# Family Firms, Accounting Conservatism, and Information Asymmetry: Evidence from Japan[†‡]

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# Family Firms, Accounting Conservatism, and Information Asymmetry: Evidence from Japan


## Abstract

This paper investigates accounting conservatism using a sample of family firms versus non-family firms in Japan. If CEOs of family firms opt to disclose bad news early, they will adopt a more conservative accounting reporting system. If shareholders and firm managers are more congruent and share similar values and are concerned with minority shareholders, firm managers may choose to disclose bad news early to face issues promptly and take necessary measures. Then, the quality of disclosure will be higher and information asymmetry of stocks will be lower. If CEOs from founding families or hired executive managers are under tight control of family management and have real authority, they may choose not to disclose bad news to minority shareholders, and information asymmetry will be higher. We investigate which of these two forces is dominant by investigating the relationship between income numbers, realized stock returns, and information asymmetry measures, given shares held by founding families and CEO either from founding families or not. The results reveal that family firms in Japan adopt a more conservative accounting reporting system for earnings and extraordinary losses, while the degree of information asymmetry of traded stocks remains higher. However, the shares held by founding families do not have explanatory power. We find evidence that the resolution of information asymmetry leads to conservative accounting choices by family firms.

## 1. Introduction

Claessens et al. (2000) investigated ownership structure among East Asian countries including Japan, which is one of the most widely cited article among Asian family business research. They cover 1,240 listed firms in Japan (*ibid*, p.104) and point out that 13.1% of firms are controlled by families with a 10% shareholding cutoff level of founding families, and 9.7% of firms are controlled by families with a 20% cutoff level. More recently, Asaba (2012) investigated investment behavior of the electric machinery industry in Japan. This sample of 184 family firms from 1995-2006 demonstrates more aggressive investment behavior during the boom and more persistent investment behavior during the recession than non-family firms. Saito (2008) finds that family firms slightly outperformed non-family firms from 1990 through 1998, and their superiority was limited to the founders' reign. Mehrotra et al. (2012) investigated the succession problem of Japanese family businesses and demonstrated that adopted heirs could avoid the succession problem. They studied Japanese firms between 1949 and 1970 and followed the data up to 2000.

However, there are few studies on Japanese family firms from an accounting viewpoint. In this paper, based on our originally constructed database which covers 2007 to 2009, we investigate accounting conservatism and information asymmetry of those family firms. The quality of earnings of financial reports reflects management decisions of reporting a firm's financial performance to current investors and other outside stakeholders. In this paper we focus on the so called accounting conservatism (Basu, 1995) and investigate financial reporting practices of family firms vis-à-vis non-family firms. The paper investigates whether accounting conservatism on loss recognition is stronger among family than non-family firms. At the same time we are also concerned whether information content of family firms contained in financial reports is larger than that of non-family firms. For the former inquiry we use the Basu measure (Basu, 1997) which is widely accepted in the empirical accounting literature, and for the latter we use the probability of private information trades as devised by Easley et al. (2002), using tick data.

We expect there will be less agency costs (Jensen and Meckling, 1976) arising for family firms between firm managers and major family shareholders. In such a case managers may choose to disclose bad news early in order to promptly face issues and try to find measures for improving future performance. On the other hand, if a CEO from a family or an executive manager under the guardianship

of founding families possesses strong authority (Aghion and Tirole, 1997), they may choose not to disclose bad information to minority shareholders. In such a case information asymmetry of traded stocks will be higher.

We empirically investigate which of these two forces dominate in a family firm by empirically assessing the relationship between reported income numbers, stock returns, and the PIN variable, a measure of private information-based trades. We believe these are worthwhile empirical questions in view of the fact that there is no study investigating accounting conservatism of Japanese family firms.

Based on previous evidence about the usefulness of using the PIN variable (Easley et al., 2002) for Japanese data (Kubota and Takehara, 2009), we hope to detect the aspect of information asymmetry in relation to accounting conservatism (LaFond and Watts, 2010). In addition, we employ alternative microstructure measures as proxy variables denoting for bad news. Bagnoli and Watts (2005, p. 787) emphasize the role of managers' tenure versus the degree of private information owned by management in the context of accounting conservatism. These two aspects can be directly applied to family business context and in our test we can detect the degree of disclosure of management's private information. Our use of a microstructure variable to detect degrees of private information for Japanese family firm data is a contribution to the literature.

Section 2 motivates the study and Section 3 describes previous studies. Section 4 raises the hypotheses. Section 5 describes the data and Section 6 reports empirical results. Section 7 concludes.

## 2. Motivation

Earnings quality is one of the major properties accounting reports ought to possess (Ronen and Yarri, 2008, and Francis et al. 2006). Under the GAAP of countries like the U.S. (FASB, 2010) and Japan (ASBJ, 2006), fair representations of financial reports are expected. Also, international accounting standards of IFRS (2012) view that conservatism harms faithful representation and lacks neutrality.

Note, however, that Japanese accounting standards (Accounting Standards Board, 1982) and U.S. accounting standards (FASB, 1982 and 2004) still advocate the use of lower-or-cost method in practice. Thus, even though most recent accounting standards try to eliminate the concept of conservatism *per se*, accounting practices of conservative income measurement still seem to be implemented, at least in Japan and the U.S.

In accounting literature Hendriksen and van Breda (1992) also criticizes accounting conservatism as constraints of accounting measurement from the three points; i.e., 1) pessimism may lead to poor decision making, 2) accountants are not necessarily in a better position to evaluate risk, and 3) unfavorable items reported may turn out to be wrong. Ijiri and Nakano (1989) synthesize the reasoning behind the existence of accounting conservatism by focusing on two points; i. e., 1) conservatism leads to more objective measurement of past cash flows, and 2) conservatism leads to a disclosure of unusual events quickly and usual events more slowly which may have higher informational value. In this paper we will not argue the pros and cons of accounting conservatism per se and empirically trace the nature accounting disclosure decisions by family firms in Japan and refrain from making any normative statements.

As to the evidence on earnings quality in general, Ali et al. (2007) finds for their sample of U.S. companies that reported earnings by family firms are of better quality measured by the level of discretionary disclosure. Wang (2006) also finds that earnings quality is higher for family than non-family firms using U.S. data. For Japanese data, Chung et al. (2004) investigates the relationship between level of accruals and ownership structure, but does not focus on family ownership. Ebihara et al. (2012) investigates the accruals quality of Japanese family firms and find that the quality of earnings is higher for family than non-family firms.

However, these studies have yet investigated accounting conservatism for public family firm samples.[1] If these firms are indeed long-term oriented (Miller and Le Breton-Miller, 2005, Boyd, 2010), and can face immediate losses for the benefit of future improvement and sustainability, we expect them to deal with incurred losses and bad news earlier than non-family firms. Managers in family firms may try to inform pertinent stakeholders including minority holders, which is an empirical question to be answered.[2]

Family firms are expected to have longer horizon because the founding family are concerned with

[1] Salvato and Moores (2010) conduct an extensive survey of accounting research in the context of family firms. Still, we find the research on accounting conservatism applied to family firms is sparse except Ball and Shivakumar (2005).

[2] In addition, recently the role of the third party, the auditor, has been emphasized because of more stringent regulations like Sarbanes-Oxley in 2002 and the 2006 Japanese version of SOX. Basu (1995, Appendix) points out this aspect is important and Antle and Nalebuff (1991) analyzed the role of auditors in forming accounting conservatism by using contract theory model.

longevity of firm and conservatism may apply to family firms. As we discussed in Introduction, we expect there will be less agency costs (Jensen and Meckling, 1976) arising for family firms between firm managers and major family shareholders. In such a case managers may choose to disclose bad news early in order to promptly face issues and try to find measures for improving future performance. On the other hand, if a CEO from a family or an executive manager under the guardianship of founding families possesses strong authority (Aghion and Tirole, 1997), they may choose not to disclose bad information to minority shareholders. Moreover, in such a case information asymmetry of traded stocks will be higher.

Hence, we expand our research motivation as follows. First, we empirically investigate which of these two forces dominate family firms. For that purpose we establish the hypothesis H1 in Section 3 to empirically assess which is true for listed family firms in Japan. As previous evidence, for example, Al et al. (2007) report that family firms are more likely to warn for a given magnitude of bad news using the earnings forecast release. They interpret the latter point as the evidence of less severe agency problems, leading less opportunistic behavior on withholding bade earnings forecast news. On the other hand, for the sample of private firms in U.K. Ball and Shivakumar (2005) find that financial reporting by private firms in U.K. is of lower quality using the variant of Basu (1997) measure using the accounting accruals measures. Because private firms are expected to be more family type firms, their finding against accounting conservatism of private firms is evidence that the family firms may show lower accounting conservatism U.K.

Moreover, LaFond and Roychowdhurry (2008) argue that when the managerial ownership in general is negatively related to accounting conservatism. In our contest the family firms with larger shareholding and CEO coming from the founding family (defined Type 1 in Section 5) belongs to this category. However, in our paper we argue instead the opposite the reason being that our sample is listed firms and firm managers have to take into consideration the continued listing of their stocks and establish H2 below.

In sum, the argument in previous studies seems to suggest either that family firms show higher accounting conservatism because the firms are with less agency problems, or that family firms are rather less concerned with disclosing bad news to the non-family stockholders. For the first argument, we established the hypothesis H1 to be tested and for the second point we established the hypothesis H2

because our sample is all listed firms on the Tokyo Stock Exchange and we argue that these firms have to keep satisfying the stringent listing requirement for their stock to be kept listed. This contrasts with the argument and evidence of Ball and Shivakumar (2005) for private firms.

As for the evidence between accounting conservatism and microstructure variables, in general, LaFond and Watts (2008) find positive association between PIN measures (Easley et al., 2002) and accounting conservatism for U.S. firms claiming that the conservatism adopted by firms is response to the information asymmetry of their traded stocks. Thus, they rather take position against the recent movement by FASB to eliminate accounting conservatism as necessary attributes accounting reports should possess.

However, note that the PIN measure they use is the information asymmetry measured through investors' ordering behavior and not necessarily between the family stockholder who will not sell their stocks and minority stockholders. [3] Thus, in our test of conservatism using the PIN variable, we include this variable in addition to the basic conservatism testing equations as a control variable. Moreover, among the variables to constitute the PIN we also use the probability of bad news occurrences in Easley et al. (2002) to distinguish between the information asymmetry and the bad news in the stock *per se*. Thus, in this paper we establish the final hypothesis H3 arguing that firms try to adopt conservative reporting, in particular bad news, for the sake of minority shareholders and outside lenders, who may not have direct access to the private information held by the founding family and their management in addition to the accounting format required by the corporate law and the regulation by the stock exchange.

*A priori* we expect there will be higher concentrations of family firm stocks leading to a lower proportion of traded floating stocks which may affect the degree of public and private information contained in those family stocks. We believe answering to this question, that is, how much private information (Bagnoli and Watts, 2005) is disseminated among family firm stocks relative to public information is an important one in its own context. Conservative accounting reporting practices may attenuate this information asymmetry problem, or create opportunity cost if the bad information turned out to be wrong.

[3] Whether asymmetry affects the cost of equity depends on the degree of competitiveness of the stock traded (Lambert et al., 2012). When a family owns substantial stocks and thus floating stock is not large, the degree of market competition will be lower and the cost of equity will be higher.

Finally, in order to test the degree of family firm accounting conservatism of financial reports, we use one of the conservatism measures used by Basu (1995).[4] His study is the first one which empirically tested the old notion of accounting conservatism in an empirical context using stock return data. Khan and Watts (2009) extended the original measure by Basu (1997) and they created the so-called C_Score to measure the degree of accounting conservatism. They find this measure can predict future conservatism of firms, and higher firm specific uncertainty and information asymmetry are related with higher accounting conservatism with longer investment cycles. In our study, we confine ourselves to the original Basu regression specifications, but at the same time extend it to accommodate the degree of information asymmetry related to bad news. As far as the authors are aware, Anderson et al. (2009) is the only study which investigated the measures of information asymmetry for a family firm sample in the U.S. They investigate firm opacity and find that stocks of heir-controlled firms have higher bid-ask spreads than founder-controlled family firms or non-family diffuse shareholder firms. However, they only used bid-ask spread data, not the tick-based PIN measure which we use here. Furthermore, Anderson et al. (2012) report that stocks of family-controlled firms experience higher abnormal short sales, suggesting the existence of more privately informed trades for U.S. family firms. This result is relevant for our study to construct our original hypotheses as well as testing models.

To empirically test these assertions, we use a multivariate testing equation using Japanese data in the followings. In the next section we establish our hypotheses first.

## 3. Hypotheses

Because we expect the two forces on agency costs and the level of disclosure discussed above may work simultaneously the other way, we state three hypotheses below. The first two are related to the first query of family firms, in which H1 is more operational and H2 is related to the fraction of shares held by founding families versus minority shareholders because our sample is all listed firms whose stocks are widely traded on stock exchanges in Japan. The third hypothesis is then related to information asymmetry of stocks and the argument would not be particularly confined to the family firm sample.

[4] We report the results where the earning numbers are denominated by the beginning of the period total assets, whose results appear in Basu (1995) after tables 11.See also Basu (1995, Appendix) for a review of the origin and development of the conservatism concept in the U.K. and the U.S. Pope and Walker (1999) compare the conservatism between U.K. and U.S.

H1: *Family firms adopt more conservative accounting reporting than non-family firms because firms are with less agency costs.*

H2: *The fraction of shares held by founding families causes an increase in accounting conservatism as family owners of listed firms become more concerned with disclosure to minority shareholders to keep their stocks listed.*

H3: *The larger the information asymmetry of firm stocks, the higher the accounting conservatism as firms try to help reduce the degree of information asymmetry for stock market participants.*

Given these three hypotheses we use the sample of Japanese family firms listed on stock exchanges in Japan and conduct cross section regression tests in Section 6.

**4. Testing Equations and Variables Used**

Using the Basu (1997) measure as our benchmark we extend this model to incorporate bad news using the PIN from Easley et al. (2002) as well as other proxy variables. The PIN model is described below and detail is shown in Appendix 1. Equation (1) is tested and definitions of the variables are as follows: $X_{it}$ is an earnings number denominated by the beginning March end book value of total assets, $TA_{i,t-1}$,[5] $DR_{it}$ is a dummy variable, which takes the value 1 if the stock return $R_{it}$ is negative, $FFO_{it}$ is the percentage of shares owned by the founding family, $PIN_{it}$ is the probability of private information-based trades as devised by Easley et al. (2002), $DSector_{ik}$ is the sector dummy variable, where sector classification schemes are based on Kubota and Takehara (2007) as listed in Appendix 2, $DYear_{it}$ is a yearly dummy variable, and $\varepsilon_{it.}$ is the error term.[6]

[5] We only use the firm sample with a March 31 fiscal year end, which comprises 90% of the total sample. Given the timed release of accounting reports, approximately three months after the fiscal year end, we compute annual returns and the annual PIN value starting from 9 months before the fiscal year end (July 1).

[6] We used the beginning book value of the total assets as a divisor for the dependent variable, unlike in Basu (1995 and 1997) where he uses the stock price. One of the reasons is that Patatoukas and Thomas (2009, 2010) point out the empirical irregularities triggered by the relationship between EPR and stock returns irrespective of the existence of accounting conservatism. We also detect possible simultaneity problems

$$X_{it} / TA_{it-1} = \alpha_0 + \alpha_1 DR_{it} + \beta_0 R_{it} + \beta_1 (R_{it} \times DR_{it}) + \beta_2 (R_{it} \times DR_{it} \times FFO_{it}) + \beta_3 (R_{it} \times DR_{it} \times PIN_{it}) + \sum_{k=2}^{6} DSector_{ik} + \sum_{t=2007}^{2008} DYear_{it} + \varepsilon_{it.} \quad (1)$$

If firm managers and accountants adopt more conservative reporting strategies, the sensitivity of earnings to bad news should be higher. In other words, the slope coefficient $\beta_0$ without dummy plus $\beta_1$ which corresponds to the case when bad news has occurred should be steeper than when there is no bad news; i.e., $\beta_1 + \beta_0 > \beta_0$. We also add a second interactive term $\beta_2$, a family share ownership variable, in order to investigate if there is an additional conservative factor owing to family stock ownership. Finally, by introducing one more interactive term $\beta_3$ of the information asymmetry variable, PIN (Easley et al., 2002), we can enforce the possible impact of bad news in this regression equation, which has never been done in family business research.

As alternative proxy variables denoting for bad news, we use other microstructure study related variables. In equation (2), $BN_{it}$ denotes alternative two proxy variables for bad news. As a first variable, we use $\alpha \times \delta$ (the probability of private information occurrences multiplied by the probability of bad news, see Appendix 1) as in Easley. For the second variable, we use a measure of order imbalance variable $\mathrm{OI} \equiv (S_t - B_t)/(S_t - B_t)$, in which $S_t$ is the number of sell orders and $B_t$ is the number of buy orders each day. The latter variable is one of the standard variables used in microstructure finance empirical studies and it is a proxy variable for information asymmetry and/or market illiquidity.

For these two variables, we rank all firms into three subgroups and classify them as H (high), M (medium), and L (low) in terms of the degree of bad news. Here, the $DBN_{itk}$ variable denotes a dummy variable for H and M groups where the subscript *k* is labeled 1 for H, 2 for M, and the case without a dummy variable corresponds to the L group. That is, $\alpha_i$ , $\gamma_i$ and $\eta_i$ for *i*=1,2 in equation (2) corresponds to H and M among these three groups, respectively.

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inherent in the standard Basu (1997) regressions. These are the two reasons why we decide to report the case when we use the total assets as a divisor, although we computed both cases. The results using the market value of equity are available upon request from the authors. However, note further defense of the original Basu measure is conducted by Ball et al. (2012).

$$X_{it}/TA_{it-1} = \alpha_0 + \alpha_1 BN_{it} + \sum_{k=1}^{2}\beta_i (BN_{it} \times DBN_{itk}) + \sum_{k=1}^{2}\gamma_i (BN_{it} \times DBN_{itk} \times FFO_{it}) + \sum_{k=1}^{2}\eta_i (BN_{it} \times DBN_{itk} \times PIN_{it}) + \sum_{k=2}^{6} DSector_{ik} + \sum_{t=2007}^{2008} DYear_{it} + \varepsilon_{it.} \quad (2)$$

Given these testing models (1) and (2), we investigate whether managers of family firms and accountants adopt more conservative income reporting and also if information relevant for outside investors is conveyed abundantly enough via firm disclosing decisions.

## 5. Data

We obtained data of the largest 30 stockholders and detailed descriptions of board members, including the CEO and executive directors, from the Major Shareholders Database and Directors Database by Toyo Keizai Shinpousha, Inc. In parallel, we also used old company handbooks published by Toyo Keizai to identify names and kinship of founding families. In 2009, to complement this data, an extensive questionnaire on family ownership and management for all 3,527 listed Japanese firms was conducted by mail and the internet to which 406 firms responded.[7]

TABLE 1 ABOUT HERE

Table 1 lists the number of total observations for both family and non-family firms of our sample. The observation period is from 2007 through 2009. In the table we report total firm years by four categories of firms: Type 1 (family owns more than 10% and CEO from the family), Type 2 (more than 10%, and CEO not from family), Type 3 (less than 10% and CEO from family), and non-family firms. The total firm years (second row from the bottom) are 1,040, 269, 490, and 3,065, respectively.[8] For each year the upper figures in each row are the sample size for each category and the lower figures in each row with the title (PIN N.A.) are cases for which a minimum 120 days of daily buy and sell orders were not

[7] The response rate of the questionnaire was 11.5%, which is close to average, or higher than normal response rates for questionnaires sent to Japanese companies.

[8] Allouche et al. (2008) used a top 10 shareholders list disclosed by all public firms in Japan. We found a more extensive list of top 30 shareholders in the Toyo Keizai database. Allouche classifies Japanese family firms into three categories: high shareholdings with a non-family CEO (Type C (their definition)), a CEO from the family (Type D) but not enough shareholding, and those with both criteria (Type B). Our cross section regressions can cover these three cases quantitatively in comparison with non-family firms (their Type A firms).

available to compute PIN and not included in the sample.

We find 36.99% of the total firm-years of our sample classified as family firms of either Type 1, 2, or 3. Overall, we have 1,799 total firm-years of family firms and 3,065 total firm-years of non-family firms.

For financial data, the source is Nikkei Media Marketing. The data to compute stock returns and tick-by-tick quote and transaction data necessary to estimate the PIN are also provided by Nikkei Media Marketing. Table 2 reports basic descriptive statistics of relevant variables.

TABLE 2 ABOUT HERE

Definitions of variables in Table 2 are as follows. %FFO is the percentage of shares held by the founding family, FSR is the floating stock ratio, Directors, the shares held by directors, Domestic, shares held by Japanese corporations, Foreign, shares held by foreign institutions, and Individuals, shares held by individual investors. EPR is the earnings-to-price ratio, ROE is return on equity, ROA is return on total assets, PIN is the probability of information-based trades, Alpha ($\alpha$) is the probability that a private information event occurs, Delta ($\delta$) is the probability of bad news, OI is order imbalance defined above, lnMV is a natural logarithm of market value of equity (in million yen), and BPR is the book-to-market ratio in percent.

From the table we find the shares owned by directors and individuals is higher for family firms while the floating stock ratio (FSR) is lower. The *p*-values denote the significance of the mean difference of three types of family versus non-family firms, and we find that differences are all significant for these two variables. We also find for family firms shares are owned more by individuals, domestic investors, and individual investors.

As for earnings, family firms demonstrate lower earnings (EPR) and lower return on equity (ROE), but higher return on assets (ROA), though these are not significant. The stock returns (Ret) for Type 1 firms are the lowest and for Type 3 firms the highest. Because our sampling period includes the period after the 2008 financial crisis, we find all returns are negative. The mean values for the dummy variable for negative return (DR) thus take values of larger than 0.5. For microstructure variables, we find the probability of private information-based trade (PIN), the probability that a private information event occurred (Alpha), the probability of bad news (Delta), and order imbalance (OI), are higher for family

firms and the differences are significant. Finally, we find that Type 1 and 2 family firms are significantly smaller in size (9.682 and 9.899), but book-to-price ratios (a measure of value stocks) are not significantly different between the three types of family and non-family firms.

In Table 3 we report the correlation of the selected variable of our interest.

TABLE 3 ABOUT HERE

We find that the correlation between the previous year's return (Ret) and the probability of bad news (Delta) as well as order imbalance (OI) are negatively correlated with -0.13 and -0.20, respectively, with Spearman rank correlations, which confirms our initial contention that alternative proxy variables we use for bad news $\alpha \times \delta$ and OI as substitutes for negative returns by Basu (2007) are considered to be good variables to represent bad news. We also confirm that the percentage of shares held by founding families (%FFO) and PIN and OI are positively correlated at 0.16 and 0.15, which confirms that family firm stocks possess higher probability of private information-based trades. Note also PIN and OI are highly correlated at 0.48.

## 6. Empirical Results

Table 4 reports results from cross section regressions. The dependent variable is the net income divided by total assets for Panel A, extraordinary income for Panel B, and extraordinary loss for Panel C. The latter two variables are also denominated by the beginning book value of total assets.

TABLE 4 ABOUT HERE

In each panel, results are presented separately for Type 1 firms (Panel A), Type 2 (Panel B), Type 3 (Panel C) (see Section 5 for definitions), and non-family firms (Panel D) from the top to bottom rows in each panel. The estimated models are the three variable case like Basu's (1997) original model.

For net income shown in Panel A we find that the coefficient for additional conservatism, Dr*Ret, is all positive. Estimated slope coefficients for conservative income measurement, $(\beta_0 + \beta_1)$ in equation (1), responding to negative returns, are, from the top to bottom row of this panel, 0.133 (=0.016+0.117,

and so forth) for Type 1, 0.128 for Type 2, 0. 094 for Type 3, and 0.077 for non-family firms. Thus we find the degrees (slope coefficients) of the loss recognition from adverse income are stronger (steeper) for family firms (Basu, 1997, Figure 2). Moreover, accounting conservatism is stronger for family firms in descending order for Type 1, 2, and 3 firms. If we highlight the relative size of coefficients on negative and positive returns, $(\beta_0 + \beta_1)/\beta_0$, the numbers from the top to bottom panel are 8.31 (=(0.016+0.117)/0.016, and so forth),12,8, 94.00, and 5.90, respectively. We again find that family firms are more conservative than non-family firms. These results support H1.

In the case of extraordinary income shown in Panel B, the results are mixed and we find coefficients for *Dr*Ret* are even negative for some cases though not significant.[9] Note the recognition of this account is non-recurring in nature (Hendriksen, 1970, Ch. 5) and we infer that managers of family firms are not as concerned with recognizing extraordinary income early.

In the case of extraordinary losses, sign conditions should be opposite because we measure losses as positive numbers and find that coefficients for *Dr*Ret* are indeed negative and even significant for all family firms. The values for $(\beta_0 + \beta_1)$ are -0.041 (=-0.003+0.08, and so forth) for Type 1, -0.044 for Type 2, -0.023 for Type 3, and 0.002 for non-family firms. The most conservative is Type 2 firms. We find that family firms overall recognize extraordinary losses earlier, which supports H1. Because this is also non-recurring in nature (*ibid*.), we believe this is an important finding on financial reporting practices among Japanese family firms. The lesson is that not only should we focus primarily on net income, but should also pay close attention to reporting of extraordinary loss items (Shrand and Walther, 2000).

TABLE 5 ABOUT HERE

In Table 5 we add two dummy variables as shown in equation (1). These are shares owned by the founding family, whose coefficient is $\beta_2$, as well as a microstructure variable PIN, whose coefficient is $\beta_3$ in equation (1). In this case we find the original additional conservatism coefficients $\beta_1$ from negative returns become insignificant for all panels for earnings, extraordinary income, and

[9] Pope and Walker (1999) find the extraordinary items play significant role to explain the degrees of conservatism among U.K. firms.

extraordinary losses.

In the case of net income, $\beta_2$ coefficients (the coefficient on $R_{it} \times DR_{it} \times FFO_{it}$) which denote the effect of family shareholdings is close to zero and not significant. Thus, the effect of shareholding is nil, and we do not support H2. However, we find the $\beta_3$ coefficients (the coefficient on $R_{it} \times DR_{it} \times PIN_{it}$), which denote the reaction to a degree of private information trade, PIN, become all positive, and for Type 1 and 3 firms they are even significant. The coefficient $\beta_3$ is the largest for Type 1 firms. This type of firm is one in which shares are owned by a family more than 10% and the CEO is from the founding family. This result contrasts with argument and evidence by LaFond and Roychowdhurry (2008) we support H3. Our result implies that whenever the PIN is higher and information asymmetry is serious, managers and accountants tend to adopt a more conservative accounting strategy to attenuate the information asymmetry problem, which is consistent with the findings by LaFond and Watts (2010) for U.S. firms.

However, the explanatory power of the other variable, family-owned shares, is marginal and the coefficients $\beta_2$ are all small. Thus, overall we support H3, but not H2 for the case of earnings in Panel A.

As for extraordinary income, the results are again not strong and it seems that managers and accountants of family firms care less about recognizing extraordinary income early. For extraordinary losses we find all $\beta_3$ coefficients (the coefficient on $R_{it} \times DR_{it} \times PIN_{it}$)for the PIN are negative as predicted and significant for Type 1 firms and non-family firms, where the absolute value of the coefficients are larger for Type 1 family firms. Thus, for extraordinary losses we find that family firms of Type 1 are more concerned with information asymmetry and this result supports H3. Again, we find coefficients for the family-owned shares dummy is very small and we do not support H2.

In interpreting our result we note Ball and Shivakumar (2005) report for U.K. private firms that their finding is opposite to ours in the sense that the family firms show less conservatism in their accounting disclosure. However, our sample is limited to listed firms, in which firm managers and accountants have to take into consideration the quality of disclosure, in particular, to minority shareholders so that the firms remain listed on stock exchanges as we laid out in H2, and we infer that this may be the reason why our sample family firms showed more conservatism. Also, because firm owners may be concerned more with the long term sustainability of their firms and family reputations, they may want to reveal the

bad news such as extraordinary losses as fast as possible to show outside investors that the correcting measures will be taken up soon.

Table 6 reports the results for which alternative proxy variables were used instead of the negative return variable by Basu (1997) as a signal to denote bad news. The specification of the three variable model is similar to the original testing equation by Basu (1995 and 1997), although our variables are composed of two dummy variables as shown in equation (2). Note in equation (2) as for the subscripts *i*=1 corresponds to the highest bad news, *i*=2 medium, and *i*=0 the least. Thus, $\beta_1$ signifies the slope coefficient for the worst news, $\beta_2$ for the medium and $\alpha_1$ for the least bad news.

TABLE 6 ABOUT HERE

From Panel A to C are cases where *Alpha*Delta* (see equation (2) is used and from D to E, cases where order imbalance is used. If accounting conservatism holds, $\alpha_1 < \alpha_1 + \beta_2 < \alpha_1 + \beta_1$ should hold for income numbers and $\alpha_1 > \alpha_1 + \beta_2 > \alpha_1 + \beta_1$ should hold for losses. In Panel A, positive coefficients for the H group of Type 2 firms at 0.241($\beta_1$) is higher than for the M group at 0.192 ($\beta_2$), which supports accounting conservatism of family firms, though it is not significant. This is the type of firm whose family stock holdings are higher than 10%, but the CEO is not from the family. It may be the case that professional managers are concerned with keeping their positions and when bad news arises (Alpha*Delta), they recognize losses promptly so their reputation will recover by targeting for higher income in the next period, and hope investors' memories are short-lived (Shrand and Walther, 2000). In Panel B and C results for extraordinary income and losses are weak.

Results using order imbalance in Panel D, E, and F are also weak, and even the signs are sometimes wrong. Thus, we do not conclude from Panel D, E, and F. Overall, from results in Panel A we support H1 for Type 2 firms when we use *Alpha*Delta* as a proxy for bad news.

Table 7 reports the results for which family shareholdings and the PIN are simultaneously used as a full variable version of equation (2).

TABLE 7 ABOUT HERE

In Panel A the signs of coefficients, *BN*DB1* and *BN*DB2*, when *Alpha*Delta* is used as a signal for bad news are all positive and, in particular, for Type 2 firms, are all significant at a 10% level. Moreover, coefficients for *BN*DB2* are all significant. However, predicted inequalities are all reversed between H (*BN*DB1*) and M (*BN*DB2*) at 0.417 and 0.570, respectively. In spite of this, we can still claim that M and H group firms are more conservative than L, the lowest bad news group at -0.171. The shareholdings by founding families do not seem to contribute much to our final results for net income in Panel A. The PIN variable is still significant, but signs become opposite. In other words, in this specification of the model information asymmetry does not lead to accounting conservatism, which is a finding opposed to LaFond and Watts (2010) for U.S. firms, we reject H3 from this particular table. We find the information asymmetry represented by the PIN is negatively related to accounting conservatism in the case of full variable models for Japanese family as well as non-family firms. Thus, we do not support H3, unlike the case in Table 5. However, because the results are not strong in Table 7, however, we stick to results from Table 5 and still support H3 overall.

Extraordinary income results in Panel B are again very weak. As for extraordinary losses shown in Panel C, we find correct and negative signs for bad news, which is evidence of the robustness of our previous result from Table 4. The PIN variable is not significant for extraordinary gain and losses. Moreover, the signs for the M group of family shareholdings are significantly positive for Type 1 and 3 firms, and thus we do not support H3 for this case of extraordinary losses. However, the results still support H1.

Again, for cases for the alternative variable, the order imbalance shown in Panel D, E, and F, the results are weak and not significant.

Overall, for family firms in Japan, we conclude that in various specifications of models to test conservatism and the resolution of information asymmetry, we support H1 and partially H3, but not H2.

## 7. Conclusion

Our empirical results revealed that Japanese family firms adopt more conservative accounting reporting than non-family firms, while the degree of information asymmetry of family firm traded stocks is higher than that of non-family firms. Because family managers and major family shareholders would be more strongly concerned with future sustainability, we infer they want to face bad news earlier than non-family firms and are eager to improve.

We have little evidence that shareholdings by families are related to the positive degree of conservatism. We found that the degree of private information is higher for family than non-family firms, and that, for firms with a CEO from the family and share- holdings larger than 10%, the existence of information asymmetry leads firms to adopt more conservative accounting practices. This finding is consistent with LaFond and Watts (2010) for U.S. firms.

Overall, we found evidence that family firms in Japan adopt more conservative accounting practices. This is the first study to use family firm samples and microstructure variables to investigate accounting conservatism for Japanese data.

**Appendix 1. PIN (Probability of Private Information-Based Trade) Related Variables (From Easley et al., 2002)**

Let $\alpha$ be the probability of a new information event occurrence, $\mu$ be the order arrival rate from an informed trader given the information event (probability of bad news is $\delta$) has occurred, and $\varepsilon_b$ and $\varepsilon_s$ be the buy order arrival rate and the sell order rate from uninformed traders. These arrival rates are all assumed to follow an independent Poisson process. Then, given the parameter vector, $\theta = (\alpha, \mu, \varepsilon_b, \varepsilon_s, \delta)$,

$$\underset{\theta}{\text{Maximize}} \prod_{t=1}^{T} L(\theta \mid B_t, S_t)$$

$$\begin{aligned} \text{where} \quad L(\theta \mid B,S) = \; & \alpha\delta e^{-\varepsilon_b} \frac{\varepsilon_b^{\,B}}{B!} e^{-(\mu+\varepsilon_s)} \frac{(\mu+\varepsilon_s)^S}{S!} \\ & + \alpha(1-\delta) e^{-(\mu+\varepsilon_b)} \frac{(\mu+\varepsilon_b)^B}{B!} e^{-\varepsilon_s} \frac{\varepsilon_s^{\,S}}{S!} \\ & + (1-\alpha) e^{-\varepsilon_b} \frac{\varepsilon_b^{\,B}}{B!} e^{-\varepsilon_s} \frac{\varepsilon_s^{\,S}}{S!} \; . \end{aligned}$$

The probability of private information-based trades is given by:

$$\text{PIN} = \frac{\alpha\mu}{\alpha\mu + \varepsilon_b + \varepsilon_s} = \frac{\text{Order arrival rate based on private information}}{\text{Total order arrival rate}} .$$

**Appendix 2. Sector Classifications**

Based on 33 industry classifications by the Tokyo Stock Exchange, we redefine seven sectors below following Kubota and Takehara (2007) for Japanese firms.

| Sector | Industry |
|---|---|
| *Consumption Goods* | Fishery and Agriculture |
| | Foods |
| | Textiles and Apparels |
| | Pharmaceutical |
| | Electric Appliances |
| | Other Products |
| *Investment Goods* | Mining |
| | Construction |
| | Pulp and Paper |
| | Chemicals |
| | Oil and Coal Products |
| | Rubber Products |
| | Glass and Ceramics Products |
| | Iron and Steel |
| | Nonferrous Metals |
| | Metal Products |
| | Machinery |
| | Transportation Equipment |
| | Precision Instruments |
| *Services* | Communication |
| | Wholesale Trade |
| | Retail Trade |
| | Services |
| *Financial* | Banks |
| | Securities |
| | Insurance |
| | Other Financial Business |
| *Transportation* | Land Transportation |
| | Marine Transportation |
| | Air Transportation |
| *Utility* | Electric Power and Gas |
| *Real Estate* | Warehousing |
| | Real Estate |

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**Table 1. Number of the Sample**

Type 1, more than 10 % shareholdings and CEO from family, Type 2, more than 10 % shareholdings, but CEO is not from family, Type 3, less than 10 % shareholdings, but CEO is from the founding family. The observation period is from 2007 through 2009. We did not include the sample for which the minimum days of available trade (buy and sell order) data were less than 120 days to compute the annual PIN values.

| | Type 1<br>%FF≧10% & CEO is a member of FF | Type 2<br>%FF≧10%, CEO is not a member of FF | Type 3<br>%FF<10% but CEO is a member of FF | Non-FB<br>%FF<10%, CEO is not a member of FF | Total |
|---|---|---|---|---|---|
| 2007 | 363 | 94 | 169 | 1056 | 1682 |
| (PIN N.A.) | 59 | 15 | 14 | 90 | 178 |
| 2008 | 373 | 95 | 165 | 1045 | 1678 |
| (PIN N.A.) | 72 | 16 | 17 | 117 | 222 |
| 2009 | 304 | 80 | 156 | 964 | 1504 |
| (PIN N.A.) | 80 | 17 | 20 | 111 | 228 |
| Total | 1040 | 269 | 490 | 3065 | 4864 |
| Family Business (%) | 21.38 | 5.53 | 10.07 | 63.01 | 100.00 |

**Table 2. Descriptive Statistics**

[**Types of Family Firms in Japa**n]

Type 1, more than 10 % shareholdings and CEO from family, Type 2, more than 10 % shareholdings, but CEO is not from family, Type 3, less than 10 % shareholdings, but CEO is from family.

[**Stock Ownership Structure Variables**]

%FFO: Percentage of shares held by founding family, FSR: Floating stock ratio, Directors: Percentage of shares held by directors, Domestic: Percentage of shares held by Japanese corporations, Foreign: Percentage of shares held by foreign institutions, Individuals: Percentage of shares held by individual investors.

[**Corporate Performance Variables**]

EPR: Earnings-to-price ratio, E/P, ROE: Return on equity, ROA: Return on asset, Ret: annual stock returns, DR: a dummy variable which takes value 1 if the return is negative.

**[PIN and other parameters in Easley et al. (2002)]**

PIN: Probability of information-based trades, Alpha ($\alpha$): Probability that private information event occurs, Delta ($\delta$): Probability of bad news, OI: Order imbalance.

[**Other Related Variables**]

lnMV, natural logarithm of market equity, BPR, book-to-market ratio.

| | Type 1 | *p* -value | Type 2 | *p* -value | Type 3 | *p* -value | Non-FB |
|---|---|---|---|---|---|---|---|
| %FFO | 31.856 | 0.000 | 23.175 | 0.000 | 3.949 | 0.000 | 0.497 |
| FSR | 45.436 | 0.000 | 48.784 | 0.002 | 59.478 | 0.000 | 51.280 |
| Directors | 16.810 | 0.000 | 7.046 | 0.000 | 2.714 | 0.000 | 1.123 |
| Domestic | 37.702 | 0.000 | 38.828 | 0.000 | 49.098 | 0.000 | 54.847 |
| Foreign | 9.045 | 0.000 | 11.540 | 0.949 | 13.363 | 0.001 | 11.492 |
| Individuals | 52.364 | 0.000 | 48.644 | 0.000 | 36.228 | 0.000 | 32.137 |
| ROA | 0.597 | 0.253 | -1.305 | 0.556 | 0.465 | 0.381 | -0.104 |
| ROE | 5.202 | 0.388 | -4.969 | 0.594 | -1.528 | 0.568 | -2.868 |
| EPR | -7.610 | 0.230 | -6.773 | 0.422 | -2.908 | 0.955 | -3.028 |
| Ret | -0.179 | 0.000 | -0.124 | 0.969 | -0.117 | 0.660 | -0.125 |
| DR | 0.774 | 0.060 | 0.773 | 0.301 | 0.718 | 0.214 | 0.746 |
| PIN | 0.197 | 0.000 | 0.191 | 0.010 | 0.178 | 0.770 | 0.179 |
| Alpha | 0.269 | 0.001 | 0.268 | 0.071 | 0.294 | 0.031 | 0.281 |
| Delta | 0.465 | 0.000 | 0.501 | 0.000 | 0.440 | 0.060 | 0.419 |
| OI | 0.043 | 0.000 | 0.043 | 0.000 | 0.014 | 0.024 | 0.022 |
| LnMV | 9.682 | 0.000 | 9.899 | 0.000 | 10.417 | 0.946 | 10.422 |
| BPR | 123.046 | 0.892 | 126.829 | 0.590 | 135.773 | 0.012 | 122.263 |

**Table 3. Correlation among Variables**

Definitions of the variables are same as in Table 2. Pearson moment correlations are in upper-right triangular matrix and Spearman rank correlations are in lower-left triangular matrix.

| | %FFO | EPR | Ret | DR | PIN | Alpha | Delta | OI |
|---|---|---|---|---|---|---|---|---|
| %FFO | 1.00 | 0.01 | -0.09 | 0.05 | 0.11 | -0.06 | 0.10 | 0.14 |
| ROA | 0.05 | 1.00 | 0.09 | -0.04 | -0.10 | 0.06 | -0.02 | -0.03 |
| Ret | -0.07 | 0.19 | 1.00 | -0.68 | 0.00 | 0.04 | -0.14 | -0.17 |
| DR | 0.03 | -0.14 | -0.75 | 1.00 | 0.01 | -0.05 | 0.14 | 0.16 |
| PIN | 0.16 | -0.14 | -0.06 | 0.02 | 1.00 | -0.11 | 0.15 | 0.37 |
| Alpha | -0.05 | 0.18 | 0.04 | -0.05 | -0.26 | 1.00 | -0.11 | -0.43 |
| Delta | 0.11 | -0.07 | -0.13 | 0.15 | 0.15 | -0.14 | 1.00 | 0.26 |
| OI | 0.15 | -0.06 | -0.20 | 0.16 | 0.48 | -0.50 | 0.27 | 1.00 |

**Table 4. Results of Regression Analysis**

Dependent variable is the earnings denominated by beginning of the period total assets. Ret: Annual stock return (from July of year *t*-1 to June of year *t*), DR: Dummy variable which is equal to 1 if Ret<0, FFO: Percentage of shares held by founding family, PIN: Probability of private information-based trades. Computed regression equations are equation (1) of the main text.

| Panel A. Dependent Variable: Net Income | | | | | | |
|---|---|---|---|---|---|---|
| | | Intercept | Ret | DR | DR*Ret | Adjusted $R^2$ |
| Type 1 | Coef. | 0.000 | 0.016 | 0.014 | 0.117 | 0.128 |
| | *p* -value | 0.997 | 0.415 | 0.015 | 0.000 | |
| Type 2 | Coef. | 0.010 | 0.010 | 0.011 | 0.118 | 0.115 |
| | p-value | 0.367 | 0.770 | 0.238 | 0.015 | |
| Type3 | Coef. | -0.001 | 0.001 | 0.014 | 0.093 | 0.116 |
| | *p* -value | 0.931 | 0.939 | 0.143 | 0.018 | |
| Non-FB | Coef. | 0.000 | 0.013 | 0.002 | 0.064 | 0.112 |
| | *p* -value | 0.951 | 0.067 | 0.433 | 0.000 | |
| Panel B. Dependent Variable: Etraordinary Income | | | | | | |
| | | Intercept | Ret | DR | DR*Ret | Adjusted $R^2$ |
| Type 1 | Coef. | 0.006 | -0.004 | -0.004 | -0.009 | 0.032 |
| | *p* -value | 0.000 | 0.183 | 0.002 | 0.049 | |
| Type 2 | Coef. | 0.008 | 0.002 | -0.001 | -0.011 | -0.007 |
| | *p* -value | 0.003 | 0.535 | 0.688 | 0.110 | |
| Type3 | Coef. | 0.006 | -0.008 | -0.001 | 0.006 | 0.029 |
| | *p* -value | 0.003 | 0.039 | 0.798 | 0.393 | |
| Non-FB | Coef. | 0.004 | 0.004 | 0.001 | -0.010 | 0.024 |
| | *p* -value | 0.000 | 0.182 | 0.232 | 0.005 | |
| Panel C. Dependent Variable: Extraordinary Loss | | | | | | |
| | | Intercept | Ret | DR | DR*Ret | Adjusted $R^2$ |
| Type 1 | Coef. | 0.020 | -0.003 | -0.006 | -0.038 | 0.063 |
| | *p* -value | 0.000 | 0.667 | 0.037 | 0.000 | |
| Type 2 | Coef. | 0.017 | 0.004 | 0.000 | -0.044 | 0.089 |
| | *p* -value | 0.002 | 0.448 | 0.916 | 0.021 | |
| Type3 | Coef. | 0.019 | 0.010 | 0.004 | -0.033 | 0.048 |
| | *p* -value | 0.000 | 0.437 | 0.344 | 0.079 | |
| Non-FB | Coef. | 0.020 | 0.002 | -0.002 | 0.000 | 0.072 |
| | *p* -value | 0.000 | 0.630 | 0.225 | 0.952 | |

**Table 5. The Extended Model**

Dependent variable is the earnings denominated by beginning of the period total assets. Ret: Annual stock return (from July of year *t*-1 to June of year *t*), DR: Dummy variable which is equal to 1 if Ret<0, FFO: Percentage of shares held by founding family, PIN: Probability of private information-based trades. Computed regression equations are equation (1) of the main text and the alternative proxy variables are as in equation (2) of the main text.

| Panel A. Dependent Variable: Net Income | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Intercept | Ret | DR | DR*Ret | DR*Ret*FFO | DR*RET*PIN | Adjusted $R^2$ |
| Type 1 | Coef. | 0.001 | 0.015 | 0.012 | -0.047 | -0.001 | 0.898 | 0.183 |
| | *p* -value | 0.836 | 0.438 | 0.029 | 0.341 | 0.148 | 0.000 | |
| Type 2 | Coef. | 0.010 | 0.010 | 0.011 | 0.067 | 0.000 | 0.301 | 0.115 |
| | p-value | 0.370 | 0.769 | 0.274 | 0.418 | 0.725 | 0.243 | |
| Type3 | Coef. | -0.001 | 0.002 | 0.014 | 0.025 | 0.001 | 0.357 | 0.123 |
| | *p* -value | 0.930 | 0.926 | 0.137 | 0.578 | 0.799 | 0.043 | |
| Non-FB | Coef. | 0.000 | 0.013 | 0.002 | -0.034 | 0.008 | 0.489 | 0.136 |
| | *p* -value | 0.908 | 0.066 | 0.537 | 0.065 | 0.112 | 0.000 | |
| Panel B. Dependent Variable: Etraordinary Income | | | | | | | | |
| | | Intercept | Ret | DR | DR*Ret | DR*Ret*FFO | DR*RET*PIN | Adjusted $R^2$ |
| Type 1 | Coef. | 0.006 | -0.004 | -0.004 | -0.003 | 0.000 | 0.015 | 0.039 |
| | *p* -value | 0.000 | 0.166 | 0.002 | 0.743 | 0.056 | 0.646 | |
| Type 2 | Coef. | 0.008 | 0.002 | -0.001 | -0.006 | 0.000 | -0.044 | -0.011 |
| | *p* -value | 0.003 | 0.515 | 0.696 | 0.634 | 0.449 | 0.426 | |
| Type3 | Coef. | 0.006 | -0.008 | -0.001 | 0.006 | -0.001 | 0.026 | 0.030 |
| | *p* -value | 0.002 | 0.039 | 0.785 | 0.528 | 0.259 | 0.494 | |
| Non-FB | Coef. | 0.004 | 0.004 | 0.001 | -0.004 | 0.000 | -0.034 | 0.025 |
| | *p* -value | 0.000 | 0.183 | 0.216 | 0.412 | 0.800 | 0.079 | |
| Panel C. Dependent Variable: Extraordinary Loss | | | | | | | | |
| | | Intercept | Ret | DR | DR*Ret | DR*Ret*FFO | DR*RET*PIN | Adjusted $R^2$ |
| Type 1 | Coef. | 0.020 | -0.002 | -0.006 | 0.006 | 0.000 | -0.254 | 0.084 |
| | *p* -value | 0.000 | 0.702 | 0.048 | 0.766 | 0.289 | 0.013 | |
| Type 2 | Coef. | 0.017 | 0.005 | 0.001 | -0.029 | 0.000 | -0.104 | 0.084 |
| | *p* -value | 0.003 | 0.443 | 0.867 | 0.496 | 0.723 | 0.343 | |
| Type3 | Coef. | 0.018 | 0.009 | 0.004 | -0.018 | 0.002 | -0.132 | 0.054 |
| | *p* -value | 0.000 | 0.440 | 0.343 | 0.517 | 0.361 | 0.278 | |
| Non-FB | Coef. | 0.020 | 0.002 | -0.002 | 0.000 | -0.004 | -0.168 | 0.072 |
| | *p* -value | 0.000 | 0.630 | 0.225 | 0.952 | 0.116 | 0.000 | |

**Table 6. Results from Alternative Proxy Variables for Bad News**

Dependent variable is the earnings denominated by beginning of the period total assets. Ret: Annual stock return (from July of year *t*-1 to June of year *t*), DR: Dummy variable which is equal to 1 if Ret<0, FFO: Percentage of shares held by founding family, PIN: Probability of private information-based trades. Computed regression equations are equation (1) of the main text.

| Panel A. Dependent Variable: Net Income, Proxy of Bad News: Alpha*Delta | | | | | | |
|---|---|---|---|---|---|---|
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | Adjusted $R^2$ |
| Type1 | Coef. | -0.005 | 0.059 | -0.011 | -0.106 | 0.034 |
| | *p* -value | 0.528 | 0.685 | 0.931 | 0.332 | |
| Type 2 | Coef. | -0.008 | -0.190 | 0.241 | 0.192 | 0.032 |
| | *p* -value | 0.605 | 0.465 | 0.294 | 0.362 | |
| Type3 | Coef. | -0.007 | -0.160 | 0.168 | 0.170 | 0.078 |
| | *p* -value | 0.486 | 0.421 | 0.328 | 0.246 | |
| Non-FB | Coef. | -0.017 | -0.039 | 0.083 | 0.095 | 0.078 |
| | *p* -value | 0.000 | 0.625 | 0.238 | 0.116 | |
| Panel B. Dependent Variable: Extraordinary Income, Proxy of Bad News: Alpha*Delta | | | | | | |
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | Adjusted $R^2$ |
| Type1 | Coef. | 0.002 | 0.058 | -0.052 | -0.027 | 0.016 |
| | *p* -value | 0.434 | 0.178 | 0.166 | 0.404 | |
| Type 2 | Coef. | 0.013 | -0.057 | 0.031 | 0.046 | 0.023 |
| | *p* -value | 0.000 | 0.385 | 0.587 | 0.383 | |
| Type3 | Coef. | 0.008 | -0.043 | 0.034 | 0.012 | 0.027 |
| | *p* -value | 0.000 | 0.221 | 0.271 | 0.635 | |
| Non-FB | Coef. | 0.008 | 0.007 | -0.014 | -0.030 | 0.025 |
| | *p* -value | 0.000 | 0.756 | 0.484 | 0.073 | |
| Panel C. Dependent Variable: Extraordinary Loss, Proxy of Bad News: Alpha*Delta | | | | | | |
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | Adjusted $R^2$ |
| Type1 | Coef. | 0.020 | 0.001 | -0.006 | 0.019 | 0.020 |
| | *p* -value | 0.000 | 0.983 | 0.915 | 0.696 | |
| Type 2 | Coef. | 0.030 | 0.114 | -0.154 | -0.155 | 0.090 |
| | *p* -value | 0.000 | 0.466 | 0.280 | 0.239 | |
| Type3 | Coef. | 0.023 | 0.075 | -0.051 | -0.080 | 0.032 |
| | *p* -value | 0.000 | 0.410 | 0.494 | 0.214 | |
| Non-FB | Coef. | 0.027 | 0.004 | -0.021 | -0.030 | 0.034 |
| | *p* -value | 0.000 | 0.910 | 0.549 | 0.333 | |

(Table 6. Continued)

| Panel D. Dependent Variable: Net Income, Proxy of Bad News: Order Imbalance | | | | | | |
|---|---|---|---|---|---|---|
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | Adjusted $R^2$ |
| Type1 | Coef. | 0.000 | 0.065 | -0.191 | -0.252 | 0.039 |
| | $p$-value | 0.989 | 0.489 | 0.081 | 0.258 | |
| Type 2 | Coef. | 0.011 | 0.133 | -0.398 | -0.691 | 0.106 |
| | $p$-value | 0.214 | 0.298 | 0.030 | 0.038 | |
| Type3 | Coef. | -0.004 | 0.023 | -0.179 | -0.809 | 0.101 |
| | $p$-value | 0.624 | 0.697 | 0.026 | 0.045 | |
| Non-FB | Coef. | -0.009 | 0.010 | -0.106 | -0.213 | 0.080 |
| | $p$-value | 0.005 | 0.801 | 0.031 | 0.043 | |
| Panel E. Dependent Variable: Extraordinary Income, Proxy of Bad News: Order Imbalance | | | | | | |
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | Adjusted $R^2$ |
| Type1 | Coef. | 0.004 | -0.011 | 0.019 | 0.088 | 0.011 |
| | $p$-value | 0.000 | 0.470 | 0.255 | 0.108 | |
| Type 2 | Coef. | 0.008 | 0.025 | 0.004 | 0.061 | 0.020 |
| | $p$-value | 0.000 | 0.301 | 0.910 | 0.536 | |
| Type3 | Coef. | 0.006 | -0.003 | 0.004 | 0.083 | 0.025 |
| | $p$-value | 0.000 | 0.835 | 0.835 | 0.276 | |
| Non-FB | Coef. | 0.007 | 0.027 | -0.020 | 0.030 | 0.023 |
| | $p$-value | 0.000 | 0.001 | 0.066 | 0.368 | |
| Panel F. Dependent Variable: Extraordinary Loss, Proxy of Bad News: Order Imbalance | | | | | | |
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | Adjusted $R^2$ |
| Type1 | Coef. | 0.019 | -0.029 | 0.067 | 0.161 | 0.025 |
| | $p$-value | 0.000 | 0.579 | 0.267 | 0.204 | |
| Type 2 | Coef. | 0.020 | 0.000 | 0.102 | 0.012 | 0.104 |
| | $p$-value | 0.000 | 0.994 | 0.155 | 0.937 | |
| Type3 | Coef. | 0.026 | 0.015 | -0.008 | 0.302 | 0.035 |
| | $p$-value | 0.000 | 0.551 | 0.789 | 0.048 | |
| Non-FB | Coef. | 0.024 | 0.020 | -0.003 | -0.030 | 0.032 |
| | $p$-value | 0.000 | 0.325 | 0.897 | 0.570 | |

**Table 7. Results from Alternative Proxy Variables**

All Variable Model Case. Dependent variable is the earnings denominated by beginning of the period total assets. Ret: Annual stock return (from July of year *t*-1 to June of year *t*), DR: Dummy variable which is equal to 1 if Ret<0, FFO: Percentage of shares held by founding family, PIN: Probability of private information-based trades. Computed regression equations are equation (2) of the main text.

| Panel A. Dependent Variable: Net Income, Proxy of Bad News = Alpha*Delta | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | BN*DBN1*FFO | BN*DBN2*FFO | BN*DBN1*PIN | BN*DBN2*PIN | Adjusted $R^2$ |
| Type 1 | Coef. | -0.008 | 0.060 | 0.154 | 0.468 | 0.000 | 0.001 | -0.874 | -2.905 | 0.065 |
| | *p*-value | 0.327 | 0.680 | 0.275 | 0.011 | 0.889 | 0.733 | 0.039 | 0.000 | |
| Type 2 | Coef. | -0.011 | -0.171 | 0.417 | 0.570 | -0.001 | -0.007 | -0.880 | -1.176 | 0.065 |
| | *p*-value | 0.448 | 0.504 | 0.086 | 0.020 | 0.591 | 0.048 | 0.016 | 0.123 | |
| Type 3 | Coef. | -0.008 | -0.143 | 0.177 | 0.723 | -0.001 | 0.012 | -0.096 | -3.451 | 0.097 |
| | *p*-value | 0.458 | 0.573 | 0.377 | 0.020 | 0.956 | 0.405 | 0.678 | 0.038 | |
| Non-FB | Coef. | -0.017 | -0.020 | 0.114 | 0.275 | 0.006 | -0.008 | -0.272 | -1.027 | 0.085 |
| | *p*-value | 0.000 | 0.802 | 0.101 | 0.000 | 0.137 | 0.576 | 0.001 | 0.000 | |
| Panel B. Dependent Variable: Extraordinary Income, Proxy of Bad News = Alpha*Delta | | | | | | | | | | |
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | BN*DBN1*FFO | BN*DBN2*FFO | BN*DBN1*PIN | BN*DBN2*PIN | Adjusted $R^2$ |
| Type 1 | Coef. | 0.002 | 0.057 | -0.049 | -0.034 | 0.000 | 0.000 | -0.021 | 0.064 | 0.011 |
| | *p*-value | 0.448 | 0.182 | 0.208 | 0.458 | 0.896 | 0.773 | 0.729 | 0.620 | |
| Type 2 | Coef. | 0.013 | -0.057 | 0.029 | -0.005 | 0.000 | -0.001 | 0.046 | 0.397 | 0.021 |
| | *p*-value | 0.000 | 0.382 | 0.613 | 0.939 | 0.266 | 0.269 | 0.174 | 0.179 | |
| Type 3 | Coef. | 0.009 | -0.058 | 0.034 | 0.061 | 0.001 | 0.002 | 0.033 | -0.268 | 0.027 |
| | *p*-value | 0.001 | 0.171 | 0.305 | 0.124 | 0.310 | 0.599 | 0.320 | 0.011 | |
| Non-FB | Coef. | 0.008 | 0.001 | -0.021 | -0.026 | 0.000 | -0.001 | 0.067 | 0.002 | 0.026 |
| | *p*-value | 0.000 | 0.971 | 0.273 | 0.162 | 0.902 | 0.692 | 0.028 | 0.969 | |

(Table 7. Continued.)

| Panel C. Dependent Variable: Extraordinary Loss, Proxy of Bad News = Alpha*Delta | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | BN*DBN1*FFO | BN*DBN2*FFO | BN*DBN1*PIN | BN*DBN2*PIN | Adjusted $R^2$ |
| Type 1 | Coef. | 0.020 | 0.003 | -0.069 | -0.108 | 0.000 | -0.002 | 0.338 | 0.855 | 0.037 |
| | *p* -value | 0.000 | 0.967 | 0.256 | 0.157 | 0.768 | 0.062 | 0.073 | 0.018 | |
| Type 2 | Coef. | 0.032 | 0.107 | -0.148 | -0.538 | 0.000 | 0.007 | 0.027 | 1.130 | 0.132 |
| | *p* -value | 0.000 | 0.490 | 0.290 | 0.002 | 0.670 | 0.034 | 0.733 | 0.010 | |
| Type 3 | Coef. | 0.025 | 0.037 | -0.054 | -0.030 | 0.004 | -0.005 | 0.090 | -0.041 | 0.033 |
| | *p* -value | 0.000 | 0.758 | 0.562 | 0.750 | 0.539 | 0.282 | 0.563 | 0.888 | |
| Non-FB | Coef. | 0.027 | 0.001 | -0.026 | -0.077 | -0.002 | 0.007 | 0.050 | 0.250 | 0.036 |
| | *p* -value | 0.000 | 0.979 | 0.456 | 0.032 | 0.131 | 0.328 | 0.218 | 0.073 | |
| Panel D. Dependent Variable: Net Income, Proxy of Bad News = Order Imbalance | | | | | | | | | | |
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | BN*DBN1*FFO | BN*DBN2*FFO | BN*DBN1*PIN | BN*DBN2*PIN | Adjusted $R^2$ |
| Type 1 | Coef. | 0.000 | 0.061 | 0.001 | 0.861 | 0.001 | 0.002 | -0.943 | -6.293 | 0.042 |
| | *p* -value | 0.998 | 0.514 | 0.997 | 0.393 | 0.558 | 0.823 | 0.243 | 0.238 | |
| Type 2 | Coef. | 0.012 | 0.138 | -0.576 | -2.184 | 0.001 | 0.055 | 0.592 | 1.663 | 0.099 |
| | *p* -value | 0.204 | 0.286 | 0.105 | 0.062 | 0.780 | 0.095 | 0.543 | 0.709 | |
| Type 3 | Coef. | -0.004 | 0.026 | -0.069 | -0.246 | -0.014 | -0.156 | -0.289 | 0.512 | 0.100 |
| | *p* -value | 0.677 | 0.652 | 0.814 | 0.474 | 0.409 | 0.443 | 0.832 | 0.864 | |
| Non-FB | Coef. | -0.009 | 0.010 | -0.061 | 0.065 | -0.014 | 0.026 | -0.157 | -1.564 | 0.081 |
| | *p* -value | 0.005 | 0.790 | 0.492 | 0.769 | 0.267 | 0.591 | 0.639 | 0.134 | |

(Table 7. Continued.)

| Panel E. Dependent Variable: Extraordinary Income, Proxy of Bad News = Order Imbalance | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | BN*DBN1*FFO | BN*DBN2*FFO | BN*DBN1*PIN | BN*DBN2*PIN | Adjusted $R^2$ |
| Type 1 | Coef. | 0.004 | -0.010 | 0.019 | 0.239 | 0.000 | -0.001 | -0.069 | -0.617 | 0.010 |
| | $p$-value | 0.000 | 0.488 | 0.588 | 0.160 | 0.211 | 0.571 | 0.531 | 0.428 | |
| Type 2 | Coef. | 0.008 | 0.026 | -0.026 | -0.038 | -0.001 | 0.001 | 0.208 | 0.396 | 0.010 |
| | $p$-value | 0.000 | 0.268 | 0.682 | 0.932 | 0.366 | 0.930 | 0.506 | 0.755 | |
| Type 3 | Coef. | 0.006 | -0.003 | 0.012 | 0.352 | 0.007 | 0.008 | -0.148 | -1.647 | 0.035 |
| | $p$-value | 0.000 | 0.807 | 0.724 | 0.122 | 0.127 | 0.728 | 0.328 | 0.065 | |
| Non-FB | Coef. | 0.007 | 0.029 | -0.043 | 0.172 | 0.001 | -0.028 | 0.083 | -0.712 | 0.024 |
| | $p$-value | 0.000 | 0.000 | 0.067 | 0.043 | 0.630 | 0.056 | 0.361 | 0.081 | |
| Panel F. Dependent Variable: Extraordinary Loss, Proxy of Bad News = Order Imbalance | | | | | | | | | | |
| | | Intercept | BN | BN*DBN1 | BN*DBN2 | BN*DBN1*FFO | BN*DBN2*FFO | BN*DBN1*PIN | BN*DBN2*PIN | Adjusted $R^2$ |
| Type 1 | Coef. | 0.019 | -0.029 | -0.009 | -0.328 | -0.001 | 0.007 | 0.442 | 1.341 | 0.029 |
| | $p$-value | 0.000 | 0.583 | 0.914 | 0.480 | 0.294 | 0.243 | 0.156 | 0.618 | |
| Type 2 | Coef. | 0.021 | 0.000 | 0.151 | -0.707 | 0.001 | 0.035 | -0.317 | 0.065 | 0.097 |
| | $p$-value | 0.000 | 1.000 | 0.417 | 0.103 | 0.774 | 0.028 | 0.561 | 0.969 | |
| Type 3 | Coef. | 0.026 | 0.015 | -0.092 | 0.203 | -0.002 | 0.024 | 0.413 | -0.020 | 0.029 |
| | $p$-value | 0.000 | 0.531 | 0.529 | 0.515 | 0.746 | 0.663 | 0.565 | 0.990 | |
| Non-FB | Coef. | 0.024 | 0.021 | -0.042 | -0.016 | 0.005 | 0.018 | 0.151 | -0.151 | 0.032 |
| | $p$-value | 0.000 | 0.299 | 0.347 | 0.887 | 0.419 | 0.699 | 0.299 | 0.764 | |