# Transparency and financing choices of family firms[*]

Tai-Yuan Chen

Sudipto Dasgupta[a]

Yangxin Yu

*Hong Kong University of Science and Technology*

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[a] Corresponding author. Contact Information: Department of Finance, Hong Kong University of Science and Technology, Clear water Bay, Kowloon, Hong Kong. Email: dasgupta@ust.hk. Fax: (852)-2358-1749.

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ABSTRACT

We examine how corporate transparency and financing choices differ for family and non-family firms in the S&P 1500 Index. While transparency on average is better for firms in the S&P 500 Index than for firms in the S&P MidCap 400 and S&P SmallCap 600 indices, the improvement is much larger for family firms. Outside the S&P 500, family firms are less transparent than their non-family counterparts, whereas the opposite is true for firms in the S&P 500 Index. Family firms outside the S&P 500 Index have shorter debt maturity and higher debt ratios than large family firms (in the S&P 500) as well as non-family firms. These results on firms' financial choices are consistent with the notion that small family firms prefer opacity and enjoy control benefits at the cost of over-reliance on "monitored finance", while other firms, especially the large family firms, prefer transparency and the lower cost of external finance.

Keywords: Family firms, transparency, debt maturity, capital structure

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## 1. Introduction

Family firms are ubiquitous in almost every industrial economy and are particularly dominant in countries in Europe, Latin America and Asia (Claessens et al., 2000; Shleifer and Vishny, 2003). Even in the U.S., as pointed out by Holderness (2009), family firms are far more common than is often assumed. In fact, founding family members are actively involved in 35.4% and 45.67% of companies listed in the S&P 500 and S&P 1500 Indices, respectively (Anderson and Reeb, 2003a; Chen et al., 2009). Due to their economic significance, a growing literature attempts to address how family-controlled firms differ from non-family publicly traded firms in terms of performance, governance and disclosure, and to a more limited extent, on financing policies.[1]

An important issue in this literature is the association between family ownership and corporate transparency. However, the findings on transparency of family firms vis-à-vis non-family firms are mixed. Specifically, Ali et al. (2007) and Wang (2006) find that family firms in the S&P 500 Index have better financial reporting quality, larger analyst following and smaller bid-ask spreads than non-family firms, suggesting that family firms are associated with a more transparent information environment. In contrast, Anderson et al. (2009) find that family firms among the top 2000 US industrial firms are less transparent than non-family firms. Moreover, Chen et al. (2008) document that family firms in the S&P 1500 firms are less likely to provide voluntary disclosures such as conference calls and earnings forecasts. These studies taken together seem to suggest that

[1]Prior studies have examined performance (Morck et al., 1988; Anderson and Reeb, 2003a; Villalonga and Amit, 2006; Fahlenbrach, 2009), financial reporting quality (Wang, 2006; Ali et al., 2007; Chen et al., 2008; Anderson et al., 2009), investment decisions (Anderson and Reeb, 2003b), cost of debt (Anderson et al., 2003), corporate governance (Anderson and Reeb, 2004; Villalonga and Amit, 2009), and tax planning (Chen et al., 2009) of family firms in the U.S..

large family firms (e.g., in the S&P 500) have better transparency than the corresponding non-family firms, whereas small family firms are more opaque than their non-family owned counterparts.

Transparency and disclosure policies shape a firm's information environment. A large literature finds that firms' financing choices are affected by information asymmetry between the firm's insiders and outside investors. Thus, if family and non-family firms have different disclosure policies, one would expect that their financial policies would also be different. However, existing literature does not document such differences. For example, Anderson and Reeb (2003b) find that family and non-family firms in the S&P500 have similar leverage ratios. Overall, research on family firms to date does not conclusively establish the relationship between family ownership and corporate transparency, and how transparency in turn shapes family firms' financing choices.

In this paper, we attempt to provide new evidence on transparency and financing choices of family and non-family firms in the S&P 1500 Index. We establish three results. First, we show that family firms in the S&P MidCap 400 and S&P SmallCap 600 Indices (henceforth, collectively, the *small* S&P 1500 firms) are the least transparent among the S&P 1500 firms. In fact, while transparency in general is higher for firms in the S&P 500 Index (henceforth, the *large* S&P 1500 firms), the improvement is much larger for family firms. Second, we investigate capital structure choices of firms in the S&P 1500 and show that, again, the small S&P 1500 family firms differ in their financing choices from other firms in the Index. Specifically, these firms have a higher proportion of shorter maturity debt and a higher debt ratio than all other firms in the S&P 1500 Index. Third, we show that transparency is one of the key features that explains the

different financing choices of the large and small family firms. We find that more transparent family firms have higher debt maturity and lower leverage ratios, consistent with the idea that the different capital structure choices of large and small family firms is related to their transparency choices.

Why do the transparency and financing choices of the small S&P 1500 family firms differ from those of other firms in the Index? In the Appendix, we present a model to show why these choices differ. We argue, first, that transparency lowers the cost of external finance, and this is especially important for firms with more growth opportunities. In recent papers, Khurana et al. (2006) and Francis et al. (2009) find that better disclosure promotes growth.[2] Therefore, one expects firms with more growth potential to be more transparent than those with less. The large S&P 1500 firms have significantly higher market-to-book ratios not only in comparison with the small S&P 1500 firms, but also with the much small non-S&P-1500 firms in Compustat. The conventional wisdom that the smallest firms are the ones with the most growth potential seems not to extend to these very large firms that dominate the economy.[3]

Second, while transparency may have associated costs, we argue that these costs are higher for family firms. This is because family ownership facilitates consumption of private benefits or expropriation of minority shareholders, but only if the firm is opaque. Opacity allows protection from shareholder action as the family firm manager can hide the misuse of corporate resources. When growth opportunities are not very high, the

[2] Khurana et al.(2006) use firm-level data and find a positive relation between a firm's disclosure policy and its "externally financed" growth rate. Francis et al.(2009) find cross-country evidence that industry growth rates are positively related to residual transparency (i.e., transparency that is unexplained by country-level factors).

[3] Excluding firms with market value of assets of less than 10 million, the smallest 20% of non-S&P 1500 firms' terms of market value have higher market-to-book ratios than non-S&P firms overall, and higher mean but lower median market-to-book ratios than S&P SmallCap and MidCap firms.

benefits of opacity outweigh the additional costs of external finance. Therefore, family firms without adequate growth options are likely to be the least transparent among S&P 1500 firms.

Finally, we argue that these transparency choices have implications for the financing choices of firms. Opacity implies that "arm's length" financing is inaccessible to the small family firms. These firms, therefore, need to rely on "monitored finance" such as short-term bank debt, where lenders have liquidation rights and the incentive to monitor to implement timely liquidation. In contrast, the large family firms, as well as non-family firms (both large and small), opt for greater transparency and financial flexibility, and are less dependent on short-term debt. Since opacity forces the small S&P 1500 family firms to rely heavily on short-term debt at the expense of other types of financing such as long-term debt and equity, the implication is that other firms in the S&P 1500 will have higher debt maturity as well as lower debt-equity ratios.

A substantial literature exists on the role of financial structure, including debt maturity structure, in resolving information problems between insiders and outsiders (Grossman and Hart (1982), Jensen (1986)). For example, Harris and Raviv (1990) argue that "managers are reluctant to liquidate the firm under any circumstances and are unwilling to provide detailed information to investors that could result in such an outcome. Consequently, investors use debt to generate information and monitor management. They gather information from the firm's ability to make payments and from a costly investigation in the event of default." Short-term debt – by forcing management to continuously refinance or roll over the debt – provides more monitoring and imposes more discipline on management. Consequently, opaque firms are likely to show greater

reliance on debt, and in particular debt of shorter maturity. There is also a sizeable literature that argues that greater transparency makes it easier for firms to issue securities the value of which is more likely to be affected by information or agency conflicts between insiders and outsiders. Equity is more affected by information asymmetry than debt (Myers and Majluf, 1984); risky long-term debt is more affected by information asymmetry about future prospects of the company than short-term debt. To the best of our knowledge, however, the issue of financing choices of family firms, and how that relates to the costs and benefits of transparency, is unexplored.

Our study is related to that by Datta et al. (2005). Although they do not specifically study family firms, these authors also examine debt maturity choice by firms in the S&P 1500. They find that firms with higher managerial ownership have more short-term debt relative to total debt. They suggest that this finding is consistent with the hypothesis that managers have an incentive to choose a longer debt maturity structure than is optimal, to avoid monitoring by short-term lenders. Greater managerial ownership aligns the interests of managers and shareholders and pushes the firm closer towards the optimal maturity structure. Interestingly, when we include a family firm indicator variable or family ownership in our specifications, the managerial ownership variable becomes insignificant in our regressions. A possible reason for this is that managerial ownership is much higher in family firms, and the managerial ownership variable is picking up the family-firm effect. Thus, our results suggest that the family-control status and preference for opacity or transparency by family owners, rather than interest alignment, is an important determinant of debt maturity among S&P 1500 firms.

The rest of the paper is organized as follows. Section 2 discusses the relevant literature. Section 3 presents our model and generates testable hypotheses. Section 4 describes the data and discusses summary statistics. The main empirical results are presented in section 5. Section 6 concludes the paper.

## 2. Related literature

### *2.1 Family firms and corporate transparency*

An important characteristic of family ownership is the mitigation of agency problems arising from the separation of ownership and management as described by Jensen and Meckling (1976). Specifically, controlling families reduce owner-manager conflicts either by directly appointing a family member as CEO or by effectively monitoring professional executives (Demsetz and Lehn, 1985; Anderson and Reeb, 2003a). However, with substantial ownership, controlling shareholders are also in a position to derive personal benefits at the expense of minority shareholders. For example, family members can engage in related-party transactions (Anderson and Reeb, 2003a), issue special dividends (DeAngelo and DeAngelo, 2000), freeze out small shareholders (Gilson and Gorbon, 2003), entrench themselves (Shleifer and Vishny, 1997; Perez-Gonzalez, 2006), or reap excessive insider trading gains (Chan et al., 2009). Thus, compared to shareholders of non-family firms, minority shareholders of family firms are exposed to less severe conflicts of interests vis-à-vis managers, but face higher risks of being expropriated by majority shareholders.

These differences in agency problems could cause corporate transparency to be different for family firms and non-family firms. In particular, the "monitor-in-place"

hypothesis would suggest that if transparency lowers the cost of capital, family firms would have better disclosure and be more transparent. However, greater alignment of interest could also reduce the demand for transparency as shareholders do not need to monitor management. If disclosure is costly, then this could lead to a negative relationship between family ownership and transparency. Family firms could also be associated with lower corporate transparency if controlling shareholders intend to expropriate minority shareholders. Empirical evidence on this issue is mixed. Ali et al. (2007) and Wang (2006) find that family firms in the S&P 500 Index provide better financial reporting quality, and also have larger analyst following and smaller bid-ask spreads. However, Chen et al. (2008) document that family firms in the S&P 1500 are less likely to provide voluntary disclosures, such as conference calls and earnings forecasts, and Anderson et al. (2009) find that family firms among the largest two thousand industrial firms in U.S. are more opaque than non-family firms. Such a result is consistent with a "monitor-in-place" argument as well as the entrenchment hypothesis.[4]

While these findings appear to be conflicting at first glance, a possible explanation is that firm size affects the disclosure incentives of family firms more than that of non-family firms. However, the issue of how firm size affects disclosure incentives and whether the effect of size is likely to be different for family and non-family firms is relatively unexplored.

[4] The authors find that family firms with higher family ownership within the S&P 500 and the Fortune 500 have higher Tobin's Q (after controlling for other potential determinants of Q) than non-family firms, but outside of these highly transparent firms, there does not appear to be any value premium. While Anderson et al. (2009) do not directly examine how transparency or opacity is related to family ownership within and outside the S&P 500, their results are very consistent with our finding that transparency is higher for family firms within the S&P 500, but the opposite is the case outside the S&P 500.

### *2.2 Family firms and financing choices*

The literature on the capital structure and financing choices of family firms is brief. Anderson and Reeb (2003b) consider firms in the S&P 500, and examine whether family firms, family ownership share, and the status of the CEO (founder, heir or hired), affect the long-term debt ratio. They do not find any significant relationships. Anderson et al. (2003) directly examine how family ownership affects the cost of debt. They find that after controlling for industry and firm specific characteristics, the cost of debt financing for family firms is lower than that in non-family firms, and they attribute the lower cost of debt to lower agency costs of family firms.

### *2.3 Debt maturity*

There is a sizeable literature on theories and determinants of debt maturity structure. As discussed in the Introduction, Harris and Raviv (1990) stress the importance of short-term debt in eliciting timely information from management. Stulz (2000) also argues that short-term debt can be very effective in monitoring management. These arguments would suggest that when the firm is not very transparent, short-term debt could be used to mitigate information problems. Rajan (1992), however, points to the dark side of short-term debt: when a lender acquires information about a firm and can threaten liquidation when the firm has insufficient cash flow and must roll over the debt, a problem of "information monopoly" is created. In this situation, the threat of liquidation can distort ex-ante effort incentives.

Diamond (1991, 1993) and Flannery (1986) stress information asymmetry rather than monitoring as a determinant of debt maturity structure. Diamond shows that both very

high rated and very low rated borrowers will rely heavily on short-term debt, but to avoid inefficient liquidation, firms with the intermediate credit ratings will issue long-term debt. Flannery (1986) argues that the presence of information asymmetry about future cash flows implies that long-term debt will be more mispriced than short-term debt. Therefore, high quality firms are more likely to issue less under-valued short-term debt, while low quality firms are more likely to issue more overvalued long-term debt. In view of the importance given to firm quality as a determinant of debt maturity choice, empirical models typically use several proxies for firm quality: abnormal earnings, debt rating, and firm age and size.

Myers (1977) argues that risky debt financing may lead to suboptimal investment incentives when a firm has growth options. Managers acting on behalf of equity holders may fail to exercise profitable investment options because risky debt captures a portion of equity holders' benefit in the form of a reduction in the probability of default. This underinvestment incentive can be mitigated by issuing short-term debt that matures before the growth options are exercised. Empirically, Barclay and Smith (1995), Guedes and Opler (1996) and Johnson (2003) find that firms' debt maturity decreases in their growth opportunity measured by the market-to-book ratio. The market-to-book ratio is considered to be an important determinant of debt maturity structure.

Other theories of debt maturity stress the importance of matching the maturities of firms' assets and liabilities, and taxes (Kane et al., 1985; Brick and Ravid, 1985). Empirical proxies to capture tax effects typically used are measures of the firm's effective tax rate, asset value variability, and the term spread.[5]

[5] Other control variables often used in maturity structure regressions are firm size, an indicator variable for the existence of commercial paper programs, and net operating loss carry forward. For firm size, a

*2.4 Leverage*

Instead of providing an overview of the extensive literature on leverage, we briefly discuss the literature on the effect of transparency and ownership on capital structure.[6] Corporate transparency reduces information asymmetry between insiders and outsiders and more transparent firms are likely to rely more on equity than debt since equity is informationally more sensitive than debt (Myers and Majluf, 1984). Consistent with this argument, Chang et al. (2006) examine the effect of greater equity analyst following on firms' debt ratios, market timing incentives, the size and frequency of equity issuance, and the debt equity choice. While they do not address the issue of whether more transparent firms attract more analyst following or whether analysts directly reduce information asymmetry, Chang et al. (2006) find that greater analyst following is associated with lower debt ratios. Similarly, Chang et al. (2009) find that firms audited by the Big Six audit firms have lower debt ratios.[7] These results are consistent with the idea that greater transparency is associated with lower debt ratios.

Empirical evidence on the relationship between managerial ownership and capital structure is mixed. Friend and Lang (1988) find that the debt ratio is negatively related to managerial ownership. By contrast, Berger et al. (1997) document lower leverage in firms run by CEOs with low direct stock ownership. Harvey et al. (2004) find that

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quadratic specification is often used. The reason is that the scale economies of larger issue costs associated with public debt (which is also typically of maturity higher than five years) can be realized mainly by larger firms, so a positive firm size effect is expected. However, some very large firms also have commercial paper programs which support lower maturity debt – hence the non-linear specification. Some authors directly use an indicator variable for commercial paper programs.

[6] Parsons and Titman (2009) provide a comprehensive review of the empirical literature on capital structure.

[7] Chang et al. (2009) provide evidence in support of the notion that the effect of auditor quality on financing decisions and capital structure is through the reduction in information asymmetry associated with an improvement of a firm's disclosure policy, and especially its accounting reporting. They find that the probability of informed trading (PIN) and the amount of discretionary accruals are significantly lower among companies that are audited by a Big Six firm where the accounting quality is greater.

actively monitored debt (e.g., syndicate loans) creates value for shareholders of firms that face severe information asymmetry associated with pyramid ownership.

## 3. Hypothesis and empirical design

### *3.1 Hypothesis development*

As discussed above, previous literature suggests that the difference in transparency between family and non-family firms could be related to firm size. There is also evidence that information asymmetry (plausibly related to transparency) is related to capital structure choices. We now develop our hypothesis on the capital structure choices of family firms based on the interaction between transparency, private benefits of control, and the need for external funds.

#### *3.1.2 Small and large firms*

Following recent literature (Khurana et al., 2006; Francis et al., 2009), we argue that transparency is especially valuable for firms with very high potential for growth. This is because the cost of external finance is lower for more transparent firms. The firms in the S&P 500 are among the largest firms in the economy. The reason they are large is that they have grown more rapidly that other firms. Therefore, it is plausible that these firms are also more transparent than other firms that did not grow as rapidly. In other words, among the small firms in the past (possibly the small S&P firms), those that had very good growth opportunities chose to become transparent and are the big firms today. This is consistent with the big S&P firms being more transparent than the small ones, a fact that we will reaffirm below.

In results not reported in a table, we find that the large S&P firms have significantly higher mean and median market-to-book ratios over our sample period (1995-2006) than the small S&P firms, the non-S&P 1500 firms overall, as well as the lowest 50% and lowest 20% of the non-S&P 1500 firms (excluding firms with market value less than 10 million). Thus, even after they make the S&P 500 through rapid growth, these firms continue to enjoy much better growth potential than other firms. While the smallest size group (bottom 20% of the non-S&P 1500 firms) has higher market-to-book ratios than the next non-S&P group overall, the conventional wisdom that the smallest firms have the highest market-to-book ratios does not extend to the large S&P 500 firms. [8]

### *3.1.2 Family and non-family firms*

Existing literature shows that there are two distinct characteristics of family firms. One is that management (usually connected to the family) owns significantly higher ownership stake in the firm than is typical in non-family firms, leading to less severe agency problems that arise from the separation of management and ownership. The second characteristic is that substantial ownership also offers much more scope for management to use corporate resources for their own benefit (private benefits) in family firms, suggesting that family firms have more severe agency problems that arise from the conflicts between large and small shareholders. We argue that greater opacity enables family members to extract personal benefits or to expropriate minority shareholders;

[8] While existing evidence suggests that small firms are more innovative than large firms (Acs and Audretsch, 1988; Acs et al., 1994), there is substantial evidence that large firms are much more able to appropriate the benefits of innovation. Chan et al., (1990), Chauvin and Hirschey (1993) and Ho et al., (2006) find that the positive effect of R&D investment on firm value is strongest for the largest firms. Indeed, the advantages that large firms enjoy in terms of complementarities/synergies within the firm, in branding and marketing, and their ability to attract skilled workers, imply that large firms can grow rapidly not only through greater appropriation of their own innovations, but also by buying out smaller innovative firms and appropriating the R&D of these smaller firms.

however, it makes the firm less known to external investors and raises the cost of obtaining external finance.

### *3.1.3 Main testable hypotheses*

We now bring together the notions, discussed above, that the *large* S&P firms have more abundant growth potential, and that family firms have more scope for extraction of private benefits. The following discussion builds on a formal model outlined in the Appendix.

Family firms that have projects today but do not have very favorable growth prospects would prefer to remain opaque and consume private benefits, as more transparency may bring action from non-family related shareholders. However, opacity makes it costly to raise external finance. The only way for these firms to raise financing for current projects without being transparent is to rely on "monitored finance" from banks, which allows access to finance without having to give up control benefits due to the risk of shareholder action. Bank monitoring is private and shareholders cannot sue the manager based on information that only the monitoring bank is privy to. Bank monitoring prevents more egregious risk-shifting behavior for the pursuit of private benefits, but otherwise allows the manager much greater control over the use of corporate resources than would be allowed by shareholders.

Consumption of private benefits, however, is likely to reduce cash flows and thus affect debt capacity. As a result, the bank may be only willing to lend if it can liquidate the firm when early signals are unfavorable. Thus, short-term debt, which gives the bank liquidation rights when early signals are bad, is likely to be more viable than long-term

debt. However, as pointed out by Rajan (1992), short-term debt also creates a bank "information monopoly" and thus has a cost if the firm needs additional funds in the future. Specifically, if the bank refuses to lend, then it is difficult for the firm to seek external financing as that is likely to convey a negative signal to the market.[9] Consequently, this form of financing, even though it allows greater scope for the pursuit of private benefits, is only attractive for family firms that are less likely to require substantial funds in the future.

Therefore, we expect the *small* family firms, which have less growth potential, to weigh the benefits of control over the firm's resources more heavily than the benefit of cheaper external finance in the future. Consequently, opacity and reliance on short-term debt is likely to characterize the choices of these firms.

The *large* family firms are likely to weigh these benefits in precisely the opposite way. Therefore, they will opt for more transparency and cheaper external finance for future projects than is possible under bank monitoring due to the information monopoly problem. By becoming more transparent, they will be subject to monitoring by shareholders and lenders at lower cost, and thus have access to a broader range of financing which would include equity as well as long-term debt. Long-term debt now becomes feasible because even though long-term lenders may not be able to liquidate in a timely manner, cash flows improve as managers commit (by becoming more transparent and subjecting themselves to shareholder action) not to use corporate resources for their own benefit. Firms will optimally choose the "right" mix of financing from the menu of

[9] In Rajan (1992), the bank exploits its information monopoly to extract rent from the firm. More generally, however, if the bank is not in a position to continue lending for any reason not observable to the market, financing may be difficult to obtain due to the information monopoly that the lending relationship creates.

equity, long-term debt and short-term debt based on the relative costs and benefits of different types of finance. In contrast, as we argue above, the small family firms (such as those in the S&P Midcap and Smallcap indices) will have capital structures that feature primarily short-term debt, as opposed to more balanced capital structures that feature both long-term debt and equity. Therefore, the first testable hypothesis is as follows:

**H1.** *Large* family firms (a) will be more transparent, (b) have longer debt maturity and (c) have lower debt ratio, than *small* family firms.

The second testable hypothesis is that the financing choices of *large* family firms and non-family firms (both large and small) will be similar to each other, in spite of transparency differences. This is because private benefits are small in all these three cases (by the very nature of the non-family firms, and by choice for the large family firms) and the firms are above a transparency threshold. Greater transparency gives these firms more financing choices and they make optimal capital structure decisions depending on the relative costs and benefits of different types of finance. However, large firms, by their very nature, are more complex; therefore, it is likely that the transparency threshold required for issuance of the full range of securities is higher for the larger firms. Moreover, even among the large firms, given the greater potential for the extraction of private benefits, the transparency threshold is likely to be higher for large family firms than for non-family firms.[10]

Thus, our second testable hypothesis is as follows:

[10] In the model outlined in the Appendix, we assume that firms have two choices of the level of transparency – to be transparent or non-transparent. Transparency implies that there is no information asymmetry between outsiders and insiders. However, for more complex firms, the level of disclosure required to mitigate information asymmetry is likely to be higher.

**H2.** (a) *Small* family firms will be the least transparent, followed by the small non-family firms, the large non-family firms, and then the *large* family firms, (b) The *small* family firms will have shorter (higher) debt maturity (debt ratio) than small non-family firms, and there will be no difference in the debt maturity (debt ratio) between non-family firms and *large* family firms.

### *3.2 Empirical design*

Our empirical model, which examines the relationship between family firms, S&P 500 inclusion, and corporate transparency, is similar to that used by Anderson et al. (2009).[11] We add an indicator variable for S&P 500 membership and its interaction with family ownership to their specification to capture the differential effect on corporate transparency of being listed in the S&P 500 Index. We use principal component factor analysis to develop the transparency index. Specifically, four individual indicators of corporate transparency are used in the analysis: analyst following (*AnalystFollowing*), forecast errors (*ForecastError*), forecast dispersions (*ForecastDispersion*), and PIN (*PIN*).[12] The estimated model is:

$$\begin{aligned} Transparency = {} & \alpha + \beta_1 FamilyD + \beta_2 SP500 + \beta_3 FamilyD*SP500 \\ & + \beta_4 lnMV + \beta_5 Volatility + \beta_6 Profit + \beta_7 FirmAge \\ & + \beta_8 RDSale + Industry\ Dummy + Year\ Dummy + error \end{aligned} \quad (1)$$

[11] Anderson et al. (2009) also add debt ratio in their model to control for the effect of leverage on corporate transparency, but we do not include leverage in our transparency model as it is one of our variables of interest in later analysis. However, including leverage in equation (1) does not affect our main conclusions – that is, it does not change the significance of family firm dummy.

[12] Because forecast errors, dispersions, and PIN are negatively related to transparency, we multiply these three measures by -1. Thus, the factor score from this analysis is increasing in corporate transparency.

Here, *FamilyD* is an indicator variable that takes a value of 1 if a firm is a family firm, and zero otherwise. *SP500* is an indicator variable that takes a value of 1 if the firm is in the S&P 500 Index, and zero otherwise. We follow Anderson et al. (2009) in choosing the remaining control variables that are likely to affect transparency.

Note that $\left.\frac{\partial T}{\partial (SP500)}\right|_{Family=1} = \beta_2 + \beta_3$, where $T$ denotes the dependent variable. Further,

$$\left.\frac{\partial T}{\partial (Family)}\right|_{SP500=0} = \beta_1, \left.\frac{\partial T}{\partial (SP500)}\right|_{Family=0} = \beta_2, \text{ and } \left.\frac{\partial T}{\partial (Family)}\right|_{SP500=1} = \beta_1 + \beta_3.$$

Consequently, we have the following:

*Empirical Implication 1.* Hypothesis 1(a) implies $\beta_2 + \beta_3 > 0$. Hypothesis 2(a) implies $\beta_1 < 0, \beta_2 > 0$ and $\beta_1 + \beta_3 > 0$.

Next, we consider the debt maturity and debt ratio regressions. Our empirical strategy follows existing literature (Barclay et al., 2003; Johnson, 2003; Datta et al., 2005; Billett et al., 2007). Specifically, we use two-stage least squares regression analysis (2SLS) to estimate the relationships between family firms, leverage ratio, and debt maturity. In the benchmark model, leverage and debt maturity are simultaneously determined using the following two equations:

$$\begin{aligned} Maturity_t = {} & \alpha + \delta_1 Predicted\_Leverage_t + \delta_2 FamilyD_{t-1} + \delta_3 S\&P500_{t-1} \\ & + \delta_4 FamilyD_{t-1} * SP500 + \delta_5 MgtOwnE_{t-1} + \delta_6 FirmAge_{t-1} + \delta_7 MB_{t-1} \\ & + \delta_8 lnMV_{t-1} + \delta_9 ln^2 MV_{t-1} + \delta_{10} Volatility_t + \delta_{11} AbEarnings_t \\ & + \delta_{12} AssetMaturity_{t-1} + \delta_{13} TermPremium_{t-1} + \delta_{14} ITC_{t-1} + \delta_{15} NOL_{t-1} \\ & + \delta_{16} Commercial_{t-1} + \delta_{17} Rating_{t-1} + \delta_{18} Industry\ Dummy + error \end{aligned} \quad (2)$$

$$Leverage_t = \alpha + \gamma_1 Predicted\_Maturity_t + \gamma_2 FamilyD_{t-1} + \gamma_3 S\&P500_{t-1} + \gamma_4 FamilyD_{t-1} * SP500_{t-1} + \gamma_5 MgtOwnE_{t-1} + \gamma_6 FirmAge_{t-1} + \gamma_7 MB_{t-1} + \gamma_8 lnMV_{t-1} + \gamma_9 Volatility_t + \gamma_{10} AbEarnings_t + \gamma_{11} FixedAssets_{t-1} + \gamma_{12} Profit_{t-1} + \gamma_{13} ITC_{t-1} + \gamma_{14} NOL_{t-1} + \gamma_{15} IndustryDummy + \gamma_{16} YearDummy + error \quad (3)$$

Note that $\left.\frac{\partial(Maturity)}{\partial(SP500)}\right|_{Family=1} = \delta_3 + \delta_4$, $\left.\frac{\partial(Maturity)}{\partial(Family)}\right|_{SP500=0} = \delta_2$,

$\left.\frac{\partial(Maturity)}{\partial(SP500)}\right|_{Family=0} = \delta_3$, and $\left.\frac{\partial(Maturity)}{\partial(Family)}\right|_{SP500=1} = \delta_2 + \delta_4$. Thus, we have:

*Empirical Implication 2.* Hypothesis 1(b) implies $\delta_3 + \delta_4 > 0$. Hypothesis 2(b) implies $\delta_2 < 0,\ \delta_3 = 0$ and $\delta_2 + \delta_4 = 0$.

Similarly, we have:

*Empirical Implication 3.* Hypothesis 1(c) implies $\gamma_3 + \gamma_4 < 0$. Hypothesis 2(c) implies $\gamma_2 > 0,\ \gamma_3 = 0$ and $\gamma_2 + \gamma_4 = 0$.

## 4. Sample

Our sample consists of companies that were listed in the S&P 1500 Index in year 2002. To construct variables for our empirical tests, we require data from various sources. Specifically, financial data are obtained from Compustat, and data related to financial analysts and their earnings forecasts are retrieved from Thomas Financial / First Call. PIN

scores generated by Brown et al. (2004) are obtained from Stephen Brown's website: http://userwww.service.emory.edu/~sbrow22/pinsdata.html. Finally, information on managerial ownership and firm age are extracted from Corporate Library and Execucomp.

Next, we describe the process of identifying family firm status for our sample firms. For firms in the S&P500 Index, we directly use the data from *BusinessWeek* (2003). *BusinessWeek* (2003) considered a company a family firm if the founder or his/her descendants are the CEO, top executive, director on the board, or the largest shareholder. This definition of family firm follows the one used by Anderson and Reeb (2003a) and has been commonly adopted by other studies.[13] Based on this definition, *BusinessWeek* (2003) classifies 177 firms in the S&P 500 Index as family firms, and the remaining as non-family firms.[14]

For the other companies in the S&P 1500 Index (including firms in the S&P MidCap 400 Index and the S&P SmallCap 600 Index), we manually classify them into family and non-family firms following the definition of Anderson and Reeb (2003a) and *BusinessWeek* (2003). The classification involves two steps. First, we collect information about a company's founding family and its history through various sources including proxy statements, company's website, Hoovers, Gale Business Resources, and internet search. Second, we go through SEC documents to identify whether the founding families still hold positions in the top management or on the board of directors. Based on the

[13] A number of academic studies including Anderson and Reeb (2003b), Anderson and Reeb (2004), Anderson et al. (2003), Villalonga and Amit (2006), Wang (2006), Ali et al. (2007), Anderson et al. (2009), Chen et al. (2008), and Chen et al. (2009) use this definition of family firms.

[14] *BusinessWeek*'s definition of a family firm follows that of Anderson and Reeb (2003a), and the same definition has been used by Anderson and Reeb (2003b, 2004), Anderson et al. (2003), Villalonga and Amit (2006), and Ali et al. (2007). We check the validity of family firm status throughout our sample period manually and find the family firm classification quite consistent. Only 8 family firms (out of 177 firms) are changed to non-family firms in our sample period (e.g., Chubb Corp and Tektronix Inc.)

criteria, we find that 508 firms (50.8%) in the S&P MidCap 400 and SmallCap 600 indices can be considered family firms, and the remaining as non-family firms. Overall, together with firms in the S&P 500, 685 firms (45.67%) of S&P1500 firms are deemed controlled by their founding family members.[15] Our final sample period spans the years 1997 to 2006.[16]

Panel A of Table 1 provides descriptive statistics on the characteristics of family and non-family firms. We find that *LEVERAGE* and *MATURITY* are significantly lower for family firms, suggesting that family firms have lower leverage ratio and shorter debt maturity. Moreover, family firms are shown to have lower debt quality as they are less likely to be rated by credit agencies (*RATING*), and their corporate bonds are less likely to receive investment grades (*InvestGrade*). As expected, *MgtOwnI* is significantly higher for family firms, indicating that executives of family firms own a larger percentage of their company's stocks. For the other variables, we find that compared to non-family firms, family firms are of smaller size (*lnMV*) and are younger (*FirmAge*), whereas they have greater growth opportunities (*MB*) and better profitability (*Profit*). However, compared to non-family firms, family firms' operating performance is more volatile (*Volatility*) and they are more likely to report carried-forward operating loss (*NOL*). Regarding asset composition, family firms have shorter maturity assets (*AssetMaturity*) and rely less on fixed assets (*FixedAssets*). Finally, family firms are less likely to issue commercial papers (*Commercial*).

[15] The percentage of family firms in the S&P1500 Index is similar to that reported by Chen at al. (2008) and Anderson et al. (2009).

[16] Family firm classification for the entire sample period is manually validated by examining corporate proxy statements.

Panel B of Table 1 presents the Pearson correlation matrix. The family firm status (*FamilyD*) and family ownership (*FamilyOwn*) have similar correlation patterns with the other variables in most cases. In particular, *FamilyOwn* is positively correlated with management ownership (*MgtOwnE*), market-to-book ratio (*MB*), earnings volatility (*Volatility*), and profitability, while it is negatively correlated with leverage ratio (*Leverage*), debt maturity (*Maturity*), firm size (*lnMV*), asset maturity (*AssetMaturity*), fixed asset ratio (*FixedAssets*), investment tax credit (*ITC*), issuance of commercial papers (*Commercial*), and the likelihood of being rated by credit agencies (*Rating*). To summarize, Table 1 suggests that family firms are different from non-family firms in many aspects, so it is important to control for these variables in our empirical estimation.

## 5. Empirical estimation

### *5.1 Family firms and corporate transparency*

Panel A in Table 2 reports the descriptive statistics for the composite transparency index and four of the components of that index. We find that analyst following is lower, and forecast error, forecast dispersion and *PIN* are larger for family firms, indicating that family firms on average are associated with a less transparent information environment. To see if large family and non-family firms have similar differences in transparency, in Panel B we report descriptive statistics for corporate transparency measures for firms in the S&P 500 Index. We find that as compared to non-family firms in the S&P 500 Index, family firms have more analyst following and smaller forecast dispersions, but larger *PIN*. The aggregate transparency measure is higher for the family firms. In aggregate, Panel A and B suggest that the transparency differences between family and non-family

firms depend on firm size: large S&P family firms have a better overall information environment than large S&P non-family firms, whereas the small S&P family firms are more opaque than the small S&P non-family firms. Panel C provides the Pearson correlation matrix. The results indicate that family firms (*FamilyD*) and family ownership (*FamilyOwn*) are negatively associated with corporate transparency (*Transparency*), firm size (*lnMV*), firm age (*FirmAge*), and S&P 500 membership (*SP500*), whereas they are positively associated with earnings volatility (*Volatility*) and R&D intensity (*RDSale*).

The regression estimate of equation (1) is presented in Panel C of Table 2. We present the results for a family firm indicator variable (*FamilyD*) (columns (1) and (2)) and also for the continuous family ownership (*FamilyOwn*) variable (column (3) and (4)). When we do not distinguish between family firms within and outside the S&P 500, family firm status or family ownership is not significantly related to transparency (columns (1) and (3)). However, in columns (2) and (4), respectively, we find that the coefficients on *FamilyD* and *FamilyOwn* (coefficient $\beta_1$ in equation (1)) are significantly negative, suggesting that family firm status and family ownership are associated with lower corporate transparency among non-S&P 500 firms. The coefficient of the S&P 500 indicator variable (coefficient $\beta_2$ in equation (1)) is significantly positive, indicating that non-family firms in the S&P 500 Index are more transparent. Finally, note that the coefficients on *FamilyD*×*SP500* and *FamilyOwn*×*SP500* (coefficient $\beta_3$ in equation (1)) are significantly positive, and larger in magnitude than the coefficient $\beta_1$ (at the 10% level). This implies that family firms in the S&P 500 are more transparent than non-family firms in the same Index. Overall, these results are consistent with Empirical Implication I.

*5.2. Family firms, leverage ratio, and debt maturity*

In Panel A of Table 3, we estimate equations (2) and (3) using the 2SLS method but we do not include the S&P 500 indicator variable and its interaction with the Family Firm indicator variable. The results in column (1) show that predicted leverage is positively related to debt maturity, and the coefficient on $FamilyD_{t-1}$ is significantly negative, indicating that family firms have shorter debt maturity. However, contrary to Datta et al. (2005), managerial ownership that does not include family ownership has no impact on debt maturity as the coefficient on $MgtOwnE_{t-1}$ is insignificantly positive.[17] The other control variables, whenever significant, are consistent with predicted signs. Turning to the result on the leverage ratio in column (2), we find that predicted maturity is positively correlated with predicted leverage, which is consistent with the results in existing literature. The coefficient on $FamilyD_{t-1}$ is significantly positive, suggesting that, after correcting for simultaneity and controlling for other firm characteristics, on average family firms use *more* debt financing than non-family firms (contrary to the descriptive statistics in Table 1). The other variables, whenever significant, are consistent with prediction.

Next, in the first column in Panel B of Table 3, we report estimation results for equation (2). Our results are consistent with Empirical Implication II. In the first column we find that coefficient of $FamilyD_{t-1}$ (coefficient $\delta_2$ in equation (2)) is significantly negative, indicating that family firms not in the S&P 500 have shorter debt maturity than corresponding non-family firms. While the coefficient of the S&P 500 indicator variable

[17] We find that the coefficient on managerial ownership is significantly negative when the family firm indicator is not included in the regression model. Detailed replication of Datta et al. (2005) is provided in Table 4.

($\delta_3$ in (2)) is itself insignificant (consistent with Empirical Implication II), that on $FamilyD_{t-1}$*$SP500_{t-1}$ ($\delta_4$) is significantly positive. Moreover, $\delta_3 + \delta_4$ is also significantly positive, consistent with Empirical Implication II. In other words, family firms in the S&P 500 Index have higher debt maturities than family firms not in the Index. Finally, while $\delta_4$ is larger than the absolute value of $\delta_2$, the sum of the two coefficients is not significant, which is also consistent with Empirical Implication II.

In the first column of Panel C of Table 3, we report estimation results for equation (3). The coefficient on $FamilyD_{t-1}$ ($\gamma_2$ in equation (3)) is significantly positive, indicating that family firms not in the S&P 500 use *more* debt financing than corresponding non-family firms. However, the coefficient on the S&P 500 indicator variable ($\gamma_3$) is insignificant, while that on $FamilyD_{t-1}$*$SP500_{t-1}$ ($\gamma_4$) is significantly negative. Again, however, the sum $\gamma_2 + \gamma_4$ is not significantly different from zero. All these results are consistent with Empirical Implication III.

In the remaining regressions reported in Panels B and C, our objective is to relate these differences in debt maturity and debt ratio to differences in transparency. Results in Table 2 indicate that inclusion in the S&P 500 Index has a major impact on transparency. We now examine more directly whether differences in transparency among family firms are associated with different choices relating to debt maturity and debt ratio. To this end, we test models very similar to equations (2) and (3), with the S&P inclusion status replaced by different proxies for transparency. Specifically, these proxies are: whether the firm is followed by credit agencies (*Rating*), whether the firm receives investment grade rating for its issued debts (*InvestGrade*), is followed by more financial analysts (*AnalystD*), and has better information environment overall. Since transparency is endogenous, instead of

using the composite transparency index, we create an indicator variable (*PTranspD*) that equals 1 if the predicted value from the regression in equation (1) (excluding *FamilyD* and *FamilyD*SP500*) is greater than the sample median predicted value, and 0 otherwise.[18]

The results are reported in columns (2)-(6) in Panels B and C of Table 3. Panel B presents the results for the relationship between debt maturity and transparency. First, we find that the coefficients on $FamilyD_{t-1} \times Rating_{t-1}$ and $FamilyD_{t-1} \times InvestGrade_{t-1}$ are both significantly positive. Higher ratings are an indication of better credit quality, which in turn is likely to be associated with a more transparent information environment. Thus, the results are consistent with the notion that greater transparency mitigates the need for more frequent monitoring by short-term lenders and makes long-term debt issuance possible on a larger scale. The coefficients on $FamilyD_{t-1} \times AnalystD_{t-1}$ and $FamilyD_{t-1} \times PTranspD_{t-1}$ are also significantly positive, and on $FamilyD_{t-1} \times PIND_{t-1}$ the coefficient is significantly negative, indicating that family firms with greater corporate transparency have longer debt maturity. Overall, the results in Panel B suggest that greater corporate transparency helps family firms lengthen their debt maturity.

In Panel C, the coefficient of $FamilyD_{t-1}$ is significantly negative in all regressions. The coefficient of $FamilyD_{t-1} \times Rating_{t-1}$ and of $FamilyD_{t-1} \times InvestGrade_{t-1}$ are both negative (although the former is not significant at conventional levels), suggesting that higher ratings indicate a more transparent information environment and firms with better ratings use less debt financing. This result is plausible if better credit quality indicates less scope for the misuse of corporate resources, making it less necessary for family firms to rely

[18] All our results hold, however, if an indicator variable corresponding to the actual composite transparency measure is used.

exclusively on short-term debt and bank monitoring. In other words, such firms have more financing options, and may move out of short-term debt to long-term debt and equity, resulting in a lowering of their debt ratio.[19] We find further support that greater corporate transparency seems to reduce the reliance on debt financing: the coefficients on $FamilyD_{t-1} \times AnalystD_{t-1}$ and $FamilyD_{t-1} \times PTranspD_{t-1}$ are also significantly negative, and on $FamilyD_{t-1} \times PIND_{t-1}$ is significantly positive, indicating that family firms with greater corporate transparency are associated with lower debt ratios. The finding is consistent with the finding of Chang et al. (2006) that firms with less information asymmetry are more likely to use equity as opposed to debt.

### *5.3 Alternative explanations and robustness*

In this section, we discuss whether there are alternative explanations for our results, and also address some robustness issues with respect to the choice of estimation methodology and control variables.

#### *5.3.1 Does managerial ownership explain our results?*

In a paper closely related to ours, Datta et al. (2005) examine debt maturity choice for the S&P 1500 firms over the period 1992-1999. However, Datta et al. (2005) do not distinguish between family and non-family firms. The authors hypothesize that short-term debt is more effective in mitigating agency problems between managers and shareholders; however, managers have an incentive to sub-optimally choose a longer debt

[19] The result is consistent with Kisgen (2006), who points out that ratings upgrades (downgrades) bring many discrete benefits (costs) to firms, and better ratings also serve to improve the information environment. Therefore, to preserve the benefits, firms with better ratings may limit the use of debt and instead issue more equity to benefit from the greater transparency.

maturity structure to avoid monitoring. As managerial ownership increases, manager and shareholder interests are more closely aligned, and debt maturity structure moves closer to optimal, i.e., towards shorter maturity. They find that managerial ownership and debt maturity are negatively related.

In the first and second columns of Panel A of Table 4, we replicate the results of Datta et al. (2005) using our sample. First, using the same period and same model as Datta et al. (2005) (years 1992-1999), column (1) shows that we get very similar results to those reported in column (1) of Table IV of Datta et al. (2005). Next, in column (2), we show that we again get very similar results using our sample period (years 1997-2006). In column (3) of Table 4, we add the family firm indicator variable and its interaction with managerial ownership. Now, the coefficient on managerial ownership is insignificant. This suggests that managerial ownership does not explain debt maturity among non-family firms. However, $FamilyD_t$, retains a significantly negative coefficient. Moreover, the interaction between $FamilyD_t$ and managerial ownership also has a significantly negative coefficient. The latter result could indicate greater alignment of interest associated with more family ownership, consistent with the arguments in Datta et al. (2005). However, it is unclear why such interest alignment would only occur for family firms. The result is also consistent with our hypothesis, namely, within family firms, more ownership by the family facilitates expropriation, creates incentives for more opacity, and makes the firm more reliant on short-term debt. [20]

[20] One interesting difference between our results and those in Datta et al. (2005) is that while we find an interaction between an investment grade rating for a firm's bonds and family firm dummy (or family ownership) to have a positive coefficient in the debt maturity regression, they find a similar interaction between managerial ownership and investment grade rating to be negative. In columns (4) and (5) of Table 4, we report regression results for the specification similar to column 2, Table 4 in Datta et al. (2005) for our sample. We find that the coefficient is significantly positive when we consider credit rating equal to or above "BBB-" as investment grade, whereas it becomes negative, though not significant at conventional

Other results provide additional support for our hypothesis that it is the positive correlation between managerial ownership and the family firm indicator variable (see Table 1), and the potential for expropriation of minority shareholders by controlling families, that explains the relationship between debt maturity and managerial ownership. First, recall that the managerial ownership variable in Table 3 ($MgtOwnE_{t-1}$) excludes ownership by family founder and descendant CEOs. As seen from Table 3, Panel B, this variable has an insignificant coefficient in all regressions, confirming that there is no "alignment effect" for the non-family firms in the S&P 1500. In unreported tests, we repeat the tests of Datta et al. (2005) using a sample that excludes family firms with family members serving as non-CEO senior executives. Specifically, we make sure that managerial ownership measures stocks held only by professional managers. We find that stock ownership of professional managers ($MgtOwnE_t$) is statistically insignificant. Moreover, when we add family ownership (*FamilyOwn*) and an interaction term of the family firm indicator variable with managerial ownership ($FamilyD_t \times MgtOwnE_t$), we find that family ownership is negatively related to debt maturity, whereas stock ownership held by professional managers does not affect debt maturity in family firms.

### *5.3.2. Alternative control variables and estimation methods*

Our main results reported in Table 3 control for family ownership status in terms of a family firm indicator variable. We also examine whether our findings are different when percentage of family ownership is used in the empirical analysis. The results (not

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levels, when we change the criteria to "A-".We are able to reproduce the result in Datta et al. (2005) that the negative effect of managerial ownership is stronger for low market-to-book firms (result is presented in column (6) of Table 4). However, the result also holds if we interact the low market-to-book dummy with family ownership or family firm dummy. Higher market-to-book firms are more transparent, with the correlation between our composite transparency dummy and market-to-book being 0.234 (p value = 0.00).

tabulated) indicate that using family ownership as a proxy for the impact of family firms leads to similar conclusions – that is, higher family ownership is related to shorter debt maturity and higher debt ratio.

We also replace dichotomous transparency measures with continuous variables to check the robustness of our results, and we find consistent results. Finally, instead of using two-stage least squares regression analysis to estimate the impact of family firm status on debt maturity and leverage, we also confirm our results by using ordinary least square regression analysis – that is, we estimate equations (7) and (8) individually. The results from OLS analysis are qualitatively similar to those reported in Table 3.

Finally, to address the potential endogeneity problem of the family firm status, following Anderson and Reeb (2003a), we model family ownership as a function of firm size (natural log of total assets), and the square of firms size, and monthly stock return volatility and then use the predicted value obtained from the analysis to repeat the estimation of Table 3. Untabulated results suggest that our main conclusion remains unaffected.

## 6. Conclusion

We examine how corporate transparency and financing choices differ for family and non-family firms. We find that which of these two groups of firms is more transparent depends on whether or not the firms are in the S&P 500 Index, or in the S&P400 Mid Cap and S&P500 Small Cap indices. Family firms in the former index are more transparent, and those in the latter two are less transparent, than non-family firms in the corresponding indices. We find that debt ratio and debt maturity choices of family firms

relative to those of non-family firms in each of these two indices also show a consistent contrast: firms in the S&P 500 Index (S&P400 Mid Cap and S&P500 Small Cap indices) have lower (higher) debt ratios and higher (lower) debt maturities than the corresponding non-family firms. We present a formal model to show how family and non-family firms' choices regarding disclosure trade off private benefits and costs of external finance, and how these tradeoffs differ for large and small firms.

**Appendix**. **Family firms, disclosure policy, and capital structure**

Here, we present a model that derives the transparency and capital structure choices of large and small family firms. We assume that there are ex-ante two types of family firms. All firms have an identical project at date $t = 0$. Motivated by the evidence that the large family firms in the S&P 500 invest much larger amounts in fixed assets (per firm as well as a proportion of existing fixed assets), we assume that large family firms have a second project at time $t = 1$ in some states of the world. Small family firms do not have a second project. The market can observe whether or not a firm is a small or a large firm and whether a firm is a family-controlled firm or otherwise (non-family firm). The states of the world are always observed by the firm's manager, but whether or not they are observed by the market depends on the firm's disclosure policy. This will be elaborated further below.

*A.1. Projects*

There are three dates in the model, $t = 0, 1, 2$. All firms have an investment project at $t = 0$. The project requires an investment of $I$. Similar to Rajan (1992), there are no cash flows at $t = 1$, but states of nature are realized. In the "Good" state, which occurs with probability $\mu > 0$, a cash flow of $X_2$ will be realized at $t = 2$ with certainty. In the "Bad" $t = 1$ state, which occurs with the complementary probability $(1 - \mu)$, with probability $\rho$, the state is "moderately good", and cash flow at $t = 2$ will be either $X_2$ (with probability $\delta$) or 0 with probability $(1 - \delta)$. With probability $(1 - \rho)$, the state is "very bad", and the cash flow will be 0. Further, similar to Rajan (1992), we assume that the project has a liquidation value of $L < I$ if liquidated at $t = 1$; otherwise, the liquidation value is zero.

Moreover, we assume $\delta X_2 > L$, which implies that liquidation is inefficient in the good and moderately good states.

We denote the Net Present Value of the $t = 0$ project under efficient liquidation by $N_2$, where

$$N_2 = (\mu + (1-\mu)\rho\delta)X_2 + (1-\mu)(1-\rho)L - I \quad \text{(A1)}$$
$$= \pi_1 X_2 + (1-\mu)(1-\rho)L - I \quad \text{(A2)}$$

Large family firms have a second project at $t = 1$ in the good and moderately good states only. This new project requires an investment of $I_G$ and an effort cost of $E$ borne by the manager, which has to be sunk before the state at $t = 1$ is realized. Importantly, we assume that even if the $t = 0$ project is liquidated, the firm can invest in the $t = 1$ project if it can obtain the necessary financing. If the state at $t = 1$ is the Good state, then the new project generates a cash flow of $X_G$. In the moderately good state, the new project generates a cash flow of $X_G$ with probability $\delta$, and 0 with probability $(1 - \delta)$. To simplify the notation, we assume that in the moderately good state, the cash flows from the original project and the new project are perfectly correlated (both are positive with probability $\delta$, and 0 with probability $1 - \delta$).

Thus, the NPV of the second project is

$$N_{GO} = (\mu + (1-\mu)\rho\delta)X_G - I_G \quad \text{(A3)}$$
$$= \pi_1 X_G - I_G \quad \text{(A4)}$$

*A.2. Family and non-family firms*

Family and non-family firms differ in one crucial respect. When the firm is opaque (opacity is a state of disclosure in which it is too costly for shareholders to monitor

management, as will be discussed below), the manager of a family firm can enjoy a private benefit of $B > 0$ per period from the $t = 0$ project. When the family firm is transparent, managers consume a smaller level of private benefit, denoted $b > 0$. Non-family firms always consume the smaller level ($b>0$) of private benefit. If the $t = 1$ project is available, we assume that the family firm manager derives a benefit $B$ if it is opaque, and $b$ if transparent (or if it is a non-family firm).

The pursuit of private benefits at the level $B$ comes at a cost to shareholders. Specifically, we assume that if the family owners operate the firm in such a way that they consume private benefit $B$, then the cash flows from the period 1 project are reduced to a value $X_1 < X_2$. Specifically, the NPV of the period one project is then

$$N_1 = \pi_1 X_1 + (1-\mu)(1-\rho)L - I < N_2$$

We also assume that $B > L>b,$ which implies that it is inefficient to liquidate in the very bad state if and only if the firm remains opaque. Moreover, $\delta X_1 > I$, so that it is never efficient to liquidate in the moderately good or good states.

Family firms are run by family-owners, who have an ownership stake (fraction of shares) $\alpha_{F.}$ Non-Family firms are run by managers, who have ownership stake $\alpha_M$. Managers maximize the sum of their cash-flow benefits and private benefits less the effort cost of generating the growth option, if any.

*A.3. Disclosure and information structure*

We assume that the market knows whether a firm is a family or a non-family firm (and whether it is large or small). However, it does not observe the $t$ =1 state unless the firm chooses to be transparent.

At time $t = 0$, the firm chooses either a policy of no disclosure ($d_0$) or one of disclosure ($d_1$). A firm choosing $d_0$ is considered opaque, while one choosing $d_1$ is considered transparent. Disclosure policy $d_1$ costs the firm $f_1$ (we assume this is a one-time cost, but this assumption can be relaxed easily) and allows outside shareholders or lenders to monitor the firm at low cost (assumed to be zero here). There are three important consequences of such monitoring.

First, we assume that an unmonitored firm can always invest in an unproductive project that provides no cash flow, but allows a very high private benefit to the controlling manager or shareholder. Disclosure $d_1$ allows other shareholders to observe whether the firm invests unproductively, and intervene in order to salvage some value from the investment. In the process, the manager is also prevented from consuming his private benefit. Thus, disclosure $d_1$ essentially ensures that the firm is able to obtain the funds for productive investment.

Second, in the case of a family firm, disclosure $d_1$ curbs the pursuit of private benefit. Specifically, we assume that if the family firm chooses $d_1$, it can only consume private benefit at the smaller level $b$. An opaque firm, on the other hand, can consume private benefits at the level $B > b$.

Third, if $d_1$ is chosen, the market gets to observe the state that is realized at $t = 1$ at that time.

*A.4. Bank monitoring*

Bank monitoring, like disclosure $d_1$, can also prevent the firm from investing in the unproductive project. In particular, we will assume that if the bank pays an upfront cost

of $c$, it can observe whether the unproductive project has been chosen, and can liquidate the project immediately and prevent the manager from consuming the private benefit. However, unlike disclosure, the firm can invest productively and at the same time consume the high level of private benefit $B$ from the period-one project. Bank monitoring is private and shareholders cannot sue the manager based on information that only the monitoring bank is privy to.

We further assume that the bank can observe the state at $t = 1$. Similar to Rajan (1992), we assume that if the bank debt is *short-term* (i.e., due at $t = 1$), then the firm is always in default at $t = 1$. The bank can then threaten liquidation. Liquidation must happen in the very bad state even though $B > L$ (i.e., even though it is *socially inefficient*) since the manager does not have the cash to pay the bank $L$ and preserve the private benefit. However, there is no inefficient liquidation in any other state.

Even though short-term debt leads to inefficient liquidation in the very bad state (unlike in Rajan's (1992) model), it may increase the firm's debt capacity, as we shall see below. There is, however, a dark side of bank borrowing for an opaque firm. Since the bank alone observes the state at $t = 1$, the bank can capture a share of the surplus from the new project by threatening liquidation. If the market believes that the bank will liquidate only when the state is bad, the firm will not be able to secure any funding for its new project, since the existing project is liquidated and the new project pays nothing in the bad state (however, the manager is still strictly better off if the project is financed because of non-zero private benefits).[21] Thus, the firm's status-quo payoff, if it refuses to bargain with the bank, is zero irrespective of the state, and that of the bank is $L$.

Recall that the manager has to exert costly effort $E$ for the potential growth option to

[21] Such beliefs will be "of-the-equilibrium-path" beliefs in the equilibrium described below.

materialize. Thus, it is not incentive-compatible for the manager to exert effort if his expected bargaining share of the NPV of the growth option plus the private benefit is less than $E$. In what follows, we assume that this is the case.

With *long-term* bank debt, there is no default-induced liquidation at time $t = 1$. However, renegotiation is possible. For the transparent firm, renegotiation is *efficient* in the very bad state since $L > b$. However, a necessary condition for efficient liquidation to happen is that $\alpha_F L > b$, i.e., the manager's share of the liquidation proceeds exceeds his private benefit.

With long-term bank debt, the information monopoly problem also exists if the firm remains opaque. In contrast, disclosure $d_1$ makes it possible for the *market* to observe the type at $t = 1$. Since this lowers the cost of regular bank monitoring, we assume that there are no additional costs $c$ of bank monitoring if the firm decides to become transparent.

Without any loss of generality, in our subsequent discussion, we assume $c = f_1$. If the firm chooses disclosure $d_1$ and raises debt, the incremental cost of bank monitoring is assumed to be zero.

### *A.5. Equilibrium*

We focus on the equilibrium choices of the family firms. Let *STD*, *LTD* and *E* denote, respectively, short-term debt, long-term debt, and equity financing for the $t = 0$ project. We illustrate our equilibrium for the following parameter values: $\mu = 0.4$, $I = 1$, $\rho = 0.5$, $\delta = 0.7$, $X_1 = 1.7$, $X_2 = 4$, $L = 0.8$, $B = 0.9$, $b = 0.5$, $c = 0.1$, $f_1 = 0.1$, $\alpha_F = 0.2$, $\alpha_M < \alpha_F$, $X_G = 4$, $I_G = 1$.

We show that for these parameter values, an equilibrium exists in which the small

family firm (that is, the family firm without the growth option) chooses *($d_0$, STD)* (that is, no disclosure and short-term bank debt) and the large family firm (that is, the family firm with the growth option) chooses $d_1$ and either *LTD* or *E*.

Suppose the manager of the small family firm chooses disclosure $d_0$ and consequently can consume the high level of private benefit, *B*. Under *LTD*, there is no liquidation in the very bad state, since there is no default at $t = 1$ (the debt is only due at $t = 2$). The manager does not voluntarily liquidate, and liquidation is not efficient ($B > L$). Thus, the debt will be priced and the repayable amount $D_L$ set on the expectation that the debt holders will receive $D_L$ with certainty in the good state, and with probability δ in the moderately good state, and receive no payment in the very bad state. Thus, the face value of debt is

$$\mu D_L + (1-\mu)\rho\delta D_L = I + c$$

or

$$D_L = \frac{I + c}{\mu + (1-\mu)\delta\rho}.$$

It can be checked that $X_2 > D_L = 1.8033 > X_1$. Thus, *LTD* is not feasible with disclosure $d_0$ since $D_L > X_1$; however, if the firm could commit to a lower level of private benefit consumption by choosing disclosure $d_1$, *LTD* would be feasible as the cash flow ($X_2$) would be enough to repay $D_L$.

Under *STD*, liquidation must happen in the very bad state. For the moment, assume there is no renegotiation in any state, and that the face value of the debt is $D_S$. Then we have under the equilibrium belief,

$$(\mu + (1-\mu)\delta\rho)D_S + (1-\mu)(1-\rho)L = I + c.$$

or

$$D_S = \left(I + c - (1-\mu)(1-\rho)L\right)/\left(\mu + (1-\mu)\delta\rho\right) \quad \text{(A5)}$$

It is easily checked that under the assumed parameter values, $D_S = 1.4098 < X_1$. Thus, *STD* is feasible even when the manager consumes the high level of private benefits.

With *STD*, the bank can threaten liquidation in any state in which it is efficient to continue and extract a part of the surplus. Suppose $\theta$ and 1-$\theta$ are the fractions of the surplus going to the bank and the firm, respectively. Then renegotiation happens in the good state if and only if

$$D_S < L + \theta(X_1 - L)$$

and in the moderately good state if and only if

$$\delta D_S < L + \theta(\delta X_1 - L).$$

Since there is ex-ante competition among lenders, it is easy to show that the bank breaks even when renegotiation is possible whenever it breaks even when $D_S$ is as in equation (A5) and there is no renegotiation.

Note that even though with *STD* the bank can extract some surplus from the renegotiation at $t = 1$, given ex-ante competition and fair pricing of debt, the manager will still obtain his share of the NPV of the $t = 0$ project.

We now show that the manager of the small family firm prefers opacity and short term debt. The payoff to the manager from *($d_0$, STD)* is

$$\alpha_F\left(\left(\mu + (1-\mu)\rho\delta\right)X_1 + (1-\mu)(1-\rho)L - I - c\right) + B + \left(\mu + (1-\mu)\rho\right)B = 1.5654$$

Suppose the manager chooses disclosure $d_1$. The firm can now issue *LTD* or *E*. Since there is no private information at $t = 0$, the securities will be issued at fair price. However, private benefits are lower. On the other hand, if $\alpha_F L < b$ , which is the case given our

parameter assumptions, the manager does not liquidate voluntarily, and consumes the private benefit even in the very bad state. Finally, lower level of private benefit consumption increases the cash flow. The payoff to the manager is

$$\alpha_F\left(\left(\mu+(1-\mu)\rho\delta\right)X_2 - I - f_1\right) + 2b = 1.268$$

Under *LTD* (which is feasible with disclosure $d_1$ because of the lower level of private benefit consumption), the payoff is identical to that under equity. This is because the maximum payoff from renegotiation is $L$, and the manager's share is $\alpha_F L < b$. Therefore, the manager cannot be compensated for his loss of private benefit. Finally, issuing *STD* with disclosure $d_1$ generates a lower payoff for the manager than *(*$d_1$, *E)*, because it forces liquidation, but the manager's share of the payoff does not compensate the loss of private benefit $b$.

Next, we show that in our example, the Net Present Value of the growth option is high enough that the payoff of the manager of the large family firm is higher under the policies of ($d_1$, *LTD)* or ($d_1$, *E)* than under *(*$d_0$, *STD)*.

Since the manager cannot invest in the new project at $t = 1$ with *(*$d_0$, *STD)*, his payoff is the same as that of the manager of the small firm. On the other hand, the manager's payoff from ($d_1$, *E)*, which is again the same as that under policy ($d_1$, *LTD)*, is

$$\alpha_F\left(\left(\mu+(1-\mu)\rho\delta\right)(X_2+X_G) - I - I_G - f_1\right) + 2b = 1.7$$

This exceeds the payoff with short-term debt. Thus, the manager of the large family firm prefers a policy of disclosure and either equity or long-term debt.

In general, there are many determinants of the debt ratio and debt maturity that our model does not capture. What the analysis shows is that under our parameter values, the small family firms will have a preference for short-term debt and opacity, whereas there

is a preference for transparency and either long-term debt or equity among the large family firms.

For non-family firms, private benefits are always at the lower level. Like the large family firms, both small and large non-family firms, under our parameter assumptions, will prefer ($d_1$, *LTD)* or ($d_1$, *E)* to *(*$d_0$, *STD)*. The reason is that with *STD*, there is forced liquidation in the very bad state, which cannot compensate for the loss of control benefit, since $\alpha_M L < b$.

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**Table 1**

Descriptive statistics and pearson correlations.

*FamilyD* is a dummy variable coded as 1 for family firms and 0 otherwise. *FamilyOwn* is family ownership defined as the percentage of ownership controlled by the founding family. *Leverage* is total debt /market value of total assets. *Maturity* is the percentage of a firm's total debt that matures in more than 3 years. *MgtOwnE* is management ownership defined as the sum of common and restricted stock owned by the top five executives (excluding family founder and descendant CEOs) divided by shares outstanding. *MgtOwnI* is management ownership defined as the sum of common and restricted stock owned by the top five executives (including family founder and descendant CEOs) divided by shares outstanding. *FirmAge* is log of the number of years since firm inception. *MB* is firm value/book value of total assets. *lnMV* is log of the market value of total assets, where market value of total asset is share price×outstanding shares + book value of total assets−book value of equity. *Volatility* is standard deviation of the change in EBITDA over the 5 years preceding and including the year in which leverage and maturity are measured. *AbEarnings* is abnormal earnings defined as (earnings in $year_{t+1}$ − earnings in $year_t$)/share price × outstanding shares in $year_t$ *FixedAsst* is net PPE/book value of total assets. *Profit* is earning before interest, taxes, depreciation, and amortization (EBITDA)/book value of total assets. *AssetMaturity* is (gross PPE/total assets) × (gross PPE/depreciation expense) + (current assets/total assets) × (current assets/cost of goods sold). *TermPremium* is month-end yield on 10-year government bonds − month-end yield on 6-month government bonds. *ITC* is a dummy variable coded as 1 for investment tax credit (data51) and 0 otherwise. *NOL* is a dummy variable coded as 1 for company with operating loss carryforwards (data52) and 0 otherwise. *Commercial* is a dummy variable coded as 1 for company with commercial paper program and 0 otherwise. *Rating* is a dummy variable coded as 1 for rated firms and 0 otherwise. *InvestGrade* is a dummy variable coded as 1 if a firm's long-term issuer credit rating (data280) is higher than BBB- and 0 otherwise.

Panel A: Mean and median of family and non-family firms

| | Mean | | | Median | | |
|---|---|---|---|---|---|---|
| | Family Firms (*N*=2743) | Non-Family Firms (*N*=3585) | Difference *t*-statistics | Family Firms (*N*=2743) | Non-Family Firms (*N*=3585) | Difference *z*-statistics |
| *Leverage (%)* | 16.521 | 18.992 | -7.35*** | 13.490 | 17.132 | -10.18*** |
| *Maturity (%)* | 56.333 | 63.485 | -9.24*** | 63.903 | 68.902 | -6.40*** |
| *FamilyOwn (%)* | 16.580 | | | 9.200 | | |
| *MgtOwnE (%)* | 2.993 | 1.212 | 14.44*** | 0.610 | 0.390 | 8.85*** |
| *MgtOwnI (%)* | 5.919 | 1.212 | 26.94*** | 1.640 | 0.390 | 30.22*** |
| *FirmAge* | 38.562 | 49.360 | -10.97*** | 28.000 | 38.000 | -8.77*** |
| *MB* | 2.090 | 1.800 | 9.86*** | 1.620 | 1.460 | 7.75*** |
| *lnMV* | 7.770 | 8.360 | -15.03*** | 7.530 | 8.250 | -15.39*** |
| *Volatility* | 0.044 | 0.037 | 7.93*** | 0.031 | 0.025 | 9.79*** |
| *AbEarnings* | 0.011 | 0.010 | 0.59 | 0.007 | 0.007 | 0.23 |
| *FixedAsst* | 0.315 | 0.372 | -10.04*** | 0.262 | 0.312 | -10.46*** |
| *Profit* | 0.146 | 0.144 | 1.20 | 0.143 | 0.136 | 2.57** |
| *AssetMaturity* | 8.930 | 12.800 | -15.58*** | 6.430 | 8.660 | -14.46*** |
| *ITC* | 0.111 | 0.122 | -1.44 | 0.000 | 0.000 | -1.43 |
| *NOL* | 0.311 | 0.274 | 3.22*** | 0.000 | 0.000 | 3.21*** |
| *Commercial* | 0.006 | 0.066 | -12.12*** | 0.000 | 0.000 | -11.97*** |
| *Rating* | 0.510 | 0.713 | -16.83*** | 1.000 | 1.000 | -16.46*** |
| *InvestGrade* | 0.309 | 0.558 | -20.29*** | 0.000 | 1.000 | -19.65*** |

Table 1(continued)

Panel B: Pearson correlations

a, b, c, represent statistical significance at the 10%,5% and 1%, and  levels, respectively.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *FamilyD* | 1.000 | | | | | | | | | | | | | | | | | |
| *FamilyOwn* | 0.559[c] | 1.000 | | | | | | | | | | | | | | | | |
| | (0.00) | | | | | | | | | | | | | | | | | |
| *Leverage* | -0.092[c] | -0.104[c] | 1.000 | | | | | | | | | | | | | | | |
| | (0.00) | (0.00) | | | | | | | | | | | | | | | | |
| *Maturity* | -0.115[c] | -0.154[c] | 0.313[c] | 1.000 | | | | | | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | | | | | | | | | | | | | | | |
| *MgtOwnE* | 0.160[c] | 0.321[c] | -0.097[c] | -0.064[c] | 1.000 | | | | | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | | | | | | | | | |
| *FirmAge* | -0.067[c] | 0.017 | -0.055[c] | 0.035[c] | 0.003 | 1.000 | | | | | | | | | | | | |
| | (0.00) | (0.18) | (0.00) | (0.01) | (0.84) | | | | | | | | | | | | | |
| *MB* | 0.112[c] | 0.079[c] | -0.482[c] | -0.192[c] | 0.057[c] | 0.001 | 1.000 | | | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.96) | | | | | | | | | | | | |
| *lnMV* | -0.188[c] | -0.161[c] | 0.061[c] | 0.163[c] | -0.181[c] | 0.119[c] | 0.184[c] | 1.000 | | | | | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | | | | | | |
| *Volatility* | 0.092[c] | 0.031[b] | -0.160[c] | -0.130[c] | -0.019 | -0.195[c] | 0.113[c] | -0.254[c] | 1.000 | | | | | | | | | |
| | (0.00) | (0.01) | (0.00) | (0.00) | (0.12) | (0.00) | (0.00) | (0.00) | | | | | | | | | | |
| *AbEarnings* | 0.0065 | 0.0024 | 0.064[c] | -0.012 | -0.003 | -0.033[c] | -0.095[c] | -0.054[c] | 0.110[c] | 1.000 | | | | | | | | |
| | (0.60) | (0.84) | (0.00) | (0.31) | (0.82) | (0.01) | (0.00) | (0.00) | (0.00) | | | | | | | | | |
| *AssetMaturity* | -0.187[c] | -0.106[c] | 0.347[c] | 0.187[c] | -0.073[c] | 0.003 | -0.233[c] | 0.160[c] | -0.121[c] | 0.006 | 1.000 | | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.80) | (0.00) | (0.00) | (0.00) | (0.62) | | | | | | | | |
| *FixedAsst* | -0.119[c] | -0.059[c] | 0.335[c] | 0.192[c] | -0.005 | -0.028[b] | -0.210[c] | 0.126[c] | -0.094[c] | 0.020 | 0.840[c] | 1.000 | | | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.71) | (0.03) | (0.00) | (0.00) | (0.00) | (0.11) | (0.00) | | | | | | | |
| *Profit* | 0.005 | 0.084[c] | -0.312[c] | -0.113[c] | 0.094[c] | 0.088[c] | 0.498[c] | 0.085[c] | -0.110[c] | -0.130[c] | -0.103[c] | 0.063[c] | 1.000 | | | | | |
| | (0.68) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | | | | | |
| *TermPremium* | 0.013 | -0.015 | -0.033[c] | 0.030[b] | -0.031[b] | 0.001 | -0.099[c] | 0.024[a] | 0.006 | 0.071[c] | -0.011 | -0.043[c] | -0.132[c] | 1.000 | | | | |
| | (0.29) | (0.21) | (0.00) | (0.01) | (0.01) | (0.91) | (0.00) | (0.05) | (0.65) | (0.00) | (0.40) | (0.00) | (0.00) | | | | | |
| *ITC* | -0.022 | -0.042[c] | -0.015 | -0.006 | -0.030[b] | 0.020 | 0.041[c] | 0.036[c] | 0.007 | -0.016 | 0.064[c] | 0.055[c] | 0.006 | -0.057[c] | 1.000 | | | |
| | (0.16) | (0.00) | (0.22) | (0.60) | (0.02) | (0.11) | (0.00) | (0.00) | (0.60) | (0.21) | (0.00) | (0.00) | (0.66) | (0.00) | | | | |
| *NOL* | 0.051[c] | 0.001 | -0.032[b] | 0.023[a] | -0.062[c] | -0.002 | 0.000 | 0.039[c] | 0.045[c] | 0.013 | -0.148[c] | -0.141[c] | -0.080[c] | 0.069[c] | -0.000 | 1.000 | | |
| | (0.00) | (0.93) | (0.01) | (0.06) | (0.00) | (0.90) | (0.98) | (0.00) | (0.00) | (0.29) | (0.00) | (0.00) | (0.00) | (0.00) | (0.99) | | | |
| *Commercial* | -0.148[c] | -0.085[c] | 0.256[c] | 0.054[c] | -0.057[c] | -0.026[b] | -0.122[c] | 0.048[c] | -0.113[c] | -0.022[a] | 0.376[c] | 0.280[c] | -0.093[c] | -0.187[c] | 0.200[c] | -0.132[c] | 1.000 | |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.04) | (0.00) | (0.00) | (0.00) | (0.08) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | | |
| *Rating* | -0.196[c] | -0.172[c] | 0.336[c] | 0.303[c] | -0.169[c] | 0.104[c] | -0.152[c] | 0.599[c] | -0.201[c] | -0.003 | 0.225[c] | 0.187[c] | -0.076[c] | 0.037[c] | -0.001 | 0.065[c] | 0.094[c] | 1.000 |
| | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.00) | (0.81) | (0.00) | (0.00) | (0.00) | (0.00) | (0.93) | (0.00) | (0.00) | |

**Table 2**

Family firms/ownership and firms' transparency.

*FamilyD* is a dummy variable coded as 1 for family firms and 0 otherwise. *AnalystNum* is the number of analysts providing EPS estimates 9 months prior to the end of the fiscal year-end. *ForecastError* is defined as absolute value of difference between the mean analysts' earnings forecast (9 months prior) and the actual firm earnings scaled by the beginning of the year price. *ForecastDisp* is defined as standard deviation of the analyst forecasts 9 months prior to the end of the fiscal year-end deflated by the absolute value of the mean consensus forecast. *PIN* is probability of informed trade. We use a principle-components factor analysis to construct a standardized factor score to collapse the four individual measures (*AnalystNum*, *ForecastError*, *ForecastDisp* and *PIN*) into a single measure of disclosure transparency. Since *ForecastError*, *ForecastDisp* and *PIN* are inversely related to disclosure transparency, we multiply these three measures by -1. *Transparency* is standardized factor score that is increasing in disclosure transparency. *SP500* is a dummy variable coded as 1 for S&P500 index firms and 0 otherwise. *R&D* is R&D expenses/net sales. Other variables are defined in Table 1. *, **, ***, represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Mean and median of family and non-family firms for S&P1500 firms

| | Mean | | | Median | | |
|---|---|---|---|---|---|---|
| | Family firms | Non-Family firms | Difference *t*-statistics | Family firms | Non-Family firms | Difference *z*-statistics |
| *AnalystNum* | 10.073 | 11.287 | -5.93*** | 7.000 | 8.000 | -7.05*** |
| *ForecastError* | 0.010 | 0.009 | 2.05** | 0.004 | 0.004 | 2.14** |
| *ForecastDisp* | 0.003 | 0.002 | 2.06** | 0.001 | 0.001 | 0.78 |
| *PIN* | 0.139 | 0.122 | 12.15*** | 0.135 | 0.116 | 13.13*** |
| *Transparency* | -0.101 | 0.075 | -6.16*** | -0.385 | -0.124 | -7.55*** |

Panel B: Mean and median of family and non-family firms for S&P500 firms

| | Mean | | | Median | | |
|---|---|---|---|---|---|---|
| | Family firms | Non-Family firms | Difference *t*-statistics | Family firms | Non-Family firms | Difference *z*-statistics |
| *AnalystNum* | 16.915 | 16.144 | 2.19** | 16.000 | 15.000 | 1.29 |
| *ForecastError* | 0.006 | 0.006 | 0.24 | 0.002 | 0.002 | -1.08 |
| *ForecastDisp* | 0.002 | 0.002 | 0.17 | 0.001 | 0.001 | -3.58*** |
| *PIN* | 0.097 | 0.089 | 4.49*** | 0.096 | 0.091 | 4.19*** |
| *Transparency* | 0.860 | 0.754 | 2.16** | 0.736 | 0.611 | 1.15 |

Panel C: Pearson correlations

| | *Transparency* | *FamilyD* | *FamilyOwn* | *SP500* | *lnMV* | *Volatility* | *Profit* | *FirmAge* | *R&D* |
|---|---|---|---|---|---|---|---|---|---|
| *Transparency* | 1.000 | | | | | | | | |
| *FamilyD* | -0.087*** | 1.000 | | | | | | | |
| | (0.00) | | | | | | | | |
| *FamilyOwn* | -0.093*** | 0.559*** | 1.000 | | | | | | |
| | (0.00) | (0.00) | | | | | | | |
| *SP500* | 0.588*** | -0.108*** | -0.086*** | 1.000 | | | | | |
| | (0.00) | (0.00) | (0.00) | | | | | | |
| *lnMV* | 0.717*** | -0.188*** | -0.161*** | 0.709*** | 1.000 | | | | |
| | (0.00) | (0.00) | (0.00) | (0.00) | | | | | |
| *Volatility* | -0.040*** | 0.095*** | 0.023* | -0.137*** | -0.251*** | 1.000 | | | |
| | (0.00) | (0.00) | (0.06) | (0.00) | (0.00) | | | | |
| *Profit* | 0.141*** | 0.005 | 0.089*** | 0.106*** | 0.083*** | -0.130*** | 1.000 | | |
| | (0.00) | (0.67) | (0.00) | (0.00) | (0.00) | (0.00) | | | |
| *FirmAge* | 0.019 | -0.067*** | 0.017 | 0.121*** | 0.119*** | -0.204*** | 0.090*** | 1.000 | |
| | (0.24) | (0.00) | (0.18) | (0.00) | (0.00) | (0.00) | (0.00) | | |
| *R&D* | 0.080*** | 0.100*** | -0.019 | -0.006 | -0.041*** | 0.326*** | -0.207*** | -0.060*** | 1.000 |
| | (0.00) | (0.00) | (0.14) | (0.65) | (0.00) | (0.00) | (0.00) | (0.00) | |

Table 2(continued)

Panel D: Transparency and family firm

The Panel B reports OLS regressions of *Transparency* on family firm. The sample period is from 1997 to 2006. All independent variables are from the year before the year in which *Transparency* is measured. All continuous variables except *FirmAge* are winsorized at the 1st and 99th percentiles. Industry and year dummies are included. We use the Fama-French definitions of industry. For brevity, we do not report the industry and year dummy coefficients. The *t*-statistics are based on Huber-White sandwich estimate of variances and are adjusted by clustering by firm.*, **, ***, represent statistical significance at the 10%, 5%, and 1% levels, respectively.

| | Dependent variable = $Transparency_t$ | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| $FamilyD_{t-1}$ | -0.008 | -0.083* | | |
| | (-0.22) | (-1.72) | | |
| $FamilyOwn_{t-1}$ | | | -0.001 | -0.004** |
| | | | (-0.54) | (-2.15) |
| $SP500_{t-1}$ | 0.199*** | 0.171* | 0.199*** | 0.217*** |
| | (3.37) | (1.94) | (3.37) | (2.81) |
| $FamilyD_{t-1} \times SP500_{t-1}$ | | 0.218** | | |
| | | (2.02) | | |
| $FamilyOwn_{t-1} \times SP500_{t-1}$ | | | | 0.011** |
| | | | | (2.01) |
| $lnMV_{t-1}$ | 0.457*** | 0.583*** | 0.457*** | 0.581*** |
| | (24.44) | (24.67) | (24.31) | (24.10) |
| $Volatility_{t-1}$ | 1.587*** | 2.018*** | 1.582*** | 2.003*** |
| | (2.96) | (2.97) | (2.95) | (2.93) |
| $Profit_{t-1}$ | 0.995*** | 1.109*** | 1.004*** | 1.132*** |
| | (4.11) | (3.79) | (4.18) | (3.90) |
| $FirmAge_{t-1}$ | -0.047*** | -0.062*** | -0.047*** | -0.060*** |
| | (-2.75) | (-2.87) | (-2.74) | (-2.77) |
| $R\&D_{t-1}$ | 1.914*** | 2.461*** | 1.910*** | 2.404*** |
| | (5.20) | (5.33) | (5.19) | (5.21) |
| Industry and year dummies | Yes | Yes | Yes | Yes |
| Adj.-$R^2$ | 0.654 | 0.655 | 0.654 | 0.655 |
| No. of Obs. | 4,998 | 4,998 | 4,998 | 4,998 |

**Table 3**

Family firms and debt leverage/maturity.

The Table 3 reports 2SLS regressions of debt leverage/maturity on family firm. The sample period is from 1997 to 2006. *FamilyD* is a dummy variable coded as 1 for family firms and 0 otherwise. *Leverage* is total debt /market value of total assets. *Maturity* is fraction of a firm's total debt that matures in more than 3 years. *AnalystD* is a dummy variable coded as 1 if *AnalystNum* is more than sample median and 0 otherwise. We take estimated *Transparency* from regression in equation (1) excluding *FamilyD* and *FamilyD*SP500. PTranspD* is a dummy variable coded as 1 if estimated *Transparency* is more than sample median estimated *Transparency* and 0 otherwise. *PIND* is a dummy variable coded as 1 if *PIN* (probability of informed trade) is more than sample median and 0 otherwise. Other variables are defined in Table 1 and Table 2. Following Johnson (2003) and Billett et al. (2007), all independent variables except *Volatility* and *AbEarnings* are from the year before the year in which *Leverage* and *Maturity* are measured. All continuous variables except *FirmAge* and *TermPremium* are winsorized at the 1st and 99th percentiles. Industry and year dummies are included in leverage regressions and industry dummies are included in maturity regressions (because *TermPremium* is included). We use the Fama-French definitions of industry. For brevity, we do not report the industry and year dummy coefficients. The *t*-statistics are based on Huber-White sandwich estimate of variances and are adjusted by clustering by firm.*, **, ***, represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Debt leverage/maturity and family firm.

| | Dependent variable = $Maturity_t$ | Dependent variable = $Leverage_t$ |
|---|---|---|
| $Maturity_t$*(predicted)* | | 0.380*** |
| | | (9.36) |
| $Leverage_t$*(predicted)* | 1.140*** | |
| | (3.39) | |
| $FamilyD_{t-1}$ | -4.569*** | 2.281*** |
| | (-3.19) | (3.24) |
| $MgtOwnE_{t-1}$ | 0.141 | -0.128** |
| | (1.08) | (-2.18) |
| $FirmAge_{t-1}$ | 1.006* | -0.530* |
| | (1.73) | (-1.76) |
| $MB_{t-1}$ | 1.363 | -2.742*** |
| | (0.95) | (-8.19) |
| $lnMV_{t-1}$ | 18.040*** | -0.323 |
| | (4.76) | (-1.29) |
| $ln^2MV_{t-1}$ | -1.021*** | |
| | (-4.49) | |
| $Volatility_t$ | -26.289 | 0.127 |
| | (-1.45) | (0.01) |
| $AbEarnings_t$ | -13.191*** | 9.139*** |
| | (-2.63) | (4.04) |
| $FixedAsst_{t-1}$ | | 2.614 |
| | | (1.14) |
| $Profit_{t-1}$ | | -8.075* |
| | | (-1.76) |
| $AssetMaturity_{t-1}$ | 0.058 | |
| | (0.77) | |
| $TermPremium_{t-1}$ | 0.869** | |
| | (2.36) | |
| $ITC_{t-1}$ | 1.100 | -0.715 |
| | (0.64) | (-0.97) |
| $NOL_{t-1}$ | 0.342 | 0.793 |
| | (0.28) | (1.27) |
| $Commercial_{t-1}$ | -5.869*** | |
| | (-2.86) | |
| $Rating_{t-1}$ | 5.024* | |
| | (1.84) | |
| Industry dummies | Yes | Yes |
| Year dummies | | Yes |
| Adj.-$R^2$ | 0.190 | 0.231 |
| No. of Obs. | 6,328 | 6,328 |

Table 3(continued)

Panel B: Incremental effect of information asymmetry on relation between debt maturity and family firm.

| | | Dependent variable = $Maturity_t$ | | | | | |
|---|---|---|---|---|---|---|---|
| | | (1) | (2) | (3) | (4) | (5) | (6) |
| $Leverage_t$(predicted) | | 1.127*** | 1.128*** | 1.152*** | 1.059*** | 1.013*** | 1.240*** |
| | | (3.25) | (3.37) | (3.35) | (3.26) | (3.04) | (3.49) |
| $FamilyD_{t-1}$ ($\delta_2$) | | -7.044*** | -7.988*** | -8.005*** | -7.302*** | -8.539*** | -8.930*** |
| | | (-3.96) | (-3.56) | (-4.27) | (-4.14) | (-3.65) | (-4.59) |
| $SP500_{t-1}$ ($\delta_3$) | | -2.967 | | | | | |
| | | (-1.30) | | | | | |
| $FamilyD_{t-1}\times SP500_{t-1}$ ($\delta_4$) | | 8.010*** | | | | | |
| | | (2.78) | | | | | |
| $Rating_{t-1}$ ($\delta_3$) | | 4.902* | 2.259 | | 5.533** | 6.441** | 3.613 |
| | | (1.71) | (0.77) | | (2.07) | (2.21) | (1.26) |
| $FamilyD_{t-1}\times Rating_{t-1}$ ($\delta_4$) | | | 5.729** | | | | |
| | | | (2.22) | | | | |
| $InvestGrade_{t-1}$ ($\delta_3$) | | | | -1.676 | | | |
| | | | | (-0.94) | | | |
| $FamilyD_{t-1}\times InvestGrade_{t-1}$ ($\delta_4$) | | | | 8.569*** | | | |
| | | | | (3.42) | | | |
| $AnalystD_{t-1}$ ($\delta_3$) | | | | | -2.438 | | |
| | | | | | (-1.59) | | |
| $FamilyD_{t-1}\times AnalystD_{t-1}$ ($\delta_4$) | | | | | 6.230*** | | |
| | | | | | (2.86) | | |
| $PTranspD_{t-1}$ ($\delta_3$) | | | | | | -2.450* | |
| | | | | | | (-1.88) | |
| $FamilyD_{t-1}\times PTranspD_{t-1}$ ($\delta_4$) | | | | | | 8.235*** | |
| | | | | | | (3.08) | |
| $PIND_{t-1}$ ($\delta_3$) | | | | | | | 0.480 |
| | | | | | | | (0.28) |
| $FamilyD_{t-1}\times PIND_{t-1}$ ($\delta_4$) | | | | | | | -7.991*** |
| | | | | | | | (-3.52) |
| $MgtOwnE_{t-1}$ | | 0.140 | 0.139 | 0.125 | 0.135 | 0.010 | 0.202 |
| | | (1.08) | (1.08) | (0.93) | (1.04) | (0.07) | (1.48) |
| $FirmAge_{t-1}$ | | 0.942 | 0.962* | 0.959* | 0.946* | -0.370 | 0.944 |
| | | (1.63) | (1.66) | (1.68) | (1.66) | (-0.56) | (1.59) |
| $MB_{t-1}$ | | 1.205 | 1.390 | 1.071 | 0.945 | 0.670 | 1.451 |
| | | (0.82) | (0.98) | (0.64) | (0.69) | (0.47) | (0.97) |
| $lnMV_{t-1}$ | | 17.229*** | 17.953*** | 20.032*** | 17.839*** | 18.136*** | 18.063*** |
| | | (4.54) | (4.78) | (4.39) | (4.61) | (4.04) | (4.28) |
| $ln^2MV_{t-1}$ | | -0.974*** | -1.015*** | -1.105*** | -1.014*** | -0.954*** | -1.045*** |
| | | (-4.43) | (-4.51) | (-4.32) | (-4.46) | (-3.81) | (-4.27) |
| $Volatility_t$ | | -26.149 | -26.589 | -23.864 | -27.266 | -22.754 | -25.199 |
| | | (-1.45) | (-1.46) | (-1.32) | (-1.52) | (-1.00) | (-1.34) |
| $AbEarnings_t$ | | -13.357*** | -13.205*** | -13.182** | -12.961*** | -11.916** | -13.274*** |
| | | (-2.62) | (-2.66) | (-2.58) | (-2.61) | (-2.12) | (-2.65) |
| $AssetMaturity_{t-1}$ | | 0.067 | 0.058 | 0.062 | 0.062 | 0.122 | 0.048 |
| | | (0.89) | (0.77) | (0.81) | (0.83) | (1.42) | (0.62) |
| $TermPremium_{t-1}$ | | 0.861** | 0.856** | 0.897** | 0.811** | 0.304 | 0.958*** |
| | | (2.26) | (2.34) | (2.35) | (2.23) | (0.72) | (2.60) |
| $ITC_{t-1}$ | | 1.422 | 1.243 | 1.339 | 1.195 | 2.233 | 1.594 |
| | | (0.83) | (0.72) | (0.77) | (0.71) | (1.16) | (0.91) |
| $NOL_{t-1}$ | | 0.281 | 0.179 | 0.430 | 0.258 | 0.903 | 0.568 |
| | | (0.23) | (0.15) | (0.35) | (0.21) | (0.66) | (0.46) |
| $Commercial_{t-1}$ | | -6.068*** | -5.964*** | -6.248*** | -6.017*** | -8.017*** | -6.647*** |
| | | (-2.93) | (-2.91) | (-2.95) | (-3.01) | (-3.38) | (-3.07) |
| Industry dummies | | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.-$R^2$ | | 0.195 | 0.194 | 0.194 | 0.196 | 0.201 | 0.192 |
| No. of Obs. | | 6,328 | 6,328 | 6,328 | 6,328 | 4,554 | 6,138 |
| $\delta_2 + \delta_4$ | $F$-stat | 0.19 | 1.90 | 0.21 | 0.35 | 0.02 | 20.54*** |
| $\delta_3 + \delta_4$ | $F$-stat | 5.97** | 6.71*** | 2.15 | 3.90** | 5.08** | 9.31*** |

Table 3(continued)

Panel C: Incremental effect of information asymmetry on relation between debt leverage and family firm.

| | Dependent variable = $Leverage_t$ | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $Maturity_t(predicted)$ | 0.394*** | 0.266*** | 0.453*** | 0.394*** | 0.375*** | 0.391*** |
| | (9.21) | (4.78) | (10.70) | (9.53) | (7.45) | (9.60) |
| $FamilyD_{t-1}$ ( $\gamma_2$) | 3.891*** | 2.787*** | 4.334*** | 3.660*** | 3.749*** | 4.378*** |
| | (4.54) | (3.02) | (4.49) | (3.98) | (3.16) | (4.69) |
| $SP500_{t-1}$ ( $\gamma_3$) | -0.604 | | | | | |
| | (-0.55) | | | | | |
| $FamilyD_{t-1} \times SP500_{t-1}$ ( $\gamma_4$) | -4.840*** | | | | | |
| | (-3.24) | | | | | |
| $Rating_{t-1}$ ( $\gamma_3$) | | 3.574*** | | | | |
| | | (3.37) | | | | |
| $FamilyD_{t-1} \times Rating_{t-1}$ ( $\gamma_4$) | | -1.339 | | | | |
| | | (-1.17) | | | | |
| $InvestGrade_{t-1}$ ( $\gamma_3$) | | | -0.590 | | | |
| | | | (-0.61) | | | |
| $FamilyD_{t-1} \times InvestGrade_{t-1}$ ( $\gamma_4$) | | | -5.146*** | | | |
| | | | (-3.84) | | | |
| $AnalystD_{t-1}$ ( $\gamma_3$) | | | | -0.039 | | |
| | | | | (-0.05) | | |
| $FamilyD_{t-1} \times AnalystD_{t-1}$ ( $\gamma_4$) | | | | -2.894** | | |
| | | | | (-2.48) | | |
| $PTranspD_{t-1}$ ( $\gamma_3$) | | | | | -0.603 | |
| | | | | | (-0.51) | |
| $FamilyD_{t-1} \times PTranspD_{t-1}$ ( $\gamma_4$) | | | | | -3.592** | |
| | | | | | (-2.51) | |
| $PIND_{t-1}$ ( $\gamma_3$) | | | | | | 0.511 |
| | | | | | | (0.73) |
| $Family_{t-1} \times PIND_{t-1}$ ( $\gamma_4$) | | | | | | 4.076*** |
| | | | | | | (3.72) |
| $MgtOwnE_{t-1}$ | -0.133** | -0.118** | -0.138** | -0.135** | -0.054 | -0.158** |
| | (-2.20) | (-2.41) | (-2.14) | (-2.23) | (-0.81) | (-2.57) |
| $FirmAge_{t-1}$ | -0.469 | -0.487* | -0.436 | -0.542* | -0.081 | -0.498 |
| | (-1.54) | (-1.78) | (-1.36) | (-1.79) | (-0.25) | (-1.64) |
| $MB_{t-1}$ | -2.696*** | -2.800*** | -2.723*** | -2.628*** | -2.267*** | -2.640*** |
| | (-7.78) | (-9.75) | (-7.28) | (-7.69) | (-5.91) | (-7.78) |
| $lnMV_{t-1}$ | 0.220 | -0.615** | 0.022 | -0.153 | -0.362 | 0.119 |
| | (0.65) | (-2.44) | (0.07) | (-0.57) | (-0.96) | (0.43) |
| $Volatility_{t-1}$ | 1.758 | -7.144 | 3.768 | 0.795 | -4.021 | 1.809 |
| | (0.19) | (-0.87) | (0.38) | (0.09) | (-0.37) | (0.19) |
| $AbEarnings_{t-1}$ | 9.761*** | 7.822*** | 10.101*** | 9.481*** | 9.675*** | 9.729*** |
| | (4.25) | (3.94) | (4.07) | (4.11) | (3.92) | (4.52) |
| $FixedAsst_{t-1}$ | 2.046 | 3.648* | 1.967 | 2.691 | 1.710 | 2.536 |
| | (0.89) | (1.72) | (0.82) | (1.16) | (0.64) | (1.10) |
| $Profit_{t-1}$ | -7.082 | -12.072*** | -4.714 | -7.721* | -16.763*** | -6.975 |
| | (-1.50) | (-2.88) | (-0.93) | (-1.65) | (-3.17) | (-1.48) |
| $ITC_{t-1}$ | -0.922 | -0.817 | -0.749 | -0.751 | -1.008 | -0.833 |
| | (-1.21) | (-1.28) | (-0.92) | (-1.00) | (-1.24) | (-1.10) |
| $NOL_{t-1}$ | 0.780 | 0.828 | 0.740 | 0.808 | 0.238 | 0.682 |
| | (1.24) | (1.51) | (1.12) | (1.29) | (0.35) | (1.09) |
| Industry and year dummies | Yes | Yes | Yes | Yes | Yes | Yes |
| Adj.-$R^2$ | 0.237 | 0.258 | 0.236 | 0.237 | 0.227 | 0.241 |
| No. of Obs. | 6,328 | 6,328 | 6,328 | 6,328 | 4,554 | 6,138 |
| $\gamma_2 + \gamma_4$ $F$-stat | 0.67 | 2.50 | 0.70* | 0.66 | 0.36 | 22.32*** |
| $\gamma_3 + \gamma_4$ $F$-stat | 16.24*** | 3.11* | 26.93*** | 10.43*** | 9.65*** | 28.07*** |

**Table 4**

The Table 4 reports 2SLS regressions of debt maturity on management ownership replicating Datta et al. (2005). *Maturity* is fraction of a firm's total debt that matures in more than 3 years. Different from our above *Leverage* definition, *Leverage* in replication regressions is long-term total debt/market value of total assets (defined as in Datta et al. (2005)). *MgtOwnI* is management ownership defined as the sum of common and restricted stock owned by the top five executives (including family founder and descendant CEOs) divided by shares outstanding. *InvestGrade1* (*InvestGrade2*) is a dummy variable coded as 1 if a firm's long-term issuer credit rating (data280) is higher than BBB- (A-) and 0 otherwise. *MBD* is a dummy variable coded as 1 if the *MB* is less than the corresponding industry median *MB* (based on two-digit SIC code) and 0 otherwise (defined as in Datta et al. (2005)). *Regulated* is a dummy variable coded as 1 if firm is in regulated industries and 0 otherwise. Regulated industries (defined as in Barclay and Smith (1995)) include railroads(SIC code 4011), trucking(4210 and 4213), airlines(4512), telecommunications(4812 and 4813) and gas and electric utilities (4900 to 4939). Other variables are defined in Table 1 and Table 2. Different from our above model specifications, all variables are measured at t period. The *t*-statistics are based on Huber-White sandwich estimate of variances and are adjusted by clustering by firm.*, **, ***, represent statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Debt maturity, family firm and management ownership.

| | Dependent variable = $Maturity_t$ | | | | | |
|---|---|---|---|---|---|---|
| | Sample period: 1992 - 1999 | Sample period:1997 – 2006 | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| $Leverage_t(predicted)$ | 1.035*** | 1.267*** | 1.326*** | 1.309*** | 1.312*** | 1.304*** |
| | (4.88) | (7.37) | (5.29) | (7.39) | (7.38) | (5.21) |
| $MgtOwnI_t$ | -0.184** | -0.138** | 0.260 | -0.107 | 0.018 | |
| | (-2.03) | (-2.29) | (1.38) | (-1.28) | (0.22) | |
| $FamilyD_t$ | | | -2.697* | | | |
| | | | (-1.76) | | | |
| $FamilyD_t \times MgtOwnI_t$ | | | -0.382* | | | |
| | | | (-1.75) | | | |
| $MgtOwnI_t \times InvestGrade1_t$ | - | - | | 0.441*** | | |
| | | | | (3.43) | | |
| $MgtOwnI_t \times InvestGrade2_t$ | | | | | -0.173 | |
| | | | | | (-1.10) | |
| $MgtOwnI_t \times MBD_t$ | - | - | | -0.310** | -0.355*** | |
| | | | | (-2.46) | (-2.75) | |
| $FamilyOwn_t$ | | | | | | -0.368*** |
| | | | | | | (-4.21) |
| $FamilyOwn_t \times MBD_t$ | | | | | | -0.216* |
| | | | | | | (-1.75) |
| $MB_t$ | 2.459* | 2.263** | 2.638** | 2.188** | 2.191** | 2.231* |
| | (1.93) | (2.51) | (2.01) | (2.47) | (2.46) | (1.82) |
| $lnMV_t$ | 19.550*** | 17.224*** | 17.053*** | 16.641*** | 16.791*** | 15.814*** |
| | (5.58) | (8.07) | (4.86) | (7.67) | (7.77) | (4.47) |
| $ln^2MV_t$ | -1.143*** | -0.930*** | -0.919*** | -0.895*** | -0.902*** | -0.855*** |
| | (-5.36) | (-7.50) | (-4.42) | (-7.08) | (-7.16) | (-4.07) |
| $Volatility_t$ | -9.173 | 10.948 | 13.963 | 11.741 | 10.981 | 8.903 |
| | (-0.54) | (0.89) | (0.82) | (0.95) | (0.89) | (0.54) |
| $AbEarnings_t$ | 9.497** | -6.377 | -7.068 | -6.815 | -6.957 | -6.941 |
| | (2.45) | (-1.19) | (-1.33) | (-1.26) | (-1.28) | (-1.32) |
| $AssetMaturity_t$ | 0.145** | 0.167*** | 0.151** | 0.159*** | 0.162*** | 0.165** |
| | (2.42) | (3.89) | (2.19) | (3.68) | (3.73) | (2.46) |
| $TermPremium_t$ | 0.827 | 0.109 | 0.144 | 0.131 | 0.131 | 0.131 |
| | (1.21) | (0.39) | (0.50) | (0.47) | (0.47) | (0.45) |
| $Rating_t$ | 7.416*** | 4.509*** | 3.942 | 3.551* | 4.336** | 4.231* |
| | (3.86) | (2.59) | (1.54) | (1.95) | (2.45) | (1.69) |
| $Regulated_t$ | -2.674 | -13.258*** | -14.143*** | -13.507*** | -13.698*** | -14.190*** |
| | (-1.47) | (-7.27) | (-4.70) | (-7.27) | (-7.33) | (-4.83) |
| Adj.-$R^2$ | 0.251 | 0.194 | 0.191 | 0.200 | 0.192 | 0.193 |
| No. of Obs. | 4,933 | 6,328 | 6,328 | 6,328 | 6,328 | 6,328 |