+1* as a *large decline* if it ranks among the firm's lowest 20% of daily returns throughout the calendar year. In that case, the indicator variable *Bottom Ret* $_{t+1}$ equals one, and zero otherwise. We classify a firm's *short sales on day t* as strong if it ranks among the highest 20% of days for that firm throughout the calendar

year. In that case we set the indicator variable *Top Short* $_t$ equals one, and to zero otherwise. We similarly classify a firm's *option trading on day t* as strong if it ranks among the highest 20% of days and set the indicator variable *Top Option* $_t$ equal to one. Since our institutional OIB sample is based on weekly data, we exclude from our sample the three weeks centered on each firm's quarterly earnings announcement week [-1, +1], and the indicator variable *Bottom Ret* $_{t+1}$ equals one if a firm's stock return in *week t+1* as a *large decline* if it ranks among the firm's lowest 20% of weekly returns throughout the calendar year. We then classify a firm's OIB in *week t* as strong if it ranks among the highest 20% of weeks throughout the calendar year, in which case the indicator variable *Top OIB* $_t$ equal to one.

We run a panel logit regression model in which *Top Short* $_t$, *Top Option* $_t$, or *Top OIB* $_t$ is the dependent variable. The *Bottom Ret* $_{t+1}$ indicator, the *Family Firm* indicator, and the interaction term between these two, *Bottom Ret* $_{t+1}$ × *Family Firm*, are the independent variables of interest. Following Akbas, Jiang, and Koch (2020), we control for firm characteristics and time fixed effects and cluster standard errors by time. *Market Cap* is the natural logarithm of the firm's market capitalization on *day t*, calculated as the total number of shares outstanding multiplied by the absolute value of the share price: SHROUT × abs(PRC). *Asset Growth* is the asset growth over a fiscal year that ends on or before *day t*, and *Profit* is the gross profitability measured as sales minus cost of goods sold, scaled by assets over the fiscal year that ends on or before day t: (SALES − COGS)/AT. *Ret* is the daily stock return on day t, and *Std Ret* is the standard deviation of each firm's daily stock returns in a calendar year.

Columns (1) and (2) of Table V show results for the short sales sample, Columns (3) and (4) for the option trading sample, and Columns (5) and (6) display results for the OIB sample. The coefficient on *Bottom Ret* $_{t+1}$ in the short sales sample is positive and significant at the 1% level,

indicating that a large stock price decline on *day t+1* is more likely preceded by strong short sales on the previous day, *day t*. When short sellers trade strongly in *nonfamily firms*, their trading is likely followed by large stock price declines on the next day. Importantly, the coefficient on the interaction term *Bottom Ret* $_{t+1}$ × *Family Firm* in the short sales sample is negative and significant at the 1% level. When short sellers trade strongly in family firms, their trading is less likely followed by large stock price declines on the next day, compared to their trading in nonfamily firms. To assess the economic magnitudes, we calculate odds rations for the logit model in Column (2). Daily stock returns in a nonfamily firm's bottom quintile are 8.26% more likely preceded by short selling in the top quintile the day before. These odds are reduced to only 4.53% for family firms.[2] Short sellers significantly increase their short selling activity prior to larger price declines, more so in nonfamily firms than in family firms.

The coefficient on *Bottom Ret* $_{t+1}$ in the option sample is positive and significant at the 1% level, indicating that a large stock price decline on *day t+1* is also more likely preceded by strong option trading on the previous day, *day t*. When option traders trade strongly in *nonfamily firms*, their trading is likely followed by large stock price declines on the next day. The coefficient on the interaction term *Bottom Ret* $_{t+1}$ × *Family Firm* in the option sample is negative and marginally significant at the 10% level. When option traders trade strongly in family firms, their trading is less likely followed by large stock price declines on the next day, compared to their trading in nonfamily firms. The odds rations for the logit model in Column (4) suggest that daily stock returns in a nonfamily firm's bottom quintile are 6.37% more likely preceded by option trading in the top

[2] In Column (2) of the table, the coefficient on *Bottom Ret* $_{t+1}$ if *Family Firm* = 0 is 0.0794, and the coefficient on *Bottom Ret* $_{t+1}$ × *Family Firm* is -0.0351. So, the coefficient on *Bottom Ret* $_{t+1}$ if *Family Firm* = 1 is 0.0794 + (-0.0351) = 0.0443. The odds ratio of *Bottom Ret* $_{t+1}$ in nonfamily firms = exp (0.0794) = 1.0826 = (Prob (*Top Short* $_{t}$ = 1 | (*Bottom Ret* $_{t+1}$ = 1, *Family Firm* = 0)) / Prob (*Top Short* $_{t}$ = 1 | (*Bottom Ret* $_{t+1}$ = 0, *Family Firm* = 0))). The odds ratio of *Bottom Ret* $_{t+1}$ in family firms = exp (0.0443) = 1.0453 = = (Prob (*Top Short* $_{t}$ = 1 | (*Bottom Ret* $_{t+1}$ = 1, *Family Firm* = 1)) / Prob (*Top Short* $_{t}$ = 1 | (*Bottom Ret* $_{t+1}$ = 0, *Family Firm* = 1))).

quintile the day before. These odds are almost halved to 3.41% for family firms.[3] Option traders, too, are more active prior to larger price declines, more so in nonfamily firms then in family firms.

The coefficient on *Bottom Ret* in the weekly OIB sample is negative and significant at the 10% level, indicating that a large stock price decline in *week t+1* is less likely preceded by strong institutional order imbalances in the previous week, *week t*. Institutional investors in the top quintile of OIB appear to reduce net purchases prior to large stock price declines. The coefficient of the interaction term *Bottom Ret* $_{t+1}$ × *Family Firm* in the OIB sample is positive, albeit insignificantly so. The odds rations for the logit model in Column 6 suggest that weekly stock returns in a nonfamily firm's bottom quintile are 3.75% less likely preceded institutional order imbalances in the top quintile the week before.[4] Institutional investors decrease their net purchases, measured by weekly trading order imbalances, prior to larger price declines. The trading behavior of short sellers, option traders and institutional investors ahead of large stock price changes is consistent with the results of our portfolio sorts and our Fama-MacBeth regression coefficients: Sophisticated traders appear to be somewhat better informed when trading stocks of nonfamily firms relative to their stock trading in family firms.

[3] In Column (4) of the table, the coefficient on *Bottom Ret* $_{t+1}$ if *Family Firm* = 0 is 0.0618, and the coefficient on *Bottom Ret* $_{t+1}$ × *Family Firm* is -0.0283. So, the coefficient on *Bottom Ret* $_{t+1}$ if *Family Firm* = 1 is 0.0618 + (-0.0283) = 0.0335. The odds ratio of *Bottom Ret* $_{t+1}$ in nonfamily firms = exp (0.0618) = 1.0637 = (Prob (*Top Option* $_t$ = 1 | (*Bottom Ret* $_{t+1}$ = 1, *Family Firm* = 0)) / Prob (*Top Option* $_t$ = 1 | (*Bottom Ret* $_{t+1}$ = 0, *Family Firm* = 0))). The odds ratio of *Bottom Ret* $_{t+1}$ in family firms = exp (0.0335) = 1.0341 = = (Prob (*Top Option* $_t$ = 1 | (*Bottom Ret* $_{t+1}$ = 1, *Family Firm* = 1)) / Prob (*Top Option* $_t$ = 1 | (*Bottom Ret* $_{t+1}$ = 0, *Family Firm* = 1))).

[4] In Column (6) of the table, the coefficient on *Bottom Ret* $_{t+1}$ if *Family Firm* = 0 is -0.0382, and the coefficient on *Bottom Ret* $_{t+1}$ × *Family Firm* is 0.0413. So, the coefficient on *Bottom Ret* $_{t+1}$ if *Family Firm* = 1 is -0.0382+ 0.0413 = 0.0030. The odds ratio of *Bottom Ret* $_{t+1}$ in nonfamily firms = exp (-0.0382) = 0.9625 = (Prob (*Top OIB* $_t$ = 1 | (*Bottom Ret* $_{t+1}$ = 1, *Family Firm* = 0)) / Prob (*Top OIB* $_t$ = 1 | (*Bottom Ret* $_{t+1}$ = 0, *Family Firm* = 0))). The odds ratio of *Bottom Ret* $_{t+1}$ in family firms = exp (0.0030) = 1.003 = = (Prob (*Top OIB* $_t$ = 1 | (*Bottom Ret* $_{t+1}$ = 1, *Family Firm* = 1)) / Prob (*Top OIB* $_t$ = 1 | (*Bottom Ret* $_{t+1}$ = 0, *Family Firm* = 1))).

V. Short Selling in Family vs. Nonfamily Firms: The Replication Sample

It is possible that our results differ from ARZ because their sample period covers 2.5 years, while ours covers 6 years. We therefore redo our analyses for the replication sample from January 2005 through July 2007 to investigate this possibility.

A. Short Sales and Future Stock Returns: Portfolio Analysis

As before, we rank family firms and, separately, nonfamily firms, into quintiles based on their daily short sales ratio, and use the Capital Asset Pricing Model and the Fama–French multi-factor models to compute future abnormal returns on day t + 2 for each of the five family firm and the five nonfamily firm portfolios. We value-weight and rebalance the portfolios every day, skip day t+1 to reduce the effect of bid-ask bounce, and measure abnormal returns with the intercept term, α, from the asset pricing models.

The layout of Table VI mirrors that of previous tables. The first three columns of Panel A report the day t + 2 average returns and abnormal returns for the five family firm portfolios sorted by short sales on day t. We find that the family firm portfolio with the lowest short sales (Low) generates positive but insignificant abnormal returns ranging from 1.9 to 2.0 basis points. In contrast, the family firm portfolio with the highest short selling (High) delivers negative abnormal returns between -2.2 to -2.3 basis points, which are not significant. There seems to be a weakly decreasing trend in abnormal returns moving from the Low portfolio to the High portfolio for the family firms. More importantly, a long-short investment strategy that buys the Low family firm portfolio and shorts the High family firm portfolio generates daily abnormal returns about 4.2 basis points, none of which are significant at the conventional 5% level. In terms of economic

significance, a daily abnormal return of 4.2 basis points is equivalent to $1.00042^{21} - 1 = 0.89\%$ return per month, assuming 21 trading days and excluding rebalancing costs.

The last three columns of Panel A report the day t + 2 average returns and abnormal returns for the five nonfamily firm portfolios sorted by short sales on day t. We find that the nonfamily firm portfolio with the lowest short sales (Low) generates positive and significant abnormal returns around 3.7 basis points. On the contrary, the nonfamily firm portfolio with the highest short selling (High) delivers negative but insignificant abnormal returns about -1.0 basis points. We also find a weakly decreasing trend in abnormal returns moving from the Low portfolio to the High portfolio for the nonfamily firms. In particular, a long-short investment strategy that buys the Low nonfamily firm portfolio and shorts the High nonfamily firm portfolio generates abnormal returns around 4.6 basis points, in which all the abnormal return are significant at the 1% level. A daily abnormal return of 6.1 basis points is equivalent to 0.97% return per month, excluding rebalancing costs.

B. Short Sales and Future Stock Returns: Multivariate Regressions

We next estimate Fama-MacBeth regressions by regressing daily stock returns from day *t+2* on daily short sales from day *t* for the family firm sample, the nonfamily firm sample and the combined sample. We use $r_{t-5 \text{ to } t-1}$, $Rank(r_{t-5 \text{ to } t-1})$, $Turnover_{(-5,-1)}$, and *Risk* as the control variables. Table IX presents the Fama-MacBeth mean coefficients from estimating the panel regressions each day over the subsample period from January 2005 through June 2007; t-ratios are based on Newey-West robust standard errors.

The first column of Panel B in Table VI reports that the coefficient on daily short sales for the family firm sample is -0.0192 with a t-ratio of -0.75. That coefficient is statistically and

economically insignificant, suggesting that a 10-percentage-point increase in a family firm's daily short sales ratio is associated with a decrease of 0.19 basis points in future daily returns, which corresponds to a monthly decline of four basis points. Compare that to the corresponding coefficient for nonfamily firms in the second column: That coefficient is -0.135, with a t ratio of -4.76, suggesting that a 10-percentage-point increase in a nonfamily firm's daily short sales ratio is associated with a decrease of 1.35 basis points in future daily returns, which corresponds to a monthly decline of 29 basis points.

When we include both family firms and nonfamily firms in the same specification, the interaction term between short sales and family-controlled status in the last column is positive and significant with a t-ratio of 4.05. While high levels of daily short sales in nonfamily firms predict low subsequent daily stock returns, the negative association is significantly weaker in family firms, indicating that short selling in family firms is less informative than in nonfamily firms.

C. Unexpected Earnings and Short Sales

To investigate the possible difference in short selling before negative earnings surprises between family and nonfamily firms, we follow ARZ and estimate quarterly panel regressions of abnormal short sales. We construct unexpected quarterly earnings and abnormal short sales by following ARZ. *Unexpected quarterly earnings* for each firm are the residual terms from the following regression:

$$EPS_{i,q} = \alpha + \beta_1 \times EPS_{i,q-1} + \beta_2 \times EPS_{i,q-4} + \beta_3 \times EPS_{i,q-8} + \varepsilon_{i,t}, \qquad (1)$$

where EPS is actual earnings per share of the announcement quarter (q), the prior quarter (q − 1), as well as quarters one year ago (q − 4), and two years ago (q − 8). We calculate *Abnormal Short Sales* by first dividing the average daily short sales from calendar day −30 to day −1 prior to

quarterly earnings announcements by the average daily short sales for the year outside of preannouncement periods and then subtracting the ratio by 1.[5] To be consistent with ARZ's tests of abnormal short sales in family vs. nonfamily firms, we control for firm size, past performance, bid-ask spread, analyst forecast dispersion, book-to-market ratio, stock return volatility, New York Stock Exchange listing status, trading volume, and put option volume in the quarterly earnings surprise tests. We lack access to ISS's *Corporate Governance Quotient* and the ownership controls for hedge funds and mutual funds, which are included in ARZ's quarterly earnings surprise regressions, but are statistically insignificant.

We report the results for *negative* earnings surprises in the first two columns of Panel C, Table VI, show results for *positive* earnings surprises in the next two columns, and *combine* negative and positive surprises in the same specification in the last column. We include industry and quarter dummies in the regression specifications, cluster standard errors by firm, and use the absolute value of negative earnings surprises in the regressions for ease of interpretation.

The coefficients of *Negative unexpected earnings* in the first two columns of Panel C are positive and marginally significant, suggesting that, for family firms and nonfamily firms, abnormal short sales increase ahead of more negative unexpected earnings. The second column shows that the interaction term between the family firm indicator and negative unexpected earnings is negative and insignificant with a t-ratio of -0.19. This coefficient indicates an insignificant difference in short selling before negative earnings surprises, family firms do not exhibit significantly higher abnormal short sales than nonfamily firms prior to negative earnings shocks,

[5] To facilitate comparison, we calculate abnormal short sales using the same methodology as ARZ, even though this method has the potential for look-ahead bias. To illustrate, suppose a firm announces quarterly earnings on the first day of February, May, August, and November of 2006. *Preannouncement periods* are the preceding 30 calendar days for each quarterly announcement, so January 2 - 31, April 1 - 30, July 2 - 31, and October 2 - 31, while all remaining days of 2006 are considered *normal days*. *Abnormal short sales* ahead of each announcement are average daily short sales during a preannouncement period minus average normal short sales. Hence, abnormal short sales before the February 2006 announcement are calculated based on observations that are only available after the end of 2006.

and abnormal short sales in family firms do not have stronger relation with subsequent negative earnings shocks. ARZ claim that the magnitude of short sales in family firms prior to a negative earnings shock is about 17 times larger compared to nonfamily firms. Our results, however, show no discernable difference in that magnitude across family and nonfamily firms. In sum, the results in Table VI indicate that the differences between our results and ARZ's are also present in the replication period from January of 2005 through June of 2007.

VI. Market Performance from January 2005 through July 2007

In this section we investigate why our results differ markedly from ARZ. An important difference is readily apparent in the summary statistics. ARZ write in their heading for Table II on page 360 that Panel B "provides daily summary statistics and difference of mean tests between family and nonfamily firms for the 1,571 sample firms from January 2005 through July 2007 [which] are calculated by aggregating family and nonfamily firms (310,720 + 523,264) and then averaging firm-day measures." The first row of ARZ's Panel B reports an average daily stock return of *negative* 1.5 basis points, with a median of *negative* 1.9 basis points. In contrast, our analysis shows that the average daily stock return for the same period is 5.1 basis points, with a median value of zero. Even for our entire sample period, which includes the global financial crisis, the average daily stock return is 3.7 basis points. To assess whether the companies in ARZ's sample performed so poorly that both their sample average and median daily returns are negative it is necessary to understand their sample construction.

ARZ merge the largest 2,000 non-utility, non-financial domestic firms, as of January 31, 2004, with daily short-sale data based on SEC REG SHO. This results in a sample of 1,571 firms for the period from January 2005 through July 2007 that captures 91.6% of Compustat's market

capitalization. We confirm that ARZ's sample closely approximating the entire U.S. stock market by regressing the value-weighted daily portfolio excess return from ARZ's sample of 2,000 firms on the daily excess returns of major market indices from Yahoo Finance. Over the decade from 2001 through 2010 that is covered by ARZ's sample, the R-squared from these regressions is 96.7% or higher for the S&P 500, the S&P 1500, the Wilshire 5000 and for Fama/French's market return. Asking how ARZ's sample firms performed is essentially asking how the stock market performed over the 649 trading days from January 2005 through July 2007: During that period the S&P 500 increased by 21%, the S&P 1500 increased by 22%, the Wilshire 5000 by 23%, and Fama/French's market return increased by 27%. We cannot reconcile the overall market performance from January 2005 through July 2007 with the negative mean and median daily returns reported by ARZ.

Long before the *Journal of Finance* required authors to post replication packages, Professors Anderson and Reeb facilitated replication of their results by posting on their websites a dataset of 2,000 non-utility, non-financial domestic firms with family control status from 2001 through 2010, which is a combined and augmented sample based on Anderson, Duru, and Reeb (2009) and Anderson, Reeb, and Zhao (2012). Our sample is based on that posted dataset. We note that their data description indicates that the ranking for these 2,000 firms is based on total assets for data-year 2001; in contrast, ARZ indicates that their 2,000 largest firms are based on market capitalization as of January 31, 2004.

When we combine the posted dataset of 2,000 firms with the REG SHO data for the sample period from January 2005 through July 2007, we obtain matches for 1,594 firms, 23 more matches than the 1,571 firms that ARZ report. Since we do not observe which 1,571 firms out of 1,594 possible matches made it into ARZ's sample, we are left with $1{,}594! / (1{,}571! \times 23!) \approx 1.498 \times 10^{51}$

possible combinations. We next investigate whether a specific group of 1,571 firms with available REG SHO data can produce the return summary statistics reported by ARZ.

Because it is not feasible to check every possible combination, we implement two separate tests. First, we conduct a bootstrap analysis where we randomly draw 1,571 firms from our 1,594 sample firms and record each iteration's summary statistics. Panel A, Table VII, shows that out of the 10,000 random draws, not a single iteration has negative values in mean for the daily returns. Second, we exclude the 23 firms with the highest average daily returns from our sample. This does not yield negative mean and median daily returns for the remaining 1,571 firms, either, as Panel B, Table VII, shows.

Negative mean and median daily returns for the 31-month sample period from January 2005 through July of 2007 are not just at odds with the stock market performance during that period; 31-month periods in which the largest 2,000 publicly traded firms performed that poorly are incredibly rare. To document that fact, we use the entire CRSP database, rank all firms each month *t* by their market capitalization six month earlier (*t-6*), select the largest 2,000 firms, and calculate their mean and median daily returns from month *t* through *t+30*. Between 1926 and 2022, the 97-year period covered by CRSP, the untabulated result shows that the largest 2,000 firms exhibited negative mean and median daily returns for a 31-month period only after the dot-com bust and during the global financial crisis. Neither the Great Depression, Black Monday 1987, the 1990s recession, the 1997 Asian Financial Crisis, the 2010 Flash Crash, the 2011 European Debt Crisis, or the 2020 Coronavirus Crisis are associated with negative mean and median daily returns for 31 months.

Stocks performed well during ARZ's 31-month sample period, no combination of the 1,571 relevant stocks in the sample can generate such negative returns, and negative average and median

daily returns for a 31-period are incredibly rare in general for the largest U.S. stocks. Together these results suggest that ARZ made an error in constructing the dataset they describe in their Panel B of Table II. That most likely explains why our results are so different from ARZ.

VII. Conclusion

Family control is one of the most prevalent governance mechanisms in the world, and many governance studies aim to better understand its benefits and costs. ARZ identify a novel and important cost of family control by asserting that short sellers' main information advantage comes from trading in family firms. That striking result suggests that family shareholders short their company stock or leak privileged information to other short sellers. Such behavior likely violates their fiduciary duty, undermines trust in financial markets, and reduces long-term price informativeness. Motivated by these high-stake implications, we investigate whether family ownership systematically affects the likelihood of information dissemination to sophisticated traders. Our undertaking is aided by Professors Ron Anderson and David Reeb, who made their family firm dataset publicly available long before the *Journal of Finance* required authors of accepted papers to share replication packages. In sharp contrast to the findings in the literature, we find no evidence that short sellers are informed when trading stocks in family firms, yet we find several settings where sophisticated trading predicts subsequent abnormal returns for nonfamily firms.

For those nonfamily firms, a hedged portfolio formed on short sales generates highly significant alphas, short selling is significantly related to subsequent returns in Fama-McBeth regression, and an interaction term between short sales and family firm status is positive and statistically significant, indicating that short sellers are more informed when trading stocks in

nonfamily firms. When we replace the short volume ratio with an option ratio or institutional order imbalances to investigate alternative measures of informed trading, we find results that are consistent with the short sales results. For family firms, long-short hedged portfolios based on option ratios or institutional order imbalances always generate insignificant alphas, while those for the nonfamily firm sample are positive and statistically significant.

The stark contrast with ARZ is not due to differences in sample construction or methodology, but likely driven by a data construction error, as we explain in the previous section. While our results indicate that family control constraints, rather than facilitates, informed trading by sophisticated investors, we note that pinning down the channel through which this happens is beyond the scope of this paper. Instead, we aim to advance the literature on family firms by refuting prior evidence that family-controlled firms exhibit more informed trading.

Our findings complement existing studies that document benefits of family control such as higher performance, lower cost of debt, better financial disclosure, greater reputational concerns and long-term focus. We show that family firms effectively guard sensitive information from sophisticated investors. This result has implications for regulators. If family firms exhibit controversial trading patterns, the SEC should devote resources to scrutiny trades by family members and informed trading in family firms. We do not find evidence that warrants such additional scrutiny. More broadly, we identify a novel link between firms' organizational structure and the information environment in which sophisticated traders operate. This link matters for capital markets because family control is a governance mechanism widely used by corporations around the world.

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Table I
Variable Definitions

Abnormal Short Sales: [(Average daily short sales from day −30 to day −1 prior to quarterly earnings announcements / average daily short sales for the year outside of preannouncement periods) −1].

Asset Growth: The asset growth over a fiscal year.

Bid-Ask Spread: (Daily bid price - daily ask price) / [(daily bid price + daily ask price)/2], averaged across each quarter.

Book-to-Market: Book value of equity divided by the lagged market value of equity at the end of the quarter.

Family Firm: Indicator variable that equals one when the family holds a 5% or larger ownership stake and zero otherwise.

Firm Size: Natural log of quarter-end total assets.

Forecast Dispersion: Standard deviation of analysts' forecasts divided by the lagged stock price at the end of the quarter.

Industry Dummy: Indicator variable that equals one for each SIC2 industry group and zero otherwise.

Institutional trading order imbalance (OIB): Weekly trading order imbalance of institutional traders in each stock. For each stock, we compute order imbalance as buyer minus seller initiated institutional trading over a week, divided by the total number of shares traded.

Institutional Ownership: Fraction of common stocks held by institutional investors.

Leverage: Long-term debt divided by quarter-end total assets at the end of the quarter.

Market Cap: The natural logarithm of the firm's market capitalization on a day, calculated as the total number of shares outstanding multiplied by the absolute value of the share price: SHROUT × abs (PRC).

NYSE: Indicator variable that equals one when the firm is listed on NYSE and zero otherwise.

Option Ratio: Daily put and call trading volume / stock trading volume.

Performance_{t-1}: Lagged quarter-end income before extraordinary items divided by lagged total assets at the end of quarter.

Profit: The gross profitability measured as sales minus cost of goods sold, scaled by assets over the fiscal year that ends on or before day t: (SALES − COGS)/AT.

Put Option Volume: Daily put option volume divided by daily stock trading volume, averaged across each quarter.

Quarter Dummy: Indicator variable that equals one for each quarter and zero otherwise.

$r_{(-5,-1)}$: Total stock return in percent for a firm from day t − 5 to day t − 1. The weekly measure is the total stock return in percent for a firm from week t − 5 to week t – 1.

Rank($r_{-5,-1}$): Rank of an individual stock's return based on ($r_{-5,-1}$) among all stocks in the sample, normalized to a range from 0.0 to 1.0.

Ret: The daily stock return.

Risk: Difference between the daily high and low stock prices of the stock divided by the high price of the stock. The weekly measure is the difference between the highest and lowest daily closing prices of the stock in a week divided by the highest closing price of the stock.

Short: Short sales volume on day t divided by total stock trading volume on day t.

Std Ret: The standard deviation of a firm's daily stock returns in a calendar year.

Stock Return Volatility: Standard deviation of daily stock returns for each quarter.

Total Assets: Total assets measured in millions of dollars at the end of the quarter.

Trading Volume: Natural log of daily trading volume averaged across each quarter.

$\text{Turnover}_{(-5,-1)}$: Average share trading volume divided by shares outstanding (multiplied by 1,000) for the stock from day t − 5 to day t − 1. The weekly measure is the average share trading volume divided by shares outstanding (multiplied by 1,000) for the stock from week t − 5 to week t – 1.

Unexpected Earnings: Residual term from the regression: $EPS_{i,q} = \alpha + \beta_1 \times EPS_{i,q-1} + \beta_2 \times EPS_{i,q-4} + \beta_3 \times EPS_{i,q-8} + \varepsilon_{i,t}$

where EPS is actual earnings per share of the announcement quarter (q), the prior quarter (q − 1), one year ago (q − 4), and two years ago (q − 8).

Table II
Descriptive Statistics

Panel A presents daily descriptive statistics and difference of mean tests between family and nonfamily firms for the 1,665 sample firms in the short sales sample from January 2005 through December 2010. The statistics are calculated by aggregating family and nonfamily firms (660,457 + 1,379,622) observations and then averaging firm-day measures. Panel B presents daily descriptive statistics and difference of mean tests between family and nonfamily firms for the 1,326 sample firms in the option trading sample from January 2005 through December 2010. The statistics are calculated by aggregating family and nonfamily firms (176,076 + 598,784) observations and then averaging firm-day measures. Panel C presents weekly descriptive statistics and difference of mean tests between family and nonfamily firms for the 1,682 sample firms in the institutional trading sample from January 2005 through December 2010. The statistics are calculated by aggregating family and nonfamily firms (108,221 + 250,677) observations and then averaging firm-week measures. Panel D presents daily descriptive statistics and difference of mean tests between family and nonfamily firms for the 1,594 sample firms in the replication sample from January 2005 through July 2007. The statistics are calculated by aggregating family and nonfamily firms (325,219 + 620,422) observations and then averaging firm-day measures. Panel E presents quarterly descriptive statistics and difference of mean tests between family and nonfamily firms for the 1,104 sample firms in the replication sample from January 2005 through July 2007. The statistics are calculated by aggregating 4,173 negative earnings surprise quarters and 4,228 positive earnings surprise quarters (4,173 + 4,228 = 8,401). Family firms comprise 2,199 firm quarters and nonfamily firms comprise 6,202 firm quarters. All quarterly data are measured at quarter-end for each firm except for family firm and institutional ownership, which are annual measures. For data measured on an annual basis, we set their quarter-end measures equal to the corresponding year-end values. Variable definitions are provided in Table I.

Table II-*Continued*

Panel A. Summary Statistics of the Fama-MacBeth Tests in the Short Sales Sample

	Mean	Median	Std. Dev.	Min.	Max.	Family (n=660,457)	Nonfamily (n=1,379,622)	t-test p-value
r(i,t+2) (%)	0.037	0.000	2.842	-9.192	9.973	0.031	0.040	0.025
Short (i,t)	0.333	0.330	0.151	0.000	0.791	0.334	0.333	0.000
r (-5,-1) i,t (%)	0.185	0.135	6.305	-19.724	21.518	0.160	0.198	0.000
Rank (r (-5,-1) i,t)	0.500	0.500	0.289	0.001	1.000	0.498	0.502	0.000
Risk (i,t)	0.037	0.029	0.027	0.006	0.160	0.037	0.037	0.000
Turnover (-5,-1) i,t (multiplied by 1,000)	11.024	8.318	9.513	0.278	53.589	8.770	12.103	0.000

Panel B. Summary Statistics of the Fama-MacBeth Tests in the Option Trading Sample

	Mean	Median	Std. Dev.	Min.	Max.	Family (n=176,076)	Nonfamily (n=598,784)	t-test p-value
r(i,t+2) (%)	0.062	0.021	2.687	-8.485	9.021	0.053	0.065	0.085
Option Ratio (i,t) (multiplied by 1,000)	0.479	0.199	0.736	0.002	4.329	0.458	0.485	0.000
r (-5,-1) i,t (%)	0.395	0.322	6.186	-18.332	20.703	0.378	0.401	0.178
Rank (r (-5,-1) i,t)	0.501	0.501	0.289	0.001	1.000	0.498	0.502	0.000
Risk (i,t)	0.035	0.028	0.023	0.008	0.133	0.035	0.034	0.000
Turnover (-5,-1) i,t (multiplied by 1,000)	15.247	12.058	11.280	2.708	65.707	14.528	15.459	0.000

Panel C. Summary Statistics of the Fama-MacBeth Tests in the Institutional Trading Sample

	Mean	Median	Std. Dev.	Min.	Max.	Family (n=108,221)	Nonfamily (n=250,677)	t-test p-value
r(i,t+1) (%)	0.243	0.135	6.137	-18.915	20.969	0.238	0.246	0.722
Institutional OIB (i,t)	-0.034	-0.052	0.707	-1.000	1.000	-0.028	-0.036	0.001
r (-5,-1) i,t (%)	0.727	0.619	13.801	-40.293	48.249	0.721	0.729	0.870
Rank (r (-5,-1) i,t)	0.500	0.500	0.289	0.001	1.000	0.497	0.502	0.000
Risk (i,t)	0.049	0.037	0.040	0.005	0.224	0.049	0.048	0.200
Turnover (-5,-1) i,t (multiplied by 1,000)	11.752	9.364	8.720	1.052	48.757	9.772	12.607	0.000

Table II-*Continued*

Panel D. Summary Statistics of the Fama-MacBeth Tests in the Replication Sample

	Mean	Median	Std. Dev.	Min.	Max.	Family (n=325,219)	Nonfamily (n=620,422)	t-test p-value
r(i,t+2) (%)	0.051	0.000	1.958	-5.631	6.385	0.042	0.056	0.000
Short (i,t)	0.289	0.276	0.153	0.004	0.912	0.304	0.282	0.000
r (-5,-1) i,t (%)	0.251	0.158	4.500	-12.745	14.286	0.204	0.275	0.000
Rank (r (-5,-1) i,t)	0.500	0.500	0.289	0.001	1.000	0.496	0.503	0.000
Risk (i,t)	0.027	0.023	0.016	0.005	0.094	0.028	0.027	0.000
Turnover (-5,-1) i,t (multiplied by 1,000)	9.450	7.132	8.022	0.282	44.427	7.668	10.383	0.000

Panel E. Summary Statistics of the Unexpected Earnings Tests in the Replication Sample

	Mean	Median	Std. Dev.	Min.	Max.	Family (n=2,199)	Nonfamily (n=6,202)	t-test p-value
Abnormal short sales (%)	-10.94	-16.31	33.84	-70.05	107.01	-11.08	-10.89	0.813
Prior to positive unexpected earnings	-11.05	-16.89	34.26	-70.05	107.01	-12.12	-10.68	0.230
Prior to negative unexpected earnings	-10.82	-15.50	33.41	-70.05	107.01	-10.05	-11.10	0.373
Unexpected earnings	0.001	0.000	0.264	-1.129	1.054	0.004	0.001	0.638
Positive unexpected earnings	0.149	0.069	0.215	0.000	1.054	0.146	0.150	0.608
Negative unexpected earnings	-0.148	-0.067	0.221	-1.129	0.000	-0.139	-0.152	0.088
Family firm (%)	26.18	0.00	43.96	0.00	100.00	100.00	0.00	
Total assets ($ billions)	5.92	1.86	11.61	0.17	80.20	4.07	6.57	0.000
Firm size	7.68	7.53	1.35	5.12	11.29	7.38	7.78	0.000
Leverage	0.18	0.16	0.16	0.00	0.65	0.17	0.18	0.004
Book-to-market	0.42	0.38	0.22	0.04	1.15	0.45	0.41	0.000
Forecast dispersion (%)	0.18	0.07	0.38	0.01	2.87	0.19	0.17	0.117
Bid-ask spread	0.03	0.03	0.01	0.01	0.05	0.03	0.03	0.000
Stock return volatility	0.02	0.02	0.01	0.01	0.04	0.02	0.02	0.000
NYSE (%)	64.48	100.00	47.86	0.00	100.00	56.71	67.24	0.000
Trading volume	13.71	13.59	1.13	11.51	16.90	13.40	13.82	0.000
Put option volume (multiplied by 10,000)	1.38	0.59	2.04	0.00	11.07	1.21	1.44	0.000
Institutional ownership	0.84	0.87	0.15	0.35	1.00	0.77	0.86	0.000
Performance (t-1)	0.01	0.02	0.02	-0.09	0.08	0.02	0.01	0.039

Table III

Informed Trading and Stock Returns in Family vs. Nonfamily Firms: Portfolio Approach

The table presents average returns and Fama-French three- and four-factor alphas from portfolios formed as follows. In Panel A, we form the value-weighted portfolios by ranking family firms and nonfamily firms, separately, into quintiles based on daily short sales/stock volume on day t and estimate α(3 factor) and α(4 factor), the abnormal daily stock returns, on day t+2. In Panel B, we form the value-weighted portfolios by ranking family firms and nonfamily firms, separately, into quintiles based on daily option/stock volume on day t and estimate α(3 factor) and α(4 factor), the abnormal daily stock returns, on day t+2. In Panel C, we form the value-weighted portfolios by ranking family firms and nonfamily firms, separately, into quintiles based on weekly institutional trade order imbalance, institutional OIB, on week t and estimate α(3 factor) and α(4 factor), the abnormal weekly stock returns, on week t+1. Low indicates the portfolio of firms in the bottom quintile. High indicates the portfolio of firms in the top quintile. Variable definitions are provided in Table I. Newey-West *t*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Short sales / Stock volume

	Family Firms (660,496 firm-day obs.)			Nonfamily Firms (1,379,750 firm-day obs.)		
	Ave. Return	α(3 factor)	α(4 factor)	Ave. Return	α(3 factor)	α(4 factor)
Low	0.0316	0.0084	0.0084	0.0822***	0.0599***	0.0599***
	(0.86)	(0.43)	(0.43)	(2.73)	(5.51)	(5.53)
2	0.0663*	0.0417**	0.0417**	0.0449	0.0233***	0.0232***
	(1.89)	(2.57)	(2.57)	(1.51)	(3.20)	(3.27)
3	0.0276	0.0030	0.0030	0.0185	-0.0042	-0.0042
	(0.81)	(0.20)	(0.20)	(0.57)	(-0.48)	(-0.51)
4	-0.0187	-0.0452***	-0.0452***	0.0022	-0.0223**	-0.0223**
	(-0.50)	(-3.03)	(-3.04)	(0.06)	(-2.29)	(-2.29)
High	0.0046	-0.0252*	-0.0251*	0.0042	-0.0237**	-0.0236**
	(0.11)	(-1.74)	(-1.76)	(0.11)	(-2.41)	(-2.42)
Low - High	0.0269	0.0336	0.0335	0.0779***	0.0836***	0.0835***
	(1.05)	(1.41)	(1.40)	(4.31)	(5.18)	(5.22)

Table III-*Continued*

Panel B: Option / Stock volume						
	Family Firms (197,158 firm-day obs.)			Nonfamily Firms (655,037 firm-day obs.)		
	Ave. Return	α(3 factor)	α(4 factor)	Ave. Return	α(3 factor)	α(4 factor)
Low	0.0426	0.0217	0.0211	0.0434	0.0233***	0.0228***
	(1.07)	(1.38)	(1.36)	(1.25)	(2.67)	(2.68)
2	0.0402	0.0188	0.0182	0.0456	0.0276***	0.0272***
	(0.97)	(1.15)	(1.13)	(1.29)	(3.11)	(3.21)
3	0.0330	0.0121	0.0120	0.0358	0.0198**	0.0198**
	(0.81)	(0.84)	(0.83)	(1.01)	(2.11)	(2.12)
4	0.0225	0.0061	0.0056	0.0251	0.0141	0.0144*
	(0.56)	(0.35)	(0.32)	(0.72)	(1.64)	(1.74)
High	0.0026	-0.0099	-0.0096	0.0115	0.0006	0.0013
	(0.07)	(-0.58)	(-0.56)	(0.33)	(0.06)	(0.16)
Low - High	0.0364	0.0274	0.0267	0.0305**	0.0222	0.0210*
	(1.43)	(1.19)	(1.17)	(2.07)	(1.62)	(1.65)

Panel C: Institutional OIB						
	Family Firms (109,314 firm-week obs.)			Nonfamily Firms (253,384 firm-week obs.)		
	Ave. Return	α(3 factor)	α(4 factor)	Ave. Return	α(3 factor)	α(4 factor)
Low	0.0548	-0.0145	-0.0142	0.0216	-0.0478	-0.0478
	(0.69)	(-0.20)	(-0.19)	(0.28)	(-0.70)	(-0.70)
2	0.0073	-0.0547	-0.0549	0.0092	-0.0536	-0.0538
	(0.10)	(-0.79)	(-0.78)	(0.14)	(-0.87)	(-0.87)
3	-0.0400	-0.1016	-0.1017	0.0071	-0.0541	-0.0543
	(-0.55)	(-1.51)	(-1.50)	(0.10)	(-0.85)	(-0.85)
4	-0.0032	-0.0655	-0.0658	0.0202	-0.0410	-0.0412
	(-0.04)	(-0.83)	(-0.83)	(0.31)	(-0.67)	(-0.67)
High	0.0249	-0.0467	-0.0470	0.0816	0.0146	0.0147
	(0.29)	(-0.59)	(-0.59)	(1.00)	(0.20)	(0.20)
High - Low	-0.0298	-0.0322	-0.0327	0.0600*	0.0624**	0.0625**
	(-0.52)	(-0.56)	(-0.57)	(1.93)	(2.01)	(2.01)

Table IV

Informed Trading and Stock Returns in Family vs. Nonfamily Firms: Multivariate Regressions

The table presents the results from Fama-MacBeth regressions of stock returns on informed trading variables, family firm status, and other firm characteristics. The informed trading variables are daily Short, daily Option Ratio, and weekly institutional trading order imbalance (Institutional OIB) in Columns (1)-(3), (4)-(6), and (7)-(9), respectively. The dependent variables are daily future stock returns in columns (1)-(6) and weekly future stock returns in columns (7)-(9). Variable definitions are provided in Table I. Newey-West *t*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Short Sales Sample			Option Trading Sample			Institutional Trading Sample		
	(1) Family Firms	(2) Nonfamily Firms	(3) Full Sample	(4) Family Firms	(5) Nonfamily Firms	(6) Full Sample	(7) Family Firms	(8) Nonfamily Firms	(9) Full Sample
Short	-0.0341	-0.0915***	-0.0903***						
	(-1.22)	(-2.73)	(-2.74)						
Short × Family Firm			0.0573*						
			(1.92)						
Option Ratio				-0.0187*	-0.0157**	-0.0124**			
				(-1.90)	(-2.20)	(-2.20)			
Option Ratio × Family Firm						-0.00770			
						(-0.77)			
Institutional OIB							0.0102	0.0601***	0.0601***
							(0.44)	(2.90)	(2.94)
Institutional OIB × Family Firm									-0.0547*
									(-1.80)
Family Firm			-0.0206*			-0.00187			-0.0220
			(-1.69)			(-0.21)			(-0.83)
r (-5,-1)	0.00179	0.00127	0.00160	0.00854**	0.00860	0.000577	0.0103	0.00850*	0.00882**
	(0.77)	(0.82)	(1.15)	(2.39)	(1.51)	(0.10)	(1.44)	(1.82)	(1.98)
Rank (r (-5,-1))	-0.0212	-0.0341	-0.0340	-0.117*	-0.107*	-0.0480	-0.296	-0.216	-0.220
	(-0.50)	(-1.10)	(-1.27)	(-1.93)	(-1.93)	(-0.78)	(-0.99)	(-1.01)	(-1.06)

Table IV-*Continued*

Risk	-0.0494	-0.260	-0.213	0.513	0.948	0.717	-0.130	0.230	0.196
	(-0.15)	(-0.80)	(-0.70)	(0.85)	(1.55)	(1.42)	(-0.13)	(0.26)	(0.23)
Turnover (-5,-1)	0.000463	0.00137**	0.00115*	-0.000769	0.00123	-2.06e-05	-0.00296	-0.00132	-0.00196
	(0.59)	(2.25)	(1.86)	(-0.83)	(1.28)	(-0.03)	(-0.72)	(-0.40)	(-0.59)
Constant	0.0566	0.0731**	0.0764**	0.118**	0.0637	0.0783**	0.452*	0.386*	0.395*
	(1.55)	(2.12)	(2.31)	(2.51)	(1.54)	(2.07)	(1.85)	(1.68)	(1.75)
Observations	660,457	1,379,622	2,040,079	176,076	598,784	774,860	108,221	250,677	358,898
R-squared	0.044	0.039	0.037	0.095	0.064	0.064	0.048	0.040	0.039

Table V
Informed Trading in Family vs. Nonfamily Firms: Large Stock Price Declines

The table presents the results from a panel logit regression model about the trading activity of sophisticated investors on days before large stock price declines. For our daily short sale and option analysis in Columns (1) – (4), we exclude the seven trading days centered on each firm's quarterly earnings announcement [-3, +3] from our sample. Next, we classify a firm's stock return on *day t+1* as a *large decline* if it ranks among the firm's lowest 20% of daily returns throughout the calendar year. In that case, the indicator variable *Bottom Ret* $_{t+1}$ equals one, and zero otherwise. We classify a firm's *short sales on day t* as strong if it ranks among the highest 20% of days for that firm throughout the calendar year. In that case we set the indicator variable *Top Short* $_{t}$ equals one, and to zero otherwise. We similarly classify a firm's *option trading on day t* as strong if it ranks among the highest 20% of days and set the indicator variable *Top Option* $_{t}$ equal to one. For our weekly institutional OIB analysis in Columns (5) and (6), we exclude from our sample the three weeks centered on each firm's quarterly earnings announcement week [-1, +1], and the indicator variable *Bottom Ret* $_{t+1}$ equals one if a firm's stock return in *week t+1* as a *large decline* if it ranks among the firm's lowest 20% of weekly returns throughout the calendar year. We then classify a firm's OIB in *week t* as strong if it ranks among the highest 20% of weeks throughout the calendar year, in which case the indicator variable *Top OIB* $_{t}$ equal to one. Control variables are defined in Table I and measured on *day(week) t*. We also control for time fixed effects and cluster standard errors by time. Robust *z*-statistics are reported in parentheses below the coefficient estimates. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

	(1) Top Short $_{t}$	(2) Top Short $_{t}$	(3) Top Option $_{t}$	(4) Top Option $_{t}$	(5) Top OIB $_{t}$	(6) Top OIB $_{t}$
Bottom Ret $_{t+1}$	0.0936***	0.0794***	0.0633***	0.0618***	-0.0177	-0.0382*
	(12.24)	(10.00)	(6.55)	(6.27)	(-0.89)	(-1.85)
Family Firm × Bottom Ret $_{t+1}$	-0.0301***	-0.0351***	-0.0270*	-0.0283*	0.0422	0.0413
	(-2.83)	(-3.16)	(-1.68)	(-1.71)	(1.31)	(1.26)
Family Firm	-0.0164***	-0.0116**	0.00632	0.00749	-0.131***	-0.0787***
	(-2.95)	(-2.20)	(0.88)	(1.03)	(-9.16)	(-5.78)
Market Cap		0.00741**		0.00674*		0.102***
		(2.34)		(1.78)		(13.60)
Ret		7.906***		2.199***		3.930***
		(39.79)		(11.96)		(16.46)
Profit		-0.000282		0.00399		0.0800***
		(-0.03)		(0.28)		(3.61)
Asset Growth		0.000305		-0.00914		0.00973
		(0.40)		(-1.13)		(1.09)
Std Ret		-0.649**		0.269		-0.736**
		(-2.28)		(0.61)		(-2.39)
Constant	-1.989***	-1.959***	-0.802***	-0.947***	-1.500***	-3.083***
	(-429.07)	(-41.07)	(-400.90)	(-14.79)	(-285.89)	(-27.62)
Coefficient of Bottom Ret $_{t+1}$						
β $_{\text{Bottom ret (t+1)}}$ if Family Firm = 0	0.0936***	0.0794***	0.0633***	0.0618***	-0.0177	-0.0382*
	(12.24)	(10.00)	(6.55)	(6.27)	(-0.89)	(-1.85)
β $_{\text{Bottom ret (t+1)}}$ if Family Firm = 1	0.0635***	0.0443***	0.0362**	0.0335**	0.0245	0.0030
	(6.86)	(4.65)	(2.50)	(2.25)	(0.91)	(0.11)
Fixed Effects	Day	Day	Day	Day	Week	Week
Clustered by	Day	Day	Day	Day	Week	Week
Observations	1,779,852	1,701,581	849,885	819,115	291,244	279,411
Pseudo R-squared	0.0489	0.0560	0.0261	0.0266	0.0263	0.0365

Table VI

Short Sales, Future Daily Stock Returns, and Unexpected Earnings in the Replication Sample

The table presents tests of short sales, future daily stock returns, and unexpected earnings in the replication sample. Panel A reports daily value-weighted portfolio returns for day t + 2 for the factor models. α(3 factor) and α(4 factor) are the abnormal daily stock returns in percent derived from the Fama–French three- and four-factor models. The portfolios are formed by ranking family firms and nonfamily firms, separately, into quintiles based on daily short sales on day t. Low indicates the portfolio of firms in the bottom quintile of short sales. High indicates the portfolio of firms in the top quintile of short sales. Low − High is the difference in portfolio returns between the low portfolio and the high portfolio. Panel B reports Fama–MacBeth results of regressing unadjusted daily stock returns for firm i on day t + 2 against short sales for firm i on day t. Panel C reports OLS results of regressing abnormal short sales on unexpected quarterly earnings, family presence, and the interaction of unexpected quarterly earnings and family presence. *t*-statistics are in parentheses, and *** denote p<0.01, ** denote p<0.05, and * denote p<0.1.

Panel A: Portfolio Sorts of Future Daily Stock Returns by Short Sales / Stock Volume

	Family Firms (325,238 firm-day obs.)			Nonfamily Firms (620,439 firm-day obs.)		
	Ave. Return	α(3 factor)	α(4 factor)	Ave. Return	α(3 factor)	α(4 factor)
Low	0.0547**	0.0191	0.0201	0.0781***	0.0366***	0.0366***
	(2.27)	(1.32)	(1.40)	(3.30)	(4.49)	(4.48)
2	0.0147	-0.0248	-0.0248	0.0555**	0.0111	0.0103
	(0.47)	(-1.49)	(-1.48)	(2.08)	(1.24)	(1.20)
3	0.0301	-0.0084	-0.0075	0.0471	-0.0005	-0.0022
	(0.93)	(-0.53)	(-0.49)	(1.57)	(-0.04)	(-0.19)
4	-0.0118	-0.0528***	-0.0525***	0.0225	-0.0189	-0.0197*
	(-0.35)	(-3.09)	(-3.07)	(0.70)	(-1.62)	(-1.73)
High	0.0197	-0.0226	-0.0220	0.0261	-0.0096	-0.0096
	(0.54)	(-1.29)	(-1.25)	(0.76)	(-0.76)	(-0.76)
Low - High	0.0350	0.0417*	0.0421*	0.0519**	0.0462***	0.0462***
	(1.34)	(1.85)	(1.87)	(2.47)	(2.81)	(2.79)

Table VI-*Continued*

Panel B: Regressions of Future Stock Returns on Current Short Sales			
	(1)	(2)	(3)
	Family Firms	Nonfamily Firms	Full Sample
Short	-0.0192	-0.135***	-0.132***
	(-0.75)	(-4.76)	(-4.71)
Short × Family Firm			0.112***
			(4.05)
Family Firm			-0.0442***
			(-4.80)
r (-5,-1)	0.00510	0.00241	0.00311
	(1.62)	(1.06)	(1.53)
Rank (r (-5,-1))	-0.0478	-0.0251	-0.0318
	(-1.20)	(-0.79)	(-1.12)
Risk	-0.196	-0.378	-0.346
	(-0.51)	(-1.00)	(-0.99)
Turnover (-5,-1)	-0.000244	0.00107	0.000707
	(-0.28)	(1.59)	(1.04)
Constant	0.0880***	0.0989***	0.110***
	(3.02)	(3.41)	(4.10)
Observations	325,219	620,422	945,641
R-squared	0.030	0.028	0.026

Table VI-*Continued*

Panel C: Unexpected Earnings and Abnormal Short Sales					
	Dependent Variable: Abnormal Short Sales				
	Negative Shocks		**Positive Shocks**		**All Shocks**
Family firm	0.00773	0.00923	-0.00680	-0.0131	0.000670
	(0.63)	(0.65)	(-0.54)	(-0.86)	(0.06)
Negative unexpected earnings	0.0580*	0.0605*			0.0468
	(1.95)	(1.75)			(1.48)
Family firm × Negative unexpected earnings		-0.0109			0.0168
		(-0.19)			(0.32)
Positive unexpected earnings			0.0130	-0.000746	0.00926
			(0.44)	(-0.02)	(0.32)
Family firm × Positive unexpected earnings				0.0575	0.00151
				(1.03)	(0.03)
Firm size	-0.0119	-0.0120	-0.0301***	-0.0296***	-0.0210***
	(-1.41)	(-1.42)	(-3.35)	(-3.27)	(-3.43)
Performance (t-1)	-0.382*	-0.382*	-0.216	-0.219	-0.323*
	(-1.77)	(-1.77)	(-0.98)	(-0.99)	(-1.89)
Bid-ask spread	-0.315	-0.326	-0.282	-0.226	-0.159
	(-0.23)	(-0.23)	(-0.16)	(-0.13)	(-0.14)
Forecast dispersion	-0.262	-0.247	-1.188	-1.351	-0.617
	(-0.14)	(-0.13)	(-0.69)	(-0.78)	(-0.50)
Book-to-market	0.0268	0.0267	0.0908***	0.0915***	0.0524
	(0.80)	(0.79)	(2.69)	(2.73)	(1.62)
Stock return volatility	0.154	0.160	2.262	2.279	0.929
	(0.10)	(0.11)	(1.26)	(1.27)	(0.78)
NYSE	-0.0377***	-0.0375***	0.00951	0.00921	-0.0143
	(-2.75)	(-2.74)	(0.67)	(0.65)	(-1.44)
Trading volume	0.0354***	0.0355***	0.0470***	0.0467***	0.0416***
	(3.97)	(3.97)	(5.15)	(5.11)	(6.29)
Put option volume	0.458	0.456	0.125	0.131	0.251
	(1.35)	(1.35)	(0.43)	(0.45)	(1.02)
Constant	-0.509***	-0.509***	-0.556***	-0.556***	-0.553***
	(-5.00)	(-5.01)	(-4.30)	(-4.32)	(-6.87)
Industry dummy & quarter dummy	Yes	Yes	Yes	Yes	Yes
Observations	4,173	4,173	4,228	4,228	8,401
R-squared	0.084	0.084	0.089	0.089	0.077

Table VII
Daily Return Summary Statistics under Various Scenarios

The table reports daily return summary statistics under various scenarios. In Panel A, we conduct a bootstrap analysis in which 1,571 firms are randomly drawn from the replication sample of daily returns, record the mean of daily returns in each iteration as the average daily return, and report the summary statistics of the average daily returns out of the 10,000 random draws. In Panel B, we exclude the 23 firms with the highest average daily returns from the replication sample, and we report the summary statistics for the remaining 1,571 firms. All returns are reported in percentages.

Panel A						
	N	Mean	Median	Std Dev	Min	Max
Average daily return	10,000	0.0513	0.0513	0.0003	0.0503	0.0523

Panel B						
	N	Mean	Median	Std Dev	Min	Max
Daily return	934,285	0.0483	0	1.9487	-5.631	6.3847